Virginia Soil and Water Conservation Board
Hunt and Company, Chatham, Virginia
September 15, 2026; 10:00 a.m.

AGENDA

A. Call to Order and Introductions

B. Approval of Minutes from July 24, 2026

C. Officer Elections

D. Director's report

E. Approval of Board bylaws

F. Approval of commending resolutions
   1. Charles Newton
   2. Adam Wilson

G. Report from Audit Subcommittee

H. Recommendations from the Cover Crop Subcommittee regarding approval of cover crop verification procedures

I. Overview of Joint Audit Legislative and Review Commission (JLARC) report

Dam Safety Division

J. Division Report
K. Dam Safety, Flood Prevention and Protection Assistance funds
   1. Deobligation of certain project funds
   2. Reobligation of funds

Soil and Water Conservation Division

L. Division report
M. Revision of VACS BMP Manual to conform with NRCS-Department procedures
N. Approval of Proposed Nutrient Management Training and Certification Regulations (4VAC50-85)
O. Repeal of Guidance Document related to FOIA requirements for Resource Management Plans Program
P. Approval of District Director appointments and resignations
   1. Regular appointments
   2. At-large appointments

Q. Old Business

R. New Business

S. Partner Reports
   1. Natural Resources Conservation Service
   2. Virginia Department of Agriculture and Consumer Services
   3. Virginia Cooperative Extension
   4. Virginia Association of Soil and Water Conservation Districts
   5. Chesapeake Bay Commission
   6. Virginia Agribusiness Council
   7. Virginia Farm Bureau Federation

T. Public Comment

U. Next Meetings
   - December 10, 2026; Hotel Roanoke, Roanoke, Virginia
   - Thursday, March 25, 2027
   - Tuesday, April 20, 2027
   - Thursday, May 27, 2027

For copies of the Virginia Soil and Water Conservation Board meeting materials contact Breanne Lindsey, Board and Constituent Liaison at 804.786.8445 or by email at breanne.lindsey@dcr.virginia.gov.

Virginia Soil and Water Conservation Board
Friday, July 24, 2026
Virginia Transportation Research Council – Research Council Auditorium
Charlottesville, Virginia

TIME AND PLACE

The meeting of the Virginia Soil and Water Conservation Board took place at 12:01 p.m. on Friday, July 24, 2026, at the Virginia Transportation Research Council, Research Council Auditorium in Charlottesville, Virginia.

VIRGINIA SOIL AND WATER CONSERVATION BOARD MEMBERS PRESENT

Charles Newton, Chair
Jason De La Cruz
Kevin Dunn
John Schick, Vice Chair
Leigh Pemberton
Dr. Edwin Martinez

VIRGINIA SOIL AND WATER CONSERVATION BOARD MEMBERS NOT PRESENT

Adam Wilson
Robert Mills
Stephanie Cornnell
Nick Thomas

VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION STAFF PRESENT

Sarah Spota, DCR Deputy Director
Darryl Glover, Deputy Director, Soil and Water Conservation, Dam Safety, and Floodplain Management
James Martin, Director, Division of Soil and Water Conservation
Christine Watlington Jones, Policy and District Services Manager
Lisa McGee, Director of Policy, Planning, and Legislative Affairs
Breanne Lindsey, Board and Constituent Liaison
Blair Gordon, District Operations Coordinator
Nico Robichaud, Policy and Program Assistant
Marissa Roland, DCR

OTHERS PRESENT

Darrell Kuntz, Office of the Attorney General
Darrell Marshall, VDACS
Tim Higgs, VDACS
Kevin Schmidt, VDACS
Kendall Tyree, VASWCD
David Massie, Culpeper SWCD
Melissa Allen, John Marshall SWCD
Meredith Rose, Tidewater SWCD
Kelly Snoddy, Peter Francisco SWCD

Luke Longanecker, TJSWCD
Joe Thompson, TJSWCD
Aaron Mills, TJSWCD
Michelle Carter, Three Rivers SWCD
Jim Wallace, Colonial SWCD
Sharon Conner, HCSWCD
Shelby Foosness, Shenandoah Valley SWCD
Megan Trice, Shenandoah Valley SWCD
Megen Dalton, Shenandoah Valley SWCD
Buck Tharpe, SSWCD
Martha Moore, Virginia Farm Bureau
Kevin Tate, Alliance for the Shenandoah Valley
Alston Horn, Chesapeake Bay Foundation

ESTABLISHMENT OF A QUORUM

With five (5) members of the Virginia Soil and Water Conservation Board present a quorum was established.

CALL TO ORDER AND INTRODUCTIONS

Chairman Newton called the meeting to order at 12:01 p.m. and asked for introductions.

APPROVAL OF THE MINUTES FROM JUNE 17, 2026

BOARD ACTION

Mr. Pemberton moved to approve the June 17, 2026, Board meeting minutes as amended. Mr. De La Cruz seconded the motion, which was unanimously approved by: De La Cruz, Dunn, Newton, Pemberton, and Schick.

DIRECTOR'S REPORT – *Darryl Glover, Deputy Director, Soil and Water Conservation, Dam Safety, and Floodplain Management*

Mr. Glover reported that the General Assembly adopted the revised FY2027–2028 budget at the end of June. The FY2027 budget includes funding for the Agricultural Best Management Practice (BMP) Cost Share, Technical Assistance, District Operations, district-owned dam rehabilitation and maintenance, District Support, and the Virginia Conservation Assistance Program (VCAP).

An update was provided on several initiatives related to the verification of cover crops. . DCR is incorporating training into the Conservation Planning Certification curriculum to more thoroughly teach how to verify that cover crops meet the required standards. The use of technology to assist with verification activities is being examined through a pilot study being conducted by Colonial SWCD and additional efforts by the Department to use a different set of satellite images to verify cover crop fields. The Department is also working to make an existing mobile field app more efficient and user-friendly. Additional information on these initiatives is expected to be presented at the annual Association meeting in December.

Mr. Glover also announced organizational changes. The Division Director of Soil and Water Conservation will report directly to the DCR Director and a new Deputy Agency Director is being recruited to oversee the Divisions of Dam Safety, Floodplain Management, and the Office of Resilience Planning. The Office of Environmental Education will be transferred to the Division of State Parks while maintaining its statutory focus on K–12 environmental education.

UPDATE ON FOIA MEETING RULES – *Lisa McGee, Director of Policy, Planning, and Legislative Affairs*

Ms. McGee informed the Board of changes resulting from Senate Bill 699, enacted during the 2026 Legislative Session. She explained that the legislation requires public bodies to post meeting agendas on their official government websites prior to each meeting. Once a meeting has begun, the Board generally may not take final action on items not included on the posted agenda, unless the matter is time-sensitive or properly considered in closed session as authorized by law.

Ms. McGee further explained that, for purposes of these requirements, "final action" refers to a vote or other formal decision that completes or finally resolves a matter. Routine procedural actions, such as referring an item to a committee, postponing consideration to a future meeting, directing staff to gather additional information, or issuing a commemorative proclamation, do not constitute final action and may still be taken.

APPROVAL OF BOARD POLICY ONO SOIL AND WATER CONSERVATION DISTRICT ADMINISTRATION AND OPERATIONS FUNDING ALLOCATIONS FOR FISCAL YEAR 2027 – *Christine Watlington Jones, Policy and District Services Manager*

Ms. Watlington Jones presented the proposed Policy on Soil and Water Conservation District Administration and Operations Funding Allocations for Fiscal Year 2027. She explained that the policy establishes the distribution of state appropriations to Soil and Water Conservation Districts for administrative and operational support in accordance with the 2026 Appropriation Act and the Board's statutory authority.

Ms. Watlington Jones reviewed the FY 2027 funding allocations, including funding for district administrative and operational expenses, district-owned dam maintenance, small dam repair projects, and department support services provided to the districts.

The Board discussed the two proposed funding allocation methodologies: one based on prior-year allocations and the other based on budget templates submitted by the districts. Ms. Watlington Jones explained that staff are reviewing the budget template format to improve its clarity and assist districts in completing it more accurately in the future.

BOARD ACTION

Mr. Pemberton made the following motion:

The Virginia Soil and Water Conservation Board approves the Policy on Soil and Water Conservation District Administration and Operations Funding Allocations for Fiscal Year 2027 utilizing the scenario with allocations based on the districts’ budget template submissions.

Mr. Schick seconded the motion, which was approved by: De La Cruz, Pemberton, and Schick.

Mr. Newton and Mr. Dunn opposed the motion.

APPROVAL OF ADMINISTRATION AND OPERATIONS SUPPORT GRANT AGREEMENT FOR FISCAL YEAR 2027 – *Christine Watlington Jones, Policy and District Services Manager*

Ms. Watlington Jones presented the proposed Administration and Operations Support Grant Agreement for Fiscal Year 2027 and reviewed several updates. Attachment E was revised to separate the Transfer In and Transfer Out columns. The image of the Attachment D Budget Template was removed while staff work to simplify and revise the template, including updates to the personnel worksheet and instructions. The revised template has been provided to the Peer Review Committee for review and comment, and training on the new template is planned for the spring.

BOARD ACTION

Mr. Pemberton made the following motion:

The Virginia Soil and Water Conservation Board approves the Department of Conservation and Recreation and Virginia Soil and Water Conservation District Administration and Operational Support Grant Agreement (Fiscal Year 2027).

Mr. Schick seconded the motion, which was unanimously approved by: De La Cruz, Dunn, Newton, Pemberton, and Schick.

APPROVAL OF BOARD POLICY ON SOIL AND WATER CONSERVATION DISTRICT COST-SHARE AND TECHNICAL ASSISTANCE FUNDING ALLOCATIONS FOR FISCAL YEAR 2027 – *Christine Watlington Jones, Policy and District Services Manager*

Ms. Watlington Jones provided an overview of the proposed Board Policy on Soil and Water Conservation District Cost-Share and Technical Assistance Funding Allocations for Fiscal Year 2027. She noted that the budget language was revised to reflect the adopted Appropriation Act, although a chapter number has not yet been assigned. The additional technical assistance amount was also corrected in several instances from 13% to 12% following the inclusion of $1.3 million in recordation revenue as base technical assistance funding. No additional changes were made to the policy.

BOARD ACTION

Mr. Pemberton made the following motion:

The Virginia Soil and Water Conservation Board approves the Policy and Procedures on Soil and Water Conservation District Cost-Share and Technical Assistance Funding Allocations (Fiscal Year 2027).

Mr. Schick seconded the motion, which was unanimously approved by: De La Cruz, Dunn, Newton, Pemberton, and Schick.

APPROVAL OF COST-SHARE AND TECHNICAL ASSISTANCE GRANT AGREEMENT FOR FISCAL YEAR 2027 – *Christine Watlington Jones, Policy and District Services Manager*

Ms. Watlington Jones provided an overview of the Cost-Share and Technical Assistance Grant Agreement for Fiscal Year 2027. She noted that the additional technical assistance amount was revised in several instances to reflect the correct percentage of 12% rather than 13%. No additional changes were made to the grant agreement.

BOARD ACTION

Mr. Pemberton made the following motion:

The Virginia Soil and Water Conservation Board (Board) approves the Department of Conservation and Recreation and Virginia Soil and Water Conservation District Cost-Share and Technical Assistance Grant Agreement (Fiscal Year 2027).

Mr. De La Cruz seconded the motion, which was unanimously approved by: De La Cruz, Dunn, Newton, Pemberton, and Schick.

APPROVAL OF DISTRICT DIRECTOR APPOINTMENTS AND RESIGNATIONS - *Christine Watlington Jones, Policy and District Services Manager*

The Board reviewed the following Soil and Water Conservation District Director appointments:

Lord Fairfax

Appointment of Ms. Jenna Wiles, of Frederik County, effective 7/24/2026, to fill the vacant elected director position (term of office expires 12/31/2027).

Ms. Wiles currently works on the family farm, raising produce and assisting at the farm market. Woodbine Farms was the 2025 Shenandoah River Basin Grad Award winner. She previously worked for NRCS and holds a bachelor's degree in crop and soil science from Virginia Tech.

Tri-County/City

Appointment of Ms. Pamela Scruggs, of the City of Fredericksburg, effective 7/24/2026, to fill the vacant elected director position (term of office expires 12/31/2027).

Ms. Scruggs has been with the U.S. Fish and Wildlife Service since 2008, serving first as a Program Leader for their International Affairs division focusing on international policy, regulation and financial assistance. In this role she helped establish a unit for wildlife trafficking and built a coalition of foreign government representatives and NGO partners to increase protections for sharks. In 2022 she moved to the division for ePermits and lead the agencies permitting process into the digital age. Ms. Scruggs also previously served as a Director for TCCSWCD.

BOARD ACTION

After review, Mr. Pemberton made the following motion:

The Virginia Soil and Water Conservation Board approves the appointments of the individuals being recommended.

Mr. Schick seconded the motion, which was unanimously approved by: De La Cruz, Dunn, Newton, Pemberton, and Schick.

DISCUSSION INVOLVING LETTERS RECEIVED REGARDING COVER CROP DECISIONS AT JUNE MEETING – SUBCOMMITTEE CHARGE – *Christine Watlington Jones, Policy and District Services Manager*

Ms. Watlington Jones provided an overview of the revisions to the cover crop specifications made by the Board at the June meeting. She noted that the adopted language was incorporated into all applicable cover crop specifications, including SL-8 (Protective Cover for Specialty Crops), SL-8B (Small Grain and Mixed Cover Crop for Nutrient Management and Residue Management), SL-8H (Harvestable Cover Crops), SL-8M (Small Grain and Mixed Cover Crop for Nutrient Management and Residue Management with Fall Manure Application), WFA-CC (Whole Farm Approach – Cover Crop Bundle), and WQ-4 (Legume Based Cover Crop).

Ms. Watlington Jones provided the language adopted at the June meeting:

"A good stand and good growth of vegetative winter cover must be obtained by January 1 to protect the area from runoff in the fall and winter. All cover crop plantings must maintain a minimum of 60% cover crop plant material on the enrolled acres from January 1 through the lifespan of the practice. District staff will conduct field visits no later than January 31 to verify required cover has been established."

The Board discussed the language and the letters received regarding the action taken to approve the language at the June meeting.

BOARD ACTION

Mr. Dunn made the following motion:

The Virginia Soil and Water Conservation Board (Board) approves the removal of the following language in the current WQ-4 specification (2027 program year):

#7. A good stand and good growth of vegetative winter cover must be obtained by January 1 to protect the area from runoff in the fall and winter. All cover crop plantings must maintain a minimum of 60% cover crop plant material on the enrolled acres from January 1 through the lifespan of the practice. District staff will conduct field visits no later than January 31 to verify required cover has been established.

Mr. De La Cruz seconded the motion, which was unanimously approved by: De La Cruz, Dunn, Newton, Pemberton, and Schick.

Ms. Watlington Jones reviewed the topics that will be the focus for the Subcommittee that was established at the June meeting. After discussion, the Board confirmed the following topics will be addressed by the Subcommittee:

- What specifications require the 60% cover verification?
- How to verify 60% cover (methodology)?
- How does the Board (Department) ensure that the verifications are done in accordance with Board directives?
- Ways to make sure cover crop "works with" the nutrient management plan
    - Soil loss versus nutrient reductions (different category of BMP)?
- Opportunities available from satellite imagery
- Is there a way for the verification date and date by which cover is established to be the same?
    - Variable verification date based on planting date (geographic area)
- Ensure input from Districts regarding, at a minimum, the workload impact is received. How to train staff?

Ms. Watlington Jones also informed the Board that the Subcommittee will attend the nutrient management and cover crop training being provided by the Virginia Association of Conservation District Employees at Graves Mountain on August 20, followed by a Subcommittee meeting.

BOARD ACTION

Mr. Pemberton moved to approve the topics that will be the focus of the Subcommittee. Mr. Dunn seconded the motion, which was unanimously approved by: De La Cruz, Dunn, Newton, Pemberton, and Schick.

OLD BUSINESS

There was no old business for the Board to consider.

NEW BUSINESS

There was no new business for the Board to consider.

PUBLIC COMMENT

Martha Moore, Virginia Farm Bureau, provided public comment about the TAC process.

Buck Tharpe, SSWCD, provided public comment about cover crops.

PARTNER REPORTS

Natural Resources Conservation Service – John Womack

Dr. Martinez gave the report for the Natural Resources Conservation Service.

Virginia Association of Soil and Water Conservation Districts – Dr. Kendall Tryree, VASWCD Executive Director

Dr. Tyree gave the report for the Virginia Association of Soil and Water Conservation Districts.

NEXT MEETINGS

The Board was reminded of the dates for the next two meetings:

- September 14-15, 2026; location to be determined
- December 10, 2026; Hotel Roanoke, Roanoke, VA

ADJOURN

The meeting adjourned at 1:03 p.m.

Approval of Board By-laws

§ 10.1-502. Soil and Water Conservation Board; composition.

The Virginia Soil and Water Conservation Board is continued and shall perform the functions conferred upon it in this chapter. The Board shall consist of nine nonlegislative citizen members and one ex officio member with nonvoting privileges. The Director of the Department of Conservation and Recreation or his designee shall be a nonvoting ex officio member of the Board. Three nonlegislative citizen members of the Board shall be appointed by the Governor as at-large members, of whom at least two members shall have a demonstrated interest in natural resource conservation with a background or knowledge in dam safety, soil conservation, or water quality protection. Additionally, four nonlegislative citizen members shall be farmers at the time of their appointment and two nonlegislative citizen members shall be farmers or district directors. Each of the six nonlegislative members who is a farmer or district director shall be a resident of a different one of the six geographic areas represented in the Virginia Association of Soil and Water Conservation Districts and shall be appointed by the Governor from a list of two qualified nominees for each vacancy jointly submitted by the Board and the Board of Directors of the Virginia Association of Soil and Water Conservation Districts in consultation with the Virginia Farm Bureau Federation and the Virginia Agribusiness Council. Nonlegislative citizen members shall be appointed for a term of four years. All appointed members shall not serve more than two consecutive full terms. Appointments to fill vacancies shall be made in the same manner as the original appointments, except that such appointments shall be for the unexpired terms only. The Board may invite the Virginia State Conservationist, Natural Resources Conservation Service, to serve as an advisory nonvoting member. <u>The Board shall keep a record of its official actions and adopt a seal and may perform acts, hold public hearings, and adopt regulations necessary for the execution of its functions under this chapter.</u>

<u>Recommended Motion:</u>

The Virginia Soil and Water Conservation Board approves the Board By-laws as presented by the Department.

VIRGINIA SOIL AND WATER CONSERVATION BOARD

By-Laws

Adopted: May 15, 1997

Revised: ~~September 18, 2024~~ September 15, 2026

ARTICLE I

NAME

The name of the board shall be the Virginia Soil and Water Conservation Board hereinafter referred to as the "Board".

ARTICLE II

AUTHORIZATION

The Board was established within Chapter 5 of Title 10.1 of the *Code of Virginia* (1950) as amended, (§10.1-502 – 10.1-505).

ARTICLE III

MISSION

The Board shall provide for the conservation of soil and water resources; control and prevention of soil erosion, flood water and sediment damage; oversee and support the programs of the soil and water conservation districts; and preserve the natural resources of the Commonwealth as set forth in §10.1-505 and elsewhere in the *Code*. The Board shall have the authority to promulgate regulations as may be conferred in the *Code* or in the Virginia Acts of Assembly.

ARTICLE IV

LOCATION

The office of the Board shall be located within the Department of Conservation and Recreation (DCR) at 600 East Main Street, 24th Floor, Richmond, Virginia.

ARTICLE V

POWERS AND DUTIES

The Board shall have all of the rights, powers, and duties bestowed by and be subject to the limitations and restrictions set forth in §§10.1-502, 10.1-503, 10.1-504 and 10.1-505 of the *Code*, or as may be conferred elsewhere in the *Code* or in the Virginia Acts of Assembly.

ARTICLE VI

MEMBERSHIP

Section 1: COMPOSITION: Pursuant to §10.1-502 of the *Code of Virginia.*

The Board shall consist of nine nonlegislative citizen members and one ex officio member with nonvoting privileges. The Director of the Department of Conservation and Recreation or his designee shall be a nonvoting ex officio member of the Board. Three nonlegislative citizen members of the Board shall be appointed by the Governor as at-large members, of whom at least two members shall have a demonstrated interest in natural resource conservation with a background or knowledge in dam safety, soil conservation, or water quality protection. Additionally, four nonlegislative citizen members shall be farmers at the time of their appointment and two nonlegislative citizen members shall be farmers or district directors. Each of the six nonlegislative members who is a farmer or district director shall be a resident of a different one of the six geographic areas represented in the Virginia Association of Soil and Water Conservation Districts and shall be appointed by the Governor from a list of two qualified nominees for each vacancy jointly submitted by the Board and the Board of Directors of the Virginia Association of Soil and Water Conservation Districts in consultation with the Virginia Farm Bureau Federation and the Virginia Agribusiness Council. Nonlegislative citizen members shall be appointed for a term of four years. All appointed members shall not serve more than two consecutive full terms. Appointments to fill vacancies shall be made in the same manner as the original appointments, except that such appointments shall be for the unexpired terms only. The Board may invite the Virginia State Conservationist, Natural Resources Conservation Service, to serve as an advisory nonvoting member.

Section 2: BOARD NOMINATION:

The Board shall accept nominations submitted by the Board of Directors of the Virginia Association of Soil and Water Conservation Districts, in consultation with the Virginia Farm Bureau Federation and the Virginia Agribusiness Council, for those members that do not serve at-large. The Board shall direct those nominations to be forwarded to the Secretary of the Commonwealth for consideration for appointment.

Section 3: TERM OF OFFICE

Board members shall be appointed to serve a term of four years. Appointments to fill vacancies shall be for the unexpired terms only. A Board member whose term has expired shall continue to serve until their successor has been appointed.

Section 4: OFFICERS

The Board shall elect from its membership a Chair, Vice-Chair and such other officers as it deems appropriate and such officers shall serve until the end of the fiscal year and thereafter shall be elected annually.

(a) CHAIR

The Chair shall preside at all meetings of the Board at which he is present and shall vote as any other member. The Chair may appoint committees, subcommittee members, call special meetings as necessary, provide representation as the Board's spokesperson, designate members as hearing officers, and perform such other duties as the Board may direct.

(b) VICE-CHAIR

The Vice Chair shall, in the absence of the Chair, have authority to perform all duties and exercise all powers of the Chair and shall perform other duties as the Board may direct. In the absence of both the Chair and the Vice-Chair, the Chair shall appoint a Chair Pro Tempore to preside for that meeting.

(c) ADMINISTRATIVE OFFICER

The Director of the Department of Conservation and Recreation shall provide technical experts and other agents and employees necessary for the execution of the functions of the Board. The Director, or designee, shall serve as the Administrative Officer of the Board. The Administrative Officer will be responsible for administrative requirements of the Board and for maintaining the official minutes and other records of the Board.

(d) AUDIT SUBCOMMITTEE

In accordance with Board action at the April 20, 2017 meeting, the Chair shall appoint an Audit Subcommittee that shall have the powers and duties to review all audit and deliverable materials and to make recommendations and to advance communications based on their assessments, or instruct the Department to take such recommended actions. Any such actions shall be communicated to the full body of the Board. Substantive actions, such as actions related to funding adjustments, shall be referred to the full Board for action. The Subcommittee shall be composed of three members and include the Board's Vice Chair, who shall serve as the Subcommittee Chair, one appointed at-large member, and one appointed member from the members nominated by the Association of Soil and Water Conservation Districts in accordance with §10.1-502 of the *Code of Virginia*.

Two members of the Subcommittee shall constitute a quorum and a majority of those present and voting shall be required for all determinations. The Subcommittee Chair shall determine and declare that a quorum is present prior to the conduct of business at any meeting.

Section 5: REIMBURSEMENT OF EXPENSES

The Board members shall be reimbursed pursuant to applicable state travel regulations for actual expenses incurred in the discharge of their Board related duties.

ARTICLE VII

MEETINGS

Section 1: REGULAR MEETINGS

The Board shall hold no less than three (3) regular meetings during each fiscal year at a time and place to be determined by the Board. Additional meetings may be held as determined by the ~~Chairman~~ Chair or the Director of the Department of Conservation and Recreation. All meetings of the Board shall be conducted in accordance with the Virginia Freedom of Information Act.

Section 2: MEETING NOTICE

Meeting notices will be published in accordance with the Virginia Freedom of Information Act. Notices will be published on the Virginia Regulatory Town Hall, the Commonwealth Calendar, the Department website, and in a public location at the Department's central office. At least two weeks' notice for regular meetings and one week's notice for special meetings will be given to all members. The notice will state the time, place, and purpose of the meeting~~, and a draft agenda~~ in accordance with §2.2-3707 of the *Code*. ~~No changes to the agenda will be made less than seven days from the date of the meeting. The Chair has discretion to waive this requirement in consultation with Department staff.~~

Section 3: MEETING AGENDA

An agenda for each meeting will be provided for all members no less than one week prior to a regular meeting and no less than 3 days prior to a special meeting. No changes may be made to the agenda after it has been provided to the members; however, the Chair has the discretion to waive this requirement.

Pursuant to §2.2-3707 of the *Code*, no final action may be taken on items added to the agenda after the meeting commences unless they are time-sensitive or are the subject of a closed meeting identified in accordance with §2.2-3711. Final action means a vote or other action that completes a matter or acts as final consideration of an item. Final action does not include (i) referral to a committee or advisory body; (ii) referral to a future meeting for action; (iii) directing staff to provide further information; or (iv) issuance of a commending or memorial resolution.

Section~~:~~ ~~3~~4: PARLIAMENTARY AUTHORITY

The Rules contained in the most current edition of Robert's Rules of Order Newly Revised shall govern the procedures and processes of the Board and its committees in all cases to which they are applicable and in which they are not inconsistent with these bylaws and any special order the Board may adopt.

Section ~~4~~5: MINUTES

In accordance with §2.2-3701.1 of the Code, ~~Draft~~ draft minutes shall be ~~provided~~ posted by the Administrative Officer ~~within~~ no later than 10 working days following any meeting. Draft minutes shall be posted on the Virginia Regulatory Town Hall and provided to members for review. Final minutes will be available within three (3) working days of Board approval and shall be posted on the Virginia Regulatory Town Hall and the Virginia Commonwealth Calendar.

Section ~~5~~6: QUORUM

Five members of the Board shall constitute a quorum and a majority of those present and voting shall be required for all determinations. The Chair shall determine and declare that a quorum is present prior to the conduct of business at any meeting.

ARTICLE VIII

INDEMNIFICATION

Every Board member shall be indemnified by the *Risk Management Plan of the Commonwealth of Virginia* according to the terms and requirements of that Plan and its enabling statutes.

ARTICLE IX

FREEDOM OF INFORMATION ACT

The members of the Board shall ensure compliance with the Virginia Freedom of Information Act (§2.2-3700 et seq.). Meetings shall be open to the public and all public records shall be available for inspection and copying upon request unless an exemption is properly invoked.

The members of the Board will ensure that electronic communications relating to the transaction of Board business are copied to the central Board email account managed by the Department of Conservation and Recreation: vswcb@dcr.virginia.gov.

ARTICLE X

AUDIT

The records of the Board shall be subject to audit by the Department Director or designee and by the Auditor of Public Accounts or legal representative on an annual basis. The Board's fiscal year shall be the same as the Commonwealth's.

ARTICLE XI

APPOINTMENTS

The Board may request the Department to appoint competent individuals to assist the Board in carrying out its duties.

ARTICLE XII

AMENDMENTS OF BY-LAWS

These By-laws may be amended or repealed at any regular meeting of the Board by a two-thirds vote of the members present provided that the members are notified of the nature and effect of any proposed amendment in advance or the meeting and provided the amendment is not in conflict with any applicable state and federal laws and regulations.

These by-laws will be reviewed on a biennial basis by the Board and the Department Director. The by-laws shall be on file, available for review and copying at the Virginia Department of Conservation and Recreation, 600 East Main Street, 24th floor, Richmond, VA 23219.

Approval of resolutions recognizing Charles Newton and Adam Wilson

§ 10.1-502. Soil and Water Conservation Board; composition.

The Virginia Soil and Water Conservation Board is continued and shall perform the functions conferred upon it in this chapter. The Board shall consist of nine nonlegislative citizen members and one ex officio member with nonvoting privileges. The Director of the Department of Conservation and Recreation or his designee shall be a nonvoting ex officio member of the Board. Three nonlegislative citizen members of the Board shall be appointed by the Governor as at-large members, of whom at least two members shall have a demonstrated interest in natural resource conservation with a background or knowledge in dam safety, soil conservation, or water quality protection. Additionally, four nonlegislative citizen members shall be farmers at the time of their appointment and two nonlegislative citizen members shall be farmers or district directors. Each of the six nonlegislative members who is a farmer or district director shall be a resident of a different one of the six geographic areas represented in the Virginia Association of Soil and Water Conservation Districts and shall be appointed by the Governor from a list of two qualified nominees for each vacancy jointly submitted by the Board and the Board of Directors of the Virginia Association of Soil and Water Conservation Districts in consultation with the Virginia Farm Bureau Federation and the Virginia Agribusiness Council. Nonlegislative citizen members shall be appointed for a term of four years. All appointed members shall not serve more than two consecutive full terms. Appointments to fill vacancies shall be made in the same manner as the original appointments, except that such appointments shall be for the unexpired terms only. The Board may invite the Virginia State Conservationist, Natural Resources Conservation Service, to serve as an advisory nonvoting member. The Board shall keep a record of its official actions and adopt a seal and may perform acts, hold public hearings, and adopt regulations necessary for the execution of its functions under this chapter.

Recommended Motion:

The Virginia Soil and Water Conservation Board approves the resolutions for Charles Newton and Adam Wilson with deep appreciation for their significant contributions to this Board.

Resolution to

Charles Newton

WHEREAS, Charles Newton has faithfully and diligently served as a member of the Virginia Soil and Water Conservation Board since September 2018; and

WHEREAS, Charles Newton has devoted generously of his time, talent, and leadership to the Board; and

WHEREAS, Charles Newton served as Chair of the Board from September 2023 through the remainder of his term on the Board; and

WHEREAS, Charles Newton has endeavored at all times to render decisions with fairness, good judgement, and in the best interest of the Board; and

WHEREAS, Mr. Newton has served the Shenandoah Valley Soil and Water Conservation District as an elected Director since 2008, including service as Treasurer and Chair of its Finance Committee, and has further devoted himself to the conservation of Virginia's natural resources through a distinguished career with the National Park Service and through his service to the Page County Planning Commission, the Page County Water Quality Advisory Committee, and the Page County Tree Board; and

WHEREAS, the Virginia Soil and Water Conservation Board wishes to acknowledge its gratitude and deepest appreciation for his services to this Board, recognizing with gratitude his contributions and dedication to protecting the quality of the land and water resources of the Commonwealth of Virginia.

NOW THEREFORE BE IT RESOLVED, by the Virginia Soil and Water Conservation Board this fifteenth day of September 2026 that Charles Newton be given all honors and respect due him for his outstanding service to the Commonwealth and its citizens and the Virginia Soil and Water Conservation Board; and

BE IT FURTHER RESOLVED, that this Resolution be presented to him and be made a part of the official minutes of the Board so that all may know of the high regard in which he is held.

______________________	______________________
, Chair	Nikki Rovner, Director

Resolution to

Adam D. Wilson

WHEREAS, Adam Wilson has faithfully and diligently served as a member of the Virginia Soil and Water Conservation Board since December 2017; and

WHEREAS, Adam Wilson has devoted generously of his time, talent, and leadership to the Board; and

WHEREAS, Adam Wilson served as Vice-Chair of the Board from 2019 through September 2025; and

WHEREAS, Adam Wilson has endeavored at all times to render decisions with fairness, good judgement, and in the best interest of the Board; and

WHEREAS, Mr. Wilson has demonstrated his commitment to agriculture and conservation through his service as Chairman of the Clinch Valley Soil and Water Conservation District and as a member and Treasurer of the Holston River Soil and Water Conservation District; and

WHEREAS, Mr. Wilson's agricultural leadership and stewardship have been recognized through honors including the Clean Water Farm Award and Progressive Farmer's Best Young Farmers and Ranchers Award; and

WHEREAS, the Virginia Soil and Water Conservation Board wishes to acknowledge its gratitude and deepest appreciation for his services to this Board, recognizing with gratitude his contributions and dedication to protecting the quality of the land and water resources of the Commonwealth of Virginia.

NOW THEREFORE BE IT RESOLVED, by the Virginia Soil and Water Conservation Board this fifteenth day of September 2026 that Adam Wilson be given all honors and respect due him for his outstanding service to the Commonwealth and its citizens and the Virginia Soil and Water Conservation Board; and

BE IT FURTHER RESOLVED, that this Resolution be presented to him and be made a part of the official minutes of the Board so that all may know of the high regard in which he is held.

________________________	________________________
, Chair	Nikki Rovner, Director

Recission of projects previously funded by the Dam Safety, Flood Prevention, and Protection Assistance Fund

§ 10.1-603.18. Administration of the Fund.

The Authority shall administer and manage the Fund, and establish the interest rates and the repayment terms of such loans as provided in this article, in accordance with a memorandum of agreement with the Director. The Director shall, after consultation with all interested parties, develop a guidance document governing project eligibility and project priority criteria, and the Director, upon approval from the Virginia Soil and Water Conservation Board, shall direct the distribution of loans and grants from the Fund to local governments and private entities. In order to carry out the administration and management of the Fund, the Authority may employ officers, employees, agents, advisers and consultants, including without limitation, attorneys, financial advisors, engineers, and other technical advisors and public accountants, and determine their duties and compensation without the approval of any other agency or instrumentality. The Authority may disburse from the Fund reasonable costs and expenses incurred in the administration and management of the Fund and may establish and collect a reasonable fee for its management services. However, any such fee shall not exceed one-eighth of one percent of any bond par, loan or grant amount.

Approved Board motion from May 20, 2021 and June 24, 2022

1. All grants are made on a reimbursement basis and will be governed by a Grant Agreement developed in consultation with the Virginia Resources Authority. All applicants will be given a period of 90 days to enter into a Grant Agreement following the Agreement being sent. The Department of Conservation and Recreation (Department) is authorized to further extend this date in its discretion and following consultation with VRA.

2. All grant agreements will require that projects be completed within 12 months of the date of execution of the Agreement. Upon receipt of a written request for a project extension with a specified completion date by the Grantee to the Department with a copy to VRA, the Department is authorized to consider such request and may amend the terms of the Agreement and allow a specified extension upon the Department's and the Authority's written approval. Extension requests must be received by the Department not later than 90 days prior to the expiration of the original agreement or grant funds are subject to rescission at the Departments discretion. No extensions shall exceed an additional year without specific Board approval.

3. In the event that any of the above applicants fail to execute a Grant Agreement with VRA within 90 days of such an Agreement being sent to the applicant, the Department, in consultation with VRA, is authorized to rescind those grant funds and allocate in subsequent grant rounds.

Approved Board motion from June 12, 2023

1. All grants are made on a reimbursement basis and will be governed by a Grant Agreement developed in consultation with the Virginia Resources Authority. All applicants will be given a period of 90 days to enter into a Grant Agreement following the Agreement being sent. The Department of Conservation and Recreation (Department) is authorized to further extend this date in its discretion and following consultation with VRA.

2. All grant agreements will require that projects be completed within 24 months of the date of execution of the Agreement. Upon receipt of a written request for a project extension with a specified completion date by the Grantee to the Department with a copy to VRA, the Department is authorized to consider such request and may amend the terms of the Agreement and allow a specified extension upon the Department's and the Authority's written approval. Extension requests must be received by the Department not later than 90 days prior to the expiration of the original agreement or grant funds are subject to rescission at the Department's discretion. No extensions shall exceed an additional year without specific Board approval.

3. In the event that any of the above applicants fail to execute a Grant Agreement with VRA within 90 days of such an Agreement being sent to the applicant, the Department, in consultation with VRA, is authorized to rescind those grant funds and allocate in subsequent grant rounds.

Approved Board motion from June 12, 2023 (ARPA funds)

1. ll grants are made on a reimbursement basis and will be governed by a Grant Agreement. All applicants will be given a period of 90 days to enter into a Grant Agreement following the Agreement being sent. The Department of Conservation and Recreation (Department) is authorized to further extend this date in its discretion.

2. All grant agreements will require that projects be completed within 24 months of the date of execution of the Agreement. Upon receipt of a written request for a project extension with a specified completion date by the Grantee to the Department, the Department is authorized to consider such request and may amend the terms of the Agreement and allow a specified extension upon the Department's written approval. Extension requests must be received by the Department not later than 90 days prior to the expiration of the original agreement or grant funds are subject to rescission at the Department's discretion. No extensions shall exceed an additional year without specific Board approval.

3. In the event that any of the above applicants fail to execute a Grant Agreement within 90 days of such an Agreement being sent to the applicant, the Department is authorized to rescind those grant funds and allocate in subsequent grant rounds.

Background:

There are numerous projects that were awarded funds from the Dam Safety, Flood Prevention, and Protection Assistance Fund that have not fully expended the awards. Awardees may not have returned grant agreements or requested their projects be cancelled; projects may have cost savings; or in some instances, the project timeline may have expired but no communication was received from the awardee.

The Department is recommending the Board rescind previous approvals of these projects and unobligates the funding associated with those projects – $1,626,481. 11 in funds provided through the American Rescue Plan Act of 2021 and $947,210.65 in state funds.

Recommended Motion:

The Virginia Soil and Water Conservation Board approves the recission of these projects and unobligates the funding associated with these projects.

Motion made by: ______________________________________

Motion seconded by: ______________________________________

Action: ______________________________________

________________________________ ______________________________________

, Chair Nikki Rovner, Director

Year	Grant Number	ARPA	Dam ID	Dam Name	Remaining Match Funds
2023	DSFP-354-23	No	61066	Colten Inc Dam	$1,750.00
2023	DSFP-389-23	No	760006	Hobby Hill Dam	$1,352.02
2023	DSFP-390-23	No	760006	Hobby Hill Dam	$5,001.59
2023	DSFP-399-23	No	760005	Youngs Pond Dam	$1,352.02
2023	DSFP-400-23	No	760005	Youngs Pond Dam	$5,001.59
2022	DSFP-266-22	No	143014	Deer Wood Springs Dam	$11,450.00
2022	DSFP-267-22	No	143014	Deer Wood Springs Dam	$2,500.00
2023	DSFP-430-23	No	67005	Burdettes Dam	$2,450.00
2025	DSFP-553-25	No	127003	Diascund Creek Dam	$287,764.00
2021	DSFP-07-21	No	199016	Queens Lake Dam	$782.50
2021	DSFP-13-21	No	87002	Canterbury Dam	$0.50
2021	DSFP-18-21	No	87005	Echo Dam	$167.50
2021	DSFP-35-21	No	3205	Mountain Valley Dam 1	$1,183.37
2021	DSFP-54-21	No	87013	Wellesley Dam	$537.20
2021	DSFP-68-21	No	800001	Lake Cohoon Dam	$56,895.63
2021	DSFP-74-21	No	800013	Lake Meade Dam	$7,530.63
2021	DSFP-79-21	No	N/A	Town of Abingdon Flood Project	$6,796.25
2022	DSFP-109-22	No	127001	Woodhaven Dam	$222,000.00
2022	DSFP-115-22	No	73006	Burke Dam	$2,578.33
2022	DSFP-129-22	No	65036	Fluvanna County Dam #7	$2,323.75
2022	DSFP-138-22	No	3060	Mt. Amos Dam	$112.50
2022	DSFP-139-22	No	3060	Mt. Amos Dam	$112.50
2022	DSFP-187-22	No	127004	Cattail Swamp Dam	$561.00
2022	DSFP-188-22	No	75068	Dovershire Dam	$1,235.50
2022	DSFP-221-22	No	73006	Burke Dam	$1,555.84
2022	DSFP-226-22	No	41039	Izaak Walton Park Dam	$50.00
2022	DSFP-271-22	No	177037	Spotsylvania County Dam #10	$5,170.00
2022	DSFP-279-22	No	61065	CJ Koehr Dam	$250.00
2022	DSFP-301-22	No	75028	Rivergate Lake Dam	$0.00
2022	DSFP-308-22	No	127008	Old Forge Pond Dam	$2,500.00
2022	DSFP-310-22	No	127008	Old Forge Pond Dam	$750.00
2023	DSFP-316-23	No	65036	Fluvanna County Dam #7	$129.06
2023	DSFP-331-23	No	75068	Dovershire Dam	$1,645.87
2023	DSFP-365-23	No	3154	Irish Langhorne Dam	$2,500.00
2023	DSFP-368-23	No	7005	Davenports Pond Dam	$2,500.00
2023	DSFP-374-23	No	49014	Atkins Dam	$450.00

2023	DSFP-388-23	No	193005	Horners Dam	$650.00
2023	DSFP-409-23	No	61114	Valley Green Dam	$12.50
2021	DSFP-23-21	No	85006	Gaines Mill Dam	$3,000.00
2021	DSFP-24-21	No	49001	Trices Lake Dam	$1,000.00
2021	DSFP-25-21	No	49001	Trices Lake Dam	$1,000.00
2021	DSFP-26-21	No	19022	Ivy Hill Dam	$900.00
2021	DSFP-27-21	No	19021	Lake Vista Dam #1	$780.00
2021	DSFP-28-21	No	19021	Lake Vista Dam #1	$1,250.00
2021	DSFP-38-21	No	159009	Connellee Dam	$1,100.00
2021	DSFP-39-21	No	159009	Connellee Dam	$11,000.00
2021	DSFP-46-21	No	3162	Clover Dam	$12,500.00
2021	DSFP-47-21	No	179037	Leeland Lake Dam	$3,900.00
2021	DSFP-53-21	No	155006	Lake Powhatan Dam	$8,500.00
2022	DSFP-100-22	No	3190	Murray Lake Dam	$1,250.00
2022	DSFP-108-22	No	3148	Whites / Roseland Farm Dam	$2,500.00
2022	DSFP-124-22	No	81007	Smiths Dam	$750.00
2022	DSFP-172-22	No	145020	Southern Service Corp. Dam	$7,500.00
2022	DSFP-173-22	No	145020	Southern Service Corp. Dam	$7,500.00
2022	DSFP-175-22	No	145020	Southern Service Corp. Dam	$7,500.00
2022	DSFP-193-22	No	65027	Fluvanna County Dam #1	$1,250.00
2022	DSFP-194-22	No	65027	Fluvanna County Dam #1	$15,000.00
2022	DSFP-195-22	No	65027	Fluvanna County Dam #1	$1,000.00
2022	DSFP-196-22	No	65027	Fluvanna County Dam #1	$500.00
2022	DSFP-198-22	No	119016	Healys Mill Dam	$11,881.00
2022	DSFP-200-22	No	119001	Healys Dam	$1,364.00
2022	DSFP-201-22	No	93007	Echo Dam	$1,000.00
2022	DSFP-202-22	No	119016	Healys Mill Dam	$1,346.00
2022	DSFP-203-22	No	93007	Echo Dam	$1,250.00
2022	DSFP-204-22	No	119016	Healys Mill Dam	$1,279.00
2022	DSFP-205-22	No	119001	Healys Dam	$1,279.00
2022	DSFP-211-22	No	53003	Picture Dam	$11,000.00

2022	DSFP-212-22	No	53003	Picture Dam	$2,000.00
2022	DSFP-222-22	No	21001	Hunting Camp Dam	$22,460.00
2022	DSFP-251-22	No	175001	Colgate Darden Dam	$2,500.00
2022	DSFP-258-22	No	107005	Archbold Dam	$17,500.00
2022	DSFP-259-22	No	107005	Archbold Dam	$1,000.00
2022	DSFP-260-22	No	107005	Archbold Dam	$750.00
2022	DSFP-261-22	No	107005	Archbold Dam	$750.00
2022	DSFP-278-22	No	21001	Hunting Camp Dam	$3,760.00
2022	DSFP-288-22	No	33010	Temples Mill Dam	$16,500.00
2022	DSFP-293-22	No	19113	Fessler dam	$1,750.00
2022	DSFP-294-22	No	19113	Fessler dam	$9,400.00
2022	DSFP-295-22	No	19113	Fessler dam	$2,350.00
2022	DSFP-94-22	No	23007	Greenfield Lake Dam	$15,900.00
2022	DSFP-96-22	No	23007	Greenfield Lake Dam	$600.00
2022	DSFP-97-22	No	3148	Whites / Roseland Farm Dam	$1,250.00
2022	DSFP-98-22	No	3190	Murray Lake Dam	$12,200.00
2022	DSFP-99-22	No	3190	Murray Lake Dam	$3,650.00
2023	DSFP-340-23	No	49048	JCM LLC Dam	$1,375.00
2023	DSFP-341-23	No	49048	JCM LLC Dam	$10,700.00
2023	DSFP-342-23	No	49048	JCM LLC Dam	$1,750.00
2023	DSFP-378-23	No	147061	Prince Edward County Dam # 9	$9,550.00
2023	DSFP-379-23	No	147061	Prince Edward County Dam # 9	$1,550.00
2023	DSFP-380-23	No	147061	Prince Edward County Dam # 9	$700.00
2023	DSFP-385-23	No	107018	Bell Dam	$2,225.00
2023	DSFP-386-23	No	107018	Bell Dam	$15,500.00
2023	DSFP-387-23	No	107018	Bell Dam	$5,750.00
2023	DSFP-406-23	No	49045	Earl Collier Dam	$9,550.00
2023	DSFP-407-23	No	49045	Earl Collier Dam	$1,550.00
2023	DSFP-423-23	No	141056	Moore Dam	$6,875.00
2023	DSFP-424-23	No	141056	Moore Dam	$4,187.50
2023	DSFP-425-23	No	141056	Moore Dam	$1,947.50
				Total	**$947,210.65**

WATERWORKS DEPARTMENT

Newport News Waterworks Department
Quality • Reliability • Community

CITY OF NEWPORT NEWS

BUSINESS SERVICES DIVISION
700 TOWN CENTER DRIVE, SUITE 400
NEWPORT NEWS, VIRGINIA 23606
(757) 926-1090

July 8, 2026

Leanne Petroziello
Grants Manager
Virginia Department of Conservation and Recreation
600 East Main Street, 24th Floor
Richmond, VA 23219

Dear Ms. Petroziello:

On behalf of the City of Newport News Waterworks, I am writing to formally request rescission of our grant acceptance for the Dam Safety, Flood Prevention and Protection Assistance Fund (DSFPPAF) award under Grant No. DSFP-553-25 for the Diascund Creek Dam Geotechnical Investigation and/or Structural Analysis for Dam/Spillway Stability project, which totaled $287,764.

After further review of the project and funding timeline, Waterworks has determined that we are no longer able to utilize the grant funding. As a result, we respectfully request that the grant award be rescinded.

We appreciate the Department's support and consideration of our application and thank you for your assistance throughout this process.

If any additional documentation is needed to complete the rescission, please let us know.

Respectfully,

Y. Le Gouellec

Yann Le Gouellec
Director, Newport News Waterworks

Yl/kst

cc: Leanne Petroziello
Yann Le Gouellec

Year	Grant Number	ARPA	Dam ID	Dam Name	Remaining Match Funds
2023	DSFP-434-23	Yes	67005	Burdettes Dam	$7,500.00
2023	DSFP-317-23	Yes	65036	Fluvanna County Dam #7	$1,220.00
2023	DSFP-391-23	Yes	179007	Lake Arrowhead Dam	$500,000.00
2023	DSFP-313-23	Yes	65010	Lake Monticello Settlement Pond Dam	$3,640.00
2024	DSFP-517-24	Yes	127001	Woodhaven Dam	$1,041,247.30
2024	DSFP-469-24	Yes	75068	Dovershire Dam	$3,000.00
2023	DSFP-356-23	Yes	33032	Lake Heritage Dam	$63,708.75
2024	DSFP-462-24	Yes	800023	Lake Kilby Water Treatment Plant Sludge Lagoon Dam	$6,165.06
				Total	**$1,626,481.11**

WOODHAVEN PROPERTY OWNERS' ASSOCIATION
7242 LAKESHORE DRIVE
QUINTON, VA 23141
804-932-4287 - OFFICE

March 30, 2026

Jack Shaw
Department of Conservation and Recreation
600 E. Main St., 24th Floor
Richmond, VA 23219

Subject: Woodhaven Property Owners Association (WPOA) – Grant DSFP-517-24

Dear Mr. Shaw,

The Woodhaven Shores neighborhood, established in 1959, consists of approximately 500 homes. The community includes about 11 miles of private roads, a beach, a pavilion, an office, 11 common areas, and a 150-acre lake with a dam and spillway.

The Woodhaven Property Owners Association (WPOA) is responsible for the operation and maintenance of these community amenities. Maintaining and upgrading these aging infrastructures requires significant and ongoing financial investment. For example, the large culverts for the main streams feeding Kent Lake recently required replacement. In addition to the dam upgrade, WPOA faces substantial annual expenditures.

Woodhaven Shores is primarily composed of low-to middle-income households. The cost of the dam and spillway expansion represents a significant financial burden for many residents. Nonetheless, WPOA is actively working toward this upgrade and has already saved $200,000 for the project.

WPOA has also met with Primis Bank to explore financing options necessary to meet the Department of Conservation and Recreation's (DCR) dam grant requirements. Unfortunately, Primis informed us that they are unable to provide funding due to WPOA's limited authority to enforce dues collection. As the neighborhood predates the Virginia Property Owners' Association Act, WPOA cannot mandate dues payment. Our only recourse is to place liens on properties with unpaid dues and collect those dues upon the sale of the property. This irregular cash flow and limited collateral make traditional bank financing unfeasible.

Given these constraints, WPOA believes the most viable funding solution is for New Kent County to establish a special tax district for Woodhaven Shores and implement an ad valorem tax on properties. While WPOA previously requested the County create this special tax district, the Commissioner representing Woodhaven was opposed to the proposal at the time.

At the request of WPOA's Commissioner and the County Administrator, we also approached the County about using the road tax fund to support the project. However, the Board of Supervisors ultimately voted against providing a loan to WPOA.

WPOA is now actively working with New Kent County to revisit the establishment of a special tax district to fund the dam and spillway upgrade. The County has provided a tentative timeline for the development and implementation of the Ad Valorem Tax. However, this process will require substantial time, including a petition in which at least 51% of WPOA members must agree to the proposal, followed by approval from the County Board and the implementation of the tax collection system.

Should the County decline to establish the special tax district, WPOA will not be able to fund the dam upgrade for many years. As such, we are unable to proceed with the grant at this time due to lack of financing.

WPOA will continue to save funds toward this critical infrastructure project and will persist in efforts to secure County support for a special tax district. If the district is approved or financing becomes available, we will then reapply for a grant. We feel applying for a grant without available financing to meet the grant requirement is a waste of your and WPOA time and resources.

Additionally, WPOA is working with Delegate Jessica Anderson to see if there are other financing opportunities available.

Sincerely,

Holly E. Berry

Holly Berry
President
Woodhaven Property Owners Association

Re: Delegate Jessica Anderson
Ron Stiers
Brent Payne DCR

Approval of 2026 Dam Safety, Flood Prevention and Protection Assistance Fund Grant Project – Beaverdam Creek Dam (#019003)

Chapter 769, 2023 General Assembly Acts of Assembly; Item 486 f.7

$10,000,000 in the first year to the Department of Conservation and Recreation (199) for improvements to identified high hazard water impounding structures consistent with the provisions of the Dam Safety, Flood Prevention, and Protection Assistance Fund established pursuant to §10.1-603.17, Code of Virginia.

§ 10.1-603.18. Administration of the Fund.

The Authority shall administer and manage the Fund, and establish the interest rates and the repayment terms of such loans as provided in this article, in accordance with a memorandum of agreement with the Director. The Director shall, after consultation with all interested parties, develop a guidance document governing project eligibility and project priority criteria, <u>and the Director, upon approval from the Virginia Soil and Water Conservation Board, shall direct the distribution of loans and grants from the Fund to local governments and private entities.</u> In order to carry out the administration and management of the Fund, the Authority may employ officers, employees, agents, advisers and consultants, including without limitation, attorneys, financial advisors, engineers, and other technical advisors and public accountants, and determine their duties and compensation without the approval of any other agency or instrumentality. The Authority may disburse from the Fund reasonable costs and expenses incurred in the administration and management of the Fund and may establish and collect a reasonable fee for its management services. However, any such fee shall not exceed one-eighth of one percent of any bond par, loan or grant amount.

<u>Background Information:</u>

Beaverdam Creek Dam (Inventory #019003) is owned by the Western Virginia Water Authority in Bedford County. At the June 26, 2024 meeting, the Board awarded $1,041,247.30 from the Dam Safety, Flood Prevention and Protection Assistance Fund for a construction remediation project that includes a spillway alteration, slope stability measures, and the installation of a toe drain.

This project was also expected to receive funding from an HHPD (high hazard potential dam) grant from the Federal Emergency Management Agency (FEMA) in the amount of $852,964.26. Due to a recent change in the interpretation of language in the Notice of Funding Opportunity, this project is unlikely to receive funding.

In order to ensure all available federal funds are utilized and to ensure the project is fully completed, the Department is requesting the use of unobligated ARPA funds to replace the anticipated HHPD funds for this project. The total estimated cost of the project is $4,706,999 and the project is currently substantially complete.

In order to utilize these funds, Western Virginia Water Authority agreed that construction will be completed and a record report will be submitted to the Department by December 2026.

Recommended Motion:

The Virginia Soil and Water Conservation Board approves $852,964 in funding received from the American Rescue Plan Act of 2021 for the Beaverdam Creek Dam (Inventory # 019003). This grant will be made on a reimbursement basis and will be governed by a Grant Agreement that details the timeframe for completion of the project, submission of any necessary documentation, and other requirements related to the use of these funds.

Motion made by: ____

Motion seconded by: ____

Action: ____

________________________________	____
, Chair	Nikki Rovner, Director

Verifying Cover Crop Percent Cover

Purpose and Standard

These procedures use established vegetation assessment techniques for research and field work and United States Department of Agriculture Natural Resource Conservation Service crop residue assessment methods to verify the percentage of cover maintained on cover crop practices. These verification procedures meet the expectations established for the Virginia Agricultural Cost Share (VACS) Program requirements.

VACS Program Standard:

- Cover crop practices are required to maintain a minimum of 60% cover of the cover crop species specifically, not weeds.
- The percent of vegetative cover that is present on the field by the date cover is required to be maintained is the only metric used for verification. Plant concentration, tiller count, and projected future cover are not considered.

Assessing Cover Crop Percent Cover

Meter Square Method

1. Place a one-meter-square frame (e.g., a PVC quadrat) in the field.
   - Select areas that are representative of the field as a whole. Avoid areas not representative of the field, e.g. end rows, edges, field borders, etc.

2. Looking straight down into the square, visually estimate the percentage of the area inside the frame that is covered by the cover crop species.
   - Only count cover crop plant material. Do not count weeds, residue of previous crops, or bare soil.
   - Compare the square to reference photographs or cutouts of known cover percentages if needed to calibrate the estimate.

3. Record the estimate percentage for that placement.

4. Repeat the procedure several times in different areas of the field and average the findings.

Point-Intercept Method (Line Transect)

1. Stretch and place a 50- or 100-foot tape measure on the ground. If the cover crop species was drilled place the tape diagonally, or at 45 degrees, to the rows.
   - Select an area that is representative of the field as a whole. Avoid areas not representative of the field e.g. end rows, edges, field borders, etc.

2. Walk along the line and count the number of times where tape markings intersect with cover crop vegetation.
   - If using a 100-foot tape measure, evaluate at 12-inch intervals. If using a 50-foot tape measure, evaluate at 6-inch intervals.
   - Remember to look straight down.
   - Be consistent. Use only the left or only the right side of the tape.

3. Use the total number of intersections to calculate crop residue percentage. Out of 100 tape markings evaluated, 60 points where cover crop vegetation intersected a mark equals 60% cover

4. Repeat procedure several times in different areas of the field and average findings.

Tip: As a supporting technique, use a photo comparison of field conditions to reference photographs showing known percentages of cover, viewed from directly overhead.

Common Errors to Avoid

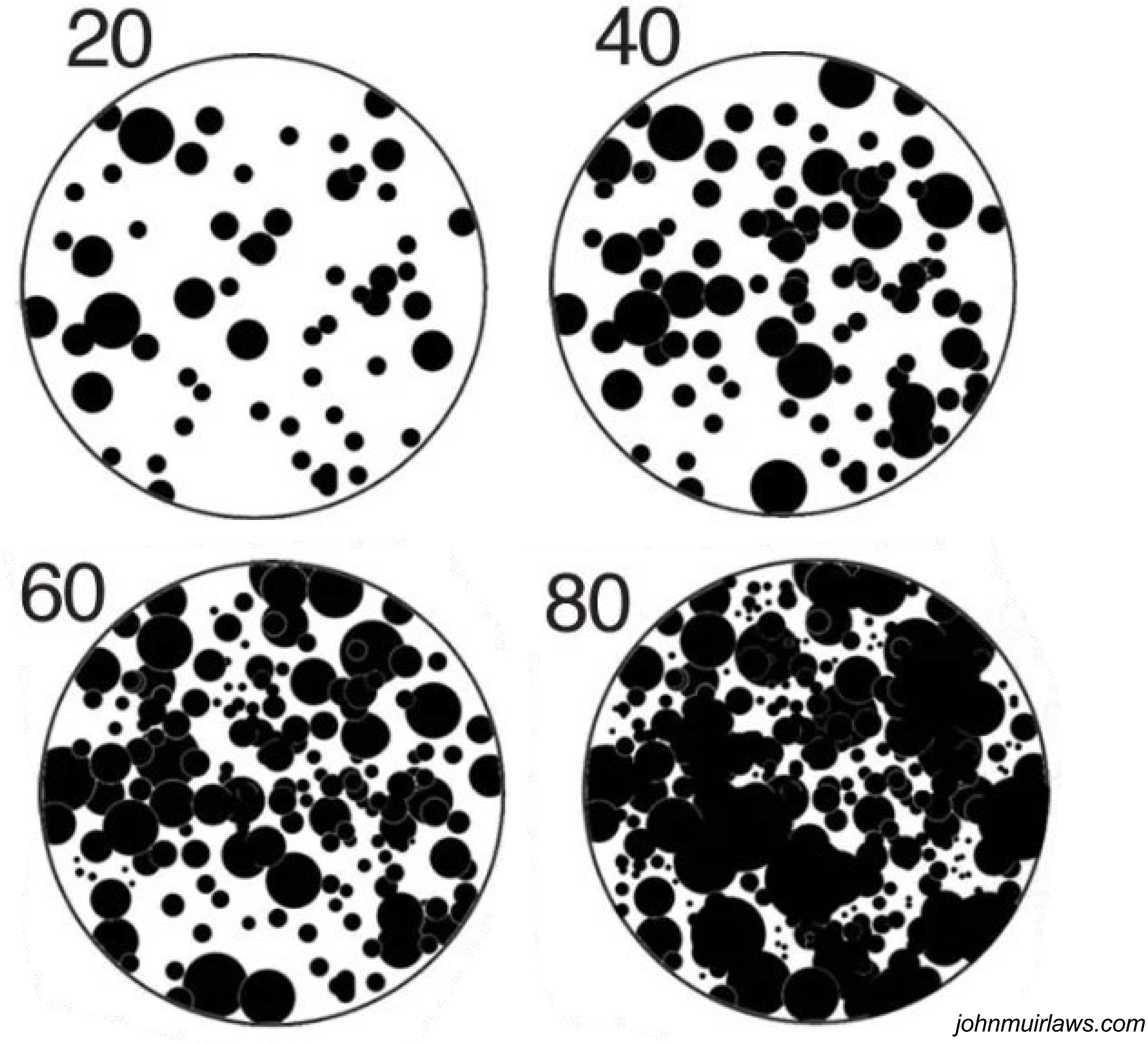
- Looking across the field instead of straight down.
- Counting weed cover or crop residue as cover crop cover.
- Switching sides of the tape between readings instead of reading consistently from the same side of the tape.
- Measuring only one spot instead of repeating in several representative areas and averaging.
- Measuring end rows, field edges, or other unrepresentative areas.
- Over or under estimating cover within the quadrat.

Training Resources

- Meter square demonstration video: https://www.youtube.com/watch?v=cS4qwSK-Mqw
- Point-intercept method demonstration (first ~4 minutes): https://www.youtube.com/watch?v=WGOXro1YVCs

Percent Cover Visual References

Various formats can be found online.



Virginia Soil and Water Conservation Board Approval of Fiscal Year 2027 Virginia Agricultural Cost-Share (VACS) BMP Manual

§ 10.1-505. Duties of Board.

In addition to other duties and powers conferred upon the Board, it shall have the following duties and powers:

3. To oversee the programs of the districts.

§ 10.1-546.1. Delivery of Agricultural Best Management Practices Cost-Share Program.

Districts shall locally deliver the Virginia Agricultural Best Management Practices Cost-Share Program described under §10.1-2128.1, under the direction of the Board, as a means of promoting voluntary adoption of conservation management practices by farmers and land managers in support of the Department's nonpoint source pollution management program.

Background Information

In order to strengthen the existing partnerships and improve project delivery, the Department and the Natural Resources Conservation Service (NRCS) have been coordinating over the last several months to more clearly define the protocols for jointly-funded projects (piggy-back projects) projects. A joint memorandum will be provided to all Soil and Water Conservation Districts, NRCS, and Department staff outlining the new process.

Revisions to the 2027 Virginia Agricultural Cost-Share BMP Manual
(Guidelines; DCR Agricultural BMP Engineering Services Program; page II-26)

~~For any practice that is funded with more than 50% federal funds, NRCS may have the lead for all engineering services, although the Agricultural BMP Engineering Services Program will continue to assist with providing engineering services if requested by either the District or NRCS.~~ All projects that are jointly funded with federal and state funds (i.e. piggy-back projects) shall adhere to the procedures established by the Department and NRCS to ensure all practices meet all applicable federal and state program requirements including practices standards and specifications.

Either an individual from DCR Agricultural BMP Engineering Services Program or an individual with appropriate EJAA must review the inventory and evaluation (such as the Risk Assessment for Water Quality Impairment from Heavy Use Areas/Animal Concentrated Areas or WP-4 Risk Assessment for Water Quality Impairment from Animal Concentrated Areas) to ensure all VACS Program qualifications and practice specifications are met prior to District Board approval of the project.

Recommended Motion:

The Virginia Soil and Water Conservation Board (Board) approves these revisions to the 2027 Virginia Agricultural Cost-Share BMP Manual.

Authorization to submit proposed amendments to the Nutrient Management Training and Certification Regulations (4VAC50-85)

§ 10.1-104.2. Voluntary nutrient management training and certification program.
D. The Virginia Soil and Water Conservation Board shall adopt regulations:
1. Specifying qualifications and standards for individuals to be deemed competent in nutrient management plan preparation, and providing for the issuance of documentation of certification to such individuals;
2. Specifying conditions under which a certificate issued to an individual may be suspended or revoked;
3. Providing for criteria relating to the development of nutrient management plans for various agricultural and urban agronomic practices, including protocols for use by laboratories in determining soil fertility, animal manure nutrient content, or plant tissue nutrient uptake for the purpose of nutrient management;
4. Establishing fees to be paid by individuals enrolling in the training and certification programs;
5. Providing for the performance of other duties and the exercise of other powers by the Director as may be necessary to provide for the training and certification of individuals preparing nutrient management plans; and
6. Giving due consideration to relevant existing agricultural certification programs.

§ 2.2-4007.05. Submission of proposed regulations to the Registrar.
Before promulgating any regulation under consideration, the agency shall deliver a copy of that regulation to the Registrar together with a summary of the regulation and a separate and concise statement of (i) the basis of the regulation, defined as the statutory authority for promulgating the regulation, including an identification of the section number and a brief statement relating the content of the statutory authority to the specific regulation proposed; (ii) the purpose of the regulation, defined as the rationale or justification for the new provisions of the regulation, from the standpoint of the public's health, safety, or welfare; (iii) the substance of the regulation, defined as the identification and explanation of the key provisions of the regulation that make changes to the current status of the law; (iv) the issues of the regulation, defined as the primary advantages and disadvantages for the public, and as applicable for the agency or the state, of implementing the new regulatory provisions; and (v) the agency's response to the economic impact analysis submitted by the Department of Planning and Budget pursuant to § 2.2-4007.04. Any economic impact estimate included in the agency's response shall represent the agency's best estimate for the purposes of public review and comment, but the accuracy of the estimate shall in no way affect the validity of the regulation. Staff as designated by the Code Commission shall review proposed regulation submission packages to ensure that the requirements of this subsection are met prior to publication of the proposed regulation in the Register. The summary; the statement of the basis, purpose, substance, and issues; the economic impact analysis; and the agency's response shall be published in the Virginia Register of Regulations and be available on the Virginia Regulatory Town Hall, together with the notice of opportunity for oral or written submittals on the proposed regulation.

Recommended Motion:

The Virginia Soil and Water Conservation Board (Board) authorizes the Department to submit proposed revisions to the Nutrient Management Training and Certification Regulations (4VAC50-85). The Board directs the Department to conduct these activities in accordance with the Administrative Process Act, Executive Order 17 (2026), and all other applicable laws, policies, and procedures. Additionally, the

Board authorizes the Department to coordinate, as necessary, with the Department of Planning and Budget, the Secretariat of Natural and Historic Resources, and the Governor's Office to develop any additional documents needed to submit these proposed regulations.

Further, the Board authorizes the Department, in consultation with the Office of the Attorney General, Department of Planning and Budget, the Secretariat of Natural and Historic Resources, or the Governor's Office, to make nonsubstantive changes to include formatting and stylistic changes as necessary to the proposed regulations.

State Agency Guide to Standard Regulatory Process

Stage 1

Notice of Intended Regulatory Action (NOIRA)

Submit NOIRA (Form TH-01) and sync RIS project (if available) for review on Town Hall.

↓

Executive branch review
(in order of review)
-DPB –14 day deadline;
-Cabinet Secretary – sometimes must review; if so, 14 day deadline;
-ORM/Governor – no deadline

↓

Within 14 days of receiving Governor's approval, submit NOIRA to *The Virginia Register of Regulations* via the Town Hall.

↓

Five days before publication in the *Register*:
Automatic email notification is sent to registered public Town Hall users.

↓

NOIRA is published in the *Register.* Thirty day public comment period begins & Town Hall comment forum opens.

↓

Comment period/forum closes. Consider public comment, draft proposed regulation, & submit it within 180 days for executive branch review.

→ Stage 2

Stage 2

Proposed regulation

Submit regulatory package (Form TH-02 and sync RIS project) for review on Town Hall.

↓

Executive branch review
(in order of review):
-OAG – no deadline;
-DPB -- including economic impact analysis (EIA) - 45 day deadline;
-Cabinet Secretary - 14 day deadline;
-ORM/Governor – no deadline

↓

Within 14 days of Governor's approval, submit proposed stage to the *Register* via the Town Hall.

↓

Five days before publication in the *Register*:
Automatic email notification is sent to registered public Town Hall users.

↓

Proposed stage is published in the *Register.*

Sixty day public comment period begins and Town Hall public comment forum opens.

↓

Comment period/forum closes. Consider public comment. Adopt final regulation no sooner than 15 days after comment period closes & submit for executive branch review within 180 days after close of comment period.

→ Stage 3

Stage 3

Final regulation

Submit regulatory package (Form TH-03 and sync RIS project) for review on Town Hall.

↓

Executive branch review
(in order of review):
--OAG review if changes with substantial impact made since proposed stage – no deadline;
-DPB – 21 day deadline;
-Cabinet Secretary – 14 day deadline;
-ORM/Governor – no deadline

↓

Within 14 days of Governor's approval, submit final regulation to the *Register* via the Town Hall.

↓

Five days before publication in the *Register*:
Automatic email notification is sent to registered public Town Hall users.

↓

Final stage is published in *Register.*

Thirty day final adoption period begins and Town Hall public comment forum opens.

↓

Final adoption period and public comment closes.
Final regulation becomes effective OR it is suspended, OR, if changes with substantial impact were made between proposed and final stages and 25+ persons and/or Governor request, an additional public comment period must be held.

An example of a standard rulemaking may be viewed here: https://townhall.virginia.gov/L/ViewAction.cfm?actionid=5590
Sources: Administrative Process Act, Office of Regulatory Management Procedures (2022) to Implement Executive Order 19 (2022)
This chart was produced by the Virginia Department of Planning and Budget's Planning, Evaluation & Regulation Division, 12/22

Chapter 85. Nutrient Management Training and Certification Regulations

4VAC50-85-10. Definitions.

The words and terms used in this chapter shall have the following meanings unless the context clearly indicates otherwise.

"Application rate" or "nutrient rate" means the quantity of major nutrients, nitrogen as N, phosphorus as P_2O_5, and potassium as K_2O on a per acre basis to supply crop or plant nutrient needs, and to achieve realistic expected crop yields.

~~"Banding" or "sideband"~~ “Banded starter fertilizer” means the placement of fertilizer as close to root zone as possible at planting ~~approximately two inches to the side and two inches below the seed~~.

"Best management practice" means a conservation or pollution control practice that manages soil, nutrient losses, or other potential pollutant sources to minimize pollution of water resources, such as split applications of nitrogen, or use of cereal grain cover crops to trap available nitrogen and reduce soil erosion.

"Biosolids" means ~~a~~ any solid, semisolid, or liquid residues which contain materials removed from municipal or domestic wastewater during treatment including primary and secondary residues ~~sewage sludge~~ that ~~has~~ have received an established treatment and are managed in a manner to meet the required pathogen control, vector attraction reduction, and meets the requirements outlined in regulations promulgated under § 62.1-44.19:3. Other residuals or solid wastes consisting of materials collected and removed by sewage treatment, septage, and portable toilet wastes that have also received appropriate treatment are also included in this definition. ~~for required pathogen control and is treated or managed to reduce vector attraction to a satisfactory level and contains acceptable levels of pollutants, such that it is acceptable for use for land application, marketing, or distribution in accordance with 9VAC25-31, Virginia Pollutant Discharge Elimination System (VPDES) Permit Regulation, and 9VAC25-32, Virginia Pollution Abatement (VPA) Permit Regulation, of the State Water Control Board.~~

"Broadcast" means the uniform surface application of a material over a field, or sub-field unit in precision nutrient management.

"Calibration" means the systematic determination of the operational parameters, such as speed and quantity delivered, of application equipment.

"Cereal crop" or "small grain" means barley, oats, rye, triticale, or wheat.

"Certified nutrient management planner" or "nutrient management planner" or "planner" means a person who holds a current Virginia nutrient management certificate of competence.

~~"Cool season grass" means grass species of temperate zone origin which exhibit the greatest rates of dry matter production in the day/night temperature range of 60°/50°F to 80°/70°F. Examples of cool season grasses include fescue, bluegrass, and ryegrass.~~

~~"Commonwealth" means the Commonwealth of Virginia.~~

"Composted organic nutrient source" means the relatively stable, humus-like product resulting from the controlled aerobic, thermophilic biological decomposition of organic material that bears little physical resemblance to the raw materials from which it originated.

"Cover crop" means a crop including, but not limited to, cereal grains, which is planted following the harvest of the preceding crop for the purpose of seasonal protection of soil or assimilation of residual soil nitrogen left from a previous crop or from continued mineralization of nitrogen.~~:~~

~~1. Seasonal protection of soil, or~~

~~2. Assimilation of residual soil nitrogen left from a previous crop or from continued mineralization of nitrogen.~~

"Crop" means cultivated plants or agricultural produce such as grain, silage, forages, oilseeds, vegetables, fruit, nursery stock, sod, or ~~turfgrass~~ turf.

"Cropland" means land used for the production of grain, oilseeds, silage, industrial crops, and any other category of crop not defined as specialty crop, hay, or pasture.

"Crop nutrient needs" means the primary nutrient requirements of a crop determined as pounds per acre or pounds per 1,000 square feet of nitrogen as N, phosphorus as P_2O_5, and potassium as K_2O required to support crop growth for production of an expected crop yield based upon soil analysis results as specified in Virginia Nutrient Management Standards and Criteria, revised September 2026~~, revised July 2014, or Virginia Commercial Vegetable Production Recommendations for 2005~~.

"Crop nutrient removal" means the amount of nutrients per acre expected to be taken up by a plant and removed from the site in the harvested portion at the expected yield level, generally expressed as tons per acre or bushels per acre~~, at rates specified in Virginia Nutrient Management Standards and Criteria, revised July 2014~~.

"Crop rotation" means one complete sequence of one or more crops grown in succession that ~~may~~ assist in minimizing disease, insects and weeds. For permanent hay, pasture, or a single crop planted continuously, the crop rotation is defined as the life of the nutrient management plan.

"Department" means the Department of Conservation and Recreation.

"Double crop" means the production and harvesting of two crops in succession within a consecutive 12-month growing season.

"Dry manure" or "semisolid manure" means manure handled by conventional dry or solid spreading equipment. ~~manure containing less than 85.5% moisture.~~

"Environmentally sensitive site" means any field which is particularly susceptible to nutrient loss to groundwater or surface water since it contains or drains to areas which contain sinkholes, or where at least 33% of the area in a specific field contains one or any combination of the following features: soils with high potential leaching based on soil texture or excessive drainage; shallow soils less than 41 inches deep likely to be located over fractured or limestone bedrock; subsurface tile drains; soils with high potential for subsurface lateral flow based on soil texture and poor drainage; floodplains as identified by soils prone to frequent flooding in county soil surveys; or lands with slopes greater than 15%.

~~1. Soils with high potential for leaching based on soil texture or excessive drainage;~~

~~2. Shallow soils less than 41 inches deep likely to be located over fractured or limestone bedrock;~~

~~3. Subsurface tile drains;~~

~~4. Soils with high potential for subsurface lateral flow based on soil texture and poor drainage;~~

~~5. Floodplains as identified by soils prone to frequent flooding in county soil surveys; or~~

~~6. Lands with slopes greater than 15%.~~

"Expected crop yield" means a realistic crop yield for a given farm field determined by using yield records or soil productivity information.

"Fertilizer" means any organic or inorganic material of natural or synthetic origin that is added to a soil to supply certain nutrients essential to plant growth.

"Field" means (i) a unit of ~~a unit of contiguous nonwooded~~ land generally used~~used~~ for crop production that is separated by permanent boundaries, such as fences, permanent waterways, woodlands~~, croplines not subject to change because of farming practices~~, ~~and~~ or other ~~similar~~ features, (ii) unit of land managed by the producer in a distinctly different manner from other contiguous land or (iii) as determined by the United States Department of Agriculture Farm Service Agency. For nonagricultural applications, management areas are equivalent.

"Field ~~identification number~~ identifier" means a number, name ~~used by a farmer~~, or alpha-numeric designation used in the plan ~~(or the identification used by the United States Department of Agriculture Farm Service Agency)~~ to distinguish or ~~identify~~ determine the location of a field ~~on a farm~~.

"Groundwater" means any water beneath the land surface in a water saturated layer of soil or rock.

"Hay" means a grass, legume, or other plants, such as clover or alfalfa, which is cut and dried for feed, bedding, or mulch.

~~"Hydrologic soil group" means a classification of soils into one of four groups, A, B, C, or D, according to their hydrologic properties, ranging from low runoff potential (high infiltration potential) in group A to high runoff potential (low infiltration potential) in group D.~~

"Incorporation" means the process whereby materials are mixed into soils and not exposed on the soil surface, such as would be achieved by disking one time to a depth of six inches.

"Industrial ~~waste~~residuals" means solid, semisolid, or liquid residues resulting from any process of industry, manufacture trade or business or from the development of any natural resources that contain nutrient value and are suitable for use as a fertilizer. ~~liquid or other waste resulting from any process of industry, manufacture, trade or business, or from the development of any natural resources.~~

"Irrigation" means the application of water to land to assist in crop growth. For nonagricultural land, irrigation means the application of water to land to assist in the establishment and maintenance of turf.

"Irrigation scheduling" means the time and amount of irrigation water to be applied to an area for optimum crop growth or maintenance of turf and to minimize leaching and runoff.

"Leaching" means the movement of soluble material, such as nitrate, in solution through the soil profile by means of percolation.

"Legume" means a plant capable of fixing nitrogen from the atmosphere such as peas, soybeans, peanuts, clovers, and alfalfas.

"Legume nitrogen credit" means the amount of nitrogen a legume is expected to supply to a succeeding crop.

"Liming" means the application of materials containing the carbonates, oxides, or hydroxides of calcium or magnesium in a condition and in a quantity suitable for neutralizing soil acidity.

"Liquid manure" means manure that is applied through subsurface injection or surface application with liquid application equipment. ~~containing at least 85.5% moisture or which can be applied through subsurface injection or surface application with liquid application equipment.~~

"Livestock" means domesticated animals such as cattle, chickens, turkeys, hogs, and horses raised for home use or for profit.

"Manure" or "animal waste" means animal fecal and urinary excretions and waste byproducts, which may include spilled feed, bedding litter, soil, ~~lactase,~~ process wastewater, and runoff water from animal confinement areas.

"Mehlich I" means the North Carolina Double-Acid soil analysis procedure to determine extractable levels of certain nutrients in soils as described in Methods of Soil Analysis, Part 3, Chemical Methods, 1996.

"Mehlich III" or "Mehlich 3" means a modified version of the Mehlich I method used to determine extractable levels of certain nutrients in soils as described in Methods of Soil Analysis, Part 3, Chemical Methods, 1996 and in Reference Soil and Media Diagnostic Procedures for the Southern Region of the United States, Southern Cooperative Series Bulletin No. 374.

"Mineralization" means the process when plant unavailable organic forms of nutrients are converted to a plant available inorganic state as a result of soil microbial decomposition.

"No-till" means the soil is left undisturbed from the time of harvest or the killing of the preceding crop or cover crop until and including the time of planting of the current crop except for strips up to 1/3 of the row width that are disturbed by coulters or disk openers during the planting operation.

"NRCS" means the United States Department of Agriculture, Natural Resources Conservation Service, formerly the Soil Conservation Service (SCS).

"Nutrient" means an element or compound essential as raw materials for plant growth and development such as carbon, nitrogen, and phosphorus.

"Nutrient content" means the percentage of any primary nutrients such as nitrogen as N, phosphorus as P_2O_5, and potassium as K_2O contained in any type or source of plant nutrients.

"Nutrient management plan" or "plan" means a plan prepared by a Virginia certified nutrient management planner to manage the amount, placement, timing, and application of manure, fertilizer, biosolids, or other materials containing plant nutrients in order to reduce nutrient loss to the environment~~, and~~ to produce crops, or to support turf and plant growth; except that for an animal feeding operation that is subject to a permit issued by the Department of Environmental Quality, when the owner of the animal feeding operation transfers all manure off-site and does not land apply plant nutrients to land under their control, a transfer plan is also considered a nutrient management plan.~~.~~

"Nutrient Management Training and Certification Fund" means the fund established by § 10.1-104.2 of the Code of Virginia to support the department's Nutrient Management Training and Certification Program.

"Organic nutrient source" or "organic source" means manure, biosolids, ~~sludge,~~ industrial residuals~~waste~~, green manure, compost, or other plant or animal residues which contain plant nutrients.

"Organic residuals" means nutrients released over time from -an organic nutrient source ~~manure, biosolids, industrial wastes, legumes, or other organic sources of nutrients~~.

"Pasture" means land which supports the grazing of animals for forages.

"Person" means an individual, corporation, partnership, association, a governmental body and its subordinate units, a municipal corporation or any other legal entity.

"Phosphorus index" means the Virginia Phosphorus Index Version 2.0 Technical Guide, revised October 2005.

"Phosphorus saturation level" means the ratio of phosphorus to aluminum plus iron (P/(Al+Fe)) in a soil using the Acid Ammonium Oxalate in Darkness method described in Methods of Soil Analysis, Part 3, Chemical Methods, 1996 (pp. 649-650) or estimated with another extraction procedure correlated to the Acid Ammonium Oxalate in Darkness method and approved by the department.

"Plant available nutrients" means the portion of nutrients contained in nutrient sources which is expected to be available for potential use by plants during the growing season or the crop rotation.

"Precision nutrient management" means a management strategy that uses data and technology to monitor and manage nutrients at the sub-field level rather than treating entire fields uniformly.

"Pre-sidedress nitrate test" or "PSNT" means a procedure used to determine soil nitrate-nitrogen levels at a specific time during a corn crop growing season.

"Primary nutrients" means nitrogen as N, phosphorus as P_2O_5, and potassium as K_2O.

"Residual nutrients" means the level of nitrogen, phosphorus, and potassium remaining or available in the soil from previously applied nutrient sources, or unharvested plants or plant parts, or naturally occurring nutrient levels in the soil.

"Runoff" means water that travels by surface flow off the land and which can carry pollutants from the land. ~~that part of precipitation, snow melt, or irrigation water that runs off the land into streams or other surface water which can carry pollutants from the land.~~

"RUSLE2" means the USDA—NRCS Revised Universal Soil Loss Equation Version 2 software package.

~~"Sewage sludge" or "sludge" means any solid, semisolid, or liquid residues which contain materials removed from municipal or domestic wastewater during treatment including primary~~

~~and secondary residues. Other residuals or solid wastes consisting of materials collected and removed by sewage treatment, septage, and portable toilet wastes are also included in this definition. Liquid sludge contains less than 15% dry residue by weight or can be applied through subsurface injection or surface application with liquid application equipment. Dewatered sludge contains 15% or more dry residue by weight."Shall" means a mandatory requirement.~~

~~"Should" means a recommendation.~~

"Sidedress" means the placement of fertilizer beside or between the rows of a crop after crop emergence.

"Sinkhole" means a depression in the earth's surface caused by dissolving of underlying limestone, salt, or gypsum having drainage patterns through underground channels.

"Slope" means the degree of deviation of a surface from horizontal, measured as a percentage, as a numerical ratio, or in degrees.

"Slowly available nitrogen" means nitrogen sources that have delayed plant availability involving compounds which dissolve slowly, materials that must be microbially decomposed, or soluble compounds coated with substances highly impermeable to water such as polymer coated products, methylene urea, isobutylidene diurea (IBDU), urea formaldehyde based (UF), sulfur coated urea, and natural organics.

"Soil erosion" or "erosion" or "soil loss" means the wearing away of the land surface by water, wind, or waves.

~~"Soil management group" means a grouping of soils based on their similarity in profile characteristics which affect crop production and require specific soil and crop management practices.~~

"Soil pH ~~level~~" means the negative logarithm of the hydrogen-ion activity of a soil which measures the relative acidity or alkalinity of the soil. The pH ~~level~~ affects the availability and plant utilization of nutrients.

"Soil productivity group" means a grouping of soils based upon expected yield levels for a given crop type.

~~"Soil series" means a classification of a specific soil type by name based on the morphological, chemical and physical properties of the soil.~~

"Soil survey" means a published or electronically available document developed by a governmental entity using the standards and protocols of the National Cooperative Soil Survey that includes detailed descriptions and classifications of soils, mapping of various soil series, and the interpretation of soils according to their adaptability for various uses. ~~crops and trees.~~

"Specialty crop" means vegetables, tree crops, perennial vine crops, ornamentals, horticultural crops, and other similar crops.

"Split application" means utilizing a sequence of two or more nutrient applications, separated by ~~approximately~~ three weeks or more, to a single crop in order to improve nutrient uptake efficiency.

"Surface water" means all water whose surface is exposed to the atmosphere.

"Tilled" means soil is disturbed between the time of harvest of the preceding crop through the time of planting of the current crop in that greater than 1/3 of the row width is disturbed by tillage implements such as moldboard plows, chisel plows, subsoilers, disks, field cultivators, roto-tillers, coulters or disk openers.

~~"Tillering" means the formation of lateral shoots from the axillary buds of small grains and grasses.~~

~~"Tissue test" means an analysis of crop tissue for the percentage of nitrogen at key growth stages, and used as an intensive nutrient management technique with small grain crops.~~

~~"Topdress" means broadcast applications of fertilizer on crops such as small grains or forage after crop emergence has occurred.~~

“Transfer nutrient management plan” or “transfer plan” means a plan, prepared by a Virginia certified nutrient management planner, to meet the requirements of a permit issued by the Department of Environmental Quality for an animal feeding operation where the owner transfers all manure offsite and does not apply manure, fertilizer, biosolids, or other materials containing plant nutrients to land under the owner's control. For an animal feeding operation covered by a permit issued by the Department of Environmental Quality, a transfer plan meets the requirements of obtaining a nutrient management plan. A transfer plan shall be effective for a period of 10 years unless a change is made where plant nutrients are being proposed for land application, thus requiring a site-specific plan for land application.

"Trap crop" means a timely planted cereal crop for the purposes of capturing residual soil nitrogen and nitrogen that is released during the decomposition of manure or biosolids in order to manage limited manure or ~~sewage sludge~~biosolids storage availability.

“Turf” means nonagricultural land that is planted as closely mowed, managed grass and includes golf courses, parks, cemeteries, publicly owned lands, and residential, commercial, or industrial property.

~~"Turfgrass" means selected grass species planted or sodded and managed for such uses as home lawns, golf courses, office parks and rights-of-way.~~

“Verifiable crop yield records” means documented, field-specific yield data that can be substantiated with supporting records obtained for review and that are sufficient to justify yield goals used in nutrient management planning, including records such as (i) yield monitor data, (ii) scale tickets or weigh tickets, (iii) crop insurance records, (iv) sales receipts or load records, or (v) farm logs or recordkeeping systems.

"Volatilization" means a process by which nitrogen is lost to the atmosphere as ammonia gas.

~~"Warm season grass" means a grass species of tropical origin that exhibits the highest rate of dry matter production in the day/night temperature range of 90°/79°F at a minimum to a maximum of 97°/88°F. Examples of warm season grasses include zoysia and bermuda grasses.~~

~~"Water insoluble nitrogen" or "WIN" means the amount of a type of slowly available nitrogen listed on fertilizer bags and reported as a percentage.~~

"Watershed" means a drainage area or basin in which all land and water areas drain or flow toward a central collector such as a stream, river, or lake at a lower elevation.

"Watershed code" means the letter and number used by the department to identify a watershed or hydrologic unit area.

"Zadoks' growth stage" means the numerical scale ranging from 0-93 which assigns values to small grain growth stages, e.g. Growth Stage 30 is just prior to the stem elongation phase in wheat growth.

4VAC50-85-20. Purpose.

A. This chapter governs the department's voluntary Nutrient Management Training and Certification Program for individuals who prepare nutrient management plans.

B. A nutrient management plan is prepared to indicate how primary nutrients are to be managed on farm fields and other land for agricultural and urban agronomic purposes ~~crop production and~~ in ways which protect groundwater and surface water from excessive nutrient enrichment. Plans contain operating procedures based on expected crop yield, existing nutrient levels in the soil, organic residuals, optimum timing and placement of nutrients, environmental resource protection, and agronomic practices such as liming, tillage, and crop rotation. The department shall certify the competence of individuals to prepare these plans and provide criteria relating to the development of nutrient management plans.

4VAC50-85-40. Eligibility requirements.

A. Certification may be obtained by satisfying all of the following requirements for certification:

1. Satisfactorily completing and submitting to the department an application in the form required by the department, including a statement of any felony convictions. Such application shall be submitted to the department at least 30 days before the approved examination date set by the department. The application shall request information relating

to the person's education, work experience, knowledge of nutrient management, and willingness to abide by the requirements of these regulations;

2. Supplying proof of meeting one of the following:

a. A copy of a college transcript indicating completion of a four-year college degree with a major in an agriculturally related area with coursework in the area of nutrient management such as soils, soil fertility, and plant science, and one year of practical experience related to nutrient management planning or implementation of nutrient management concepts and principles acceptable to the department;

b. A copy of a college transcript indicating completion of a two-year college degree with a major in an agriculturally related area with coursework in the area of nutrient management such as soils, soil fertility, and plant science, and one and one-half years of practical experience related to nutrient management planning or implementation of nutrient management concepts and principles acceptable to the department; or

c. A combination of education to include nutrient management related educational courses or training and a minimum of three years of practical experience related to nutrient management planning or implementation of nutrient management concepts and principles acceptable to the department;

3. Obtaining a passing score on each of the parts of the nutrient management certification examination administered by the department; and

4. Submitting a $100 certification fee ~~by check or money order~~to the department.

B. Certificates shall be valid for two years and will expire on the last day of the expiration month. Certified nutrient management planners or applicants shall notify the department of any change in mailing address within 30 days of such change in address.

C. Individuals certified as nutrient management consultants by the State of Maryland or certified as nutrient management specialists by the Commonwealth of Pennsylvania will be eligible for certification in Virginia by complying with all requirements of these regulations except for subdivision A 2 of this section. These individuals may also substitute, for the requirements in 4VAC50-85-60 C, the attainment of a passing score on a Virginia specific examination component which shall include at a minimum the elements listed in 4VAC50-85-60 C 9 and C 10. The department, upon review, may accept or approve nutrient management certification programs of other states as satisfying partial requirements for certification.

4VAC50-85-50. Fees.

A. Fees shall be collected for certification and recertification to defray the administrative cost for the certification program. The certification fee of $100 for the initial certification period shall be due with the application for certification submitted pursuant to 4VAC50-85-40. The recertification fee of $100 shall be due with the renewal application submitted pursuant to 4VAC50-85-80.

B. Fees collected for certification and recertification may include a processing charge to defray the costs of payment processing services. Such processing charges are subject to contracted charges incurred by the department and may be adjusted and charged to the applicant in accordance with those contracts.

~~B~~C. A fee may be charged to supply training materials and present education and training programs, including continuing education, which support the certification program.

~~C~~D. Fees are nonrefundable and shall not be prorated.

~~D. The certification fee of $100 for the initial certification period shall be due with the application for certification. If the applicant is unsuccessful in achieving a passing score on the examination, the applicant may retake the examination at the next scheduled time. Applicants may retake the examination one time with no additional charge by resubmitting the application for certification.~~

E. All fees collected by the department shall be deposited in the state treasury Nutrient Management Training and Certification Fund and shall be used exclusively for the operation of the Nutrient Management Training and Certification Program.

4VAC50-85-60. Examination.

A. The department shall administer nutrient management certification examinations at least once per year. The examinations shall require a demonstration of the ability to prepare a nutrient management plan. The department may limit the number of applicants taking the examination based upon available examination space.

B. Applicants for certification shall achieve a passing score on each of the parts of the nutrient management certification examination to become eligible for certification.

C. The examinations for persons involved in agricultural nutrient management shall address the elements listed below. To address nutrient management on urban land uses, specialty specific examinations may be added to or substituted by the department for the elements below.

1. General understanding of overall nutrient management concepts such as nutrient cycling on farms, the purpose of nutrient management planning, economic aspects of nutrient use, and components of a nutrient management plan;

2. Basic soil science concepts such as soil physical and chemical properties including texture, structure, organic matter, and horizon development, and how such characteristics influence crop productivity and adaptation, water runoff, and infiltration;

3. Environmental management concepts such as the water cycle, nutrient loss mechanisms, environmental effects of nutrients in waters including Chesapeake Bay, identification of high risk sites relating to nutrient use and appropriate nutrient management practices to reduce nutrient losses;

4. Nutrient sampling, testing, and analysis such as basic sampling procedures, relationship of soil test level with the likelihood of crop response, soil nitrate testing, manure and biosolids sampling and interpretation, and determining nitrogen supplied by legumes;

5. Basic soil fertility concepts such as relationship of soil pH to nutrient availability and toxicity, essential elements for crop growth, limiting factors to crop production, cation exchange capacity and related concepts, nutrient cycles, and forms of nutrients in soils;

6. Fertilizer management concepts such as types of fertilizers, nutrient analysis of common materials and grades, basic calculations and blending, calibration of equipment, and application methods;

7. Manure management concepts such as nutrient content and volume produced, determination of plant available nutrients, selecting sites for manure application, proper timing and placement, coordination of fertilizers with manure, application methods and calibration;

8. Biosolids management concepts such as determination of plant available nutrients, nutrient content, forms of nutrients, types of ~~sludges~~ biosolids, coordination with fertilizer applications, and application methods;

9. Nutrient management training and certification regulatory requirements, and requirements of other nutrient management related laws, regulations, and incentive programs; and

10. Development of multiple components of nutrient management plans and completion of calculations comparable to development of nutrient management plans such as, but not limited to, determination of specific soil types in fields, determination of specific nutrient requirements based on soil productivity and soil analysis results, evaluation of field limitations based on environmental hazards or concerns, timing of nitrogen applications, phosphorus nutrient management planning methods and assessment techniques, and interpretation of manure analysis results.

D. An individual who is unable to take an examination at the scheduled time shall notify the department at least five days prior to the date and time of the examination; such individual will be rescheduled for the next examination. The department may consider accepting notice of less than five days due to individual hardship situations on a case-by-case basis. Failure to notify the department may require the individual to submit a new application and payment of fees in accordance with 4VAC50-85-40.

E. The department shall establish acceptable passing scores for the examinations based on the department's determination of the level of examination performance required to show minimal acceptable competence.

F. If the applicant is unsuccessful in achieving a passing score on the examination, the applicant may retake the examination one time with no additional charge by resubmitting the application for certification.

G. All applicants shall be notified of results in writing within 60 days of the completion of the examinations.

4VAC50-85-80. Certificate renewal.

The department will not renew a certificate if a proceeding to deny certification under 4VAC50-85-110 has begun, or if the department has found that the applicant violated any requirements of this chapter. A certificate is issued for two years and may be renewed on or before the expiration of a certificate by complying with all of the following requirements:

1. Submittal of a renewal application on the form the department requires;

2. Payment of a $100 renewal fee to the department;

3. Submittal of proof of satisfactory completion of at least four hours of continuing education pre-approved by the department within the past two years. Requests for pre-approval of continuing education courses must be received at least 60 days prior to the expected course date or dates and must include a detailed syllabus indicating time to be spent on each topic area covered. Continuing education hours must be in subject matter consistent with 4VAC50-85-60 C. Department personnel may attend continuing education sessions to verify that the requirements are met. Proof of attendance must be verified by the course provider. The department may accept continuing education units obtained in Delaware, Maryland and Pennsylvania if such continuing education units are specifically for the purpose of recertification in the state nutrient management certification program; and

4. Completion of at least one nutrient management plan or completion of four hours of continuing education pre-approved by the department within the past two years in addition to the requirements of subdivision 3 of this section.

~~Persons certified prior to January 11, 2006, shall attend a department approved training course in phosphorus nutrient management planning methods and assessment techniques prior to~~

~~certificate renewal. The training course hours may be applied toward other continuing education requirements of this subsection.~~

4VAC50-85-100. Recordkeeping and reporting requirements.

A. Certified nutrient management planner reporting requirements. A person who holds a certificate under these regulations shall keep records and file with the department by ~~September 30~~ August 15 of each year an annual activity report in a format ~~on a form~~ ~~supplied~~ specified by the department covering the previous year (July 1 through June 30). The annual activity report shall contain the following information:

1. Name and certificate number of the certified nutrient management planner;

2. Any change of mailing address during the previous year;

3. Number of nutrient management plans completed;

4. Acreage covered by plans and planned acreage by county and state watershed codes specified by plan categories of new or revised;

5. Breakdown of planned acreage by cropland, hay, pasture, and specialty crops by county and watershed code specified by plan categories of new or revised; and

6. Other information indicating number of practices facilitated by the planner such as manure testing and use of the PSNT.

7. A summary listing of all plans prepared to include plan number, landowner or operator's name and the date the plan was prepared or revised.

The department may consider data already submitted to the department through an approved reporting system as satisfying the requirements of this subsection in whole or in part, provided the submitted data meets the information required by subdivisions 1 through 7 of this subsection.

B. Certified nutrient management planner recordkeeping requirements. The department may periodically inspect nutrient management plans prepared by certified persons and required records for the purpose of review for compliance with 4VAC50-85-130 and 4VAC50-85-140. A certified nutrient management planner shall maintain a complete copy of each nutrient management plan prepared and developed in accordance with 4VAC50-85-140 and make such plans available for inspection by department personnel upon request within one week of receiving such request ~~the following plan records~~ for a period of not less than three years from the date the plan was prepared.~~:~~

~~1. A complete copy of each nutrient management plan prepared and shall make such plans available for inspection by department personnel upon request within one week of receiving such request;~~

~~2. Records for each plan with all of the following information if the information is not already contained in the plan:~~

~~a. Representative soil analysis results for fields, or field grids if grid soil sampling is used, dated not more than three years prior to the date the nutrient management plan was completed to include information on soil fertility levels for phosphorus and potassium, and pH level;~~

~~b. Copies of soil survey maps or a soil survey book containing maps for each field unless a soil survey has not been published for the county;~~

~~c. Yield records for each field to include calculations used to determine the planning yield if upward adjustments to soil productivity based yields were made to more than 20% of the fields covered by the plan;~~

~~d. Type and number of livestock, if any, as well as a description of the livestock to include average weight;~~

~~e. Calculations or records indicating annual quantity of manure produced or expected to be produced; and~~

~~f. Organic nutrient source analysis, if applicable, to include information on percentage of moisture, total nitrogen or total Kjeldahl nitrogen, ammonium nitrogen, total phosphorus, and total potassium.~~

~~3. A summary listing of all plans prepared to include landowner or operator's name and the date the plan was prepared or revised.~~

C. Certified nutrient management planners shall provide the department with a copy of a nutrient management plan within two weeks following the modification of any plan required by regulations promulgated under § 62.1-44.19:3 for ~~sewage sludge~~ biosolids, § 62.1-44.17:1 for animal waste, and § 62.1-44.17:1.1 for poultry waste.

4VAC50-85-110. Compliance with regulations and disciplinary action.

If the department finds that a certified person or an applicant for certification violated any requirements of this chapter, including the circumstances listed below, the department may deny, suspend or revoke certification, following the informal fact-finding procedures of the Virginia Administrative Process Act (§ 2.2-4000 et seq. of the Code of Virginia).

1. Providing misleading, false, or fraudulent information in applying for a certificate;

2. Providing the department with any misleading, false, or fraudulent report;

3. Offering or preparing a nutrient management plan claimed to be prepared by a person certified as a nutrient management planner in Virginia as provided by these regulations without a certificate;

4. Offering, preparing, modifying, or revising a nutrient management plan that does not comply with the requirements of these regulations;

5. Failing to promptly provide any report or to allow the department access to inspect any records required to be kept by these regulations;

6. Failing to provide the department with a copy of a nutrient management plan within two weeks following the modification of any plan required by regulations promulgated under § 62.1-44.19:3 of the Code of Virginia for biosolids~~sewage sludge~~, § 62.1-44.17:1 of the Code of Virginia for animal waste, or § 62.1-44.17:1.1 of the Code of Virginia for poultry waste; or

7. Conviction of a felony related in any way to the responsibilities of a certified nutrient management planner.

4VAC50-85-130. Nutrient management plan content.

A. A certified nutrient management planner shall prepare nutrient management plans which contain the information in subsections B through G of this section. For nutrient management plans covering nonagricultural, specialty land uses, for example residential lawns, office parks, and golf courses, the department may specify additional plan elements which are critical to the management of nutrients for a particular activity, and may eliminate requirements not pertinent to nonagricultural land uses.

B. Plan identification. Each plan shall be identified by a single cover sheet indicating:

1. Farmer/operator name and address;

2. Name, certificate number, and signature of the certified nutrient management planner that prepared the plan;

3. County and watershed code of land under the nutrient management plan;

4. Total acreage under the plan with double cropped acreage accounted for only once;

5. Acreage of cropland, hay, pasture, and specialty crops included in the plan for the first year of the plan;

6. Date the plan was prepared or revised; ~~and~~

7. Type and approximate number of livestock, if applicable; and~~.~~

8. The applicable permit number if the nutrient management plan is developed to cover an activity that requires a permit issued by the Department of Environmental Quality.

C. Map or aerial photograph.

1. Each plan shall contain a map or aerial photograph to identify:

a. The farm location and boundaries;

b. Individual field boundaries where nutrients will be applied;

c. Field numbers and acreages where nutrients will be applied;

d. Environmentally sensitive sites as defined in 4VAC50-85-10;

e. Setback areas for nonapplication for manure and biosolids as specified in 4VAC50-85-140 A 5 e;

f. Location of manure, biosolids, or waste storage if any; and

g. Intermittent or perennial streams and associated buffers (if the phosphorus index is used to determine phosphorus application rates for specific fields).

2. The map or aerial photograph shall be legible, with the features in subdivision 1 of this subsection recognizable. A farm sketch or soil survey map may be used when a map or aerial photograph is not available, if the features described in subdivision 1 of this subsection are recognizable.

D. Summary of nutrient management plan recommendations. Each plan shall contain one or more summary sheets that list the following information for each field:

1. Name of the farmer/operator;

2. Field ~~identification~~ ~~numbers to include the United States Department of Agriculture Farm Service Agency tract and field numbers~~ identifiers;

3. Field acreages;

4. Expected crops or crop rotations;

5. Crop nutrient needs per acre based on soil analysis results and soil productivity;

6. Legume nitrogen credits per acre;

7. Available nutrients in soil from previous crop and mineralization of organic residuals;

8. Recommended organic nutrient source application rates in tons per acre or 1,000 gallons per acre; plant available nitrogen as N, phosphorus as P_2O_5, and potassium as K_2O per acre; and spreading schedule to include approximate months of application;

9. Expected time of incorporation of organic nutrient sources into the soil if organic nutrient sources will be used;

10. Commercial fertilizer rates and timing of applications, including split applications of nitrogen and the possible use of soil nitrogen test results on a field before sidedressing with nitrogen; and

11. Numerical phosphorus and potassium soil analysis results expressed as ppm P and K, pounds per acre P and K or pounds per acre P_2O_5 and K_2O for all fields in the plan.

E. Individual fields may be grouped together if similar soil productivity levels, soil fertility levels, and environmentally sensitive site features exist pertaining to subsection D of this section.

F. Each plan shall also contain the following information in summary or narrative form:

1. Identification and management of environmentally sensitive sites;

2. Quantities of manure produced on the farm, available manure storage capacity, and manure analysis;

3. Total manure used as crop nutrients, if any, including manure from both on farm and off farm sources based on plan recommendations and total land requirements for manure utilization;

4. Quantity of unused manure, if applicable, and recommendations on appropriate use options;

5. Liming recommendations if soil pH is below the optimal range or to raise soil pH to no more than the upper limit for lime stabilized ~~sewage sludge~~biosolids;

6. Recommendations or fact sheets to ensure efficient application of fertilizers and organic nutrient sources and other best management practices to reduce the potential for the degradation of surface and groundwater quality, which may include but are not limited to:

a. Equipment calibration;

b. Application timing and method;

c. Crop rotation and agronomic practices;

d. Soil nitrate testing; and

e. Cover crop management;

7. Information on maintaining and updating a nutrient management plan. General comments about plan maintenance shall include:

a. The length of time the plan is effective consistent with 4VAC50-85-140 D 1; and

b. Identification of circumstances or changes in the farm operation such as an increase in animal numbers, change in animal type, or any changes that would impact the amount of manure available from the operation that would require the plan to be updated prior to the time specified in this subdivision

c. Identification of circumstances or changes on nonagricultural lands that would require the plan to be updated prior to the time specified in this subdivision include:

(1) Major changes in management area such as major golf course renovation, changing general turf to an athletic field, removal or inclusion of impervious surfaces, or removal or inclusion of landscape beds;

(2) Changes in turf type such as changing from a cool season to warm season grass species;

(3) Changes in structural management practices such as adding or eliminating irrigation or changes in drainage; and

(4) New soil test results showing an increased phosphorus fertility rating compared to previous results.

8. Expected crop yields for each field for the planned crop rotation;

9. The following information for all fields where the phosphorus applications are based on the phosphorus index:

a. Functioning riparian buffer widths and distances to surface waters in feet;

b. Presence of any contour planting at a maximum of 1.0% row grade, strip cropping, conservation tillage with greater than 30% residue, or terraces;

c. Percentage of required ground cover on pastures stated as <50% cover, 50-75% cover, or >75% cover;

d. Crop tillage type for each crop stated as either no-till or tilled for all cropland; and

e. If expected soil erosion for the phosphorus index was developed using RUSLE2, a copy of the RUSLE2 Profile Erosion Calculation Record computerized print-out indicating: (i) crop(s) for each year in the crop rotation to match those identified in the nutrient management plan, (ii) all mechanical field operations, and (iii) edge of field soil loss for each field; and

10. Other notes as needed pertaining to nutrient application, tillage, and other special conditions.

G. The nutrient management planner shall incorporate additional more restrictive plan requirements if required by other specific legislative, regulatory or incentive programs which apply to a specific operator.

H. Where precision nutrient management is utilized, a nutrient management plan for those fields shall contain the following:

1. Plan identification. Each plan shall be identified by a single cover sheet indicating:

a. Farmer or operator name and address;

b. Name, certificate number, and signature of the certified nutrient management planner that prepared the plan;

c. County and watershed code of land under the nutrient management plan;

d. Total acreage under the plan with double cropped acreage accounted for only once;

e. Acreage of cropland, hay, pasture, and specialty crops included in the plan for the first year of the plan;

f. Date the plan was prepared or revised;

g. Type and approximate number of livestock, if applicable; and

h. The applicable permit number if the nutrient management plan is developed to cover an activity that requires a permit issued by the Department of Environmental Quality.

2. Map, aerial photograph, or georeferenced data.

a. Each plan shall contain a map, aerial photograph, or georeferenced data in an electronic format acceptable to the department that clearly identifies the following:

(1). The farm location and boundaries;

(2). Individual field boundaries where nutrients will be applied;

(3). Field numbers and acreages where nutrients will be applied;

(4). Environmentally sensitive sites as defined in 4VAC50-85-10; and

(5). Intermittent or perennial streams and associated buffers (if the phosphorus index is used to determine phosphorus application rates for specific fields).

3. The planned nutrient application rates by zone, which shall serve as the nutrient application plan for the field, in an electronic format, acceptable to the department, that clearly indicates the field identifier and the georeferenced boundaries. Nutrient application rates in each zone shall not exceed the rates allowable under 4VAC50-85-140 A 2, calculated at the sub-field level. The planned nutrient application rates must account for all nutrient applications and organic residuals.

a. Individual fields may be grouped together if similar soil productivity levels, soil fertility levels, and environmentally sensitive site features exist pertaining to subsection D of this section.

4. Each plan shall also contain the following information in summary or narrative form:

a. Identification and management of environmentally sensitive sites;

b. Liming recommendations if soil pH is below the optimal range or to raise soil pH to no more than the upper limit for lime stabilized biosolids;

c. Recommendations or fact sheets to ensure efficient application of fertilizers and organic nutrient sources and other best management practices to reduce the potential for the degradation of surface and groundwater quality, which may include but are not limited to:

(1). Equipment calibration;

(2). Application timing and method;

(3). Crop rotation and agronomic practices;

(4). Soil nitrate testing; and

(5). Cover crop management;

5. Information on maintaining and updating a nutrient management plan. General comments about plan maintenance shall include:

a. The length of time the plan is effective consistent with 4VAC50-85-140 D 1; and

b. Identification of circumstances or changes in the farm operation such as changes in the zone or grid sampling or changes to which nutrients are being managed under precision nutrient management that would require the plan to be updated prior to the time specified in this subdivision; and

c. Identification of circumstances or changes on nonagricultural lands that would require the plan to be updated prior to the time specified in this subdivision include:

(1). Major changes in management area such as major golf course renovation, changing general turf to an athletic field, removal or inclusion of impervious surfaces, or removal or inclusion of landscape beds;

(2). Changes in turf type such as changing from a cool season to warm season grass species;

(3). Changes in structural management practices such as adding or eliminating irrigation or changes in drainage; and

(4). New soil tests showing an increased phosphorus fertility rating compared to previous results.

6. Yield records, including georeferenced yield data where available, sufficient to establish expected crop yields consistent with 4VAC50-85-140 or the Virginia Agronomic Land Use Evaluation System (VALUES) as contained in the Virginia Nutrient Management Standards and Criteria, revised September 2026, for the field or management zone; and

7. If manure, biosolids, or organic wastes are used on any field included in the nutrient management plan, the following shall also be included:

a. The following information in summary or narrative form:

(1) Quantities of manure produced on the farm, available manure storage capacity, and manure analysis;

(2) Total manure used as crop nutrients, if any, including manure from both on farm and off farm sources based on plan recommendations and total land requirements for manure utilization;

(3) Quantity of unused manure, if applicable, and recommendations on appropriate use options;

b. The location of the following:

(1) Setback areas for nonapplication for manure and biosolids as specified in 4VAC50-85-140 A 5 e; and

(2) Location of manure, biosolids, or waste storage if any.

c. Recommended organic nutrient source application rates in tons per acre or 1,000 gallons per acre; plant available nitrogen as N, phosphorus as P_2O_5, and potassium as K_2O per acre; and spreading schedule to include approximate months of application; and

d. Expected time of incorporation of organic nutrient sources into the soil if organic nutrient sources will be used.

8. The following information for all fields where the phosphorus applications are based on the phosphorus index:

a. Functioning riparian buffer widths and distances to surface waters in feet;

b. Presence of any contour planting at a maximum of 1.0% row grade, strip cropping, conservation tillage with greater than 30% residue, or terraces;

c. Percentage of required ground cover on pastures stated as <50% cover, 50-75% cover, or >75% cover;

d. Crop tillage type for each crop stated as either no-till or tilled for all cropland; and

e. If expected soil erosion for the phosphorus index was developed using RUSLE2, a copy of the RUSLE2 Profile Erosion Calculation Record computerized print-out indicating: (i) crop(s) for each year in the crop rotation to match those identified in the nutrient management plan, (ii) all mechanical field operations, and (iii) edge of field soil loss for each field; and

9. Identification of circumstances or changes in the farm operation such as an increase in animal numbers, change in animal type or any changes that would impact the amount of manure available from the operation that would require the plan to be updated prior to the time specified in this subdivision; and

10. Other notes as needed pertaining to nutrient application, tillage, and other special conditions.

11. The nutrient management planner shall incorporate additional more restrictive plan requirements if required by other specific legislative, regulatory or incentive programs which apply to a specific operator.

I. Transfer nutrient management plan requirements. A transfer nutrient management plan shall include the following:

1. Farmer or operator name and address;

2. Name, certificate number, and signature of the certified nutrient management planner that prepared the plan;

3. County and watershed code of land under the transfer nutrient management plan;

4. Date the plan was prepared or revised;

5. Type and approximate number of livestock;

6. A map or aerial photograph identifying the (i) the farm location and boundaries, and (ii) the location of manure, biosolids, or waste storage if any. The map or aerial photograph shall be legible, with those features recognizable. A farm sketch or soil survey map may be used when a map or aerial photograph is not available, if those features are recognizable;

7. An estimate of manure production and most recent manure analysis;

8. The applicable permit number if the nutrient management plan is developed to cover an activity that requires a permit issued by the Department of Environmental Quality; and

8. The requirements of subsection F of this section, where applicable.

4VAC50-85-140. Required nutrient management plan procedures.

A. Nutrient application.

1. A certified nutrient management planner shall include, in each plan, nutrient application practices for each field in the plan. The nutrient application rates shall be calculated for nitrogen (N), phosphate (P_2O_5), and potash (K_2O). Individual field recommendations shall be made after considering nutrients contained in fertilizers, manure, biosolids, industrial ~~wastes~~residuals, legumes in the crop rotation, crop residues, residual nutrients, and all other sources of nutrients. Individual fields may be grouped together if similar soil productivity levels, soil fertility levels, and environmentally sensitive site features exist.

2. Nutrient application rates.

a. Determination of crop nutrient needs shall be consistent with tables and procedures contained in Virginia Nutrient Management Standards and Criteria~~, revised July 2014,~~, revised September 2026, ~~and the Commercial Vegetable Production Recommendations, 2005 (Virginia Cooperative Extension Publication 456-420),~~ and shall be based on soil test results for P_2O_5 and K_2O.

b. Nitrogen applications rates in nutrient management plans shall not exceed crop nutrient needs in subdivision 2 a of this subsection.

c. Phosphorus application rates shall be managed to minimize adverse water quality impacts consistent with subdivisions 2 c (1) through (5) of this subsection.

(1) Phosphorus applications from inorganic nutrient sources shall not exceed crop nutrient needs over the crop rotation based on a soil test.

(2) Phosphorus applications shall not ~~be included in nutrient management plans developed after December 31, 2005, for soils~~ exceed~~ing~~ 65% phosphorus saturation levels as listed in Virginia Nutrient Management Standards and Criteria~~, revised July 2014~~ revised September 2026, regardless of the outcome of other procedures specified in this subsection except as allowed in subdivision 2 c (4) of this subsection.

(3) ~~Whenever possible, phosphorus~~ Phosphorus applications from organic nutrient sources should not exceed crop needs based on a soil test over the duration of the

crop rotation. If this is not possible, maximum phosphorus application rates and phosphorus control practices contained in nutrient management plans shall be consistent with the phosphorus management provisions contained in Virginia Nutrient Management Standards and Criteria~~, revised July 2014~~ revised September 2026, except as allowed in subdivision 2 c (4) of this subsection.

~~(4) Fields controlled by existing operations that receive phosphorus applications only from on-farm or on-site generated liquid dairy manure, liquid swine manure, or liquid sewage sludge shall be limited to a maximum of crop removal amounts of applied phosphorus until December 31, 2010, if the field exceeds 65% phosphorus saturation levels or has a phosphorus index rating that exceeds 100. New operations that begin production after December 31, 2005, or operations that expand after December 31, 2005, by increasing the total phosphorus generated in liquid dairy manure, liquid swine manure or liquid sewage sludge by more than 10% shall not be considered existing operations.~~

(5) A single phosphorus application may be recommended to address multiple crops in the crop rotation identified within the timeframe covered by the nutrient management plan consistent with 4VAC50-85-140 D 1 if the single application does not exceed the sum of the appropriate application rates for individual crops as determined by subdivisions 2 c (1) through (3) of this subsection.

d. ~~Recommended application rates for secondary nutrients and micronutrients should be at agronomically or economically justifiable levels for expected crop production.~~ Potassium applications sufficient to meet crop nutrient needs shall be included in nutrient management plans for all fields. ~~consistent with recommendations contained in Virginia Nutrient Management Standards and Criteria, revised July 2014.~~

e. Expected crop yield shall be determined from any of the following methods on a given field:

(1) Soil productivity group expected crop yields based on and consistent with soil productivity information contained in Virginia Nutrient Management Standards and Criteria, revised September 2026~~, revised July 2014~~;

(2) ~~The farmer's past experience with crop yields in specific fields may be used to make reasonable adjustments to expected crop yields in subdivision 2 e (1) of this subsection in lieu of verifiable yield records provided the upward adjustments impact no more than 20% of the acreage of any crop on a particular farm; or~~ Where field-specific yield records are unavailable, expected crop yields for new or unrecorded fields may be derived, utilizing the planner's professional judgement, by applying verified crop yield records from similar fields under the

same management (e.g., averaging the top-performing years), adjusted using soil productivity data, with clear justification and recordkeeping, and transitioning to field-specific yield records once sufficient data are collected.

(3) ~~Verifiable past crop yields are utilized to determined expected crop yield.~~If verifiable crop yield records are available during the development of the plan, these records should be used to determine the expected crop yields. - The calculation of expected crop yield shall be an average of the three highest yielding years taken from the last five years the particular crop was grown in the specific field.

f. Representative soil analysis results for fields shall be determined by using standard soil sampling and analysis methods according to Methods of Soil Analysis, Part 3, Chemical Methods, 1996, utilizing the Mehlich I extraction procedure for phosphorus or other methods and laboratories approved by the department and correlated to Mehlich I and utilizing correlation procedures contained in Virginia Nutrient Management Standards and Criteria~~, revised July 2014~~ , revised September 2026. Soil analysis ~~results~~ reports shall be dated no more than three years prior to the beginning date of the nutrient management plan. ~~A single composite soil sample should represent an area up to approximately 20 acres.~~

(1) Each agricultural field shall have a soil sample. Fields such as those common to strip cropping may be combined when soils, previous cropping history, and soil fertility are similar. ~~Representative soil sample cores shall be obtained from the soil surface to a depth of four inches (0-4") for fields that have not been tilled within the past three years, and from the soil surface to a depth of six inches (0-6") for fields that are tilled or have been tilled within the past three years.~~ Soil sampling of fields based on subfield grids or management zones may be utilized.

(2) For nonagricultural land, a single composite soil sample should represent an area up to approximately 20 acres. Soil sampling of fields based on subfield grids or management areas may be utilized.

g. For existing operations, the most recent organic nutrient source analysis results or an average of past nutrient analysis results for the specific operation shall be used to determine the nutrient content of organic nutrient sources. Organic nutrient source analysis report shall be dated no more than three years before the date of the nutrient management plan. ~~within the last three-year period shall be used to determine the nutrient content of organic nutrient sources.~~ Manure analyses shall include percent moisture, total nitrogen or total Kjeldahl nitrogen, ammonium nitrogen, total phosphorus, and total potassium determined using laboratory methods consistent with Recommended Methods of Manure Analysis, publication A3769, University of Wisconsin, 2003, or other methods approved by the department. For plans on new animal waste facilities, average analyses published in Virginia Nutrient Management Standards and Criteria~~, revised July 2014~~ revised September 2026, ~~should~~ shall be utilized unless proposed manure storage and treatment conditions warrant the use of alternative data. Plant available nutrient content shall be determined using the mineralization rates and availability coefficients found in Virginia Nutrient Management Standards and Criteria~~, revised July 2014,~~ revised September 2026, for different forms and sources of organic nutrients. Mineralization of organic nutrients from previous applications shall be accounted for in the plan.

h. The expected nitrogen contributions from legumes shall be credited when determining nutrient application rates at levels listed in Virginia Nutrient Management Standards and Criteria~~, revised July 2014~~ revised September 2026.

3. ~~Soil pH influences nutrient availability and crop nutrient utilization and shall be adjusted to the level suited for the crop.~~ Nutrient management plans shall contain lime recommendations to adjust soil pH to a level within the appropriate agronomic range for the existing crop or crop(s) to be grown. ~~Recommendations shall address lime application if soil pH is below the optimal range. Nutrient management planners shall not recommend the application of lime, lime-amended materials, or nutrient sources that are expected to raise the soil pH to a level that exceeds the appropriate agronomic range for the growing crop or crop(s) to be grown based on recommendations contained in Virginia Nutrient Management Standards and Criteria, revised July 2014~~.

4. Nutrient application timing.

a. Timing recommendations for nutrient sources containing nitrogen shall be as close to plant nutrient uptake periods as reasonably possible. A certified nutrient management planner shall utilize procedures contained in Virginia Nutrient Management Standards and Criteria~~, revised July 2014~~ revised September 2026, to determine the timing of nutrient applications. To reduce the potential for nutrient leaching or runoff, a certified nutrient management planner shall recommend applications of nitrogen-containing materials only to sites where an actively growing crop is in place at the time of application or where a timely planted crop will be established within 30 days of the planned nutrient application, except as specified in subdivisions 4 b through e of this subsection. If such nutrient applications are made to fall-seeded crops such as small grain, the crop planted shall be capable of germination and significant growth before the onset of winter so the crop is able to take up the available applied nitrogen.

b. Organic nutrient source applications may be applied at differing times than specified in subdivision 4 a of this subsection in order to manage storage constraints in accordance with the following conditions:

(1) Applications of organic nutrient sources shall be within 60 days of planting a spring seeded crop to sites that are not environmentally sensitive sites as identified in 4VAC50-85-10 or the Virginia Nutrient Management Standards and Criteria~~, revised July 2014~~ revised September 2026, except as specified in subdivision 4 b (2) of this subsection. Such nutrient applications shall not exceed allowable application rates of the spring seeded crop;

(2) Applications shall be within 90 days of planting a spring seeded crop to sites that meet all of the following requirements:

(a) Are not environmentally sensitive sites as identified in 4VAC50-85-10 or the Virginia Nutrient Management Standards and Criteria~~, revised July 2014~~ revised September 2026;

(b) Have slopes of less than 7.0% throughout the application area unless: (i) at least 60% uniformly distributed crop residue cover exists following application or (ii) the application and any associated tillage is in conformance with an existing and implemented soil conservation plan meeting NRCS requirements for the site; and

(c) The organic sources being applied are one of the following: semi-solid beef manure, semi-solid dairy manure with sawdust bedding or straw bedding, ~~dewatered anaerobically digested sewage sludge~~biosolids, or dewatered ~~lime stabilized sewage sludge~~biosolids. Such nutrient applications shall not exceed allowable application rates of the spring planted crop;

(3) Applications of organic nutrient sources may occur prior to the times specified in subdivisions 4 b (1) and (2) of this subsection on:

(a) Sites that are not environmentally sensitive sites if all of the following requirements are met: (i) a trap crop exists that has reached a Zadoks growth stage of 23 or greater having a uniform stand throughout the site area of at least 20 plants per square foot; (ii) the trap crop shall be allowed to continue growing on the entire site until within two weeks of the spring crop planting date; (iii) all such nitrogen applications of organic nutrient sources to trap crops shall not exceed the crop nutrient needs of the upcoming spring planted crop subtracting at least 30 pounds per acre of nitrogen to be reserved for use as a banded starter fertilizer at the time of spring planting; and (iv) the rate of organic nutrient source applied does not smother the crop.

(b) Environmentally sensitive sites as identified in 4VAC50-85-10 or the Virginia Nutrient Management Standards and Criteria~~, revised July 2014~~ revised September 2026, in addition to those criteria outlined in subdivision 4 b (3) (a) of this subsection, such applications to a trap crop must be within 60 days of planting a spring planted crop.

~~c. The nutrient timing requirements of subdivisions 4 a and b of this subsection for application of sewage sludge to nonenvironmentally sensitive sites in nutrient management plans shall not be effective until January 1, 2009. The delayed implementation time is provided to allow for the development of adequate winter storage capacity, landfilling, or alternative uses. All applications of sewage sludge to environmentally sensitive sites in nutrient management plans will fully comply with the requirements of subdivisions 4 a and b of this subsection by January 11, 2006.~~

~~d~~c. Composted organic nutrient sources having a final carbon to nitrogen ratio of 20:1 or greater are exempt from requirements of subdivisions 4 a and b of this subsection if analyzed for carbon to nitrogen ratio at the conclusion of the composting process and results are obtained prior to land application. The planner shall recommend soil nitrate testing to determine nitrogen application rates during the growing season following the application of composted organic nutrient sources.

~~e~~d. The nutrient management planner shall recommend split application of inorganic nitrogen fertilizers as starter or broadcast and sidedressing or top dressing in row crops and small grains consistent with procedures contained in Virginia Nutrient Management Standards and Criteria~~, revised July 2014~~ revised September 2026, on environmentally sensitive sites as identified in 4VAC50-85-10. Split applications of inorganic nitrogen fertilizers and irrigation scheduling shall be recommended for crops to receive irrigation. The use of a pre-sidedress nitrogen test (PSNT) can help to determine nitrogen needs during the growing period. In lieu of split applications, the planner may recommend the application of the total nitrogen requirement for spring-planted row crops within one week prior to planting if at least 50% of the plant available nitrogen requirement of the crop is supplied with slowly available nitrogen sources.

~~f~~e. Nutrient management plans shall include a statement indicating that applications of inorganic nutrient sources, liquid manure, liquid ~~sewage sludge~~biosolids, or liquid industrial residuals ~~waste~~ are not to occur on frozen or snow-covered ground. When ground is frozen, dry or semi-solid manures, dewatered ~~sludges~~biosolids, or dewatered industrial ~~wastes~~ residuals may only be applied if the field ~~has~~meets the following conditions:

(i) slopes not greater than 6.0%;

(ii) 60% uniform ground cover from crop residue or an existing actively growing crop such as a small grain or fescue with exposed plant height of three inches or more;

(iii) a minimum of a 200-foot vegetated or adequate crop residue buffer between the application area and all surface water courses; and

(iv) soils characterized by USDA as "well drained."

5. Application method for nutrients.

a. The application of nitrogen containing materials shall be managed to minimize runoff, leaching, and volatilization losses.

b. Applications of liquid manures or ~~sludges~~ biosolids utilizing irrigation shall not be recommended to be applied at hydraulic rates above those contained in Virginia Nutrient Management Standards and Criteria~~, revised July 2014~~ revised September 2026.

c. Plans shall not recommend liquid manure or ~~sludge~~ biosolids application rates utilizing nonirrigation liquid spreading equipment which exceed 14,000 gallons per acre (approximately one-half (0.5) inch) per application. The amount of liquid manure or ~~sludge~~ biosolids application in plans will not exceed the hydraulic loading capacity of the soil at the time of each application. If a subsequent pass across a field is necessary to achieve the desired application rate, the plan will allow for sufficient drying time.

~~d. Where possible, the planner should recommend that biosolids, industrial wastes and manures be incorporated or injected in the crop root zone in order to reduce losses of nitrogen to the atmosphere and to increase the plant available nitrogen to phosphorus ratio of these nutrient sources relative to crop nutrient needs. Lime stabilized biosolids should not be injected due to the creation of a localized band of high soil pH unless subsequent practices are utilized, such as disking, in order to adequately mix the soil.~~

~~e~~d. The planner shall recommend setbacks around wells, springs, surface waters, sinkholes, and rock outcrops where manure, biosolids, or industrial ~~waste~~ residuals should not be applied. Such setbacks recommended shall be consistent with criteria contained in Virginia Nutrient Management Standards and Criteria~~, revised July 2014~~ revised September 2026, unless alternative setbacks or buffers are specified in regulations or permits pertaining to the site. For sites impacted by other regulations or permits, the planner shall include the setbacks and buffers specified in regulations promulgated under § 62.1-44.19:3 of the Code of Virginia for ~~sewage sludge~~ biosolids, § 62.1-44.17:1 of the Code of Virginia for animal waste, § 62.1-44.17:1.1 of the Code of Virginia for poultry waste, and Article 2.5 (§ 62.1-44.15:67 et seq.) of Chapter 3.1 of Title 62.1 of the Code of Virginia for sites in Chesapeake Bay Preservation areas, and § 62.1-44.16 ~~permits~~of the Code of Virginia for industrial waste land application. The land area within setback and buffer areas shall be deducted from field acreage to determine usable field acreage for nutrient application in nutrient management plans.

B. Manure production and utilization.

1. The planner shall estimate the annual manure quantity produced on each farm utilizing tables and forms contained in Virginia Nutrient Management Standards and Criteria, ~~revised July 2014,~~ revised September 2026, or from actual farm records of manure pumped or hauled during a representative 12-month period.

2. The nutrient management plan shall state the total amount of manure produced and the amount that can be used on the farm, utilizing the information and methods provided in the Virginia Nutrient Management Standards and Criteria~~, revised July 2014~~ revised September 2026. The plan shall discuss any excess manure and shall provide recommendations concerning options for the proper use of such excess manure.

C. Plans shall identify and address the protection from nutrient pollution of environmentally sensitive sites.

D. Plan maintenance and revisions.

1. A site-specific nutrient management plan developed in accordance with all requirements of these regulations, including specified crops or crop rotations, shall provide information on soil fertility and seasonal application of required nutrients for one to five years of crop production. Plans developed for a period of time greater than three years and up to five years shall be limited to sites in permanent pasture or continuous hay or that are golf courses. Plans that are developed to meet the requirements of §10.1-104.4 shall be in effect for no more than three years.

2. The plan shall state a need for immediate modification if:

~~(i)~~a. animal numbers are to increase above the level specified in the plan;

~~(ii)~~b. animal types including intended market weights are to be changed;

~~(iii)~~c. additional imported manure, biosolids, or industrial ~~waste~~ residuals that was not identified in the existing plan is to be applied to fields under the control of the operator; ~~or~~

~~(iv)~~d. available land area for the utilization of manure decreases below the level necessary to utilize manure in the plan; or. ~~The plan shall also state a need for~~

~~modification prior to subsequent nutrient applications if cropping systems, rotations, or fields are changed and phosphorus will be applied at levels greater than crop nutrient needs based on soil analysis as determined from procedures in Virginia Nutrient Management Standards and Criteria, revised July 2014~~

e. at an animal feeding operation utilizing a transfer plan where plant nutrients are being proposed for land application, thus requiring a site-specific plan for land application.~~.~~

3. The plan shall also state a need for modification prior to subsequent nutrient applications if cropping systems, rotations, or fields are changed and phosphorus will be applied at levels greater than crop nutrient needs based on soil analysis as determined from procedures in Virginia Nutrient Management Standards and Criteria, revised September 2026.

4. All plans on nonagricultural land shall state a need for modification prior to subsequent nutrient applications in the following circumstances:

a. Major changes in management area such as major golf course renovation, changing general turf to an athletic field, removal or inclusion of impervious surfaces, or removal or inclusion of landscape beds;

b. Changes in turf type such as changing from a cool season to warm season grass species;

c. Changes in structural management practices such as adding or eliminating irrigation or changes in drainage; and

d. New soil test results showing an increased phosphorus fertility rating compared to previous results.

~~3. Adjustments to manure production and application should be made if there are increases in animal numbers or changes in how animal waste is stored or applied, or when there are changes in nutrient content of manure resulting from changing feed rations, animal types, or new sampling and analysis for nutrient content and application rate calculations.~~

~~4. Soil analysis shall be recommended for each field at least once every three years to determine the soil fertility and pH, and to update the nutrient management plan.~~

~~5. Manure analysis shall be recommended before field application until a baseline nutrient content is established for the specific manure type on the corresponding farm operation. After a baseline nutrient content is established, a manure analysis shall be recommended at least once every three years for dry or semisolid manures, and at least once every year for liquid manures.~~

~~6~~4. Modified top dressing or sidedressing application rates of nitrogen may be recommended if a pre-sidedress nitrogen test (PSNT) administered during the growing season indicates different levels of nitrogen than planning time calculations if the use of the PSNT and interpretation of the test results are consistent with Virginia Nutrient Management Standards and Criteria~~, revised July 2014~~ revised September 2026.

Documents Incorporated by Reference (4VAC50-85)

Virginia Nutrient Management Standards and Criteria, revised September 2026~~revised July 2014,~~ Department of Conservation and Recreation~~, Division of Nonpoint Pollution Prevention~~

~~Virginia Commercial Vegetable Production Recommendations for 2005, Virginia Cooperative Extension Service, Publication No. 456-420~~

Electronic Field Office Technical Guide, Natural Resources Conservation Service, United States Department of Agriculture

Methods of Soil Analysis, Part 3, Chemical Methods, 1996, Soil Science Society of America/American Society of Agronomy

Recommended Methods of Manure Analysis, publication A3769, University of Wisconsin, 2003

Tucker, M.R. 1992. Determination of phosphorus by Mehlich 3 extraction. pg. 6-8. In S.J. Donohue (Ed.) Reference Soil and Media Diagnostic Procedures for the Southern Region of the United States. Southern Cooperative Series Bulletin No. 374

Virginia Phosphorus Index Version 2.0 Technical Guide, Revised October 2005, Virginia Tech

Commonwealth of Virginia

Virginia Nutrient ~~-~~Management Standards and Criteria

Revised ~~July 2014~~ September 2026

Department of Conservation and Recreation
Division of Soil and Water Conservation
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VIRGINIA NUTRIENT MANAGEMENT
STANDARDS AND CRITERIA

Revised ~~July 2014~~ September 2026

Virginia Department of Conservation and Recreation
Division of Soil and Water Conservation
600 East Main Street, 4th Floor
Richmond, VA 23219

~~600 East Main Street, 4th Floor~~

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~~Richmond, VA 23219~~

Virginia Nutrient Management Standards and Criteria Definitions

The following words and terms when used in this document shall have the following meanings unless the context clearly indicates otherwise:

“Broadcast” means the uniform application of a material over a field, or sub-field unit in precision nutrient management.

“Cool season grass” means grass species of temperate zone origin which exhibit the greatest rates of dry matter production in the day/night temperature range of 60°/50°F to 80°/70°F. Examples of cool season grasses include fescue, bluegrass, and ryegrass.

“Enhanced efficiency fertilizer” describes fertilizer products with characteristics that allow increased plant nutrient availability and reduce the potential of nutrient losses to the environment when compared to an appropriate reference product.

“Hydrologic soil group” means a classification of soils into one of four groups, A, B, C, or D, according to their hydrologic properties, ranging from low runoff potential (high infiltration potential) in group A to high runoff potential (low infiltration potential) in group D.

“Slow or controlled release fertilizer” means a fertilizer containing a plant nutrient in a form which delays its availability for plant uptake and use after application, or which extends its availability to the plant significantly longer than a reference “rapidly available nutrient fertilizer” such as ammonium nitrate, urea, ammonium phosphate or potassium chloride. A slow or controlled release fertilizer must contain a minimum of 15 percent slowly available forms of nitrogen.

“Soil management group” means a grouping of soils based on their similarity in profile characteristics which affect crop production and require specific soil and crop management practices.

“Soil series” means a classification of a specific soil type by name based on the morphological, chemical, and physical properties of the soil.

“Tissue test” means an analysis of crop tissue for the percentage of nitrogen at key growth stages, and used as an intensive nutrient management technique with small grain crops.

“Topdress” means broadcast applications of fertilizer on crops such as small grains or forage after crop emergence has occurred.

“Warm season grass” means a grass species of tropical origin that exhibits the highest rate of dry matter production in the day/night temperature range of 90°/79°F at a minimum to a maximum of 97°/88°F. Examples of warm season grasses include zoysia and bermuda grasses.

“Water insoluble nitrogen” or “WIN” means the amount of a type of slowly available nitrogen listed on fertilizer bags and reported as a percentage.

“Water soluble nitrogen”, “WSN”, or “readily available nitrogen” means: Water soluble nitrogen in either ammonical, urea, or nitrate form that does not have a controlled release, or slow response.

Section I – Virginia Agronomic Land Use Evaluation System (VALUES)/Estimated Yields

VALUES

When developing nutrient recommendations using the Virginia Agronomic Land Use Evaluation System (VALUES), first determine the soil map units (soil series) within field boundaries from the soil survey maps of the subject farm. Using this information, the soil productivity group is determined from Table 1-1 for each crop to be grown.

Nitrogen fertilizer recommendations are developed by identifying the soil productivity group for the crop to be grown in Table 1-1, and utilizing the appropriate Department approved application rate for the crop. Phosphorus and potassium recommendations are determined based on the soil test results for the field and a corresponding Department approved recommended application rate for the crop.

When using soil productivity groupings to determine expected yields, if a soil is listed in Table 1-1 as not suited (NS) for a particular crop, the farmer should be advised that the particular crop is not recommended to be grown on the soil. If the crop is still grown in that soil type, use the lowest productivity group rating for that crop to determine the expected yield (i.e, if alfalfa will be grown on a soil listed as NS, then the planner would use productivity group III to determine nutrient application rates).

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~~Instructions for the Use of the Virginia Nutrient Management Standards and Criteria, Revised 2014~~

~~♦ When producer records are utilized to establish expected crop yields, average the three highest yields achieved over the last five crop years the particular crop was grown in the field, (i.e. exclude the two lowest crop yields before calculating the average). The corresponding soil productivity group for the field is determined by finding the expected crop yield in Table 1-2 that is closest to the above determined yield. These yields must be adjusted to reflect standard moisture levels for grains and forages as indicated in Table 1-2.~~

~~♦ When developing nutrient recommendations using the Virginia Agronomic Land Use Evaluation System (VALUES), first determine the soil map units (soil series) within field boundaries from the soil survey maps of the subject farm. Using this information, the soil productivity group is determined from Table 1-1 for each crop to be grown.~~

~~♦ Using the Virginia Agronomic Land Use Evaluation System (VALUES), Table 1-2, the expected yield of a c rop for any one field may be det ermined in one o f two ways. If any single soil productivity group comprises 67% or more of a field, this is considered a predominant soil group, and it may be us ed to establish the expected yield for the entire field. The other method is to use a w eighted average of all soil productivity groups to determine the expected yield and nutrient recommendations. If several map units make up a field representing multiple productivity groups, none of which account for 67% or more of the field, then the weighted average method to determine the expected crop yield shall be used.~~

~~♦ When using the weighted average method, determine expected crop yield for each soil map unit from Table 1-2, and determine the weighted average yield for the field by summing the fractional yields for each soil map unit. After the weighted average expected yield is calculated and any yield reductions are considered, the soil productivity group of the field is determined by finding the expected crop yield in Table 1-2 which is closest to the weighted average yield.~~

~~♦ To establish an expected yield for a soil series complex use a weighted average formula based on t he percentages for each complex as specified in the county soil survey OR with percentages of 60%-40% for complexes with two named soils and 50% -30%-20% for complexes with three named soils. In complexes, the percentages shall be appl ied in decending order in the same order as the soils are denoted in the complex name.~~

~~♦ Micronutrient or trace element recommendations should be made using Virginia Tech Soil Test Note 4: Trace Elements, (Publication 452-234) or the Commercial Vegetable Production Recommendations 2005 (Publication 456-420). With the exception of boron, micronutrient recommendations should be based on soil test levels.~~

~~♦ Once the expected yield for a crop is determined, a yield reduction will need to be applied if certain conditions exist within the soil profile such as eroded~~

~~topsoil, slope, coarse fragments and rock outcrops. These conditions are explained with the associated yield reductions in Table 1-3.~~

~~♦ A field shall be considered an “environmentally sensitive site”, where any part of the field drains into a sinkhole or if at least 33% of the area of the field contains one o r a combination of the following features:~~

1. ~~Soils with high potential for leaching based on soil texture or excessive drainage (Table 1-4);~~
2. ~~Shallow soils less than 41 inches deep likely to be located over fractures or limestone bedrock (Table 1-4);~~
3. ~~Subsurface tile drains;~~
4. ~~Soils with high potential for subsurface lateral flow based on soil texture and poor drainage table 1-4);~~
5. ~~Floodplains as identified by soils prone to frequent flooding in county soil surveys;~~
6. ~~Lands with slopes greater than 15%.~~

~~Fields containing environmentally sensitive sites may be subdivided into separate fields, if the areas can be m anaged individually and the operator agrees to manage each area as written in the plan.~~

~~♦ The results of soil testing labs approved by the Department must be correlated to Virginia Tech Mehlich I using Table 2-1, and the conversion procedures in Section II. Only the Virginia Tech soil test scale and the conversion of other approved labs to the Virginia Tech soil test scale can be used to develop phosphorus and potassium recommendations when developing Virginia nutrient management plans.~~

~~♦ Nitrogen fertilizer recommendations are developed by identifying the soil productivity group for the crop to be grown in Table 1-1, and selecting a recommended application rate from the various crops listed in Section V. Phosphorus and potassium recommendations are determined based on the soil test results for the field by the accompanying table listed with each crop in Section V.~~

~~♦ Use the Virginia Tech soil test rating (such as M+) to determine Phosphorus and Potassium recommendations from Section V. If the soil test level is L, M, or H use the midpoint of the recommended nutrient application range. If the soil test level is L-, M-, or H- use the highest value of the recommended nutrient application range. If the soil test level is L+, M+, or H+ use the lowest value of the recommended nutrient application range. Where there is only a single recommendation listed for any soil test rating use the same recommendation for any of the three soil test ratings.~~

~~♦ When using soil productivity groupings to determine expected yields, if a soil is listed in Table 1-1 as not suited (NS) for a particular crop, the farmer should be advised that the particular crop is not recommended to be grown on the soil. If the crop will still be grown in that soil type, use the lowest productivity group rating for that crop to determine the expected yield (i.e, if alfalfa will be grown on a soil listed as NS, then the planner would use productivity group III to determine nutrient application rates).~~

Table 1-1
Soil Productivity Groupings for Various Cropping Categories

Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Abell	G	IIa	IIa	I	II	II	I
Abell variant	G	IIa	IIa	I	II	II	I
Ackwater	K	IIb	IIb	I	II	III	I
Acredale (drained)	C	Ib	Ib	II	Ib	NS*	I
Acredale (undrained)	OO	V	V	V	V	NS*	NS*
Aden (drained)	C	Ib	Ib	II	Ib	NS*	I
Aden (undrained)	OO	V	V	V	V	NS*	NS*
Airmont	BB	IVb	IVb	III	IV	NS*	III
Alaga	II	V	V	III	V	NS*	NS*
Alamance	FF	IVb	IVb	III	IV	NS*	III
Alanthus	D	Ib	Ib	I	Ib	I	I
Albano	KK	V	V	V	V	NS*	IV
Albemarle	JJ	V	V	IV	V	NS*	IV
Alderflats	NN	V	V	V	V	NS*	NS*
Aldino	W	IVa	IVa	IV	III	NS*	IV
Allegheny	L	IIb	IIb	I	II	III	II
Alluvial Land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Alluvial Land, sandy and gravelly	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Alluvial Land, wet	MM	V	V	V	V	NS*	IV
Alonemill	A	Ia	Ia	I	Ia	I	I
Alonemill, Fluvaquentic	I	IIa	IIa	I	II	NS*	I
Alonzville	L	IIb	IIb	I	II	III	II
Altavista	B	Ia	Ia	I	Ia	II	I
Altavista, variant	B	Ia	Ia	I	Ia	II	I
Alticrest	E	IIa	IIa	I	II	NS*	II
Angie	AA	IVa	IVa	II	III	NS*	IV
Angie variant	AA	IVa	IVa	II	III	NS*	IV
Appling	V	IVa	IVa	II	III	III	III
Appling gritty	V	IVa	IVa	II	III	III	III
Appomattox	O	IIb	IIb	I	II	II	II
Aqualfs	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Aquents	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Aquic Udifluvents	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Aquults	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Arapahoe	EE	IVb	IVb	III	IV	NS*	NS*
Arcola	U	IIIb	IIIb	II	II	III	II
Ardilla	W	IVa	IVa	IV	III	NS*	IV

Table 1-1
Soil Productivity Groupings for Various Cropping Categories

Soil Series	**Soil Mgt. Group**	**Corn**	**Grain Sorghum**	**Small Grain**	**Soybeans**	**Alfalfa**	**Tall Grass, Clover, Hay, Pasture**
Argent	PP	V	V	V	V	NS*	NS*
Arkaqua	I	IIa	IIa	I	II	NS*	I
Arlington National Cemetery	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Ashburn	BB	IVb	IVb	III	IV	NS*	III
Ashe	JJ	V	V	IV	V	NS*	IV
Ashlar	FF	IVb	IVb	III	IV	NS*	III
Assateague	QQ	V	V	V	V	NS*	NS*
Athol	M	IIb	IIb	I	II	I	II
Atkins	NN	V	V	V	V	NS*	NS*
Atlee	Q	IIIa	IIIa	II	II	NS*	III
Augusta (drained)	P	IIb	IIb	II	II	NS*	III
Augusta (undrained)	Z	IVa	IVa	IV	III	NS*	NS*
Augusta variant (drained)	P	IIb	IIb	II	II	NS*	III
Augusta variant (undrained)	Z	IVa	IVa	IV	III	NS*	NS*
Aura	T	IIIb	IIIb	II	II	NS*	III
Austinville	O	IIb	IIb	I	II	II	II
Axis	PP	V	V	V	V	NS*	NS*
Aycock	R	IIIa	IIIa	II	II	III	II
Ayersville	FF	IVb	IVb	III	IV	NS*	III
Backbay	PP	V	V	V	V	NS*	NS*
Badin	X	IVa	IVa	II	III	III	II
Baile	HH	IVb	IVb	III	IV	NS*	IV
Bailegap	GG	IVb	IVb	IV	IV	NS*	III
Balsam	GG	IVb	IVb	IV	IV	NS*	III
Bama	R	IIIa	IIIa	II	II	III	II
Banister	K	IIb	IIb	I	II	III	I
Bannertown	FF	IVb	IVb	III	IV	NS*	III
Barclay	E	IIa	IIa	I	II	NS*	II
Barkers Crossroads	G	IIa	IIa	I	II	II	I
Bateau	I	IIa	IIa	I	II	NS*	I
Batteau	I	IIa	IIa	I	II	NS*	I
Bayboro (drained)	C	Ib	Ib	II	Ib	NS*	I
Bayboro (undrained)	OO	V	V	V	V	NS*	NS*
Bearknob	GG	IVb	IVb	IV	IV	NS*	III
Beckham	O	IIb	IIb	I	II	II	II
Bedington	FF	IVb	IVb	III	IV	NS*	III
Beech	L	IIb	IIb	I	II	III	II

Table 1-1
Soil Productivity Groupings for Various Cropping Categories

Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Beech Grove	JJ	V	V	IV	V	NS*	IV
Belhaven	PP	V	V	V	V	NS*	NS*
Bellspur	H	IIa	IIa	III	II	NS*	IV
Beltsville	BB	IVb	IVb	III	IV	NS*	III
Belvoir	BB	IVb	IVb	III	IV	NS*	III
Benthole	CC	IVb	IVb	II	IV	NS*	III
Bentley	R	IIIa	IIIa	II	II	III	II
Berks	JJ	V	V	IV	V	NS*	IV
Berks variant	JJ	V	V	IV	V	NS*	IV
Bermudian	A	Ia	Ia	I	Ia	I	I
Bertie	J	IIb	IIb	I	II	NS*	I
Bertie, variant	J	IIb	IIb	I	II	NS*	I
Bethera (drained)	C	Ib	Ib	II	Ib	NS*	I
Bethera (undrained)	OO	V	V	V	V	NS*	NS*
Bethesda	JJ	V	V	IV	V	NS*	IV
Bethlehem	V	IVa	IVa	II	III	III	III
Bibb	EE	IVb	IVb	III	IV	NS*	NS*
Biltmore	II	V	V	III	V	NS*	NS*
Birdsboro	L	IIb	IIb	I	II	III	II
Blackarn	JJ	V	V	IV	V	NS*	IV
Blackthorn	GG	IVb	IVb	IV	IV	NS*	III
Bladen	OO	V	V	V	V	NS*	NS*
Bladen (drained)	C	Ib	Ib	II	Ib	NS*	I
Bladen (undrained)	OO	V	V	V	V	NS*	NS
Blago	HH	IVb	IVb	III	IV	NS*	IV
Blairton	FF	IVb	IVb	III	IV	NS*	III
Bland	Y	IVa	IVa	III	III	NS*	III
Blocktown	JJ	V	V	IV	V	NS*	IV
Bloodyhorse	JJ	V	V	IV	V	NS*	IV
Bluemont	JJ	V	V	IV	V	NS*	IV
Bohicket	PP	V	V	V	V	NS*	NS*
Bojac (ES, VA Beach, Ches.)	T	IIIb	IIIb	II	II	NS*	III
Bojac (Mainland, excluding VA Beach & Ches.)	DD	IVb	IVb	II	IV	NS*	III
Bolling	J	IIb	IIb	I	II	NS*	I
Bolling variant	J	IIb	IIb	I	II	NS*	I
Bolton	M	IIb	IIb	I	II	I	II
Bonneau	DD	IVb	IVb	II	IV	NS*	III
Bookwood	U	IIIb	IIIb	II	II	III	II

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Borrow pit	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Botetourt	G	IIa	IIa	I	II	II	I
Bourne	BB	IVb	IVb	III	IV	NS*	III
Bourne variant	BB	IVb	IVb	III	IV	NS*	III
Bowmansville	I	IIa	IIa	I	II	NS*	I
Braddock	O	IIb	IIb	I	II	II	II
Brandywine	FF	IVb	IVb	III	IV	NS*	III
Brecknock	U	IIIb	IIIb	II	II	III	II
Bremo	JJ	V	V	IV	V	NS*	IV
Brentsville	FF	IVb	IVb	III	IV	NS*	III
Brevard	B	Ia	Ia	I	Ia	II	I
Brickhaven	Y	IVa	IVa	III	III	NS*	III
Brinkerton	LL	V	V	V	V	NS*	IV
Brinklow	FF	IVb	IVb	III	IV	NS*	III
Broadway	A	Ia	Ia	I	Ia	I	I
Brockroad	V	IVa	IVa	II	III	III	III
Brownsville	JJ	V	V	IV	V	NS*	IV
Brownwood	JJ	V	V	IV	V	NS*	IV
Brumbaugh	L	IIb	IIb	I	II	III	II
Brushy	JJ	V	V	IV	V	NS*	IV
Buchanan	BB	IVb	IVb	III	IV	NS*	III
Buchanan cobbly	JJ	V	V	IV	V	NS*	IV
Buckhall	V	IVa	IVa	II	III	III	III
Buckingham	JJ	V	V	IV	V	NS*	IV
Bucks	U	IIIb	IIIb	II	II	III	II
Buckton	A	Ia	Ia	I	Ia	I	I
Buffstat	V	IVa	IVa	II	III	III	III
Bugley	JJ	V	V	IV	V	NS*	IV
Buncombe	II	V	V	III	V	NS*	NS*
Burketown	BB	IVb	IVb	III	IV	NS*	III
Burrowsville	BB	IVb	IVb	III	IV	NS*	III
Burton	FF	IVb	IVb	III	IV	NS*	III
Buzzrock	JJ	V	V	IV	V	NS*	IV
Cahaba	R	IIIa	IIIa	II	II	III	II
Calverton	BB	IVb	IVb	III	IV	NS*	III
Calvin	JJ	V	V	IV	V	NS*	IV
Calvin cobbly	JJ	V	V	IV	V	NS*	IV
Camocca	PP	V	V	V	V	NS*	NS*
Caneyville	Y	IVa	IVa	III	III	NS*	III
Cape Fear (drained)	C	Ib	Ib	II	Ib	NS*	I
Cape Fear (undrained)	OO	V	V	V	V	NS*	NS*

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Captina	BB	IVb	IVb	III	IV	NS*	III
Carbo	Y	IVa	IVa	III	III	NS*	III
Carbonton	Y	IVa	IVa	III	III	NS*	III
Cardiff	FF	IVb	IVb	III	IV	NS*	III
Cardova	JJ	V	V	IV	V	NS*	IV
Caroline	AA	IVa	IVa	II	III	NS*	IV
Cartecay	I	IIa	IIa	I	II	NS*	I
Carteret	PP	V	V	V	V	NS*	NS*
Casville	Y	IVa	IVa	III	III	NS*	III
Cataska	JJ	V	V	IV	V	NS*	IV
Catharpin	X	IVa	IVa	II	III	III	II
Catlett	JJ	V	V	IV	V	NS*	IV
Catlett variant	JJ	V	V	IV	V	NS*	IV
Catoctin	JJ	V	V	IV	V	NS*	IV
Catoctin variant	JJ	V	V	IV	V	NS*	IV
Catpoint	II	V	V	III	V	NS*	NS*
Caverns	I	IIa	IIa	I	II	NS*	I
Cecil	X	IVa	IVa	II	III	III	II
Cedarcreek	GG	IVb	IVb	IV	IV	NS*	III
Chagrin	A	Ia	Ia	I	Ia	I	I
Chagrin variant	A	Ia	Ia	I	Ia	I	I
Chandler	FF	IVb	IVb	III	IV	NS*	III
Chantilly	JJ	V	V	IV	V	NS*	IV
Chapanoke (drained)	C	Ib	Ib	II	Ib	NS*	I
Chapanoke (undrained)	OO	V	V	V	V	NS*	NS*
Charity	N	IIb	IIb	I	II	II	II
Chastain	LL	V	V	V	V	NS*	IV
Chatuge (drained)	C	Ib	Ib	II	Ib	NS*	I
Chatuge (undrained)	OO	V	V	V	V	NS*	NS*
Chavies	U	IIIb	IIIb	II	II	III	II
Chavies variant	U	IIIb	IIIb	II	II	III	II
Chenneby	I	IIa	IIa	I	II	NS*	I
Chesapeake	B	Ia	Ia	I	Ia	II	I
Chester	D	Ib	Ib	I	Ib	I	I
Chester Loam	D	Ib	Ib	I	Ib	I	I
Chestnut	GG	IVb	IVb	IV	IV	NS*	III
Chewacla	I	IIa	IIa	I	II	NS*	I
Chickahominy	LL	V	V	V	V	NS*	IV
Chilhowie	JJ	V	V	IV	V	NS*	IV
Chincoteague	PP	V	V	V	V	NS*	NS*

Table 1-1
Soil Productivity Groupings for Various Cropping Categories

Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Chipley	EE	IVb	IVb	III	IV	NS*	NS*
Chiswell	JJ	V	V	IV	V	NS*	IV
Christian	AA	IVa	IVa	II	III	NS*	IV
Cid	KK	V	V	V	V	NS*	IV
Claiborne	U	IIIb	IIIb	II	II	III	II
Clapham	BB	IVb	IVb	III	IV	NS*	III
Clarksburg	W	IVa	IVa	IV	III	NS*	IV
Clarksville	GG	IVb	IVb	IV	IV	NS*	III
Clearbrook	JJ	V	V	IV	V	NS*	IV
Cliffield	JJ	V	V	IV	V	NS*	IV
Clifford	X	IVa	IVa	II	III	III	II
Clifftop	JJ	V	V	IV	V	NS*	IV
Clifton	L	IIb	IIb	I	II	III	II
Clingman	JJ	V	V	IV	V	NS*	IV
Clover	V	IVa	IVa	II	III	III	III
Cloverlick	JJ	V	V	IV	V	NS*	IV
Clubcaf	LL	V	V	V	V	NS*	IV
Clymer	U	IIIb	IIIb	II	II	III	II
Coastal beach	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Codorus	A	Ia	Ia	I	Ia	I	I
Codorus stony	A	Ia	Ia	I	Ia	I	I
Codorus variant	A	Ia	Ia	I	Ia	I	I
Colescreek	L	IIb	IIb	I	II	III	II
Colfax	BB	IVb	IVb	III	IV	NS*	III
Colfax variant	BB	IVb	IVb	III	IV	NS*	III
Colleen	KK	V	V	V	V	NS*	IV
Colluvial land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Colvard	II	V	V	III	V	NS*	NS*
Colvard fine	II	V	V	III	V	NS*	NS*
Colvard stony	II	V	V	III	V	NS*	NS*
Combs	A	Ia	Ia	I	Ia	I	I
Comus	A	Ia	Ia	I	Ia	I	I
Conetoe	DD	IVb	IVb	II	IV	NS*	III
Congaree	A	Ia	Ia	I	Ia	I	I
Coosaw	DD	IVb	IVb	II	IV	NS*	III
Corolla	EE	IVb	IVb	III	IV	NS*	NS*
Corydon	JJ	V	V	IV	V	NS*	IV
Cotaco	G	IIa	IIa	I	II	II	I
Cotaco cobbly	G	IIa	IIa	I	II	II	I
Cotaco variant	G	IIa	IIa	I	II	II	I
Cottonbend	L	IIb	IIb	I	II	III	II
Coursey	G	IIa	IIa	I	II	II	I
Cowee	N	IIb	IIb	I	II	II	II

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Coxville	LL	V	V	V	V	NS*	IV
Craggey	JJ	V	V	IV	V	NS*	IV
Craigsville	CC	IVb	IVb	II	IV	NS*	III
Craven	HH	IVb	IVb	III	IV	NS*	IV
Creedmoor	KK	V	V	V	V	NS*	IV
Creedmoor variant	KK	V	V	V	V	NS*	IV
Croton	LL	V	V	V	V	NS*	IV
Cullasaja	FF	IVb	IVb	III	IV	NS*	III
Cullen	N	IIb	IIb	I	II	II	II
Culleoka	U	IIIb	IIIb	II	II	III	II
Culpeper	X	IVa	IVa	II	III	III	II
Culpeper variant	X	IVa	IVa	II	III	III	II
Cut and fill land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Daleville (drained)	C	Ib	Ib	II	Ib	NS*	I
Daleville (undrained)	OO	V	V	V	V	NS*	NS*
Dam	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Dams	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Dan River	G	IIa	IIa	I	II	II	I
Dandridge	JJ	V	V	IV	V	NS*	IV
Danripple	L	IIb	IIb	I	II	III	II
Davidson	N	IIb	IIb	I	II	II	II
Dawhoo	PP	V	V	V	V	NS*	NS*
Dawhoo variant	PP	V	V	V	V	NS*	NS*
Decatur	M	IIb	IIb	I	II	I	II
Dekalb	FF	IVb	IVb	III	IV	NS*	III
Dekalb variant	FF	IVb	IVb	III	IV	NS*	III
Delanco	B	Ia	Ia	I	Ia	II	I
Delila	HH	IVb	IVb	III	IV	NS*	IV
Dellwood	CC	IVb	IVb	II	IV	NS*	III
Deloss (drained)	C	Ib	Ib	II	Ib	NS*	I
Deloss (undrained)	OO	V	V	V	V	NS*	NS*
Derroc	CC	IVb	IVb	II	IV	NS*	III
Devotion	FF	IVb	IVb	III	IV	NS*	III
Diana Mills	V	IVa	IVa	II	III	III	III
Dillard	G	IIa	IIa	I	II	II	I
Dillsboro	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Dogue	K	IIb	IIb	I	II	III	I
Dogue variant	K	IIb	IIb	I	II	III	I
Dorovan	PP	V	V	V	V	NS*	NS*
Dothan	Q	IIIa	IIIa	II	II	NS*	III
Doubletop	JJ	V	V	IV	V	NS*	IV

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Downer	DD	IVb	IVb	II	IV	NS*	III
Dragston	E	IIa	IIa	I	II	NS*	II
Drall	FF	IVb	IVb	III	IV	NS*	III
Drapermill	U	IIIb	IIIb	II	II	III	II
Drayke	O	IIb	IIb	I	II	II	II
Drypond	JJ	V	V	IV	V	NS*	IV
Duckston	QQ	V	V	V	V	NS*	NS*
Duffield	G	IIa	IIa	I	II	II	I
Dulles	Y	IVa	IVa	III	III	NS*	III
Dumfries	T	IIIb	IIIb	II	II	NS*	III
Dumps	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Dumps, mine	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Dunbar (drained)	P	IIb	IIb	II	II	NS*	III
Dunbar (undrained)	Z	IVa	IVa	IV	III	NS*	NS*
Dunning (drained)	H	IIa	IIa	III	II	NS*	IV
Dunning (undrained)	NN	V	V	V	V	NS*	NS*
Duplin	K	IIb	IIb	I	II	III	I
Durham	CC	IVb	IVb	II	IV	NS*	III
Dystrudepts	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Easthamlet	KK	V	V	V	V	NS*	IV
Ebbing	G	IIa	IIa	I	II	II	I
Edgehill	CC	IVb	IVb	II	IV	NS*	III
Edgehill variant	CC	IVb	IVb	II	IV	NS*	III
Edgemont	U	IIIb	IIIb	II	II	III	II
Edneytown	L	IIb	IIb	I	II	III	II
Edneyville	T	IIIb	IIIb	II	II	NS*	III
Edom	M	IIb	IIb	I	II	I	II
Elbert	LL	V	V	V	V	NS*	IV
Elbert variant	LL	V	V	V	V	NS*	IV
Elioak	X	IVa	IVa	II	III	III	II
Elk	A	Ia	Ia	I	Ia	I	I
Elkton (drained)	C	Ib	Ib	II	Ib	NS*	I
Elkton (undrained)	OO	V	V	V	V	NS*	NS*
Elliber	M	IIb	IIb	I	II	I	II
Elsinboro	L	IIb	IIb	I	II	III	II
Emory	G	IIa	IIa	I	II	II	I
Emporia	R	IIIa	IIIa	II	II	III	II
Endcav	Y	IVa	IVa	III	III	NS*	III
Enon	Y	IVa	IVa	III	III	NS*	III
Enott	Y	IVa	IVa	III	III	NS*	III
Ernest	W	IVa	IVa	IV	III	NS*	IV

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Escatawba	L	IIb	IIb	I	II	III	II
Eubanks	N	IIb	IIb	I	II	II	II
Eulonia	K	IIb	IIb	I	II	III	I
Eunola	T	IIIb	IIIb	II	II	NS*	III
Evansham	LL	V	V	V	V	NS*	IV
Evard	L	IIb	IIb	I	II	III	II
Evesboro	II	V	V	III	V	NS*	NS*
Exum	J	IIb	IIb	I	II	NS*	I
Exway	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Ezel	L	IIb	IIb	I	II	III	II
Faceville	R	IIIa	IIIa	II	II	III	II
Fairfax	D	Ib	Ib	I	Ib	I	I
Fairpoint	JJ	V	V	IV	V	NS*	IV
Fairview	X	IVa	IVa	II	III	III	II
Fairystone	X	IVa	IVa	II	III	III	II
Fallsington	E	IIa	IIa	I	II	NS*	II
Fauquier	N	IIb	IIb	I	II	II	II
Fauquier, deep phase	N	IIb	IIb	I	II	II	II
Faywood	U	IIIb	IIIb	II	II	III	II
Featherstone	PP	V	V	V	V	NS*	NS*
Fedscreek	GG	IVb	IVb	IV	IV	NS*	III
Feedstone	G	IIa	IIa	I	II	II	I
Fisherman	QQ	V	V	V	V	NS*	NS*
Fiveblock	JJ	V	V	IV	V	NS*	IV
Flairmont	BB	IVb	IVb	III	IV	NS*	III
Flatwoods	M	IIb	IIb	I	II	I	II
Fletcher	U	IIIb	IIIb	II	II	III	II
Fletcherville	W	IVa	IVa	IV	III	NS*	IV
Flume	R	IIIa	IIIa	II	II	III	II
Fluvanna	Y	IVa	IVa	III	III	NS*	III
Fluvaquents	HH	IVb	IVb	III	IV	NS*	IV
Fluvaquents, ponded	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Fluvaquents, saline	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Forestdale	LL	V	V	V	V	NS*	IV
Fork (drained)	P	IIb	IIb	II	II	NS*	III
Fork (undrained)	Z	IVa	IVa	IV	III	NS*	NS*
Fork variant (drained)	P	IIb	IIb	II	II	NS*	III
Fork variant (undrained)	Z	IVa	IVa	IV	III	NS*	NS*

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Frankstown	U	IIIb	IIIb	II	II	III	II
Frederick	M	IIb	IIb	I	II	I	II
Frederick/Christian	M	IIb	IIb	I	II	I	II
Frederick/Lodi	M	IIb	IIb	I	II	I	II
Freemanville	Q	IIIa	IIIa	II	II	NS*	III
French	A	Ia	Ia	I	Ia	I	I
Fresh water swamp	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Fripp	QQ	V	V	V	V	NS*	NS*
Funkstown	A	Ia	Ia	I	Ia	I	I
Gaila	FF	IVb	IVb	III	IV	NS*	III
Gainesboro	FF	IVb	IVb	III	IV	NS*	III
Galestown	II	V	V	III	V	NS*	NS*
Galtsmill	II	V	V	III	V	NS*	NS*
Georgeville	X	IVa	IVa	II	III	III	II
Germanna	L	IIb	IIb	I	II	III	II
Gertie	OO	V	V	V	V	NS*	NS*
Gilpin	U	IIIb	IIIb	II	II	III	II
Gilpin variant	U	IIIb	IIIb	II	II	III	II
Gladehill	A	Ia	Ia	I	Ia	I	I
Glenelg(BRH)	N	IIb	IIb	I	II	II	II
Glenelg(NV)	U	IIIb	IIIb	II	II	III	II
Glenville	W	IVa	IVa	IV	III	NS*	IV
Glynwood	GG	IVb	IVb	IV	IV	NS*	III
Glynwood variant	GG	IVb	IVb	IV	IV	NS*	III
Goblintown	V	IVa	IVa	II	III	III	III
Goldsboro	J	IIb	IIb	I	II	NS*	I
Goldston	JJ	V	V	IV	V	NS*	IV
Goldvein	BB	IVb	IVb	III	IV	NS*	III
Goldvein gritty	BB	IVb	IVb	III	IV	NS*	III
Goresville	N	IIb	IIb	I	II	II	II
Granville	R	IIIa	IIIa	II	II	III	II
Grassland	L	IIb	IIb	I	II	III	II
Gravel pit	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Gravelly alluvial land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Greendale	A	Ia	Ia	I	Ia	I	I
Greenlee	CC	IVb	IVb	II	IV	NS*	III
Griffinsburg	JJ	V	V	IV	V	NS*	IV
Grigsby	A	Ia	Ia	I	Ia	I	I
Grimsley	GG	IVb	IVb	IV	IV	NS*	III
Grist Mill	OO	V	V	V	V	NS*	NS*

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Gritney	T	IIIb	IIIb	II	II	NS*	III
Groseclose	M	IIb	IIb	I	II	I	II
Grover	X	IVa	IVa	II	III	III	II
Guernsey	M	IIb	IIb	I	II	I	II
Gullied land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Gullion	B	Ia	Ia	I	Ia	II	I
Gundy	V	IVa	IVa	II	III	III	III
Gunstock	V	IVa	IVa	II	III	III	III
Gunston	LL	V	V	V	V	NS*	IV
Guyan	Z	IVa	IVa	IV	III	NS*	NS*
Guyandotte	FF	IVb	IVb	III	IV	NS*	III
Gwinnett variant	X	IVa	IVa	II	III	III	II
Hagerstown	M	IIb	IIb	I	II	I	II
Halewood	U	IIIb	IIIb	II	II	III	II
Halifax	KK	V	V	V	V	NS*	IV
Hanceville	V	IVa	IVa	II	III	III	III
Haplaquepts	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Haplosaprists	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Hapludults	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Happyland	U	IIIb	IIIb	II	II	III	II
Hartleton	FF	IVb	IVb	III	IV	NS*	III
Hartsells	CC	IVb	IVb	II	IV	NS*	III
Hatboro	HH	IVb	IVb	III	IV	NS*	IV
Hattontown	JJ	V	V	IV	V	NS*	IV
Hawksbill	CC	IVb	IVb	II	IV	NS*	III
Hawksbill cobbly	CC	IVb	IVb	II	IV	NS*	III
Hayesville	X	IVa	IVa	II	III	III	II
Haymarket	KK	V	V	V	V	NS*	IV
Hayter	L	IIb	IIb	I	II	III	II
Haywood	JJ	V	V	IV	V	NS*	IV
Hazel	JJ	V	V	IV	V	NS*	IV
Hazel channery	JJ	V	V	IV	V	NS*	IV
Hazel Run	U	IIIb	IIIb	II	II	III	II
Hazleton	JJ	V	V	IV	V	NS*	IV
Helena	KK	V	V	V	V	NS*	IV
Helena taxadjunct	KK	V	V	V	V	NS*	IV
Herndon	V	IVa	IVa	II	III	III	III
Hibler	L	IIb	IIb	I	II	III	II
Hickoryknob	N	IIb	IIb	I	II	II	II
Highsplint	CC	IVb	IVb	II	IV	NS*	III
Hiwassee	O	IIb	IIb	I	II	II	II
Hiwassee variant	O	IIb	IIb	I	II	II	II
Hoadley	BB	IVb	IVb	III	IV	NS*	III

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Hobucken	PP	V	V	V	V	NS*	NS*
Holly	NN	V	V	V	V	NS*	NS*
Hollywood	LL	V	V	V	V	NS*	IV
Honga	OO	V	V	V	V	NS*	NS*
Hublersburg	M	IIb	IIb	I	II	I	II
Huddleston	X	IVa	IVa	II	III	III	II
Huntington	A	Ia	Ia	I	Ia	I	I
Hyde (drained)	C	Ib	Ib	II	Ib	NS*	I
Hyde (undrained)	OO	V	V	V	V	NS*	NS*
Hydraquents	OO	V	V	V	V	NS*	NS*
Ingledove	A	Ia	Ia	I	Ia	I	I
Iotla	A	Ia	Ia	I	Ia	I	I
Iredell	KK	V	V	V	V	NS*	IV
Iredell variant	KK	V	V	V	V	NS*	IV
Irongate	DD	IVb	IVb	II	IV	NS*	III
Itman	JJ	V	V	IV	V	NS*	IV
Iuka	F	IIa	IIa	I	II	III	II
Izagora	J	IIb	IIb	I	II	NS*	I
Jackland	KK	V	V	V	V	NS*	IV
Jedburg	Z	IVa	IVa	IV	III	NS*	NS*
Jefferson	U	IIIb	IIIb	II	II	III	II
Jefferson variant	U	IIIb	IIIb	II	II	III	II
Johns (drained)	C	Ib	Ib	II	Ib	NS*	I
Johns (undrained)	OO	V	V	V	V	NS*	NS*
Johns variant (drained)	C	Ib	Ib	II	Ib	NS*	I
Johns variant (undrained)	OO	V	V	V	V	NS*	NS*
Johnston	PP	V	V	V	V	NS*	NS*
Junaluska	U	IIIb	IIIb	II	II	III	II
Kalmia	S	IIIa	IIIa	II	II	NS*	III
Kaymine	JJ	V	V	IV	V	NS*	IV
Keener	O	IIb	IIb	I	II	II	II
Kelly	KK	V	V	V	V	NS*	IV
Kempsville	S	IIIa	IIIa	II	II	NS*	III
Kenansville	DD	IVb	IVb	II	IV	NS*	III
Kenansville variant	DD	IVb	IVb	II	IV	NS*	III
Keyport	K	IIb	IIb	I	II	III	I
Kibler	L	IIb	IIb	I	II	III	II
Kimper	JJ	V	V	IV	V	NS*	IV
Kingstowne	OO	V	V	V	V	NS*	NS*
Kinkora (drained)	C	Ib	Ib	II	Ib	NS*	I

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Kinkora (undrained)	OO	V	V	V	V	NS*	NS*
Kinston (drained)	C	Ib	Ib	II	Ib	NS*	I
Kinston (undrained)	OO	V	V	V	V	NS*	NS*
Klej	EE	IVb	IVb	III	IV	NS*	NS*
Klinesville	JJ	V	V	IV	V	NS*	IV
Konnarock	JJ	V	V	IV	V	NS*	IV
Lackstown	K	IIb	IIb	I	II	III	I
Laidig	W	IVa	IVa	IV	III	NS*	IV
Laidig cobbly	W	IVa	IVa	IV	III	NS*	IV
Lakehurst	EE	IVb	IVb	III	IV	NS*	NS*
Lakeland	II	V	V	III	V	NS*	NS
Lakin	II	V	V	III	V	NS*	NS
Landfills	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Lanexa	PP	V	V	V	V	NS*	NS*
Lansdale	FF	IVb	IVb	III	IV	NS*	III
Laroque	FF	IVb	IVb	III	IV	NS*	III
Lawnes	PP	V	V	V	V	NS*	NS*
Leadvale	BB	IVb	IVb	III	IV	NS*	III
Leaf (drained)	C	Ib	Ib	II	Ib	NS*	I
Leaf (undrained)	OO	V	V	V	V	NS*	NS*
Leaksville	KK	V	V	V	V	NS*	IV
Leatherwood	OO	V	V	V	V	NS*	NS*
Leck Kill	U	IIIb	IIIb	II	II	III	II
Leedsville	L	IIb	IIb	I	II	III	II
Leetonia	II	V	V	III	V	NS*	NS*
Legore	V	IVa	IVa	II	III	III	III
Lehew	JJ	V	V	IV	V	NS*	IV
Lenoir	LL	V	V	V	V	NS*	IV
Leon	II	V	V	III	V	NS*	NS*
Levy	PP	V	V	V	V	NS*	NS*
Lew	FF	IVb	IVb	III	IV	NS*	III
Lewisberry	II	V	V	III	V	NS*	NS*
Lewisburg	CC	IVb	IVb	II	IV	NS*	III
Library	KK	V	V	V	V	NS*	IV
Lickdale (drained)	H	IIa	IIa	III	II	NS*	IV
Lickdale (undrained)	NN	V	V	V	V	NS*	NS*
Lignum	LL	V	V	V	V	NS*	IV
Lily	FF	IVb	IVb	III	IV	NS*	III
Linden	F	IIa	IIa	I	II	III	II
Lindside	A	Ia	Ia	I	Ia	I	I

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Littlejoe	V	IVa	IVa	II	III	III	III
Litz	JJ	V	V	IV	V	NS*	IV
Lloyd	N	IIb	IIb	I	II	II	II
Lloyd variant	N	IIb	IIb	I	II	II	II
Lobdell	A	Ia	Ia	I	Ia	I	I
Local alluvial land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Lodi	M	IIb	IIb	I	II	I	II
Lostcove	FF	IVb	IVb	III	IV	NS*	III
Louisa	JJ	V	V	IV	V	NS*	IV
Louisa variant	JJ	V	V	IV	V	NS*	IV
Louisburg	FF	IVb	IVb	III	IV	NS*	III
Lowell	M	IIb	IIb	I	II	I	II
Lucketts	Y	IVa	IVa	III	III	NS*	III
Lucy	DD	IVb	IVb	II	IV	NS*	III
Lumbee (drained)	C	Ib	Ib	II	Ib	NS*	I
Lumbee (undrained)	OO	V	V	V	V	NS*	NS*
Lumbee variant (drained)	C	Ib	Ib	II	Ib	NS*	I
Lumbee variant (undrained)	OO	V	V	V	V	NS*	NS*
Lunt	AA	IVa	IVa	II	III	NS*	IV
Lynchburg	E	IIa	IIa	I	II	NS*	II
Macove	CC	IVb	IVb	II	IV	NS*	III
Made Land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Madison	X	IVa	IVa	II	III	III	II
Madsheep	JJ	V	V	IV	V	NS*	IV
Maggodee	A	Ia	Ia	I	Ia	I	I
Magotha	PP	V	V	V	V	NS*	NS*
Malbis	W	IVa	IVa	IV	III	NS*	IV
Manassas	D	Ib	Ib	I	Ib	I	I
Mandy	JJ	V	V	IV	V	NS*	IV
Manor	FF	IVb	IVb	III	IV	NS*	III
Mantachie	I	IIa	IIa	I	II	NS*	I
Manteo	JJ	V	V	IV	V	NS*	IV
Marbie	W	IVa	IVa	IV	III	NS*	IV
Marbleyard	FF	IVb	IVb	III	IV	NS*	III
Margo	A	Ia	Ia	I	Ia	I	I
Markes	NN	V	V	V	V	NS*	NS*
Marlboro	R	IIIa	IIIa	II	II	III	II
Marr	T	IIIb	IIIb	II	II	NS*	III
Marrowbone	JJ	V	V	IV	V	NS*	IV
Marumsco	K	IIb	IIb	I	II	III	I

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Masada	L	IIb	IIb	I	II	III	II
Massanetta	B	Ia	Ia	I	Ia	II	I
Massanutten	JJ	V	V	IV	V	NS*	IV
Matapeake	R	IIIa	IIIa	II	II	III	II
Matewan	FF	IVb	IVb	III	IV	NS*	III
Matneflat	CC	IVb	IVb	II	IV	NS*	III
Mattamuskeet	PP	V	V	V	V	NS*	NS*
Mattan	PP	V	V	V	V	NS*	NS*
Mattapex	K	IIb	IIb	I	II	III	I
Mattaponi	R	IIIa	IIIa	II	II	III	II
Maurertown	NN	V	V	V	V	NS*	NS*
Maury	M	IIb	IIb	I	II	I	II
Mayodan	V	IVa	IVa	II	III	III	III
McCamy	FF	IVb	IVb	III	IV	NS*	III
McClung	M	IIb	IIb	I	II	I	II
McGary (drained)	P	IIb	IIb	II	II	NS*	III
McGary (undrained)	Z	IVa	IVa	IV	III	NS*	NS*
McLaurin	DD	IVb	IVb	II	IV	NS*	III
McQueen	B	Ia	Ia	I	Ia	II	I
Meadowfield	JJ	V	V	IV	V	NS*	IV
Meadows	JJ	V	V	IV	V	NS*	IV
Meadowville	G	IIa	IIa	I	II	II	I
Meadowville variant	G	IIa	IIa	I	II	II	I
Meckesville	W	IVa	IVa	IV	III	NS*	IV
Mecklenburg	V	IVa	IVa	II	III	III	III
Mecklenburg variant	V	IVa	IVa	II	III	III	III
Meggett (drained)	C	Ib	Ib	II	Ib	NS*	I
Meggett (undrained)	OO	V	V	V	V	NS*	NS*
Melfa	PP	V	V	V	V	NS*	NS*
Melvin (drained)	H	IIa	IIa	III	II	NS*	IV
Melvin (undrained)	NN	V	V	V	V	NS*	NS*
Middleburg	G	IIa	IIa	I	II	II	I
Milldraper	L	IIb	IIb	I	II	III	II
Millrock	II	V	V	III	V	NS*	NS*
Mine dump	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Mine Dumps	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Mine pits	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Mine Run	II	V	V	III	V	NS*	NS*
Mine Tailings	NP**	NP**	NP**	NP**	NP**	NP**	NP**

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	**Soil Mgt. Group**	**Corn**	**Grain Sorghum**	**Small Grain**	**Soybeans**	**Alfalfa**	**Tall Grass, Clover, Hay, Pasture**
Mine Tipples	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Mines	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Minnieville	N	IIb	IIb	I	II	II	II
Mirerock	KK	V	V	V	V	NS*	IV
Misenheimer	JJ	V	V	IV	V	NS*	IV
Mixed alluvial land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Mixed alluvium	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Molena	II	V	V	III	V	NS*	NS*
Monacan	I	IIa	IIa	I	II	NS*	I
Mongle	H	IIa	IIa	III	II	NS*	IV
Monongahela	W	IVa	IVa	IV	III	NS*	IV
Montalto	N	IIb	IIb	I	II	II	II
Montonia	X	IVa	IVa	II	III	III	II
Montross	Q	IIIa	IIIa	II	II	NS*	III
Moomaw	W	IVa	IVa	IV	III	NS*	IV
Morven	G	IIa	IIa	I	II	II	I
Mount Lucas	J	IIb	IIb	I	II	NS*	I
Mt. Rogers	GG	IVb	IVb	IV	IV	NS*	III
Muckalee	MM	V	V	V	V	NS*	IV
Munden	F	IIa	IIa	I	II	III	II
Murrill	L	IIb	IIb	I	II	III	II
Muskingum	JJ	V	V	IV	V	NS*	IV
Myatt (drained)	C	Ib	Ib	II	Ib	NS*	I
Myatt (undrained)	OO	V	V	V	V	NS*	NS*
Myatt variant (drained)	C	Ib	Ib	II	Ib	NS*	I
Myatt variant (undrained)	OO	V	V	V	V	NS*	NS*
Myersville	D	Ib	Ib	I	Ib	I	I
Nahunta	E	IIa	IIa	I	II	NS*	II
Nanford	V	IVa	IVa	II	III	III	III
Nansemond	F	IIa	IIa	I	II	III	II
Nason	V	IVa	IVa	II	III	III	III
Nathalie	V	IVa	IVa	II	III	III	III
Nawney	PP	V	V	V	V	NS*	NS*
Neabsco	BB	IVb	IVb	III	IV	NS*	III
Needmore	FF	IVb	IVb	III	IV	NS*	III
Nestoria	JJ	V	V	IV	V	NS*	IV
Nevarc	HH	IVb	IVb	III	IV	NS*	IV
Newark (drained)	H	IIa	IIa	III	II	NS*	IV
Newark (undrained)	NN	V	V	V	V	NS*	NS*
Newark variant	H	IIa	IIa	III	II	NS*	IV

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
(drained)							
Newark variant (undrained)	NN	V	V	V	V	NS*	NS*
Newbern	JJ	V	V	IV	V	NS*	IV
Newflat	LL	V	V	V	V	NS*	IV
Newhan	QQ	V	V	V	V	NS*	NS*
Newmarc	B	Ia	Ia	I	Ia	II	I
Nicelytown	A	Ia	Ia	I	Ia	I	I
Nicholson	BB	IVb	IVb	III	IV	NS*	III
Nickwasi	JJ	V	V	IV	V	NS*	IV
Nimmo	E	IIa	IIa	I	II	NS*	II
Nixa	BB	IVb	IVb	III	IV	NS*	III
Nolichucky	O	IIb	IIb	I	II	II	II
Nolin	A	Ia	Ia	I	Ia	I	I
Nollville	G	IIa	IIa	I	II	II	I
Nomberville	A	Ia	Ia	I	Ia	I	I
Nopan	GG	IVb	IVb	IV	IV	NS*	III
Norfolk	R	IIIa	IIIa	II	II	III	II
Oak Level	V	IVa	IVa	II	III	III	III
Oakhill	FF	IVb	IVb	III	IV	NS*	III
Oaklet	Y	IVa	IVa	III	III	NS*	III
Oatlands	FF	IVb	IVb	III	IV	NS*	III
Occoquan	DD	IVb	IVb	II	IV	NS*	III
Ochlockonee	II	V	V	III	V	NS*	NS*
Ochlockonee variant	II	V	V	III	V	NS*	NS*
Ochraquults	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Ochrepts	Y	IVa	IVa	III	III	NS*	III
Ocilla	F	IIa	IIa	I	II	III	II
Ogles	CC	IVb	IVb	II	IV	NS*	III
Okeetee	LL	V	V	V	V	NS*	IV
Opequon	JJ	V	V	IV	V	NS*	IV
Orange	KK	V	V	V	V	NS*	IV
Orange variant	KK	V	V	V	V	NS*	IV
Orangeburg	R	IIIa	IIIa	II	II	III	II
Orenda	KK	V	V	V	V	NS*	IV
Oriskany	CC	IVb	IVb	II	IV	NS*	III
Orrville (drained)	C	Ib	Ib	II	Ib	NS*	I
Orrville (undrained)	OO	V	V	V	V	NS*	NS*
Orrville variant (drained)	C	Ib	Ib	II	Ib	NS*	I
Orrville variant	OO	V	V	V	V	NS*	NS*

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	**Soil Mgt. Group**	**Corn**	**Grain Sorghum**	**Small Grain**	**Soybeans**	**Alfalfa**	**Tall Grass, Clover, Hay, Pasture**
(undrained)							
Orthents	JJ	V	V	IV	V	NS	IV
Osier	E	IIa	IIa	I	II	NS*	II
Ostin	II	V	V	III	V	NS*	NS*
Othello (drained)	C	Ib	Ib	II	Ib	NS*	I
Othello (undrained)	OO	V	V	V	V	NS*	NS*
Ott	JJ	V	V	IV	V	NS*	IV
Pacolet	X	IVa	IVa	II	III	III	II
Pactolus	EE	IVb	IVb	III	IV	NS*	NS*
Paddyknob	JJ	V	V	IV	V	NS*	IV
Pagebrook	Y	IVa	IVa	III	III	NS*	III
Palms variant	L	IIb	IIb	I	II	III	II
Pamlico	PP	V	V	V	V	NS*	NS*
Pamunkey	B	Ia	Ia	I	Ia	II	I
Pamunkey variant	B	Ia	Ia	I	Ia	II	I
Panorama	U	IIIb	IIIb	II	II	III	II
Pantego (drained)	C	Ib	Ib	II	Ib	NS*	I
Pantego (undrained)	OO	V	V	V	V	NS*	NS*
Parker	GG	IVb	IVb	IV	IV	NS*	III
Partlow	HH	IVb	IVb	III	IV	NS*	IV
Pasquotank (drained)	C	Ib	Ib	II	Ib	NS*	I
Pasquotank (undrained)	OO	V	V	V	V	NS*	NS*
Peaks	JJ	V	V	IV	V	NS*	IV
Peawick	HH	IVb	IVb	III	IV	NS*	IV
Pecktonville	M	IIb	IIb	I	II	I	II
Penhook	X	IVa	IVa	II	III	III	II
Penn	FF	IVb	IVb	III	IV	NS*	III
Perrowville	FF	IVb	IVb	III	IV	NS*	III
Pfafftown	L	IIb	IIb	I	II	III	II
Philo (drained)	H	IIa	IIa	III	II	NS*	IV
Philo (undrained)	NN	V	V	V	V	NS*	NS*
Philomont	D	Ib	Ib	I	Ib	I	I
Pigeonroost	N	IIb	IIb	I	II	II	II
Pignut	JJ	V	V	IV	V	NS*	IV
Pilot Mountain	JJ	V	V	IV	V	NS*	IV
Pineola	L	IIb	IIb	I	II	III	II
Pineville	U	IIIb	IIIb	II	II	III	II
Pineywoods	NN	V	V	V	V	NS*	NS*
Pinkston	JJ	V	V	IV	V	NS*	IV

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	**Soil Mgt. Group**	**Corn**	**Grain Sorghum**	**Small Grain**	**Soybeans**	**Alfalfa**	**Tall Grass, Clover, Hay, Pasture**
Pinoka	JJ	V	V	IV	V	NS*	IV
Pisgah	M	IIb	IIb	I	II	I	II
Pits	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Pits and dumps	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Pits and quarry	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Pits, bedrock	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Pits, borrow	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Pits, gravel	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Pits, quarries	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Pits, quarry	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Plott	FF	IVb	IVb	III	IV	NS*	III
Plummer	EE	IVb	IVb	III	IV	NS*	NS*
Pocalla	DD	IVb	IVb	II	IV	NS*	III
Pocaty	PP	V	V	V	V	NS*	NS*
Pocomoke	E	IIa	IIa	I	II	NS*	II
Poindexter	FF	IVb	IVb	III	IV	NS*	III
Poindexter variant	FF	IVb	IVb	III	IV	NS*	III
Polawana	PP	V	V	V	V	NS*	NS*
Polkton	KK	V	V	V	V	NS*	IV
Pooler variant (drained)	C	Ib	Ib	II	Ib	NS*	I
Pooler variant (undrained)	OO	V	V	V	V	NS*	NS*
Pope	A	Ia	Ia	I	Ia	I	I
Poplar Forest	X	IVa	IVa	II	III	III	II
Poplimento	M	IIb	IIb	I	II	I	II
Porters	FF	IVb	IVb	III	IV	NS*	III
Portsmouth (drained)	C	Ib	Ib	II	Ib	NS*	I
Portsmouth (undrained)	OO	V	V	V	V	NS*	NS*
Post	V	IVa	IVa	II	III	III	III
Pouncey	LL	V	V	V	V	NS*	IV
Poynor	GG	IVb	IVb	IV	IV	NS*	III
Psamments	II	V	V	III	V	NS*	NS*
Pungo	PP	V	V	V	V	NS*	NS*
Purcellville	D	Ib	Ib	I	Ib	I	I
Purdy (drained)	H	IIa	IIa	III	II	NS*	IV
Purdy (undrained)	NN	V	V	V	V	NS*	NS*
Quantico	R	IIIa	IIIa	II	II	III	II
Quarries	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Quarry	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Quarry mine	NP**	NP**	NP**	NP**	NP**	NP**	NP**

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Quarry, limestone	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Rabun	N	IIb	IIb	I	II	II	II
Rains (drained)	C	Ib	Ib	II	Ib	NS*	I
Rains (undrained)	OO	V	V	V	V	NS*	NS*
Ramsey	JJ	V	V	IV	V	NS*	IV
Rapidan	N	IIb	IIb	I	II	II	II
Rappahanock	PP	V	V	V	V	NS*	NS*
Raritan	W	IVa	IVa	IV	III	NS*	IV
Rasalo	Y	IVa	IVa	III	III	NS*	III
Rayne	U	IIIb	IIIb	II	II	III	II
Readington	W	IVa	IVa	IV	III	NS*	IV
Reaville	JJ	V	V	IV	V	NS*	IV
Redbrush	Y	IVa	IVa	III	III	NS*	III
Remlik	DD	IVb	IVb	II	IV	NS*	III
Rhodhiss	X	IVa	IVa	II	III	III	II
Rigley	CC	IVb	IVb	II	IV	NS*	III
Rion	X	IVa	IVa	II	III	III	II
Riverview	G	IIa	IIa	I	II	II	I
Riverwash	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Rixeyville	JJ	V	V	IV	V	NS*	IV
Roanoke (drained)	H	IIa	IIa	III	II	NS*	IV
Roanoke (undrained)	NN	V	V	V	V	NS*	NS*
Robertsville	LL	V	V	V	V	NS*	IV
Rock land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Rock land basic	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Rock outcrop	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Rohrersville	BB	IVb	IVb	III	IV	NS*	III
Ronda	II	V	V	III	V	NS*	NS*
Ross	A	Ia	Ia	I	Ia	I	I
Rough	JJ	V	V	IV	V	NS*	IV
Rough gullied land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Rowland	A	Ia	Ia	I	Ia	I	I
Rubble land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Rumford	DD	IVb	IVb	II	IV	NS*	III
Rushtown	FF	IVb	IVb	III	IV	NS*	III
Ruston	S	IIIa	IIIa	II	II	NS*	III
Saffell	DD	IVb	IVb	II	IV	NS*	III
Sand and gravel pits	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Sandy and clayey land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Santuc	G	IIa	IIa	I	II	II	I

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	**Soil Mgt. Group**	**Corn**	**Grain Sorghum**	**Small Grain**	**Soybeans**	**Alfalfa**	**Tall Grass, Clover, Hay, Pasture**
Sassafras	T	IIIb	IIIb	II	II	NS*	III
Saunook	L	IIb	IIb	I	II	III	II
Sauratown	CC	IVb	IVb	II	IV	NS*	III
Savannah	BB	IVb	IVb	III	IV	NS*	III
Scales	GG	IVb	IVb	IV	IV	NS*	III
Scattersville	BB	IVb	IVb	III	IV	NS*	III
Schaffenaker	II	V	V	III	V	NS*	NS*
Seabrook	EE	IVb	IVb	III	IV	NS*	NS*
Seagate	EE	IVb	IVb	III	IV	NS*	NS*
Sedgefield	KK	V	V	V	V	NS*	IV
Sekil	FF	IVb	IVb	III	IV	NS*	III
Seneca	G	IIa	IIa	I	II	II	I
Sensabaugh	U	IIIb	IIIb	II	II	III	II
Sequatchie	B	Ia	Ia	I	Ia	II	I
Sequoia	U	IIIb	IIIb	II	II	III	II
Sewell	JJ	V	V	IV	V	NS*	IV
Shelocta	L	IIb	IIb	I	II	III	II
Shelocta variant	L	IIb	IIb	I	II	III	II
Shenval	O	IIb	IIb	I	II	II	II
Sherando	CC	IVb	IVb	II	IV	NS*	III
Sheva	KK	V	V	V	V	NS*	IV
Shottower	O	IIb	IIb	I	II	II	II
Shouns	G	IIa	IIa	I	II	II	I
Siloam	JJ	V	V	IV	V	NS*	IV
Sindion	B	Ia	Ia	I	Ia	II	I
Sketerville	KK	V	V	V	V	NS*	IV
Slabtown	G	IIa	IIa	I	II	II	I
Slagle	K	IIb	IIb	I	II	III	I
Slickens	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Sloping sandy land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Snowdog	BB	IVb	IVb	III	IV	NS*	III
Snowsnake	JJ	V	V	IV	V	NS*	IV
Sowego	D	Ib	Ib	I	Ib	I	I
Spears Mountain	V	IVa	IVa	II	III	III	III
Speedwell	A	Ia	Ia	I	Ia	I	I
Spessard	CC	IVb	IVb	II	IV	NS*	III
Spivey	FF	IVb	IVb	III	IV	NS*	III
Spotsylvania	V	IVa	IVa	II	III	III	III
Spray	JJ	V	V	IV	V	NS*	IV
Spriggs	JJ	V	V	IV	V	NS*	IV
Springwood	D	Ib	Ib	I	Ib	I	I
Starr	G	IIa	IIa	I	II	II	I

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Staser	A	Ia	Ia	I	Ia	I	I
State (ES)	T	IIIb	IIIb	II	II	NS*	III
State (Mainland)	B	Ia	Ia	I	Ia	II	I
Statler	L	IIb	IIb	I	II	III	II
Steep sandy land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Steinsburg	JJ	V	V	IV	V	NS*	IV
Stonecoal	JJ	V	V	IV	V	NS*	IV
Stoneville	X	IVa	IVa	II	III	III	II
Stony colluvial land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Stony land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Stony rolling land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Stony steep land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Stott Knob	N	IIb	IIb	I	II	II	II
Stough	F	IIa	IIa	I	II	III	II
Straightstone	V	IVa	IVa	II	III	III	III
Strawfield	X	IVa	IVa	II	III	III	II
Stumptown	FF	IVb	IVb	III	IV	NS*	III
Suches	A	Ia	Ia	I	Ia	I	I
Sudley	D	Ib	Ib	I	Ib	I	I
Suffolk	T	IIIb	IIIb	II	II	NS*	III
Sugarhol	O	IIb	IIb	I	II	II	II
Sulfaquents	PP	V	V	V	V	NS*	NS*
Sumerduck	G	IIa	IIa	I	II	II	I
Summers	GG	IVb	IVb	IV	IV	NS*	III
Susquehanna	KK	V	V	V	V	NS*	IV
Swampoodle	D	Ib	Ib	I	Ib	I	I
Sweetapple	FF	IVb	IVb	III	IV	NS*	III
Swimley	M	IIb	IIb	I	II	I	II
Sycoline	KK	V	V	V	V	NS*	IV
Sylco	JJ	V	V	IV	V	NS*	IV
Sylva	CC	IVb	IVb	II	IV	NS*	III
Sylvatus	JJ	V	V	IV	V	NS*	IV
Talladega	JJ	V	V	IV	V	NS*	IV
Tallapoosa	JJ	V	V	IV	V	NS*	IV
Tallapoosa variant	JJ	V	V	IV	V	NS*	IV
Tanasee	JJ	V	V	IV	V	NS*	IV
Tankerville	N	IIb	IIb	I	II	II	II
Tankerville taxadjunct	N	IIb	IIb	I	II	II	II
Tarboro	II	V	V	III	V	NS*	NS*
Tarrus	X	IVa	IVa	II	III	III	II
Tate	O	IIb	IIb	I	II	II	II

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Tate variant	O	IIb	IIb	I	II	II	II
Tatum	X	IVa	IVa	II	III	III	II
Tetotum	K	IIb	IIb	I	II	III	I
Tetotum variant	K	IIb	IIb	I	II	III	I
Thunder	GG	IVb	IVb	IV	IV	NS*	III
Thurmont	L	IIb	IIb	I	II	III	II
Tidal Marsh	PP	V	V	V	V	NS*	NS*
Tidal Marsh, high	PP	V	V	V	V	NS*	NS*
Tidal Marsh, low	PP	V	V	V	V	NS*	NS*
Tifton	Q	IIIa	IIIa	II	II	NS*	III
Timberville	G	IIa	IIa	I	II	II	I
Timberville variant	G	IIa	IIa	I	II	II	I
Tioga	A	Ia	Ia	I	Ia	I	I
Toast	V	IVa	IVa	II	III	III	III
Toccoa	II	V	V	III	V	NS*	NS*
Toddstav	HH	IVb	IVb	III	IV	NS*	IV
Tomotley (drained)	C	Ib	Ib	II	Ib	NS*	I
Tomotley (undrained)	OO	V	V	V	V	NS*	NS*
Toms	C	Ib	Ib	II	Ib	NS*	I
Torhunta	E	IIa	IIa	I	II	NS*	II
Totier	U	IIIb	IIIb	II	II	III	II
Toxaway	CC	IVb	IVb	II	IV	NS*	III
Toxaway (drained)	C	Ib	Ib	II	Ib	NS*	I
Toxaway (undrained)	OO	V	V	V	V	NS*	NS*
Trappist	U	IIIb	IIIb	II	II	III	II
Trego	W	IVa	IVa	IV	III	NS*	IV
Trenholm	KK	V	V	V	V	NS*	IV
Trimont	FF	IVb	IVb	III	IV	NS*	III
Trussel	BB	IVb	IVb	III	IV	NS*	III
Tuckahoe	A	Ia	Ia	I	Ia	I	I
Tuckasegee	G	IIa	IIa	I	II	II	I
Tugglesgap	CC	IVb	IVb	II	IV	NS*	III
Tumbling	O	IIb	IIb	I	II	II	II
Turbeville	O	IIb	IIb	I	II	II	II
Tusquitee	G	IIa	IIa	I	II	II	I
Tygart (drained)	P	IIb	IIb	II	II	NS*	III
Tygart (undrained)	Z	IVa	IVa	IV	III	NS*	NS*
Typic Udorthents	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Uchee	DD	IVb	IVb	II	IV	NS*	III
Udalfs	NP**	NP**	NP**	NP**	NP**	NP**	NP**

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	**Soil Mgt. Group**	**Corn**	**Grain Sorghum**	**Small Grain**	**Soybeans**	**Alfalfa**	**Tall Grass, Clover, Hay, Pasture**
Udifluvents	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Udipsamments	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Udorthents	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Udorthents, dams	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Udorthents, smoothed	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Udults	Y	IVa	IVa	III	III	NS*	III
Unaka	FF	IVb	IVb	III	IV	NS*	III
Unicoi	JJ	V	V	IV	V	NS*	IV
Unison	L	IIb	IIb	I	II	III	II
Unison variant	L	IIb	IIb	I	II	III	II
Urban land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Vance	Y	IVa	IVa	III	III	NS*	III
Vandalia	L	IIb	IIb	I	II	III	II
Vanella	O	IIb	IIb	I	II	II	II
Varilla	U	IIIb	IIIb	II	II	III	II
Varina	Q	IIIa	IIIa	II	II	NS*	III
Vaucluse	Q	IIIa	IIIa	II	II	NS*	III
Vertrees	M	IIb	IIb	I	II	I	II
Very rocky land	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Virgilina	KK	V	V	V	V	NS*	IV
Wadesboro	X	IVa	IVa	II	III	III	II
Wagram	DD	IVb	IVb	II	IV	NS*	III
Wahee (drained)	C	Ib	Ib	II	Ib	NS*	I
Wahee (undrained)	OO	V	V	V	V	NS*	NS*
Wakulla	II	V	V	III	V	NS*	NS*
Wallen	JJ	V	V	IV	V	NS*	IV
Walnut	GG	IVb	IVb	IV	IV	NS*	III
Wando	II	V	V	III	V	NS*	NS*
Warminster	X	IVa	IVa	II	III	III	II
Warne	OO	V	V	V	V	NS*	NS*
Watahala	M	IIb	IIb	I	II	I	II
Watauga	V	IVa	IVa	II	III	III	III
Wate	K	IIb	IIb	I	II	III	I
Water	NP**	NP**	NP**	NP**	NP**	NP**	NP**
Wateree	FF	IVb	IVb	III	IV	NS*	III
Watt	JJ	V	V	IV	V	NS*	IV
Watt variant	JJ	V	V	IV	V	NS*	IV
Waxpool	LL	V	V	V	V	NS*	IV
Waynesboro	L	IIb	IIb	I	II	III	II
Weaver	A	Ia	Ia	I	Ia	I	I
Webbtown	JJ	V	V	IV	V	NS*	IV

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Wedowee	V	IVa	IVa	II	III	III	III
Weeksville (drained)	C	Ib	Ib	II	Ib	NS*	I
Weeksville (undrained)	OO	V	V	V	V	NS*	NS*
Wehadkee	MM	V	V	V	V	NS*	IV
Weikert	JJ	V	V	IV	V	NS*	IV
Westfield	V	IVa	IVa	II	III	III	III
Westmoreland	U	IIIb	IIIb	II	II	III	II
Weston	E	IIa	IIa	I	II	NS*	II
Westphalia	II	V	V	III	V	NS*	NS*
Weverton	GG	IVb	IVb	IV	IV	NS*	III
Wharton	M	IIb	IIb	I	II	I	II
Wheaton	U	IIIb	IIIb	II	II	III	II
Wheeling	A	Ia	Ia	I	Ia	I	I
White Store	KK	V	V	V	V	NS*	IV
White Store variant	KK	V	V	V	V	NS*	IV
Whiteford	U	IIIb	IIIb	II	II	III	II
Wickham	B	Ia	Ia	I	Ia	II	I
Wickham variant	B	Ia	Ia	I	Ia	II	I
Widget	CC	IVb	IVb	II	IV	NS*	III
Wildell	JJ	V	V	IV	V	NS*	IV
Wilkes	JJ	V	V	IV	V	NS*	IV
Wingina	A	Ia	Ia	I	Ia	I	I
Winnsboro	KK	V	V	V	V	NS*	IV
Wintergreen	O	IIb	IIb	I	II	II	II
Winton	B	Ia	Ia	I	Ia	II	I
Wolfgap	A	Ia	Ia	I	Ia	I	I
Wolftrap	K	IIb	IIb	I	II	III	I
Woodington	EE	IVb	IVb	III	IV	NS*	NS*
Woodstown	J	IIb	IIb	I	II	NS*	I
Woolvine	V	IVa	IVa	II	III	III	III
Worsham	HH	IVb	IVb	III	IV	NS*	IV
Worsham variant	HH	IVb	IVb	III	IV	NS*	IV
Wrightsboro	J	IIb	IIb	I	II	NS*	I
Wurno	JJ	V	V	IV	V	NS*	IV
Wyrick	G	IIa	IIa	I	II	II	I
Yadkin	X	IVa	IVa	II	III	III	II
Yellowbottom	V	IVa	IVa	II	III	III	III
Yemasse (drained)	C	Ib	Ib	II	Ib	NS*	I
Yemasse	OO	V	V	V	V	NS*	NS*

Table 1-1
Soil Productivity Groupings for Various Cropping Categories

Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
(undrained)							
Yeopim	K	IIb	IIb	I	II	III	I
Yogaville	MM	V	V	V	V	NS*	IV
York	BB	IVb	IVb	III	IV	NS*	III
Zepp	JJ	V	V	IV	V	NS*	IV
Zion	Y	IVa	IVa	III	III	NS*	III
Zion variant	Y	IVa	IVa	III	III	NS*	III
Zoar	K	IIb	IIb	I	II	III	I

~~**Table 1-1**~~
~~**Soil Productivity Groupings for Various Cropping Categories**~~

~~Soil Series~~	~~Soil Mgt Group~~	~~Corn~~	~~Grain Sorghum~~	~~Small Grain~~	~~Soybeans~~	~~Alfalfa~~	~~Tall Grass, Clover, Hay, Pasture~~
~~Abell~~	~~G~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~II~~	~~I~~
~~Abell variant~~	~~G~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~II~~	~~I~~
~~Ackwater~~	~~K~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~I~~
~~Acredale (drained)~~	~~C~~	~~Ib~~	~~Ib~~	~~II~~	~~Ib~~	~~NS*~~	~~I~~
~~Acredale (undrained)~~	~~OO~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Aden (drained)~~	~~C~~	~~Ib~~	~~Ib~~	~~II~~	~~Ib~~	~~NS*~~	~~I~~
~~Aden (undrained)~~	~~OO~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Airmont~~	~~BB~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Alaga~~	~~II~~	~~V~~	~~V~~	~~III~~	~~V~~	~~NS*~~	~~NS*~~
~~Alamance~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Alanthus~~	~~D~~	~~Ib~~	~~Ib~~	~~I~~	~~Ib~~	~~I~~	~~I~~
~~Albano~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Albemarle~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Alderflats~~	~~NN~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Aldino~~	~~W~~	~~IVa~~	~~IVa~~	~~IV~~	~~III~~	~~NS*~~	~~IV~~
~~Aldie~~	~~Y~~	~~IVa~~	~~IVa~~	~~III~~	~~III~~	~~NS*~~	~~III~~
~~Allegheny~~	~~L~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Alluvial Land, wet~~	~~MM~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Alonemill~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Alonemill, Fluvaquentic~~	~~I~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~NS*~~	~~I~~
~~Alonzville~~	~~L~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Altavista~~	~~B~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~II~~	~~I~~
~~Altavista, variant~~	~~B~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~II~~	~~I~~
~~Alticrest~~	~~E~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~NS*~~	~~II~~
~~Angie~~	~~AA~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~NS*~~	~~IV~~
~~Angie variant~~	~~AA~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~NS*~~	~~IV~~

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	Soil Mgt. Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
~~Appling~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~III~~
~~Appling gritty~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~III~~
~~Appomattox~~	~~O~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Arapahoe~~	~~EE~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~NS*~~
~~Arcola~~	~~U~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Ardilla~~	~~W~~	~~IVa~~	~~IVa~~	~~IV~~	~~III~~	~~NS*~~	~~IV~~
~~Argent~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Arkaqua~~	~~I~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~NS*~~	~~I~~
~~Ashburn~~	~~BB~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Ashe~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Ashlar~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Assateague~~	~~QQ~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~

~~Table 1-1~~
~~Soil Productivity Groupings for Various Cropping Categories~~

~~Soil Series~~	~~Soil Mgt Group~~	~~Corn~~	~~Grain Sorghum~~	~~Small Grain~~	~~Soybeans~~	~~Alfalfa~~	~~Tall Grass, Clover, Hay, Pasture~~
~~Athol~~	~~M~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~I~~	~~II~~
~~Atkins~~	~~NN~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Atlee~~	~~Q~~	~~IIIa~~	~~IIIa~~	~~II~~	~~II~~	~~NS*~~	~~III~~
~~Augusta (drained)~~	~~P~~	~~IIb~~	~~IIb~~	~~II~~	~~II~~	~~NS*~~	~~III~~
~~Augusta (undrained)~~	~~Z~~	~~IVa~~	~~IVa~~	~~IV~~	~~III~~	~~NS*~~	~~NS*~~
~~Augusta variant(drained)~~	~~P~~	~~IIb~~	~~IIb~~	~~II~~	~~II~~	~~NS*~~	~~III~~
~~Augusta variant(undrain ed)~~	~~Z~~	~~IVa~~	~~IVa~~	~~IV~~	~~III~~	~~NS*~~	~~NS*~~
~~Aura~~	~~T~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~NS*~~	~~III~~
~~Austinville~~	~~O~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Axis~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Aycock~~	~~R~~	~~IIIa~~	~~IIIa~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Ayersville~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Backbay~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Badin~~	~~X~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~II~~
~~Baile~~	~~HH~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~IV~~
~~Bailegap~~	~~GG~~	~~IVb~~	~~IVb~~	~~IV~~	~~IV~~	~~NS*~~	~~III~~
~~Balsam~~	~~GG~~	~~IVb~~	~~IVb~~	~~IV~~	~~IV~~	~~NS*~~	~~III~~
~~Bama~~	~~R~~	~~IIIa~~	~~IIIa~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Banister~~	~~K~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~I~~
~~Barclay~~	~~E~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~NS*~~	~~II~~
~~Bateau~~	~~I~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~NS*~~	~~I~~
~~Bayboro (drained)~~	~~C~~	~~Ib~~	~~Ib~~	~~II~~	~~Ib~~	~~NS*~~	~~I~~
~~Bayboro (undrained)~~	~~OO~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Beckham~~	~~O~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Bedington~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Beech~~	~~L~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Beech Grove~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Belhaven~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Belspur~~	~~H~~	~~IIa~~	~~IIa~~	~~III~~	~~II~~	~~NS*~~	~~IV~~
~~Beltsville~~	~~BB~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Belvoir~~	~~BB~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Benthole~~	~~CC~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Bentley~~	~~R~~	~~IIIa~~	~~IIIa~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Berks~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Berks variant~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Bermudian~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Bertie~~	~~J~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~NS*~~	~~I~~
~~Bertie, variant~~	~~J~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~NS*~~	~~I~~
~~Bethera (drained)~~	~~C~~	~~Ib~~	~~Ib~~	~~II~~	~~Ib~~	~~NS*~~	~~I~~

~~Table 1-1~~
~~Soil Productivity Groupings for Various Cropping Categories~~

~~Soil Series~~	~~Soil Mgt Group~~	~~Corn~~	~~Grain Sorghum~~	~~Small Grain~~	~~Soybeans~~	~~Alfalfa~~	~~Tall Grass, Clover, Hay, Pasture~~
~~Bethera (undrained)~~	~~OO~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Bethesda~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Bethlehem~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~III~~
~~Bibb~~	~~EE~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~NS*~~
~~Biltmore~~	~~II~~	~~V~~	~~V~~	~~III~~	~~V~~	~~NS*~~	~~NS*~~
~~Birdsboro~~	~~L~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Blackthorn~~	~~GG~~	~~IVb~~	~~IVb~~	~~IV~~	~~IV~~	~~NS*~~	~~III~~
~~Bladen (drained)~~	~~C~~	~~Ib~~	~~Ib~~	~~II~~	~~Ib~~	~~NS*~~	~~I~~
~~Bladen (undrained)~~	~~OO~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS~~
~~Blago~~	~~HH~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~IV~~
~~Blairton~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Bland~~	~~Y~~	~~IVa~~	~~IVa~~	~~III~~	~~III~~	~~NS*~~	~~III~~
~~Bleakhill~~	~~J~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~NS*~~	~~I~~
~~Blocktown~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Bloodyhorse~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Bluemont~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Bohicket~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Bojac (ES, VA Beach, Ches.)~~	~~T~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~NS*~~	~~III~~
~~Bojac (Mainland, excluding VA Beach & Ches.)~~	~~DD~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Bolling~~	~~J~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~NS*~~	~~I~~
~~Bolling variant~~	~~J~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~NS*~~	~~I~~
~~Bolton~~	~~M~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~I~~	~~II~~
~~Bonneau~~	~~DD~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Bookwood~~	~~U~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Botetourt~~	~~G~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~II~~	~~I~~
~~Bourne~~	~~BB~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Bourne variant~~	~~BB~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Bowmansville~~	~~I~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~NS*~~	~~I~~
~~Braddock~~	~~O~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Brandywine~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Brecknock~~	~~U~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Bremo~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Brentsville~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Brevard~~	~~B~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~II~~	~~I~~
~~Brickhaven~~	~~Y~~	~~IVa~~	~~IVa~~	~~III~~	~~III~~	~~NS*~~	~~III~~
~~Brinkerton~~	~~LL~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Brinklow~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Broadway~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Brockroad~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~III~~
~~Brownsville~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Brownwood~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~

~~Table 1-1~~
~~Soil Productivity Groupings for Various Cropping Categories~~

~~Soil Series~~	~~Soil Mgt Group~~	~~Corn~~	~~Grain Sorghum~~	~~Small Grain~~	~~Soybeans~~	~~Alfalfa~~	~~Tall Grass, Clover, Hay, Pasture~~
~~Brumbaugh~~	~~L~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Brushy~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Buchanan~~	~~BB~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Buchanan cobbly~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Buckhall~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~III~~
~~Buckingham~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Bucks~~	~~U~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Buckton~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Buffstat~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~III~~
~~Bugley~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Buncombe~~	~~II~~	~~V~~	~~V~~	~~III~~	~~V~~	~~NS*~~	~~NS*~~
~~Burketown~~	~~BB~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Burrowsville~~	~~BB~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Burton~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Buzzrock~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Cahaba~~	~~R~~	~~IIIa~~	~~IIIa~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Calverton~~	~~BB~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Calvin~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Calvin cobbly~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Camocca~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Caneyville~~	~~Y~~	~~IVa~~	~~IVa~~	~~III~~	~~III~~	~~NS*~~	~~III~~
~~Cape Fear (drained)~~	~~C~~	~~Ib~~	~~Ib~~	~~II~~	~~Ib~~	~~NS*~~	~~I~~
~~Cape Fear (undrained)~~	~~OO~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Captina~~	~~BB~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Carbo~~	~~Y~~	~~IVa~~	~~IVa~~	~~III~~	~~III~~	~~NS*~~	~~III~~
~~Carbonton~~	~~Y~~	~~IVa~~	~~IVa~~	~~III~~	~~III~~	~~NS*~~	~~III~~
~~Cardiff~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Cardova~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Caroline~~	~~AA~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~NS*~~	~~IV~~
~~Cartecay~~	~~I~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~NS*~~	~~I~~
~~Carteret~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Cataska~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Catharpin~~	~~X~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~II~~
~~Catlett~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Catlett variant~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Catoctin~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Catoctin variant~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Catpoint~~	~~II~~	~~V~~	~~V~~	~~III~~	~~V~~	~~NS*~~	~~NS*~~
~~Caverns~~	~~I~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~NS*~~	~~I~~
~~Cecil~~	~~X~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~II~~
~~Cedarcreek~~	~~GG~~	~~IVb~~	~~IVb~~	~~IV~~	~~IV~~	~~NS*~~	~~III~~
~~Chagrin~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Chagrin variant~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Chandler~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~

Table 1-1
Soil Productivity Groupings for Various Cropping Categories

Soil Series	Soil Mgt Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Chapanoke (drained)	C	Ib	Ib	II	Ib	NS*	I
Chapanoke (undrained)	OO	V	V	V	V	NS*	NS*
Charity	N	IIb	IIb	I	II	II	II
Chastain	LL	V	V	V	V	NS*	IV
Chatuge (drained)	C	Ib	Ib	II	Ib	NS*	I
Chatuge (undrained)	OO	V	V	V	V	NS*	NS*
Chavies	U	IIIb	IIIb	II	II	III	II
Chavies variant	U	IIIb	IIIb	II	II	III	II
Chenneby	I	IIa	IIa	I	II	NS*	I
Chesapeake	B	Ia	Ia	I	Ia	II	I
Chester	D	Ib	Ib	I	Ib	I	I
Chester Loam	D	Ib	Ib	I	Ib	I	I
Chesterfield	V	IVa	IVa	II	III	III	III
Chestnut	GG	IVb	IVb	IV	IV	NS*	III
Chewacla	I	IIa	IIa	I	II	NS*	I
Chickahominy	LL	V	V	V	V	NS*	IV
Chilhowie	JJ	V	V	IV	V	NS*	IV
Chincoteague	PP	V	V	V	V	NS*	NS*
Chipley	EE	IVb	IVb	III	IV	NS*	NS*
Chiswell	JJ	V	V	IV	V	NS*	IV
Christian	AA	IVa	IVa	II	III	NS*	IV
Christiana	AA	IVa	IVa	II	III	NS*	IV
Cid	KK	V	V	V	V	NS*	IV
Claiborne	U	IIIb	IIIb	II	II	III	II
Clapham	BB	IVb	IVb	III	IV	NS*	III
Clarksburg	W	IVa	IVa	IV	III	NS*	IV
Clarksville	GG	IVb	IVb	IV	IV	NS*	III
Clearbrook	JJ	V	V	IV	V	NS*	IV
Cliffield	JJ	V	V	IV	V	NS*	IV
Clifford	X	IVa	IVa	II	III	III	II
Clifton	L	IIb	IIb	I	II	III	II
Clover	V	IVa	IVa	II	III	III	III
Cloverlick	JJ	V	V	IV	V	NS*	IV
Clubcaf	LL	V	V	V	V	NS*	IV
Clymer	U	IIIb	IIIb	II	II	III	II
Codorus	A	Ia	Ia	I	Ia	I	I
Codorus variant	A	Ia	Ia	I	Ia	I	I
Codorus stony	A	Ia	Ia	I	Ia	I	I
Codorus variant	A	Ia	Ia	I	Ia	I	I
Colescreek	L	IIb	IIb	I	II	III	II
Colfax	BB	IVb	IVb	III	IV	NS*	III
Colfax variant	BB	IVb	IVb	III	IV	NS*	III
Colleen	KK	V	V	V	V	NS*	IV
Colvard	II	V	V	III	V	NS*	NS*

Table 1-1
Soil Productivity Groupings for Various Cropping Categories

Soil Series	Soil Mgt Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Colvard fine	II	V	V	III	V	NS*	NS*
Colvard stony	II	V	V	III	V	NS*	NS*
Combs	A	Ia	Ia	I	Ia	I	I
Comus	A	Ia	Ia	I	Ia	I	I
Conetoe	DD	IVb	IVb	II	IV	NS*	III
Congaree	A	Ia	Ia	I	Ia	I	I
Coosaw	DD	IVb	IVb	II	IV	NS*	III
Corolla	EE	IVb	IVb	III	IV	NS*	NS*
Corydon	JJ	V	V	IV	V	NS*	IV
Cotaco	G	IIa	IIa	I	II	II	I
Cotaco cobbly	G	IIa	IIa	I	II	II	I
Cotaco variant	G	IIa	IIa	I	II	II	I
Cottonbend	L	IIb	IIb	I	II	III	II
Coursey	G	IIa	IIa	I	II	II	I
Cowee	N	IIb	IIb	I	II	II	II
Coxville	LL	V	V	V	V	NS*	IV
Craggey	JJ	V	V	IV	V	NS*	IV
Craigsville	CC	IVb	IVb	II	IV	NS*	III
Craven	HH	IVb	IVb	III	IV	NS*	IV
Creedmoor	KK	V	V	V	V	NS*	IV
Creedmoor variant	KK	V	V	V	V	NS*	IV
Croton	LL	V	V	V	V	NS*	IV
Cullasaja	FF	IVb	IVb	III	IV	NS*	III
Cullen	N	IIb	IIb	I	II	II	II
Culleoka	U	IIIb	IIIb	II	II	III	II
Culpeper	X	IVa	IVa	II	III	III	II
Culpeper variant	X	IVa	IVa	II	III	III	II
Daleville (drained)	C	Ib	Ib	II	Ib	NS*	I
Daleville (undrained)	OO	V	V	V	V	NS*	NS*
Dan River	G	IIa	IIa	I	II	II	I
Dandridge	JJ	V	V	IV	V	NS*	IV
Danripple	L	IIb	IIb	I	II	III	II
Davidson	N	IIb	IIb	I	II	II	II
Dawhoo	PP	V	V	V	V	NS*	NS*
Dawhoo variant	PP	V	V	V	V	NS*	NS*
Decatur	M	IIb	IIb	I	II	I	II
Dekalb	FF	IVb	IVb	III	IV	NS*	III
Dekalb variant	FF	IVb	IVb	III	IV	NS*	III
Delanco	B	Ia	Ia	I	Ia	II	I
Delila	HH	IVb	IVb	III	IV	NS*	IV
Dellwood	CC	IVb	IVb	II	IV	NS*	III
Deloss (drained)	C	Ib	Ib	II	Ib	NS*	I

Table 1-1
Soil Productivity Groupings for Various Cropping Categories

Soil Series	Soil Mgt Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Deloss (undrained)	OO	V	V	V	V	NS*	NS*
Derroc	CC	IVb	IVb	II	IV	NS*	III
Devotion	FF	IVb	IVb	III	IV	NS*	III
Diana Mills	V	IVa	IVa	II	III	III	III
Dillard	G	IIa	IIa	I	II	II	I
Dogue	K	IIb	IIb	I	II	III	I
Dogue variant	K	IIb	IIb	I	II	III	I
Dorovan	PP	V	V	V	V	NS*	NS*
Dothan	Q	IIIa	IIIa	II	II	NS*	III
Downer	DD	IIb	IIb	II	IV	NS*	III
Dragston	E	IIa	IIa	I	II	NS*	II
Drall	FF	IVb	IVb	III	IV	NS*	III
Drapermill	U	IIIb	IIIb	II	II	III	II
Drypond	JJ	V	V	IV	V	NS*	IV
Duckston	QQ	V	V	V	V	NS*	NS*
Duffield	G	IIa	IIa	I	II	II	I
Dulles	Y	IVa	IVa	III	III	NS*	III
Dumfries	T	IIIb	IIIb	II	II	NS*	III
Dunbar (drained)	P	IIb	IIb	II	II	NS*	III
Dunbar (undrained)	Z	IVa	IVa	IV	III	NS*	NS*
Dunning (drained)	H	IIa	IIa	III	II	NS*	IV
Dunning (undrained)	NN	V	V	V	V	NS*	NS*
Duplin	K	IIb	IIb	I	II	III	I
Durham	CC	IVb	IVb	II	IV	NS*	III
Dyke	O	IIb	IIb	I	II	II	II
Easthamlet	KK	V	V	V	V	NS*	IV
Ebbing	G	IIa	IIa	I	II	II	I
Edgehill	CC	IVb	IVb	II	IV	NS*	III
Edgehill variant	CC	IVb	IVb	II	IV	NS*	III
Edgemont	U	IIIb	IIIb	II	II	III	II
Edneytown	L	IIb	IIb	I	II	III	II
Edneyville	T	IIIb	IIIb	II	II	NS*	III
Edom	M	IIb	IIb	I	II	I	II
Elbert	LL	V	V	V	V	NS*	IV
Elbert variant	LL	V	V	V	V	NS*	IV
Elioak	X	IVa	IVa	II	III	III	II
Elk	A	Ia	Ia	I	Ia	I	I
Elkton (drained)	C	Ib	Ib	II	Ib	NS*	I
Elkton (undrained)	OO	V	V	V	V	NS*	NS*
Elliber	M	IIb	IIb	I	II	I	II
Elsinboro	L	IIb	IIb	I	II	III	II
Emory	G	IIa	IIa	I	II	II	I

~~Table 1-1~~
~~Soil Productivity Groupings for Various Cropping Categories~~

~~Soil Series~~	~~Soil Mgt Group~~	~~Corn~~	~~Grain Sorghum~~	~~Small Grain~~	~~Soybeans~~	~~Alfalfa~~	~~Tall Grass, Clover, Hay, Pasture~~
~~Emporia~~	~~R~~	~~IIIa~~	~~IIIa~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Endcav~~	~~Y~~	~~IVa~~	~~IVa~~	~~III~~	~~III~~	~~NS*~~	~~III~~
~~Enon~~	~~Y~~	~~IVa~~	~~IVa~~	~~III~~	~~III~~	~~NS*~~	~~III~~
~~Enott~~	~~Y~~	~~IVa~~	~~IVa~~	~~III~~	~~III~~	~~NS*~~	~~III~~
~~Ernest~~	~~W~~	~~IVa~~	~~IVa~~	~~IV~~	~~III~~	~~NS*~~	~~IV~~
~~Escatawba~~	~~L~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Eubanks~~	~~N~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Eulonia~~	~~K~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~I~~
~~Eunola~~	~~T~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~NS*~~	~~III~~
~~Evansham~~	~~LL~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Evard~~	~~L~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Evesboro~~	~~II~~	~~V~~	~~V~~	~~III~~	~~V~~	~~NS*~~	~~NS*~~
~~Exum~~	~~J~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~NS*~~	~~I~~
~~Faceville~~	~~R~~	~~IIIa~~	~~IIIa~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Fairfax~~	~~D~~	~~Ib~~	~~Ib~~	~~I~~	~~Ib~~	~~I~~	~~I~~
~~Fairpoint~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Fairview~~	~~X~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~II~~
~~Fairystone~~	~~X~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~II~~
~~Fallsington~~	~~E~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~NS*~~	~~II~~
~~Fauquier~~	~~N~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Fauquier, deep phase~~	~~N~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Faywood~~	~~U~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Featherstone~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Fedscreek~~	~~GG~~	~~IVb~~	~~IVb~~	~~IV~~	~~IV~~	~~NS*~~	~~III~~
~~Feedstone~~	~~G~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~II~~	~~I~~
~~Fisherman~~	~~QQ~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Fiveblock~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Flatwoods~~	~~M~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~I~~	~~II~~
~~Fletcher~~	~~U~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Flume~~	~~R~~	~~IIIa~~	~~IIIa~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Fluvanna~~	~~Y~~	~~IVa~~	~~IVa~~	~~III~~	~~III~~	~~NS*~~	~~III~~
~~Fluvaquents~~	~~HH~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~IV~~
~~Forestdale~~	~~LL~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Fork (drained)~~	~~P~~	~~IIb~~	~~IIb~~	~~II~~	~~II~~	~~NS*~~	~~III~~
~~Fork (undrained)~~	~~Z~~	~~IVa~~	~~IVa~~	~~IV~~	~~III~~	~~NS*~~	~~NS*~~
~~Fork variant (drained)~~	~~P~~	~~IIb~~	~~IIb~~	~~II~~	~~II~~	~~NS*~~	~~III~~
~~Fork variant (undrained)~~	~~Z~~	~~IVa~~	~~IVa~~	~~IV~~	~~III~~	~~NS*~~	~~NS*~~
~~Frankstown~~	~~U~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Frederick~~	~~M~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~I~~	~~II~~
~~Frederick/ Christian~~	~~M~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~I~~	~~II~~
~~Frederick/Lodi~~	~~M~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~I~~	~~II~~
~~Freemanville~~	~~Q~~	~~IIIa~~	~~IIIa~~	~~II~~	~~II~~	~~NS*~~	~~III~~
~~French~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~

Table 1-1
Soil Productivity Groupings for Various Cropping Categories

Soil Series	Soil Mgt Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Fripp	QQ	V	V	V	V	NS*	NS*
Funkstown	A	Ia	Ia	I	Ia	I	I
Gaila	FF	IVb	IVb	III	IV	NS*	III
Gainesboro	FF	IVb	IVb	III	IV	NS*	III
Galestown	II	V	V	III	V	NS*	NS*
Galtsmill	II	V	V	III	V	NS*	NS*
Georgeville	X	IVa	IVa	II	III	III	II
Germanna	L	IIb	IIb	I	II	III	II
Gertie	OO	V	V	V	V	NS*	NS*
Gilpin	U	IIIb	IIIb	II	II	III	II
Gilpin variant	U	IIIb	IIIb	II	II	III	II
Gladehill	A	Ia	Ia	I	Ia	I	I
Glenelg(BRH)	N	IIb	IIb	I	II	II	II
Glenelg(NV)	U	IIIb	IIIb	II	II	III	II
Glenville	W	IVa	IVa	IV	III	NS*	IV
Glynwood	GG	IVb	IVb	IV	IV	NS*	III
Glynwood variant	GG	IVb	IVb	IV	IV	NS*	III
Goblintown	V	IVa	IVa	II	III	III	III
Goldsboro	J	IIb	IIb	I	II	NS*	I
Goldston	JJ	V	V	IV	V	NS*	IV
Goldvein	BB	IVb	IVb	III	IV	NS*	III
Goldvein gritty	BB	IVb	IVb	III	IV	NS*	III
Goresville	N	IIb	IIb	I	II	II	II
Granville	R	IIIa	IIIa	II	II	III	II
Grassland	L	IIb	IIb	I	II	III	II
Greendale	A	Ia	Ia	I	Ia	I	I
Greenlee	CC	IVb	IVb	II	IV	NS*	III
Grigsby	A	Ia	Ia	I	Ia	I	I
Grimsley	GG	IVb	IVb	IV	IV	NS*	III
Gritney	T	IIIb	IIIb	II	II	NS*	III
Groseclose	M	IIb	IIb	I	II	I	II
Grover	X	IVa	IVa	II	III	III	II
Guernsey	M	IIb	IIb	I	II	I	II
Gullion	B	Ia	Ia	I	Ia	II	I
Gundy	V	IVa	IVa	II	III	III	III
Gunstock	V	IVa	IVa	II	III	III	III
Guyen	Z	IVa	IVa	IV	III	NS*	NS*
Gwinnett variant	X	IVa	IVa	II	III	III	II
Hagerstown	M	IIb	IIb	I	II	I	II
Halewood	U	IIIb	IIIb	II	II	III	II
Halifax	KK	V	V	V	V	NS*	IV
Hanceville	V	IVa	IVa	II	III	III	III
Happyland	U	IIIb	IIIb	II	II	III	II
Hartleton	FF	IVb	IVb	III	IV	NS*	III
Hartsells	CC	IVb	IVb	II	IV	NS*	III
Hatboro	HH	IVb	IVb	III	IV	NS*	IV

~~Table 1-1~~
~~Soil Productivity Groupings for Various Cropping Categories~~

~~Soil Series~~	~~Soil Mgt Group~~	~~Corn~~	~~Grain Sorghum~~	~~Small Grain~~	~~Soybeans~~	~~Alfalfa~~	~~Tall Grass, Clover, Hay, Pasture~~
~~Hawksbill~~	~~CC~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Hawksbill cobbly~~	~~CC~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Hayesville~~	~~X~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~II~~
~~Haymarket~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Hayter~~	~~L~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Haywood~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Hazel~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Hazel channery~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Hazel Run~~	~~U~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Hazleton~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Helena~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Helena taxadjunct~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Herndon~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~III~~
~~Hibler~~	~~L~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Hickoryknob~~	~~N~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Highsplint~~	~~CC~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Hiwassee~~	~~O~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Hiwassee variant~~	~~O~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Hoadley~~	~~BB~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Hobucken~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Holly~~	~~NN~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Hollywood~~	~~LL~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Hublersburg~~	~~M~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~I~~	~~II~~
~~Huntington~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Hyde (drained)~~	~~C~~	~~Ib~~	~~Ib~~	~~II~~	~~Ib~~	~~NS*~~	~~I~~
~~Hyde (undrained)~~	~~OO~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Ingledove~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Iotla~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Iredell~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Iredell variant~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Irongate~~	~~DD~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Itman~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Iuka~~	~~F~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Izagora~~	~~J~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~NS*~~	~~I~~
~~Jackland~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Jedburg~~	~~Z~~	~~IVa~~	~~IVa~~	~~IV~~	~~III~~	~~NS*~~	~~NS*~~
~~Jefferson~~	~~U~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Jefferson variant~~	~~U~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Johns (drained)~~	~~C~~	~~Ib~~	~~Ib~~	~~II~~	~~Ib~~	~~NS*~~	~~I~~
~~Johns (undrained)~~	~~OO~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Johns variant~~	~~C~~	~~Ib~~	~~Ib~~	~~II~~	~~Ib~~	~~NS*~~	~~I~~

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	Soil Mgt Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
(drained)							
Johns variant (undrained)	OO	V	V	V	V	NS*	NS*
Johnston	PP	V	V	V	V	NS*	NS*
Junaluska	U	IIIb	IIIb	II	II	III	II
Kalmia	S	IIIa	IIIa	II	II	NS*	III
Kaymine	JJ	V	V	IV	V	NS*	IV
Keener	O	IIb	IIb	I	II	II	II
Kelly	KK	V	V	V	V	NS*	IV
Kempsville	S	IIIa	IIIa	II	II	NS*	III
Kenansville	DD	IVb	IVb	II	IV	NS*	III
Kenansville variant	DD	IVb	IVb	II	IV	NS*	III
Keyport	K	IIb	IIb	I	II	III	I
Kinkora (drained)	C	Ib	Ib	II	Ib	NS*	I
Kinkora (undrained)	OO	V	V	V	V	NS*	NS*
Kinston (drained)	C	Ib	Ib	II	Ib	NS*	I
Kinston (undrained)	OO	V	V	V	V	NS*	NS*
Klej	EE	IVb	IVb	III	IV	NS*	NS*
Klinesville	JJ	V	V	IV	V	NS*	IV
Konnarock	JJ	V	V	IV	V	NS*	IV
Lackstown	K	IIb	IIb	I	II	III	I
Laidig	W	IVa	IVa	IV	III	NS*	IV
Laidig cobbly	W	IVa	IVa	IV	III	NS*	IV
Lakehurst	EE	IVb	IVb	III	IV	NS*	NS*
Lakeland	II	V	V	III	V	NS*	NS
Lakin	II	V	V	III	V	NS*	NS
Landisburg	W	IVa	IVa	IV	III	NS*	IV
Lanexa	PP	V	V	V	V	NS*	NS*
Lansdale	FF	IVb	IVb	III	IV	NS*	III
Laroque	FF	IVb	IVb	III	IV	NS*	III
Lawnes	PP	V	V	V	V	NS*	NS*
Leadvale	BB	IVb	IVb	III	IV	NS*	III
Leaf (drained)	C	Ib	Ib	II	Ib	NS*	I
Leaf (undrained)	OO	V	V	V	V	NS*	NS*
Leaksville	KK	V	V	V	V	NS*	IV
Leatherwood	OO	V	V	V	V	NS*	NS*
Leck Kill	U	IIIb	IIIb	II	II	III	II
Leedsville	L	IIb	IIb	I	II	III	II
Leetonia	II	V	V	III	V	NS*	NS*
Legore	V	IVa	IVa	II	III	III	III
Lehew	JJ	V	V	IV	V	NS*	IV
Lenoir	LL	V	V	V	V	NS*	IV

~~Table 1-1 Soil Productivity Groupings for Various Cropping Categories~~							
~~Soil Series~~	~~Soil Mgt Group~~	~~Corn~~	~~Grain Sorghum~~	~~Small Grain~~	~~Soybeans~~	~~Alfalfa~~	~~Tall Grass, Clover, Hay, Pasture~~
~~Leon~~	~~II~~	~~V~~	~~V~~	~~III~~	~~V~~	~~NS*~~	~~NS*~~
~~Levy~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Lew~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Lewisberry~~	~~II~~	~~V~~	~~V~~	~~III~~	~~V~~	~~NS*~~	~~NS*~~
~~Lewisburg~~	~~CC~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Library~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Lickdale (drained)~~	~~H~~	~~IIa~~	~~IIa~~	~~III~~	~~II~~	~~NS*~~	~~IV~~
~~Lickdale (undrained)~~	~~NN~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Lignum~~	~~LL~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Lily~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Linden~~	~~F~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Lindside~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Littlejoe~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~III~~
~~Litz~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Lloyd~~	~~N~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Lloyd variant~~	~~N~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Lobdell~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Lodi~~	~~M~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~I~~	~~II~~
~~Lostcove~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Louisa~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Louisa variant~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Louisburg~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Lowell~~	~~M~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~I~~	~~II~~
~~Lucketts~~	~~Y~~	~~IVa~~	~~IVa~~	~~III~~	~~III~~	~~NS*~~	~~III~~
~~Lucy~~	~~DD~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Lumbee (drained)~~	~~C~~	~~Ib~~	~~Ib~~	~~II~~	~~Ib~~	~~NS*~~	~~I~~
~~Lumbee (undrained)~~	~~OO~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Lumbee variant (drained)~~	~~C~~	~~Ib~~	~~Ib~~	~~II~~	~~Ib~~	~~NS*~~	~~I~~
~~Lumbee variant (undrained)~~	~~OO~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Lunt~~	~~AA~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~NS*~~	~~IV~~
~~Lynchburg~~	~~E~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~NS*~~	~~II~~
~~Macove~~	~~CC~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Madison~~	~~X~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~II~~
~~Madsheep~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Maggodee~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Magotha~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Malbis~~	~~W~~	~~IVa~~	~~IVa~~	~~IV~~	~~III~~	~~NS*~~	~~IV~~
~~Manassas~~	~~D~~	~~Ib~~	~~Ib~~	~~I~~	~~Ib~~	~~I~~	~~I~~
~~Mandy~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Manor~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Mantachie~~	~~I~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~NS*~~	~~I~~
~~Manteo~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~

~~Table 1-1~~

~~Soil Productivity Groupings for Various Cropping Categories~~

~~Soil Series~~	~~Soil Mgt Group~~	~~Corn~~	~~Grain Sorghum~~	~~Small Grain~~	~~Soybeans~~	~~Alfalfa~~	~~Tall Grass, Clover, Hay, Pasture~~
~~Marbie~~	~~W~~	~~IVa~~	~~IVa~~	~~IV~~	~~III~~	~~NS*~~	~~IV~~
~~Marbleyard~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Margo~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Markes~~	~~NN~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Marlboro~~	~~R~~	~~IIIa~~	~~IIIa~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Marr~~	~~T~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~NS*~~	~~III~~
~~Marrowbone~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~NS*~~
~~Marumsco~~	~~K~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~I~~
~~Masada~~	~~L~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Massanetta~~	~~B~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~II~~	~~I~~
~~Massanutten~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Matapeake~~	~~R~~	~~IIIa~~	~~IIIa~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Matewan~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Matewan~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Matneflat~~	~~CC~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Mattamuskeet~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Mattan~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Mattapex~~	~~K~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~I~~
~~Mattaponi~~	~~R~~	~~IIIa~~	~~IIIa~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Maurertown~~	~~NN~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Maury~~	~~M~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~I~~	~~II~~
~~Mayodan~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~III~~
~~McCamy~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~McClung~~	~~M~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~I~~	~~II~~
~~McGary (drained)~~	~~P~~	~~IIb~~	~~IIb~~	~~II~~	~~II~~	~~NS*~~	~~III~~
~~McGary (undrained)~~	~~Z~~	~~IVa~~	~~IVa~~	~~IV~~	~~III~~	~~NS*~~	~~NS*~~
~~McLaurin~~	~~DD~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~McQueen~~	~~B~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~II~~	~~I~~
~~Meadowfield~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Meadows~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Meadowville~~	~~G~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~II~~	~~I~~
~~Meadowville variant~~	~~G~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~II~~	~~I~~
~~Meckesville~~	~~W~~	~~IVa~~	~~IVa~~	~~IV~~	~~III~~	~~NS*~~	~~IV~~
~~Mecklenburg~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~III~~
~~Mecklenburg variant~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~III~~
~~Meggett (drained)~~	~~C~~	~~Ib~~	~~Ib~~	~~II~~	~~Ib~~	~~NS*~~	~~I~~
~~Meggett (undrained)~~	~~OO~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Melfa~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Melvin (drained)~~	~~H~~	~~IIa~~	~~IIa~~	~~III~~	~~II~~	~~NS*~~	~~IV~~

~~Table 1-1~~ ~~Soil Productivity Groupings for Various Cropping Categories~~							
~~Soil Series~~	~~Soil Mgt Group~~	~~Corn~~	~~Grain Sorghum~~	~~Small Grain~~	~~Soybeans~~	~~Alfalfa~~	~~Tall Grass, Clover, Hay, Pasture~~
~~Melvin (undrained)~~	~~NN~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Middleburg~~	~~G~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~II~~	~~I~~
~~Millrock~~	~~II~~	~~V~~	~~V~~	~~III~~	~~V~~	~~NS*~~	~~NS*~~
~~Mine Run~~	~~II~~	~~V~~	~~V~~	~~III~~	~~V~~	~~NS*~~	~~NS*~~
~~Minnieville~~	~~N~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Mirerock~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Misenheimer~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Molena~~	~~II~~	~~V~~	~~V~~	~~III~~	~~V~~	~~NS*~~	~~NS*~~
~~Monacan~~	~~I~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~NS*~~	~~I~~
~~Mongle~~	~~H~~	~~IIa~~	~~IIa~~	~~III~~	~~II~~	~~NS*~~	~~IV~~
~~Monongahela~~	~~W~~	~~IVa~~	~~IVa~~	~~IV~~	~~III~~	~~NS*~~	~~IV~~
~~Montalto~~	~~N~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Montonia~~	~~X~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~II~~
~~Montresso~~	~~D~~	~~Ib~~	~~Ib~~	~~I~~	~~Ib~~	~~I~~	~~I~~
~~Montross~~	~~Q~~	~~IIIa~~	~~IIIa~~	~~II~~	~~II~~	~~NS*~~	~~III~~
~~Moomaw~~	~~W~~	~~IVa~~	~~IVa~~	~~IV~~	~~III~~	~~NS*~~	~~IV~~
~~Morasonville~~	~~D~~	~~Ib~~	~~Ib~~	~~I~~	~~Ib~~	~~I~~	~~I~~
~~Morven~~	~~G~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~II~~	~~I~~
~~Mount Lucas~~	~~J~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~NS*~~	~~I~~
~~Mt. Rogers~~	~~GG~~	~~IVb~~	~~IVb~~	~~IV~~	~~IV~~	~~NS*~~	~~III~~
~~Muckalee~~	~~MM~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Munden~~	~~F~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Murrill~~	~~L~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Muskingum~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Myatt (drained)~~	~~C~~	~~Ib~~	~~Ib~~	~~II~~	~~Ib~~	~~NS*~~	~~I~~
~~Myatt (undrained)~~	~~OO~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Myatt variant (drained)~~	~~C~~	~~Ib~~	~~Ib~~	~~II~~	~~Ib~~	~~NS*~~	~~I~~
~~Myatt variant (undrained)~~	~~OO~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Myersville~~	~~D~~	~~Ib~~	~~Ib~~	~~I~~	~~Ib~~	~~I~~	~~I~~
~~Nahunta~~	~~E~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~NS*~~	~~II~~
~~Nanford~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~III~~
~~Nansemond~~	~~F~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Nason~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~III~~
~~Nawney~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Neabsco~~	~~BB~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Needmore~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Nestoria~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Nevarc~~	~~HH~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~IV~~
~~Newark (drained)~~	~~H~~	~~IIa~~	~~IIa~~	~~III~~	~~II~~	~~NS*~~	~~IV~~
~~Newark (undrained)~~	~~NN~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Newark variant (drained)~~	~~H~~	~~IIa~~	~~IIa~~	~~III~~	~~II~~	~~NS*~~	~~IV~~

~~Table 1-1~~ ~~Soil Productivity Groupings for Various Cropping Categories~~							
~~Soil Series~~	~~Soil Mgt Group~~	~~Corn~~	~~Grain Sorghum~~	~~Small Grain~~	~~Soybeans~~	~~Alfalfa~~	~~Tall Grass, Clover, Hay, Pasture~~
~~Newark variant (undrained)~~	~~NN~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Newbern~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Newflat~~	~~LL~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Newhan~~	~~QQ~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Newmarc~~	~~B~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~II~~	~~I~~
~~Nicelytown~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Nicholson~~	~~BB~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Nickwasi~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~NS*~~
~~Nimmo~~	~~E~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~NS*~~	~~II~~
~~Nixa~~	~~BB~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Nolichucky~~	~~O~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Nolin~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Nollville~~	~~G~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~II~~	~~I~~
~~Nomberville~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Norfolk~~	~~R~~	~~IIIa~~	~~IIIa~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Oak Level~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~III~~
~~Oakhill~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Oaklet~~	~~Y~~	~~IVa~~	~~IVa~~	~~III~~	~~III~~	~~NS*~~	~~III~~
~~Oatlands~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Occoquan~~	~~DD~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Ochlockonee~~	~~II~~	~~V~~	~~V~~	~~III~~	~~V~~	~~NS*~~	~~NS*~~
~~Ochlockonee variant~~	~~II~~	~~V~~	~~V~~	~~III~~	~~V~~	~~NS*~~	~~NS*~~
~~Ocilla~~	~~F~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Ogles~~	~~CC~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Okeetee~~	~~LL~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Opequon~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Orange~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Orange variant~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Orangeburg~~	~~R~~	~~IIIa~~	~~IIIa~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Orenda~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Oriskany~~	~~CC~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Orrville (drained)~~	~~C~~	~~Ib~~	~~Ib~~	~~II~~	~~Ib~~	~~NS*~~	~~I~~
~~Orrville (undrained)~~	~~OO~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Orrville variant (drained)~~	~~C~~	~~Ib~~	~~Ib~~	~~II~~	~~Ib~~	~~NS*~~	~~I~~
~~Orrville variant (undrained)~~	~~OO~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Orthents~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS~~	~~IV~~
~~Osier~~	~~E~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~NS*~~	~~II~~
~~Ostin~~	~~II~~	~~V~~	~~V~~	~~III~~	~~V~~	~~NS*~~	~~NS*~~
~~Othello (drained)~~	~~C~~	~~Ib~~	~~Ib~~	~~II~~	~~Ib~~	~~NS*~~	~~I~~
~~Othello~~	~~OO~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~

Table 1-1
Soil Productivity Groupings for Various Cropping Categories

Soil Series	Soil Mgt Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
(undrained)							
Ott	JJ	V	V	IV	V	NS*	NS*
Pacolet	X	IVa	IVa	II	III	III	II
Pactolus	EE	IVb	IVb	III	IV	NS*	NS*
Paddyknob	JJ	V	V	IV	V	NS*	IV
Pagebrook	Y	IVa	IVa	III	III	NS*	III
Pamlico	PP	V	V	V	V	NS*	NS*
Pamunkey	B	Ia	Ia	I	Ia	II	I
Pamunkey variant	B	Ia	Ia	I	Ia	II	I
Panorama	U	IIIb	IIIb	II	II	III	II
Pantego (drained)	C	Ib	Ib	II	Ib	NS*	I
Pantego (undrained)	OO	V	V	V	V	NS*	NS*
Parker	GG	IVb	IVb	IV	IV	NS*	III
Partlow	HH	IVb	IVb	III	IV	NS*	IV
Pasquotank (drained)	C	Ib	Ib	II	Ib	NS*	I
Pasquotank (undrained)	OO	V	V	V	V	NS*	NS*
Peaks	JJ	V	V	IV	V	NS*	IV
Peawick	HH	IVb	IVb	III	IV	NS*	IV
Pecktonville	M	IIb	IIb	I	II	I	II
Penhook	X	IVa	IVa	II	III	III	II
Penn	FF	IVb	IVb	III	IV	NS*	III
Philo (drained)	H	IIa	IIa	III	II	NS*	IV
Philo (undrained)	NN	V	V	V	V	NS*	NS*
Philoment	D	Ib	Ib	I	Ib	I	I
Pigeonroost	N	IIb	IIb	I	II	II	II
Pilot Mountain	JJ	V	V	IV	V	NS*	IV
Pineola	L	IIb	IIb	I	II	III	II
Pineville	U	IIIb	IIIb	II	II	III	II
Pineywoods	NN	V	V	V	V	NS*	NS*
Pinkston	JJ	V	V	IV	V	NS*	IV
Pinoka	JJ	V	V	IV	V	NS*	IV
Pisgah	M	IIb	IIb	I	II	I	II
Plummer	EE	IVb	IVb	III	IV	NS*	NS*
Pocalla	DD	IVb	IVb	II	IV	NS*	III
Pocaty	PP	V	V	V	V	NS*	NS*
Pocomoke	E	IIa	IIa	I	II	NS*	II
Poindexter	FF	IVb	IVb	III	IV	NS*	III
Poindexter variant	FF	IVb	IVb	III	IV	NS*	III
Polawana	PP	V	V	V	V	NS*	NS*
Pooler variant	C	Ib	Ib	II	Ib	NS*	I

Table 1-1
Soil Productivity Groupings for Various Cropping Categories

Soil Series	Soil Mgt Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
(drained)							
Pooler variant (undrained)	OO	V	V	V	V	NS*	NS*
Pope	A	Ia	Ia	I	Ia	I	I
Poplimento	M	IIb	IIb	I	II	I	II
Porters	FF	IVb	IVb	III	IV	NS*	III
Portsmouth (drained)	C	Ib	Ib	II	Ib	NS*	I
Portsmouth (undrained)	OO	V	V	V	V	NS*	NS*
Post	V	IVa	IVa	II	III	III	III
Pouncey	LL	V	V	V	V	NS*	IV
Poynor	GG	IVb	IVb	IV	IV	NS*	III
Psamments	II	V	V	III	V	NS*	NS*
Pungo	PP	V	V	V	V	NS*	NS*
Purcellville	D	Ib	Ib	I	Ib	I	I
Purdy (drained)	H	IIa	IIa	III	II	NS*	IV
Purdy (undrained)	NN	V	V	V	V	NS*	NS*
Quantico	R	IIIa	IIIa	II	II	III	II
Rabun	N	IIb	IIb	I	II	II	II
Rains (drained)	C	Ib	Ib	II	Ib	NS*	I
Rains (undrained)	OO	V	V	V	V	NS*	NS*
Ramsey	JJ	V	V	IV	V	NS*	IV
Rapidan	N	IIb	IIb	I	II	II	II
Rappahanock	PP	V	V	V	V	NS*	NS*
Raritan	W	IVa	IVa	IV	III	NS*	IV
Rasalo	Y	IVa	IVa	III	III	NS*	III
Rayne	U	IIIb	IIIb	II	II	III	II
Readington	W	IVa	IVa	IV	III	NS*	IV
Reaville	JJ	V	V	IV	V	NS*	IV
Redbrush	Y	IVa	IVa	III	III	NS*	III
Remlik	DD	IVb	IVb	II	IV	NS*	III
Rhodhiss	X	IVa	IVa	II	III	III	II
Rigley	CC	IVb	IVb	II	IV	NS*	III
Rion	X	IVa	IVa	II	III	III	II
Riverview	G	IIa	IIa	I	II	II	I
Rixeyville	JJ	V	V	IV	V	NS*	NS*
Roanoke (drained)	H	IIa	IIa	III	II	NS*	IV
Roanoke (undrained)	NN	V	V	V	V	NS*	NS*
Robertsville	LL	V	V	V	V	NS*	IV
Rockbam	X	IVa	IVa	II	III	III	II
Rohrersville	BB	IVb	IVb	III	IV	NS*	III
Ross	A	Ia	Ia	I	Ia	I	I
Rough	JJ	V	V	IV	V	NS*	IV

~~Table 1-1~~ ~~Soil Productivity Groupings for Various Cropping Categories~~							
~~Soil Series~~	~~Soil Mgt Group~~	~~Corn~~	~~Grain Sorghum~~	~~Small Grain~~	~~Soybeans~~	~~Alfalfa~~	~~Tall Grass, Clover, Hay, Pasture~~
~~Rowland~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Rumford~~	~~DD~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Rushtown~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Ruston~~	~~S~~	~~IIIa~~	~~IIIa~~	~~II~~	~~II~~	~~NS*~~	~~III~~
~~Saffell~~	~~DD~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Santuc~~	~~G~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~II~~	~~I~~
~~Sassafras~~	~~T~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~NS*~~	~~III~~
~~Saunook~~	~~L~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Sauratown~~	~~CC~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Savannah~~	~~BB~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Scatterville~~	~~BB~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Schaffenaker~~	~~II~~	~~V~~	~~V~~	~~III~~	~~V~~	~~NS*~~	~~NS*~~
~~Seabrook~~	~~EE~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~NS*~~
~~Seagate~~	~~EE~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~NS*~~
~~Sedgefield~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Sekil~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Seneca~~	~~G~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~II~~	~~I~~
~~Sequatchie~~	~~B~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~II~~	~~I~~
~~Sequoia~~	~~U~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Sewell~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Shelocta~~	~~L~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Shelocta variant~~	~~L~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Shenval~~	~~O~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Sherando~~	~~CC~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Sheva~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Shottower~~	~~O~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Shouns~~	~~G~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~II~~	~~I~~
~~Sindion~~	~~B~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~II~~	~~I~~
~~Skeeterville~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Slabtown~~	~~G~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~II~~	~~I~~
~~Slagle~~	~~K~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~I~~
~~Snicksville~~	~~D~~	~~Ib~~	~~Ib~~	~~I~~	~~Ib~~	~~I~~	~~I~~
~~Snowdog~~	~~BB~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Spears Mountain~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~III~~
~~Speedwell~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Spessard~~	~~CC~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Spivey~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Spotsylvania~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~III~~
~~Spray~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Spriggs~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Springwood~~	~~D~~	~~Ib~~	~~Ib~~	~~I~~	~~Ib~~	~~I~~	~~I~~
~~Stanton~~	~~LL~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Starr~~	~~G~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~II~~	~~I~~
~~Starr-Dyke~~	~~O~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Staser~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~State (ES)~~	~~T~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~NS*~~	~~III~~

~~Table 1-1~~
~~Soil Productivity Groupings for Various Cropping Categories~~

~~Soil Series~~	~~Soil Mgt Group~~	~~Corn~~	~~Grain Sorghum~~	~~Small Grain~~	~~Soybeans~~	~~Alfalfa~~	~~Tall Grass, Clover, Hay, Pasture~~
~~State (Mainland)~~	~~B~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~II~~	~~I~~
~~Steinsburg~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Stonecoal~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Stoneville~~	~~X~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~II~~
~~Stott Knob~~	~~N~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Stough~~	~~F~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Straightstone~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~III~~
~~Strawfield~~	~~X~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~II~~
~~Stumptown~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Suches~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Sudley~~	~~D~~	~~Ib~~	~~Ib~~	~~I~~	~~Ib~~	~~I~~	~~I~~
~~Suffolk~~	~~T~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~NS*~~	~~III~~
~~Sugarhol~~	~~O~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Sulfaquents~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Summers~~	~~GG~~	~~IVb~~	~~IVb~~	~~IV~~	~~IV~~	~~NS*~~	~~III~~
~~Susquehanna~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Swamp~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Swampoodle~~	~~D~~	~~Ib~~	~~Ib~~	~~I~~	~~Ib~~	~~I~~	~~I~~
~~Sweetapple~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Swimley~~	~~M~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~I~~	~~II~~
~~Sycoline~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Sylco~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Sylvatus~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Talladega~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Tallapoosa~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Tallapoosa variant~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Tanasee~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Tankerville~~	~~N~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Tankerville taxadjunct~~	~~N~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Tarboro~~	~~II~~	~~V~~	~~V~~	~~III~~	~~V~~	~~NS*~~	~~NS*~~
~~Tarrus~~	~~X~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~II~~
~~Tate~~	~~O~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Tate variant~~	~~O~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Tatum~~	~~X~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~II~~
~~Terric Medisaprists~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Tetotum~~	~~K~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~I~~
~~Tetotum variant~~	~~K~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~I~~
~~Thunder~~	~~GG~~	~~IVb~~	~~IVb~~	~~IV~~	~~IV~~	~~NS*~~	~~III~~
~~Thurmont~~	~~L~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Tidal Marsh~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Tidal Marsh, high~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Tidal Marsh, low~~	~~PP~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~

Table 1-1
Soil Productivity Groupings for Various Cropping Categories

Soil Series	Soil Mgt Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Tidal Mudflats	PP	V	V	V	V	NS*	NS*
Tidal Pool	PP	V	V	V	V	NS*	NS*
Tifton	Q	IIIa	IIIa	II	II	NS*	III
Timberville	G	IIa	IIa	I	II	II	I
Timberville variant	G	IIa	IIa	I	II	II	I
Tioga	A	Ia	Ia	I	Ia	I	I
Toccoa	II	V	V	III	V	NS*	NS*
Toddstav	HH	IVb	IVb	III	IV	NS*	IV
Tomotley (drained)	C	Ib	Ib	II	Ib	NS*	I
Tomotley (undrained)	OO	V	V	V	V	NS*	NS*
Toms	C	Ib	Ib	II	Ib	NS*	I
Toqast	V	IVa	IVa	II	III	III	III
Torhunta	E	IIa	IIa	I	II	NS*	II
Totier	U	IIIb	IIIb	II	II	III	II
Toxaway	CC	IVb	IVb	II	IV	NS*	III
Toxaway (drained)	C	Ib	Ib	II	Ib	NS*	I
Toxaway (undrained)	OO	V	V	V	V	NS*	NS*
Trappist	U	IIIb	IIIb	II	II	III	II
Trego	W	IVa	IVa	IV	III	NS*	IV
Trenholm	KK	V	V	V	V	NS*	IV
Trimont	FF	IVb	IVb	III	IV	NS*	III
Trussell	BB	IVb	IVb	III	IV	NS*	NS*
Tuckahoe	A	Ia	Ia	I	Ia	I	I
Tuckasegee	G	IIa	IIa	I	II	II	I
Tugglesgap	CC	IVb	IVb	II	IV	NS*	III
Tumbling	O	IIb	IIb	I	II	II	II
Turbeville	O	IIb	IIb	I	II	II	II
Tusquitee	G	IIa	IIa	I	II	II	I
Tygart (drained)	P	IIb	IIb	II	II	NS*	III
Tygart (undrained)	Z	IVa	IVa	IV	III	NS*	NS*
Uchee	DD	IVb	IVb	II	IV	NS*	III
Udults	Y	IVa	IVa	III	III	NS*	III
Unison	L	IIb	IIb	I	II	III	II
Unison variant	L	IIb	IIb	I	II	III	II
Vance	Y	IVa	IVa	III	III	NS*	III
Vandalia	L	IIb	IIb	I	II	III	II
Varina	Q	IIIa	IIIa	II	II	NS*	III
Vaucluse	Q	IIIa	IIIa	II	II	NS*	III
Vertrees	M	IIb	IIb	I	II	I	II
Virgilina	KK	V	V	V	V	NS*	IV
Wadesboro	X	IVa	IVa	II	III	III	II

~~Table 1-1~~
~~Soil Productivity Groupings for Various Cropping Categories~~

~~Soil Series~~	~~Soil Mgt Group~~	~~Corn~~	~~Grain Sorghum~~	~~Small Grain~~	~~Soybeans~~	~~Alfalfa~~	~~Tall Grass, Clover, Hay, Pasture~~
~~Wagram~~	~~DD~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Wahee (drained)~~	~~C~~	~~Ib~~	~~Ib~~	~~II~~	~~Ib~~	~~NS*~~	~~I~~
~~Wahee (undrained)~~	~~OO~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Wakulla~~	~~II~~	~~V~~	~~V~~	~~III~~	~~V~~	~~NS*~~	~~NS*~~
~~Wallen~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Walnut~~	~~GG~~	~~IVb~~	~~IVb~~	~~IV~~	~~IV~~	~~NS*~~	~~III~~
~~Wando~~	~~II~~	~~V~~	~~V~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Warminster~~	~~X~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~II~~
~~Watahala~~	~~M~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~I~~	~~II~~
~~Watauga~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~III~~
~~Wateree~~	~~FF~~	~~IVb~~	~~IVb~~	~~III~~	~~IV~~	~~NS*~~	~~III~~
~~Watt~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Watt variant~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Waxpool~~	~~LL~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Waynesboro~~	~~L~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~II~~
~~Weaver~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Webbtown~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Wedowee~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~III~~	~~III~~	~~III~~
~~Weeksville (drained)~~	~~C~~	~~Ib~~	~~Ib~~	~~II~~	~~Ib~~	~~NS*~~	~~I~~
~~Weeksville (undrained)~~	~~OO~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~NS*~~
~~Wehadkee~~	~~MM~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Weikert~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Westfield~~	~~V~~	~~IVa~~	~~IVa~~	~~II~~	~~IV~~	~~III~~	~~III~~
~~Westmoreland~~	~~U~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Weston~~	~~E~~	~~IIa~~	~~IIa~~	~~I~~	~~II~~	~~NS*~~	~~II~~
~~Westphalia~~	~~II~~	~~V~~	~~V~~	~~III~~	~~V~~	~~NS*~~	~~NS*~~
~~Weverton~~	~~GG~~	~~IVb~~	~~IVb~~	~~IV~~	~~IV~~	~~NS*~~	~~III~~
~~Wharton~~	~~M~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~I~~	~~II~~
~~Wheeling~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~White Store~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~White Store variant~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Whiteford~~	~~U~~	~~IIIb~~	~~IIIb~~	~~II~~	~~II~~	~~III~~	~~II~~
~~Wickham~~	~~B~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~II~~	~~I~~
~~Wickham variant~~	~~B~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~II~~	~~I~~
~~Widget~~	~~CC~~	~~IVb~~	~~IVb~~	~~II~~	~~IV~~	~~NS*~~	~~III~~
~~Wilkes~~	~~JJ~~	~~V~~	~~V~~	~~IV~~	~~V~~	~~NS*~~	~~IV~~
~~Wingina~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Winnsboro~~	~~KK~~	~~V~~	~~V~~	~~V~~	~~V~~	~~NS*~~	~~IV~~
~~Wintergreen~~	~~O~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~II~~	~~II~~
~~Winton~~	~~B~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~II~~	~~I~~
~~Wolfgap~~	~~A~~	~~Ia~~	~~Ia~~	~~I~~	~~Ia~~	~~I~~	~~I~~
~~Wolftrap~~	~~K~~	~~IIb~~	~~IIb~~	~~I~~	~~II~~	~~III~~	~~I~~

Table 1-1 Soil Productivity Groupings for Various Cropping Categories							
Soil Series	Soil Mgt Group	Corn	Grain Sorghum	Small Grain	Soybeans	Alfalfa	Tall Grass, Clover, Hay, Pasture
Woodington	EE	IVb	IVb	III	IV	NS*	NS*
Woodstown	J	IIb	IIb	I	II	NS*	I
Woolvine	V	IVa	IVa	II	III	III	III
Woolwine	V	IVa	IVa	II	III	III	III
Worsham	HH	IVb	IVb	III	IV	NS*	IV
Worsham variant	HH	IVb	IVb	III	IV	NS*	IV
Wrightsboro	J	IIb	IIb	I	II	NS*	I
Wurno	JJ	V	V	IV	V	NS*	IV
Wyrick	G	IIa	IIa	I	II	II	I
Yadkin	X	IVa	IVa	II	III	III	II
Yellowbottom	V	IVa	IVa	II	III	III	III
Yemasse (drained)	C	Ib	Ib	II	Ib	NS*	I
Yemasse (undrained)	OO	V	V	V	V	NS*	NS*
Yeopim	K	IIb	IIb	I	II	III	I
Yogaville	MM	V	V	V	V	NS*	IV
York	BB	IVb	IVb	III	IV	NS*	III
Zepp	JJ	V	V	IV	V	NS*	IV
Zion	Y	IVa	IVa	III	III	NS*	III
Zion variant	Y	IVa	IVa	III	III	NS*	III
Zoar	K	IIb	IIb	I	II	III	I

*NS - Not Suited. If crop will be grown in this soil series, use the lowest Productivity Group Yield OR verifiable past crop yields as defined in 4VAC5-15-150.A.2.e.(3) of the Nutrient Management Training and Certification Regulations.

**NP- Not Producing. A soil series that does not produce crops.

Sources: Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey.

Simpson, T.W., S.J. Donohue, G.W. Hawkins, M.M. Monnett, and J.C. Baker. 1993. The Development and Implementation of the Virginia Agronomic Land Use Evaluation System (VALUES). Department of Crop and Soil Environmental Sciences, Virginia Polytechnic Institute and State University, Blacksburg, VA. Available at: www.soiltest.vt.edu/content/dam/soiltest_vt_edu/PDF/1993-VALUES-Original-Development.pdf

Estimated Yields Using VALUES

1. Using the Virginia Agronomic Land Use Evaluation System (VALUES) and Department approved estimated crop yields, the expected yield of a crop for any one field may be determined in one of two ways. If any single soil productivity group comprises 67% or more of a field, this is considered a predominant soil group, and it may be used to establish the expected yield for the entire field. The other method is to use a weighted average of all soil productivity groups to determine the expected yield and nutrient recommendations from a Department approved source. If several map units make up a field representing multiple productivity groups, none of which account for 67% or more of the field, then the weighted average method to determine the expected crop yield shall be used.

2. When using the weighted average method, determine expected crop yield for each soil map unit from a Department approved crop yield, and determine the weighted average yield for the field by summing the fractional yields for each soil map unit. After the weighted average expected yield is calculated and any yield reductions are considered, the soil productivity group of the field is determined by finding the expected crop yield by utilizing the Department approved estimated crop yields which is closest to the weighted average yield.

3. To establish an expected yield for a soil series complex use a weighted average formula based on the percentages for each complex as specified in the county soil survey OR with percentages of 60%-40% for complexes with two named soils and 50%-30%-20% for complexes with three named soils. In complexes, the percentages shall be applied in descending order in the same order as the soils are denoted in the complex name.

4. Yields are based on the following moisture levels: grain-corn-15.5%, wheat-13.5%, barley-14%, oats-14%, grain sorghum-13%, soybeans-14.5%; all silage-65%; all hay-15%.

~~Table 1-2~~
~~Estimated Yields in Bushels (Bu) or Tons (T) per Acre (Ac) of Various Non-Irrigated Crops for Identified Soil Productivity Groups~~

Crop	I		II		III		IV		V
	a	b	a	b	a	b	a	b	
Corn									
Grain (Bu/Ac)	180	170	160	150	140	130	120	100	80
Silage (T/Ac) [1]	25.4	24.4	23.4	22.5	21.5	20.5	19.5	17.5	15.6
Grain Sorghum (Bu/Ac)	140	130	120	110	100		90		80
Soybeans (Bu/Ac)									
Early season	50	45	40		35		25		20
Late season [2]	40	34	34	30	25		18		15
Wheat (Bu/Ac)									
Standard	64		56		48		40		24
Intensive	80		70		60		50		30
Barley (Bu/Ac)									
Standard	100		70		60		50		30
Intensive	115		88		75		63		38
Oats (Bu/Ac)	80		80		80		60		60
Cereal Silage (T/Ac)									
Barley/Oats/Rye	>10		8-10		6-8		3-6		<3
Wheat/Triticale	>12		10-12		8-10		4-8		<4
Tallgrass Hay (T/Ac)	>4.0		3.5-4.0		3.0-3.5		<3.0		<3.0
Bermudagrass Hay (T/Ac)	>6.0		5.0-6.0		4.0-5.0		3.0-4.0		<3
Prairie Grass Hay (T/Ac)	>5.0		4.25-5		3.5-4.25		3-3.5		<3
Alfalfa (T/Ac)	>6.0		4.0-6.0		<4.0		<4.0		<4.0
Pasture (Ac/AU)*	1.0		1.1-1.5		1.6-3.0		3.1-6.5		

1. ~~When using documented farmer records, corn silage yield may be calculated using the following formula:~~

   ~~Corn Grain Yield (bu/ac) X 0.0985 + 7.6964 = **Corn Silage Yield** Tons/ac.~~

2. ~~Late season beans would be planted on or after 6/21 of that year.~~
3. ~~Yields are based on the following moisture levels: grain-corn-15.5%, wheat-13.5%, barley-14%, oats-14%, grain sorghum-13%, soybeans-14.5%; all silage-65%; all hay-15%.~~

~~*Animal Unit (AU) - To determine pasture carrying capacity, one animal unit = 1000 lbs of any animal type or one 1000 lb cow and calf or two 500 lb steers or five ewes with lambs.~~

~~Table 1-3~~
Utilizing Erosion and/ Slope ~~Information~~Reduction

Once the expected yield for a crop is determined, a yield reduction will need to be applied if certain conditions exist within the soil profile such as eroded topsoil, slope, coarse fragments and rock outcrops. These conditions are explained with the associated yield reductions in Tables 1-3(a-d).

Soil mapping units provide information on severity of erosion as well as slope yield information. If multiple yield reductions occur in a field, for example, a soil with severe erosion (25% yield reduction) on a class D slope in the ridge and valley physiographic region (20% yield reduction), the single most limiting reduction would be used (25%) as opposed to an additive factor (45%).

When considering reductions to yield, if multiple reductions apply to a field, use only the higher percentage reduction in adjustments; these are not additive percentages. i.e. use severe erosion at 25%, not 35%, if soil is severely eroded (25) and fine gravely (10).

Table 1-2a Yield Adjustment According to Erosion	
Erosion Classes	**% Yield Reduction**
slight and moderate (1 and 2)	0
severe (3)	25

Table 1-2b Yield Adjustment According to Slope					
Slope Classes	**% Slope Coastal Plain**	**% Slope Piedmont, Mountain Regions**	**% Yield Reduction Row Crops and Hay[3]**		**% Increase in Acres/Animal Unit[2]**
			Conv. Till[1]	**No till[1]**	
A	0-2	0-2	-	-	-
B	2-6	2-7	-	-	-
C	6-10	7-15	6	0	-
D	10-15	15-25	20	10	25
E	15-25	25-45	too steep for tillage		50
F	25+	45+	too steep for tillage		50

[1] A and B are equal and are the class standard.
[2] A, B and C are equal and are the class standard.
[3] Use No-till reduction for established hay.

Table 1-2c Yield Adjustment According to Coarse Fragments	
Soil Series Description	**% yield reduction**
Fine gravelly, gravelly (gritty), cherty	10
Cobbly, angular cobbly, channery, flaggy, slaty, shaly	15
Very gravelly, extremely gravelly, very cherty	20
Very cobbly, extremely cobbly, very channery, very flaggy	25

Table 1-2d Yield Adjustment According to Rock Outcrop	
Soil Series Description	**% yield reduction**
Bouldery, very bouldery, very rocky, stony, very stony	0 - subtract 10% of land area from field acreage to account for rock outcrop area
Bouldery, very bouldery, very rocky, stony, very stony	25 - for pasture, N.S. - for row crops
Extremely bouldery, extremely rocky, extremely stony (rubbly) and all complexes with rock outcrop	50- for pasture, N.S. - for row crops

Sources: U.S. Department of Agriculture, Natural Resources Conservation Service. Web Soil Survey (WSS). Available at: websoilsurvey.nrcs.usda.gov.
Soil Series Descriptions, Slope Classes, and Erosion Classes are based on WSS

~~**1. Yield Adjustment According to Erosion:**~~

~~**Erosion Classes** **% Yield Reduction**~~
~~slight and moderate (1 and 2) 0 severe (3) 25~~

~~2. Yield Adjustment According to Slope:~~

~~Slope Classes~~	~~% Slope Coastal Plain~~	~~% Slope Piedmont, Mountain Regions~~	~~% Yield Reduction Row Crops and Hay*** Conv.till*~~	~~No till*~~	~~% Increase in Acres/Animal Unit**~~
~~A~~	~~0-2~~	~~0-2~~	~~-~~	~~-~~	~~-~~
~~B~~	~~2-6~~	~~2-7~~	~~-~~	~~-~~	~~-~~
~~C~~	~~6-10~~	~~7-15~~	~~6~~	~~0~~	~~-~~
~~D~~	~~10-15~~	~~15-25~~	~~20~~	~~10~~	~~25~~
~~E~~	~~15-25~~	~~25-45~~	~~too steep for tillage~~		~~50~~
~~F~~	~~25+~~	~~45+~~	~~too steep for tillage~~		~~50~~

~~* A and B are equal and are the class standard.~~
~~** A, B and C are equal and are the class standard.~~
~~*** Use No-till reduction for established hay.~~

~~3. **Yield Adjustment According to Coarse Fragments:** Exclude group GG since coarse fragments are part of its series criteria:~~

~~a. Fine gravelly, gravelly (gritty), cherty - 10% yield reduction~~
~~b. Cobbly, angular cobbly, channery, flaggy, slaty, shaly - 15% yield reduction~~
~~c. Very gravelly, extremely gravelly, very cherty - 20% yield reduction~~
~~d. Very cobbly, extremely cobbly, very channery, very flaggy - 25% yield reduction~~

~~4. Yield Adjustment According to Rock Outcrop:~~

~~a. Rocky - No yield reduction; subtract 10% of land area from field acreage to account for rock outcrop area~~
~~b. Bouldery, very bouldery, very rocky, stony, very stony - 25% yield reduction for pasture, not suited to row crops~~
~~c. Extremely bouldery, extremely rocky, extremely stony (rubbly) and all complexes with rock outcrop - 50% yield reduction for pasture, not suited to row crops~~

~~Section I.A~~ Explanation of Environmentally Sensitive Sites

The regulations define "environmentally sensitive site" to mean any field which is particularly susceptible to nutrient loss to groundwater or surface water since it contains or drains to areas which contain sinkholes; or where at least 33% of the area in a specific field contains one or any combination of the following features:

1. Soils with high potential for leaching based on soil texture or excessive drainage;
2. Shallow soils less than 41 inches deep likely to be located over fractured or limestone bedrock;
3. Soils with high potential for subsurface lateral flow based on soil texture and poor drainage;
4. Floodplains as identified by soils prone to frequent flooding in county soil surveys5. Lands with slopes greater than 15%.

Table 1-3 contains environmental risk ratings for Virginia soils for criteria 1,2 and 3 listed above and are based on the Nirate Leaching Index provided by the NRCS. Criteria for 4 and 5 are based on Soil Survey information. Criteria 6 is information provided by the farmer.

The primary reason for the environmental sensitivity rating for each soil listed as high or moderate risk in Table 1-3 is identified by the following key:

Leaching: Soils with potential for leaching based on soil texture or excessive drainage

Shallow: Shallow soils less than 41 inches deep likely to be located over fractured or limestone bedrock

Drainage: Soils with high potential for subsurface lateral flow based on soil texture and poor drainage

The category rating should be used to develop nitrogen application programs to address this concern through rate and timing recommendations.

Determine the percentage of field area for soils listed as H (high) for Environmental Sensitivity Rating in Table 1-3 plus any field areas that meet criteria 4-6 to determine if the field is an environmentally sensitive site. Soils listed as moderate risk are not defined as environmentally sensitive, but should be treated with similar caution when making nitrogen recommendations.

Fields containing environmentally sensitive sites may be subdivided into separate fields, if the areas can be managed individually and the operator agrees to manage each area as written in the plan.

~~The regulations define "environmentally sensitive site" to mean any field which is particularly susceptible to nutrient loss to groundwater or surface water since it contains or drains to areas which contain sinkholes; or where at least 33% of the area in a specific field contains one or any combination of the following features:~~

~~1. Soils with high potential for leaching based on soil texture or excessive drainage;~~
~~2. Shallow soils less than 41 inches deep likely to be located over fractured or limestone bedrock;~~

3. ~~Subsurface tile drains;~~
4. ~~Soils with high potential for subsurface lateral flow based on soil texture and poor drainage;~~
5. ~~Floodplains as identified by soils prone to frequent flooding in county soil surveys; or~~
6. ~~Lands with slopes greater than 15%.~~

~~Table 1-4 contains environmental risk ratings for Virginia soils for criteria 1,2 and 4 listed above. Determine the percentage of field area for soils listed as H (high) for Environmental Sensitivity Rating in Table 1-4 plus any field areas that meet criteria 3, 5 or 6 above to determine if the field is an env ironmentally sensitive site. Soils listed as moderate risk are not defined as environmentally sensitive, but should be treated with similar caution when making nitrogen recommendations.~~

~~The primary reason for the environmental sensitivity rating for each soil listed as high or moderate risk in Table 1-4 is identified by the following key:~~

~~**Leaching** - Soils with potential for leaching based on soil texture or excessive drainage~~
~~**Shallow** - Shallow soils less than 41 inches deep likely to be located over fractured or limestone bedrock~~
~~**Drainage** - Soils with high potential for subsurface lateral flow based on soil texture and poor drainage~~

~~The category rating should be used to develop nitrogen application programs to address this concern through rate and timing recommendations.~~

~~Table 1-4 that follows lists the environmental sensitivity rating and category for each soil in Virginia.~~

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	Environmental Sensitivity	Category
Abell	L	_
Abell variant	L	_
Ackwater	L	_
Acredale (drained)	M	Drainage
Acredale (undrained)	L	_
Aden (drained)	M	Drainage
Aden (undrained)	L	_
Airmont	L	_
Alaga	H	Leaching
Alamance	M	Leaching
Alanthus	L	_
Albano	M	Leaching
Albemarle	L	_
Alderflats	H	Shallow
Aldino	L	_
Allegheny	H	Shallow
Alluvial Land	L	_
Alluvial Land, sandy and gravelly	M	Leaching
Alluvial Land, wet	M	Drainage
Alonemill	H	Leaching
Alonemill, Fluvaquentic	H	Leaching
Alonzville	M	Leaching
Altavista	L	_
Altavista, variant	L	_
Alticrest	H	Shallow
Angie	L	_
Angie variant	L	_
Appling	L	_
Appling gritty	L	_
Appomattox	L	_
Aqualfs	L	_
Aquents	H	Drainage
Aquic Udifluvents	L	_
Aquults	L	_
Arapahoe	H	Drainage
Arcola	M	Leaching
Ardilla	L	_
Argent	L	_
Arkaqua	L	_

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	**Environmental Sensitivity**	**Category**
Arlington National Cemetery	M	Drainage
Ashburn	L	_
Ashe	H	Leaching
Ashlar	H	Leaching
Assateague	H	Leaching
Athol	L	_
Atkins	H	Drainage
Atlee	L	_
Augusta (drained)	M	Drainage
Augusta (undrained)	L	_
Augusta variant (drained)	M	Drainage
Augusta variant (undrained)	L	_
Aura	H	Leaching
Austinville	L	_
Axis	H	Drainage
Aycock	L	_
Ayersville	M	Leaching
Backbay	H	Drainage
Badin	L	_
Baile	L	_
Bailegap	M	Leaching
Balsam	H	Shallow
Bama	M	Leaching
Banister	L	_
Bannertown	L	_
Barclay	L	_
Barkers Crossroads	M	Drainage
Bateau	L	_
Batteau	L	_
Bayboro (drained)	M	Drainage
Bayboro (undrained)	L	_
Bearknob	L	_
Beckham	L	_
Bedington	M	Leaching
Beech	L	_
Beech Grove	H	Shallow
Belhaven	H	Drainage
Bellspur	M	Leaching
Beltsville	L	_
Belvoir	L	_
Benthole	H	Leaching

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	**Environmental Sensitivity**	**Category**
Bentley	L	
Berks	H	Shallow
Berks variant	H	Shallow
Bermudian	M	Leaching
Bertie	L	
Bertie, variant	L	
Bethera (drained)	H	Drainage
Bethera (undrained)	L	
Bethesda	H	Leaching
Bethlehem	M	Leaching
Bibb	H	Drainage
Biltmore	H	Leaching
Birdsboro	L	
Blackarn	H	Leaching
Blackthorn	L	
Bladen	L	
Bladen (drained)	M	Drainage
Bladen (undrained)	L	
Blago	L	
Blairton	H	Shallow
Bland	H	Shallow
Blocktown	H	Shallow
Bloodyhorse	H	Leaching
Bluemont	M	Leaching
Bohicket	L	
Bojac (ES, VA Beach, Ches.)	H	Leaching
Bojac (Mainland, excluding VA Beach & Ches.)	H	Leaching
Bolling	L	
Bolling variant	L	
Bolton	M	Leaching
Bonneau	H	Leaching
Bookwood	H	Shallow
Borrow pit	L	
Botetourt	L	
Bourne	L	
Bourne variant	L	
Bowmansville	H	Drainage
Braddock	L	
Brandywine	H	Leaching
Brecknock	M	Leaching
Bremo	H	Leaching

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	**Environmental Sensitivity**	**Category**
Brentsville	H	Shallow
Brevard	M	Leaching
Brickhaven	L	_
Brinkerton	L	_
Brinklow	M	Leaching
Broadway	L	_
Brockroad	L	_
Brownsville	H	Leaching
Brownwood	H	Leaching
Brumbaugh	L	_
Brushy	H	Shallow
Buchanan	L	_
Buchanan cobbly	M	Leaching
Buckhall	L	_
Buckingham	L	_
Bucks	M	Leaching
Buckton	L	_
Buffstat	L	_
Bugley	H	Shallow
Buncombe	H	Leaching
Burketown	L	_
Burrowsville	L	_
Burton	H	Shallow
Buzzrock	H	Shallow
Cahaba	L	_
Calverton	L	_
Calvin	H	Shallow
Calvin cobbly	H	Shallow, Leaching
Camocca	H	Drainage
Caneyville	H	Shallow
Cape Fear (drained)	M	Drainage
Cape Fear (undrained)	L	_
Captina	L	_
Carbo	H	Shallow
Carbonton	L	_
Cardiff	H	Leaching
Cardova	M	Leaching
Caroline	L	_
Cartecay	H	Leaching
Carteret	L	_
Casville	H	Drainage
Cataska	H	Shallow
Catharpin	L	_
Catlett	H	Shallow
Catlett variant	H	Shallow
Catoctin	H	Shallow

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	**Environmental Sensitivity**	**Category**
Catoctin variant	H	Shallow
Catpoint	H	Leaching
Caverns	H	Leaching
Cecil	L	
Cedarcreek	H	Shallow
Chagrin	M	Leaching
Chagrin variant	H	Leaching
Chandler	H	Leaching
Chantilly	H	Leaching
Chapanoke (drained)	M	Drainage
Chapanoke (undrained)	L	
Charity	L	
Chastain	L	
Chatuge (drained)	M	Drainage
Chatuge (undrained)	L	
Chavies	H	Leaching
Chavies variant	H	Leaching
Chenneby	L	
Chesapeake	M	Leaching
Chester	M	Leaching
Chester Loam	M	Leaching
Chestnut	H	Leaching
Chewacla	L	
Chickahominy	L	
Chilhowie	H	Shallow
Chincoteague	L	
Chipley	L	
Chiswell	H	Shallow
Christian	L	
Cid	L	
Claiborne	M	Leaching
Clapham	L	
Clarksburg	L	
Clarksville	M	Leaching
Clearbrook	H	Shallow
Cliffield	H	Leaching
Clifford	L	
Clifftop	H	Leaching
Clifton	L	
Clingman	H	Leaching
Clover	L	
Cloverlick	H	Leaching
Clubcaf	L	
Clymer	M	Leaching
Coastal beach	H	Leaching
Codorus	L	

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	**Environmental Sensitivity**	**Category**
Codorus stony	M	Leaching
Codorus variant	L	
Colescreek	L	
Colfax	L	
Colfax variant	L	
Colleen	L	
Colluvial land	L	
Colvard	H	Leaching
Colvard fine	H	Leaching
Colvard stony	H	Leaching
Combs	M	Leaching
Comus	M	Leaching
Conetoe	H	Leaching
Congaree	L	
Coosaw	L	
Corolla	L	
Corydon	H	Shallow
Cotaco	L	
Cotaco cobbly	M	Leaching
Cotaco variant	L	
Cottonbend	M	Leaching
Coursey	L	
Cowee	H	Shallow
Coxville	L	
Craggey	H	Shallow
Craigsville	H	Leaching
Craven	L	
Creedmoor	L	
Creedmoor variant	L	
Croton	L	
Cullasaja	H	Leaching
Cullen	L	
Culleoka	M	Leaching
Culpeper	L	
Culpeper variant	L	
Cut and fill land	M	Shallow
Daleville (drained)	M	Drainage
Daleville (undrained)	L	
Dam	L	
Dams	L	
Dan River	M	Leaching
Dandridge	H	Shallow
Danripple	L	
Davidson	L	
Dawhoo	H	Drainage

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	**Environmental Sensitivity**	**Category**
Dawhoo variant	H	Drainage
Decatur	L	
Dekalb	H	Leaching
Dekalb variant	H	Leaching
Delanco	L	
Delila	L	
Dellwood	L	
Deloss (drained)	H	Drainage
Deloss (undrained)	H	Drainage
Derroc	H	Leaching
Devotion	H	Leaching
Diana Mills	L	
Dillard	L	
Dillsboro	L	
Dogue	L	
Dogue variant	L	
Dorovan	H	Drainage
Dothan	M	Leaching
Doubletop	H	Leaching
Downer	H	Leaching
Dragston	M	Drainage
Drall	H	Leaching
Drapermill	M	Leaching
Drayke	L	
Drypond	H	Shallow
Duckston	H	Drainage
Duffield	M	Leaching
Dulles	L	
Dumfries	M	Leaching
Dumps	L	
Dumps, mine	L	
Dunbar (drained)	M	Drainage
Dunbar (undrained)	L	
Dunning (drained)	M	Drainage
Dunning (undrained)	L	
Duplin	L	
Durham	M	Leaching
Dystrudepts	H	Leaching
Easthamlet	L	
Ebbing	L	
Edgehill	L	
Edgehill variant	L	
Edgemont	M	Leaching
Edneytown	M	Leaching

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	Environmental Sensitivity	Category
Edneyville	H	Leaching
Edom	L	_
Elbert	L	_
Elbert variant	L	_
Elioak	L	_
Elk	L	_
Elkton (drained)	H	Drainage
Elkton (undrained)	L	_
Elliber	H	Leaching
Elsinboro	M	Leaching
Emory	L	_
Emporia	M	Leaching
Endcav	L	_
Enon	L	_
Enott	L	_
Ernest	L	_
Escatawba	M	Leaching
Eubanks	M	Leaching
Eulonia	L	_
Eunola	L	_
Evansham	L	_
Evard	M	Leaching
Evesboro	H	Shallow
Exum	L	_
Exway	M	Leaching
Ezel	M	Leaching
Faceville	L	_
Fairfax	L	_
Fairpoint	H	Shallow
Fairview	L	_
Fairystone	L	_
Fallsington	M	Drainage
Fauquier	L	_
Fauquier, deep phase	L	_
Faywood	H	Shallow
Featherstone	L	_
Fedscreek	H	Leaching
Feedstone	L	_
Fisherman	L	_
Fiveblock	H	Leaching
Flairmont	M	Drainage
Flatwoods	L	_
Fletcher	L	_
Fletcherville	M	Drainage
Flume	L	_
Fluvanna	L	_

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	Environmental Sensitivity	Category
Fluvaquents	L	
Fluvaquents, ponded	L	
Fluvaquents, saline	L	
Forestdale	L	
Fork (drained)	M	Drainage
Fork (undrained)	L	
Fork variant (drained)	M	Drainage
Fork variant (undrained)	L	
Frankstown	M	Leaching
Frederick	L	
Frederick/Christian	L	
Frederick/Lodi	L	
Freemanville	L	
French	L	
Fresh water swamp	H	Drainage
Fripp	H	Leaching
Funkstown	L	
Gaila	M	Leaching
Gainesboro	H	Shallow
Galestown	H	Leaching
Galtsmill	H	Leaching
Georgeville	L	
Germanna	L	
Gertie	L	
Gilpin	H	Shallow
Gilpin variant	H	Shallow
Gladehill	H	Leaching
Glenelg (BRH)	M	Leaching
Glenelg (NV)	M	Leaching
Glenville	L	
Glynwood	L	
Glynwood variant	L	
Goblintown	L	
Goldsboro	L	
Goldston	H	Leaching
Goldvein	L	
Goldvein gritty		
Goresville	L	
Granville	L	
Grassland	L	
Gravel pit	L	

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings

Soil Series	Environmental Sensitivity	Category
Gravelly alluvial land	M	Leaching
Greendale	L	
Greenlee	H	Leaching
Griffinsburg	H	Shallow
Grigsby	H	Leaching
Grimsley	H	Leaching
Grist Mill	M	Leaching
Gritney	L	
Groseclose	L	
Grover	M	Leaching
Guernsey	L	
Gullied land	H	Shallow
Gullion	L	
Gundy	L	
Gunstock	H	Shallow
Gunston	L	
Guyan	L	
Guyandotte	L	
Gwinnett variant	L	
Hagerstown	L	
Halewood	L	
Halifax	L	
Hanceville	L	
Haplaquepts	H	Leaching
Haplosaprists	L	
Hapludults	L	
Happyland	M	Leaching
Hartleton	H	Shallow
Hartsells	M	Shallow
Hatboro	H	Drainage
Hattontown	M	Drainage
Hawksbill	H	Leaching
Hawksbill cobbly	H	Leaching
Hayesville	L	
Haymarket	L	
Hayter	M	Leaching
Haywood	H	Leaching
Hazel	H	Shallow
Hazel channery	H	Shallow
Hazel Run	M	Leaching
Hazleton	H	Shallow
Helena	L	
Helena taxadjunct	L	
Herndon	L	
Hibler	L	
Hickoryknob	M	Leaching

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	Environmental Sensitivity	Category
Highsplint	H	Leaching
Hiwassee	L	
Hiwassee variant	L	
Hoadley	L	
Hobucken	H	Drainage
Holly	H	Drainage
Hollywood	L	
Honga	L	
Hublersburg	L	
Huddleston	L	
Huntington	M	Drainage
Hyde (drained)	L	
Hyde (undrained)	L	
Hydraquents	H	Drainage
Ingledove	M	Leaching
Iotla	L	
Iredell	L	
Iredell variant	L	
Irongate	H	Leaching
Itman	H	Shallow
Iuka	L	
Izagora	L	
Jackland	L	
Jedburg	L	
Jefferson	M	Leaching
Jefferson variant	H	Leaching
Johns (drained)	H	Drainage
Johns (undrained)	L	
Johns variant (drained)	H	Drainage
Johns variant (undrained)	L	
Johnston	H	Drainage
Junaluska	H	Shallow
Kalmia	M	Leaching
Kaymine	H	Shallow
Keener	M	Leaching
Kelly	L	
Kempsville	M	Leaching
Kenansville	H	Leaching
Kenansville variant	L	
Keyport	L	
Kibler	M	Leaching
Kimper	H	Drainage
Kingstowne	M	Leaching

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	**Environmental Sensitivity**	**Category**
Kinkora (drained)	M	Drainage
Kinkora (undrained)	L	_
Kinston (drained)	M	Drainage
Kinston (undrained)	L	_
Klej	H	Drainage
Klinesville	H	Shallow
Konnarock	H	Shallow
Lackstown	L	_
Laidig	M	Leaching
Laidig cobbly	H	Leaching
Lakehurst	L	_
Lakeland	H	Leaching
Lakin	H	Leaching
Landfills	L	_
Lanexa	H	Drainage
Lansdale	H	Leaching
Laroque	M	Leaching
Lawnes	H	Drainage
Leadvale	L	_
Leaf (drained)	M	Drainage
Leaf (undrained)	L	_
Leaksville	L	_
Leatherwood	M	Leaching
Leck Kill	M	Leaching
Leedsville	M	Leaching
Leetonia	H	Shallow
Legore	M	Leaching
Lehew	H	Shallow
Lenoir	L	_
Leon	H	Drainage
Levy	H	Drainage
Lew	H	Leaching
Lewisberry	H	Leaching
Lewisburg	M	Leaching
Library	L	_
Lickdale (drained)	H	Drainage
Lickdale (undrained)	L	_
Lignum	L	_
Lily	H	Shallow
Linden	H	Leaching
Lindside	L	_
Littlejoe	L	_
Litz	H	Shallow

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings

Soil Series	Environmental Sensitivity	Category
Lloyd	L	
Lloyd variant	L	
Lobdell	L	
Local alluvial land	L	
Lodi	L	
Lostcove	H	Leaching
Louisa	H	Leaching
Louisa variant	H	Leaching
Louisburg	H	Leaching
Lowell	L	
Lucketts	L	
Lucy	H	Leaching
Lumbee (drained)	H	Drainage
Lumbee (undrained)	H	Drainage
Lumbee variant (drained)	H	Drainage
Lumbee variant (undrained)	H	Drainage
Lunt	L	
Lynchburg	L	
Macove	H	Leaching
Made Land	M	L
Madison	L	
Madsheep	H	Shallow
Maggodee	L	
Magotha	H	Drainage
Malbis	M	Leaching
Manassas	L	
Mandy	H	Shallow
Manor	H	Leaching
Mantachie	L	
Manteo	H	Shallow
Marbie	L	
Marbleyard	H	Leaching
Margo	L	
Markes	H	Drainage
Marlboro	L	
Marr	M	Leaching
Marrowbone	H	Shallow
Marumsco	L	
Masada	L	
Massanetta	L	
Massanutten	H	Shallow
Matapeake	L	
Matewan	H	Leaching
Matneflat	H	Leaching
Mattamuskeet	H	Drainage

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	**Environmental Sensitivity**	**Category**
Mattan	H	Drainage
Mattapex	L	_
Mattaponi	L	_
Maurertown	L	_
Maury	L	_
Mayodan	L	_
McCamy	M	Leaching
McClung	M	Leaching
McGary (drained)	M	Drainage
McGary (undrained)	L	_
McLaurin	H	Leaching
McQueen	L	_
Meadowfield	H	Shallow
Meadows	H	Shallow
Meadowville	M	Leaching
Meadowville variant	M	Leaching
Meckesville	L	_
Mecklenburg	L	_
Mecklenburg variant	L	_
Meggett (drained)	M	Drainage
Meggett (undrained)	L	_
Melfa	H	Drainage
Melvin (drained)	H	Leaching
Melvin (undrained)	L	_
Middleburg	M	Leaching
Milldraper	M	Leaching
Millrock	H	Leaching
Mine dump	H	Shallow
Mine Dumps	H	Shallow
Mine pits	H	Shallow
Mine Run	H	Leaching
Mine Tailings	H	Leaching
Mine Tipples	H	Leaching
Mines	H	Leaching
Minnieville	L	_
Mirerock	L	_
Misenheimer	H	Shallow
Mixed alluvial land	L	_
Mixed alluvium	H	Drainage
Molena	H	Leaching
Monacan	L	_

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	**Environmental Sensitivity**	**Category**
Mongle	L	_
Monongahela	L	_
Montalto	L	_
Montonia	M	Leaching
Montross	L	_
Moomaw	L	_
Morven	M	Leaching
Mount Lucas	L	_
Mt. Rogers	H	Leaching
Muckalee	H	Drainage
Munden	M	Leaching
Murrill	M	Leaching
Muskingum	H	Shallow
Myatt (drained)	M	Leaching
Myatt (undrained)	L	_
Myatt variant (drained)	M	Leaching
Myatt variant (undrained)	L	_
Myersville	M	Leaching
Nahunta	L	_
Nanford	L	_
Nansemond	M	Leaching
Nason	L	_
Nathalie	L	_
Nawney	L	_
Neabsco	L	_
Needmore	M	Shallow
Nestoria	H	Shallow
Nevarc	L	_
Newark (drained)	L	_
Newark (undrained)	L	_
Newark variant (drained)	M	Drainage
Newark variant (undrained)	L	_
Newbern	H	Shallow
Newflat	L	_
Newhan	H	Leaching
Newmarc	L	_
Nicelytown	L	_
Nicholson	L	_
Nickwasi	H	Drainage
Nimmo	H	Drainage
Nixa	L	_
Nolichucky	M	Leaching
Nolin	L	_

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	**Environmental Sensitivity**	**Category**
Nollville	L	_
Nomberville	L	_
Nopan	L	_
Norfolk	M	Leaching
Oak Level	L	_
Oakhill	H	Leaching
Oaklet	L	_
Oatlands	M	Leaching
Occoquan	M	Leaching
Ochlockonee	H	Leaching
Ochlockonee variant	L	_
Ochraquults	L	_
Ochrepts	L	_
Ocilla	L	_
Ogles	H	Leaching
Okeetee	L	_
Opequon	H	Shallow
Orange	L	_
Orange variant	L	_
Orangeburg	M	Leaching
Orenda	L	_
Oriskany	H	Leaching
Orrville (drained)	M	Leaching
Orrville (undrained)	L	_
Orrville variant (drained)	M	Leaching
Orrville variant (undrained)	L	_
Orthents	L	_
Osier	H	Drainage
Ostin	M	Leaching
Othello (drained)	M	Drainage
Othello (undrained)	L	_
Ott	M	Leaching
Pacolet	L	_
Pactolus	L	_
Paddyknob	H	Shallow
Pagebrook	L	_
Palms variant	H	Drainage
Pamlico	H	Drainage
Pamunkey	M	Leaching
Pamunkey variant	M	Leaching
Panorama	M	Leaching

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	**Environmental Sensitivity**	**Category**
Pantego (drained)	M	Drainage
Pantego (undrained)	L	
Parker	H	Leaching
Partlow	M	Drainage
Pasquotank (drained)	H	Drainage
Pasquotank (undrained)	H	Drainage
Peaks	H	Shallow
Peawick	L	
Pecktonville	L	
Penhook	L	
Penn	M	Leaching
Perrowville	H	Drainage
Pfafftown	L	
Philo (drained)	M	Leaching
Philo (undrained)	L	
Philomont	H	Leaching
Pigeonroost	H	Shallow
Pignut	M	Leaching
Pilot Mountain	H	Leaching
Pineola	M	Leaching
Pineville	M	Leaching
Pineywoods	L	
Pinkston	H	Leaching
Pinoka	M	Leaching
Pisgah	L	
Pits	H	Leaching
Pits and dumps	H	Leaching
Pits and quarry	H	Leaching
Pits, bedrock	H	Leaching
Pits, borrow	H	Leaching
Pits, gravel	H	Leaching
Pits, quarries	H	Leaching
Pits, quarry	H	Leaching
Plott	M	Leaching
Plummer	M	Drainage
Pocalla	M	Leaching
Pocaty	L	
Pocomoke	M	Drainage
Poindexter	M	Leaching
Poindexter variant	M	Leaching
Polawana	H	Drainage
Polkton	M	Leaching
Pooler variant (drained)	L	

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	**Environmental Sensitivity**	**Category**
Pooler variant (undrained)	L	_
Pope	H	Leaching
Poplar Forest	M	Leaching
Poplimento	L	_
Porters	M	Leaching
Portsmouth (drained)	H	Drainage
Portsmouth (undrained)	M	Drainage
Post	M	Leaching
Pouncey	L	_
Poynor	H	Leaching
Psamments	H	Leaching
Pungo	H	Drainage
Purcellville	L	_
Purdy (drained)	M	Drainage
Purdy (undrained)	L	_
Quantico	L	_
Quarries	H	Leaching
Quarry	H	Leaching
Quarry mine	H	Leaching
Quarry, limestone	H	Leaching
Rabun	L	_
Rains (drained)	M	Drainage
Rains (undrained)	L	_
Ramsey	H	Shallow
Rapidan	L	_
Rappahanock	H	Drainage
Raritan	L	_
Rasalo	L	_
Rayne	M	Leaching
Readington	L	_
Reaville	L	_
Redbrush	L	_
Remlik	H	Leaching
Rhodhiss	M	Leaching
Rigley	H	Leaching
Rion	M	Leaching
Riverview	M	Leaching
Riverwash	H	Leaching
Rixeyville	H	Shallow
Roanoke (drained)	M	Drainage
Roanoke (undrained)	L	_
Robertsville	L	_

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	Environmental Sensitivity	Category
Rock land	L	_
Rock land basic	L	_
Rock outcrop	L	_
Rohrersville	L	_
Ronda	H	Drainage
Ross	M	Leaching
Rough	H	Shallow
Rough gullied land	H	Leaching
Rowland	L	_
Rubble land	H	Leaching
Rumford	H	Leaching
Rushtown	H	Leaching
Ruston	M	Leaching
Saffell	H	Shallow
Sand and gravel pits	H	Leaching
Sandy and clayey land	H	Leaching
Santuc	L	_
Sassafras	M	Leaching
Saunook	M	Leaching
Sauratown	M	Leaching
Savannah	L	_
Scales	L	_
Scattersville	L	_
Schaffenaker	H	Leaching
Seabrook	L	_
Seagate	H	Drainage
Sedgefield	L	_
Sekil	H	Leaching
Seneca	L	_
Sensabaugh	M	Leaching
Sequatchie	L	_
Sequoia	H	Shallow
Sewell	H	Shallow
Shelocta	M	Leaching
Shelocta variant	L	_
Shenval	L	_
Sherando	H	Leaching
Sheva	L	_
Shottower	L	_
Shouns	L	_
Siloam	L	_
Sindion	L	_
Sketerville	L	_
Slabtown	L	_
Slagle	L	_

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	**Environmental Sensitivity**	**Category**
Slagle	L	_
Slickens	L	_
Sloping sandy land	M	Leaching
Snowdog	L	_
Snowsnake	L	_
Sowego	M	Leaching
Spears Mountain	L	_
Speedwell	M	Leaching
Spessard	H	Leaching
Spivey	H	Leaching
Spotsylvania	L	_
Spray	M	Leaching
Spriggs	M	Leaching
Springwood	L	_
Starr	M	Leaching
Staser	L	_
State (ES)	H	Leaching
State (Mainland)	M	Leaching
Statler	M	Leaching
Steep sandy land	M	Leaching
Steinsburg	H	Leaching
Stonecoal	H	Shallow
Stoneville	L	_
Stony colluvial land	L	_
Stony land	L	_
Stony rolling land	L	_
Stony steep land	L	_
Stott Knob	M	Leaching
Stough	L	_
Straightstone	L	_
Strawfield	L	_
Stumptown	H	Leaching
Suches	M	Leaching
Sudley	M	Leaching
Suffolk	M	Leaching
Sugarhol	L	_
Sulfaquents	L	_
Sumerduck	L	_
Summers	H	Shallow
Susquehanna	L	_
Swampoodle	L	_
Sweetapple	H	Leaching
Swimley	L	_

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	**Environmental Sensitivity**	**Category**
Sycoline	L	_
Sylco	H	Shallow
Sylva	L	_
Sylvatus	H	Shallow
Talladega	H	Shallow
Tallapoosa	L	_
Tallapoosa variant	L	_
Tanasee	H	Leaching
Tankerville	H	Shallow
Tankerville taxadjunct	H	Shallow
Tarboro	H	Leaching
Tarrus	L	_
Tate	M	Leaching
Tate variant	M	Leaching
Tatum	L	_
Tetotum	L	_
Tetotum variant	L	_
Thunder	H	Leaching
Thurmont	M	Leaching
Tidal Marsh	H	Leaching
Tidal Marsh, high	H	Leaching
Tidal Marsh, low	H	Leaching
Tifton	L	_
Timberville	L	_
Timberville variant	M	Leaching
Tioga	H	Leaching
Toast	L	_
Toccoa	M	Leaching
Toddstav	L	_
Tomotley (drained)	M	Drainage
Tomotley (undrained)	L	_
Toms	L	_
Torhunta	H	Drainage
Totier	L	_
Toxaway	M	Drainage
Toxaway (drained)	H	Drainage
Toxaway (undrained)	M	Drainage
Trappist	M	Shallow
Trego	M	Leaching
Trenholm	L	_
Trimont	M	Leaching

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	**Environmental Sensitivity**	**Category**
Trussel	L	_
Tuckahoe	M	Leaching
Tuckasegee	M	Leaching
Tugglesgap	L	_
Tumbling	L	_
Turbeville	L	_
Tusquitee	M	Leaching
Tygart (drained)	M	Drainage
Tygart (undrained)	L	_
Typic Udorthents	L	_
Uchee	H	Leaching
Udalfs	H	Drainage
Udifluvents	L	_
Udipsamments	L	_
Udorthents	L	_
Udorthents, dams	L	_
Udorthents, smoothed	L	_
Udults	L	_
Unaka	L	_
Unicoi	M	Shallow
Unison	L	_
Unison variant	L	_
Urban land	L	_
Vance	L	_
Vandalia	L	_
Vanella	M	Leaching
Varilla	L	_
Varina	L	_
Vaucluse	M	Leaching
Vertrees	L	_
Very rocky land	L	_
Virgilina	L	_
Wadesboro	L	_
Wagram	M	Leaching
Wahee (drained)	M	Drainage
Wahee (undrained)	L	_
Wakulla	L	_
Wallen	H	Shallow
Walnut	H	Leaching
Wando	H	Leaching
Warminster	L	_
Warne	L	_
Watahala	M	Leaching

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	**Environmental Sensitivity**	**Category**
Watauga	M	Leaching
Wate	L	_
Water	H	Leaching
Wateree	H	Leaching
Watt	H	Shallow
Watt variant	H	Shallow
Waxpool	L	_
Waynesboro	L	_
Weaver	L	_
Webbtown	H	Shallow
Wedowee	L	_
Weeksville (drained)	H	Drainage
Weeksville (undrained)	M	Drainage
Wehadkee	L	_
Weikert	H	Shallow
Westfield	L	_
Westmoreland	M	Leaching
Weston	H	Drainage
Westphalia	H	Leaching
Weverton	H	Leaching
Wharton	L	_
Wheaton	L	_
Wheeling	M	Leaching
White Store	L	_
White Store variant	L	_
Whiteford	M	Leaching
Wickham	M	Leaching
Wickham variant	M	Leaching
Widget	H	Leaching
Wildell	M	Leaching
Wilkes	L	_
Wingina	M	Leaching
Winnsboro	L	_
Wintergreen	L	_
Winton	L	_
Wolfgap	M	Leaching
Wolftrap	L	_
Woodington	H	Drainage
Woodstown	L	_
Woolvine	L	_
Worsham	L	_
Worsham variant	L	_
Wrightsboro	L	_
Wurno	H	Shallow
Wyrick	M	Leaching

Table 1-3: Nitrogen Loss Risk and Environmentally Sensitive Ratings		
Soil Series	**Environmental Sensitivity**	**Category**
Yadkin	H	Leaching
Yellowbottom	L	_
Yemasse (drained)	H	Drainage
Yemasse (undrained)	L	_
Yeopim	L	_
Yogaville	L	_
York	L	_
Zepp	H	Leaching
Zion	L	_
Zion variant	L	_
Zoar	L	_

~~Table 1-4~~
~~Nitrogen Loss Risk and Environmental Sensitivity Ratings for Virginia Soils & Soil Series Associated With Environmentally Sensitive Sites~~

~~Soil Series~~	~~Environmental Sensitivity~~	~~Category~~
~~Abell~~	~~L~~	
~~Ackwater~~	~~L~~	
~~Acredale~~	~~L~~	
~~Aden~~	~~L~~	
~~Airmont~~	~~L~~	
~~Alaga~~	~~H~~	~~Leaching~~
~~Alamance~~	~~H~~	~~Leaching~~
~~Alanthus~~	~~M~~	~~Leaching~~
~~Albano~~	~~L~~	
~~Albemarle~~	~~M~~	~~Leaching~~
~~Alderflats~~	~~L~~	
~~Aldino~~	~~L~~	
~~Allegheny~~	~~H~~	~~Shallow~~
~~Alonemill~~	~~H~~	~~Leaching~~
~~Alonzville~~	~~M~~	~~Leaching~~
~~Altavista~~	~~L~~	
~~Altavista variant~~	~~L~~	
~~Alticrest~~	~~H~~	~~Shallow~~
~~Angie~~	~~L~~	
~~Appling~~	~~L~~	
~~Appling gritty~~	~~L~~	
~~Appomattox~~	~~L~~	
~~Aqualfs~~	~~L~~	
~~Aquents~~	~~H~~	~~Drainage~~
~~Aquic Udifluvents~~	~~L~~	
~~Aquults~~	~~L~~	
~~Arapahoe~~	~~H~~	~~Drainage~~
~~Arcola~~	~~M~~	~~Leaching~~
~~Ardilla~~	~~L~~	
~~Argent~~	~~L~~	
~~Arkaqua~~	~~L~~	
~~Ashburn~~	~~L~~	
~~Ashe~~	~~H~~	~~Leaching~~
~~Ashlar~~	~~H~~	~~Leaching~~
~~Assateague~~	~~H~~	~~Leaching~~
~~Athol~~	~~L~~	
~~Atkins~~	~~H~~	~~Drainage~~
~~Atlee~~	~~L~~	
~~Augusta variant~~	~~L~~	
~~Augusta~~	~~L~~	
~~Aura~~	~~H~~	~~Leaching~~
~~Austinville~~	~~L~~	
~~Axis~~	~~H~~	~~Drainage~~
~~Aycock~~	~~L~~	
~~Ayersville~~	~~M~~	~~Leaching~~
~~Backbay~~	~~H~~	~~Drainage~~
~~Badin~~	~~L~~	
~~Baile~~	~~L~~	

~~Soil Series~~	~~Environmental Sensitivity~~	~~Category~~
~~Bailegap~~	~~M~~	~~Leaching~~
~~Balsam~~	~~H~~	~~Shallow~~
~~Bama~~	~~M~~	~~Leaching~~
~~Banister~~	~~L~~	
~~Barclay~~	~~M~~	~~Leaching~~
~~Batteau~~	~~L~~	
~~Beckham~~	~~L~~	
~~Bedington~~	~~M~~	~~Leaching~~
~~Beech~~	~~L~~	
~~Beech Grove~~	~~H~~	~~Shallow~~
~~Belhaven~~	~~H~~	~~Drainage~~
~~Bellspur~~	~~M~~	~~Leaching~~
~~Beltsville~~	~~L~~	
~~Belvoir~~	~~L~~	
~~Benthole~~	~~H~~	~~Leaching~~
~~Bentley~~	~~L~~	
~~Berks~~	~~H~~	~~Shallow~~
~~Berks variant~~	~~H~~	~~Shallow~~
~~Bermudian~~	~~M~~	~~Leaching~~
~~Berthera~~	~~L~~	
~~Bertie~~	~~L~~	
~~Bethera~~	~~L~~	
~~Bethesda~~	~~H~~	~~Leaching~~
~~Bethlehem~~	~~H~~	~~Shallow~~
~~Bibb~~	~~H~~	~~Drainage~~
~~Biltmore~~	~~H~~	~~Leaching~~
~~Birdsboro~~	~~L~~	
~~Blackthorn~~	~~L~~	
~~Bladen~~	~~L~~	
~~Blago~~	~~L~~	
~~Blairton~~	~~H~~	~~Shallow~~
~~Bland~~	~~H~~	~~Shallow~~
~~Blocktown~~	~~H~~	~~Shallow~~
~~Bloodyhorse~~	~~H~~	~~Leaching~~
~~Bluemont~~	~~M~~	~~Shallow~~
~~Bluemount~~	~~M~~	~~Leaching~~
~~Bohicket~~	~~L~~	
~~Bojac, Eastern Shore~~	~~H~~	~~Leaching~~
~~Bojac, mainland~~	~~H~~	~~Leaching~~
~~Bolling~~	~~L~~	
~~Bolling variant~~	~~L~~	
~~Bolton~~	~~M~~	~~Leaching~~
~~Bonneau~~	~~H~~	~~Leaching~~
~~Bookwood~~	~~H~~	~~Shallow~~
~~Botetourt~~	~~L~~	
~~Bourne~~	~~L~~	
~~Bourne variant~~	~~L~~	
~~Bowmansville~~	~~H~~	~~Drainage~~

Table 1-4
Nitrogen Loss Risk and Environmental Sensitivity Ratings for Virginia Soils & Soil Series Associated With Environmentally Sensitive Sites

Soil Series	Environmental Sensitivity	Category
Braddock	L	
Brandywine	H	Leaching
Brecknock	M	Leaching
Bremo	H	Leaching
Brentsville	H	Shallow
Brevard	M	Leaching
Brickhaven	L	
Brikerton	L	
Brinklow	M	Leaching
Broadway	L	
Brockroad	L	
Brownsville	H	Shallow
Brownwood	H	Leaching
Brumbaugh	L	
Brushy	H	Shallow
Buchanan	L	
Buckhall	L	
Buckingham	L	
Bucks	M	Leaching
Buckton	L	
Buffstat	L	
Bugley	H	Shallow
Buncombe	H	Leaching
Burketown	L	
Burrowsville	L	
Burton	H	Shallow
Buzzrock	H	Shallow
Cahaba	L	
Calverton	L	
Calvin	H	Shallow
Camocca	H	Drainage
Caneyville	H	Shallow
Captina	L	
Carbo	H	Shallow
Carbonton	L	
Cardiff	H	Leaching
Cardova	M	Leaching
Caroline	L	
Cartecay	H	Leaching
Carteret	H	Drainage
Cataska	H	Shallow
Catharpin	L	
Catlett	H	Shallow
Catoctin	H	Shallow
Catpoint	H	Leaching
Caverns	H	Leaching
Cecil	L	
Cedarcreek	H	Shallow
Chagrin	M	Leaching
Chagrin variant	H	Leaching
Chandler	H	Leaching

Soil Series	Environmental Sensitivity	Category
Chapanoke	L	
Charity	L	
Chastain	L	
Chastaina	L	
Chatuge	L	
Chavies	H	Leaching
Chavies variant	H	Leaching
Chenneby	L	
Chesapeake	M	Leaching
Chester	M	Leaching
Chestnut	H	Leaching
Chewacla	L	
Chickahominy	L	
Chilhowie	H	Shallow
Chincoteague	L	
Chipley	L	
Chiswell	H	Shallow
Christian	L	
Cid	L	
Claiborne	M	Leaching
Clapham	L	
Clarksburg	L	
Clearbrook	H	Shallow
Cliffield	H	Leaching
Clifford	L	
Clifton	L	
Clover	L	
Cloverlick	H	Leaching
Clubcaf	L	
Clymer	M	Leaching
Codorus	L	
Codorus variant	L	
Colescreek	L	
Colfax	L	
Colfax variant	L	
Colleen	L	
Colvard	H	Leaching
Combs	M	Leaching
Comus	M	Leaching
Conetoe	H	Leaching
Congaree	L	
Coosaw	L	
Corolla	L	
Corydon	H	Shallow
Cotaco	L	
Cottonbend	M	Leaching
Coursey	L	
Cowee	H	Shallow
Coxville	L	
Craggey	H	Shallow

Table 1-4
Nitrogen Loss Risk and Environmental Sensitivity Ratings for Virginia Soils & Soil Series Associated With Environmentally Sensitive Sites

Soil Series	Environmental Sensitivity	Category
Craigsville	H	Leaching
Craven	L	
Creedmoor variant	L	
Croton	L	
Cullasaja	H	Leaching
Cullen	L	
Culleoka	M	Leaching
Culpeper	L	
Daleville	L	
Dan River	M	Leaching
Dandridge	H	Shallow
Danripple	L	
Davidson	L	
Dawhoo variant	H	Drainage
Decatur	L	
Dekalb	H	Leaching
Delanco	L	
Delila	L	
Dellwood	L	
Deloss	H	Drainage
Derroc	H	Leaching
Devotion	H	Leaching
Diana Mills	L	
Dillard	L	
Dillsboro	L	
Dismal	H	Drainage
Dogue	L	
Dorovan	H	Drainage
Dothan	M	Leaching
Downer	H	Leaching
Dragston	M	Drainage
Drall	H	Leaching
Draper	M	Leaching
Drapermill	M	Leaching
Drypond	H	Shallow
Duckston	H	Drainage
Duffield	M	Leaching
Dulles	L	
Dumfries	M	Leaching
Dunbar	L	
Dunning	L	
Duplin	L	
Durham	M	Leaching
Dyke	L	
Dystrochrepts	H	Leaching
Easthamlet	L	
Ebbing	L	
Edgehill	L	
Edgehill variant	L	
Edgemont	M	Leaching
Edneytown	M	Leaching
Edneyville	H	Leaching
Edom	L	
Elbert	L	
Elbert variant	L	
Elioak	L	
Elk	L	
Elkton, drained	H	Drainage
Elkton, undrained	L	
Elliber	H	Leaching
Elsinboro	M	Leaching
Emory	L	
Emporia	M	Leaching
Endcav	L	
Enon	L	
Enott	L	
Ernest	L	
Escatawba	M	Leaching
Eubanks	M	Leaching
Eulonia	L	
Eunola	L	
Evansham	L	
Evard	M	Leaching
Evesboro	H	Shallow
Exum	L	
Faceville	L	
Fairfax	L	
Fairpoint	H	Shallow
Fairview	L	
Fairystone	L	
Fallsington	M	Drainage
Fauquier	L	
Fauquier, deep phase	L	
Faywood	H	Shallow
Featherstone	L	
Fedscreek	H	Leaching
Feedstone	L	
Fisherman	L	
Fiveblock	H	Leaching
Flatwoods	L	
Fletcher	L	
Flume	L	
Fluvanna	L	
Fluvaquents	L	
Forestdale	L	
Fork	L	
Fork variant	L	
Frankstown	M	Leaching
Frederick	L	

~~Table 1-4~~
~~Nitrogen Loss Risk and Environmental Sensitivity Ratings for Virginia Soils & Soil Series Associated With Environmentally Sensitive Sites~~

~~Soil Series~~	~~Environmental Sensitivity~~	~~Category~~
~~Freemanville~~	~~L~~	
~~French~~	~~L~~	
~~Fresh water swamp~~	~~H~~	~~Drainage~~
~~Fripp~~	~~H~~	~~Leaching~~
~~Funkstown~~	~~L~~	
~~Gaila~~	~~M~~	~~Leaching~~
~~Gainesboro~~	~~H~~	~~Shallow~~
~~Galestown~~	~~H~~	~~Leaching~~
~~Galtsmill~~	~~H~~	~~Leaching~~
~~Georgeville~~	~~L~~	
~~Germanna~~	~~L~~	
~~Gertie~~	~~L~~	
~~Gilpin~~	~~H~~	~~Shallow~~
~~Gladehill~~	~~H~~	~~Leaching~~
~~Glenelg~~	~~M~~	~~Leaching~~
~~Glenelg, Blue Ridge~~	~~M~~	~~Leaching~~
~~Glenelg, New River Valley~~	~~M~~	~~Leaching~~
~~Glenville~~	~~L~~	
~~Glynwood~~	~~L~~	
~~Goblintown~~	~~L~~	
~~Goldsboro~~	~~L~~	
~~Goldston~~	~~H~~	~~Leaching~~
~~Goldvein~~	~~L~~	
~~Goresville~~	~~L~~	
~~Granville~~	~~L~~	
~~Grassland~~	~~L~~	
~~Greendale~~	~~L~~	
~~Greenlee~~	~~H~~	~~Leaching~~
~~Griffinsburg~~	~~H~~	~~Shallow~~
~~Grigsby~~	~~H~~	~~Leaching~~
~~Grimsley~~	~~H~~	~~Leaching~~
~~Gritney~~	~~L~~	
~~Groseclose~~	~~L~~	
~~Grover~~	~~M~~	~~Leaching~~
~~Gullion~~	~~L~~	
~~Gundy~~	~~L~~	
~~Gunstock~~	~~H~~	~~Shallow~~
~~Guyan~~	~~L~~	
~~Gwinnett variant~~	~~L~~	
~~Hagerstown~~	~~L~~	
~~Halewood~~	~~L~~	
~~Halifax~~	~~L~~	
~~Hanceville~~	~~L~~	
~~Haplaquepts~~	~~H~~	~~Leaching~~
~~Happyland~~	~~M~~	~~Leaching~~
~~Hartleton~~	~~H~~	~~Shallow~~
~~Hartsells~~	~~M~~	~~Shallow~~
~~Hatboro~~	~~H~~	~~Drainage~~
~~Hawksbill~~	~~H~~	~~Leaching~~
~~Hayesville~~	~~L~~	
~~Haymarket~~	~~L~~	
~~Hayter~~	~~M~~	~~Leaching~~
~~Haywood~~	~~H~~	~~Leaching~~
~~Hazel~~	~~H~~	~~Shallow~~
~~Hazel (channery)~~	~~H~~	~~Shallow~~
~~Hazel Run~~	~~M~~	~~Leaching~~
~~Hazleton~~	~~H~~	~~Shallow~~
~~Helena~~	~~L~~	
~~Herndon~~	~~L~~	
~~Hibler~~	~~L~~	
~~Hickoryknob~~	~~M~~	~~Leaching~~
~~Highsplint~~	~~H~~	~~Leaching~~
~~Hiwassee~~	~~L~~	
~~Hoadly~~	~~L~~	
~~Hobucken~~	~~H~~	~~Drainage~~
~~Holly~~	~~H~~	~~Drainage~~
~~Hollywood~~	~~L~~	
~~Hubersburg~~	~~L~~	
~~Huntington~~	~~L~~	
~~Hyde~~	~~L~~	
~~Hydraquents~~	~~H~~	~~Drainage~~
~~Ingledove~~	~~M~~	~~Leaching~~
~~Iotla~~	~~L~~	
~~Iredell~~	~~L~~	
~~Irongate~~	~~H~~	~~Leaching~~
~~Itmann~~	~~H~~	~~Shallow~~
~~Iuka~~	~~L~~	
~~Izagora~~	~~L~~	
~~Jackland~~	~~L~~	
~~Jedburg~~	~~L~~	
~~Jefferson~~	~~M~~	~~Leaching~~
~~Jefferson variant~~	~~H~~	~~Leaching~~
~~Johns, drained~~	~~H~~	~~Drainage~~
~~Johns, undrained~~	~~L~~	
~~Johnston~~	~~H~~	~~Drainage~~
~~Junaluska~~	~~H~~	~~Shallow~~
~~Kalmia~~	~~M~~	~~Leaching~~
~~Kaymine~~	~~H~~	~~Shallow~~
~~Keener~~	~~M~~	~~Leaching~~
~~Kelly~~	~~L~~	
~~Kempsville~~	~~M~~	~~Leaching~~
~~Kenansville~~	~~H~~	~~Leaching~~
~~Kenansville variant~~	~~L~~	
~~Keyport~~	~~L~~	
~~Kibler~~	~~M~~	~~Leaching~~
~~Kinkora~~	~~L~~	

~~Table 1-4~~
~~Nitrogen Loss Risk and Environmental Sensitivity Ratings for Virginia Soils & Soil Series Associated With Environmentally Sensitive Sites~~

~~Soil Series~~	~~Environmental Sensitivity~~	~~Category~~
~~Kinston~~	~~L~~	
~~Klej~~	~~H~~	~~Drainage~~
~~Klinesville~~	~~H~~	~~Shallow~~
~~Konnarock~~	~~H~~	~~Shallow~~
~~Lackstown~~	~~L~~	
~~Laidig~~	~~M~~	~~Leaching~~
~~Lakehurst variant~~	~~L~~	
~~Lakeland~~	~~H~~	~~Leaching~~
~~Lakin~~	~~H~~	~~Leaching~~
~~Landsiburg~~	~~L~~	
~~Lanexa~~	~~H~~	~~Drainage~~
~~Lanside~~	~~H~~	~~Shallow~~
~~LaRoque~~	~~M~~	~~Leaching~~
~~Lawnes~~	~~H~~	~~Drainage~~
~~Leaf~~	~~L~~	
~~Leaksville~~	~~L~~	
~~Leck Kill~~	~~M~~	~~Leaching~~
~~Leedsville~~	~~M~~	~~Leaching~~
~~Leetonia~~	~~H~~	~~Shallow~~
~~Legore~~	~~M~~	~~Leaching~~
~~Lehew~~	~~H~~	~~Shallow~~
~~Lenoir~~	~~L~~	
~~Leon~~	~~H~~	~~Drainage~~
~~Levy~~	~~H~~	~~Drainage~~
~~Lew~~	~~H~~	~~Leaching~~
~~Lewisberry~~	~~H~~	~~Leaching~~
~~Library~~	~~L~~	
~~Lignum~~	~~L~~	
~~Lily~~	~~H~~	~~Shallow~~
~~Lindside~~	~~L~~	
~~Littlejoe~~	~~L~~	
~~Litz~~	~~H~~	~~Shallow~~
~~Lloyd~~	~~L~~	
~~Lloyd variant~~	~~L~~	
~~Lobdell~~	~~L~~	
~~Lodi~~	~~L~~	
~~Lostcove~~	~~H~~	~~Leaching~~
~~Louisa~~	~~H~~	~~Leaching~~
~~Louisa variant~~	~~H~~	~~Leaching~~
~~Louisburg~~	~~H~~	~~Leaching~~
~~Louisburg, hapludalfs~~	~~H~~	~~Leaching~~
~~Lowell~~	~~L~~	
~~Lucketts~~	~~L~~	
~~Lucy~~	~~H~~	~~Leaching~~
~~Lumbee~~	~~H~~	~~Drainage~~
~~Lumbee variant~~	~~H~~	~~Drainage~~
~~Lunt~~	~~L~~	
~~Lynchburg~~	~~L~~	
~~Macove~~	~~H~~	~~Leaching~~
~~Madison~~	~~L~~	
~~Madsheep~~	~~H~~	~~Shallow~~
~~Magotha~~	~~H~~	~~Drainage~~
~~Manassas~~	~~L~~	
~~Mandy~~	~~H~~	~~Shallow~~
~~Manor~~	~~H~~	~~Leaching~~
~~Mantachie~~	~~L~~	
~~Manteo~~	~~H~~	~~Shallow~~
~~Marbie~~	~~L~~	
~~Marbleyard~~	~~H~~	~~Leaching~~
~~Margo~~	~~L~~	
~~Markes~~	~~H~~	~~Drainage~~
~~Marlboro~~	~~L~~	
~~Marr~~	~~M~~	~~Leaching~~
~~Marrowbone~~	~~H~~	~~Shallow~~
~~Masada~~	~~L~~	
~~Massanetta~~	~~L~~	
~~Massanutten~~	~~H~~	~~Shallow~~
~~Matapeake~~	~~L~~	
~~Matewan~~	~~H~~	~~Leaching~~
~~Matneflat~~	~~H~~	~~Leaching~~
~~Mattamuskeet~~	~~H~~	~~Drainage~~
~~Mattan~~	~~H~~	~~Drainage~~
~~Mattapex~~	~~L~~	
~~Mattaponi~~	~~L~~	
~~Maurertown~~	~~L~~	
~~Maury~~	~~L~~	
~~Mayodan~~	~~L~~	
~~McCamy~~	~~M~~	~~Leaching~~
~~McClung~~	~~M~~	~~Leaching~~
~~McGary~~	~~L~~	
~~McLaurin~~	~~H~~	~~Leaching~~
~~McQueen~~	~~L~~	
~~Meadowfield~~	~~H~~	~~Shallow~~
~~Meadows~~	~~H~~	~~Shallow~~
~~Meadowville~~	~~M~~	~~Leaching~~
~~Meckesville~~	~~L~~	
~~Mecklenburg~~	~~L~~	
~~Mecklenburg variant~~	~~L~~	
~~Meggett~~	~~L~~	
~~Melfa~~	~~H~~	~~Drainage~~
~~Melvin~~	~~L~~	
~~Middleburg~~	~~M~~	~~Leaching~~
~~Millrock~~	~~H~~	~~Leaching~~
~~Mine Run~~	~~H~~	~~Leaching~~
~~Minnieville~~	~~L~~	
~~Mirerock~~	~~L~~	
~~Misenheimer~~	~~H~~	~~Shallow~~
~~Mixed alluvium, poorly drained~~	~~H~~	~~Drainage~~

~~Table 1-4~~
~~Nitrogen Loss Risk and Environmental Sensitivity Ratings for Virginia Soils~~
~~& Soil Series Associated With Environmentally Sensitive Sites~~

~~Soil Series~~	~~Environmental Sensitivity~~	~~Category~~
~~Mixed alluvium, well drained~~	~~L~~	
~~Molena~~	~~H~~	~~Leaching~~
~~Monacan~~	~~L~~	
~~Mongle~~	~~L~~	
~~Monongahela~~	~~L~~	
~~Montalto~~	~~L~~	
~~Montonia~~	~~M~~	~~Leaching~~
~~Montross~~	~~L~~	
~~Moomaw~~	~~L~~	
~~Morven~~	~~M~~	~~Leaching~~
~~Mount Lucas~~	~~L~~	
~~Mt Rogers~~	~~H~~	~~Leaching~~
~~Muckalee~~	~~H~~	~~Drainage~~
~~Munden~~	~~M~~	~~Leaching~~
~~Murrill~~	~~M~~	~~Leaching~~
~~Muskingum~~	~~H~~	~~Shallow~~
~~Myatt, drained~~	~~M~~	~~Leaching~~
~~Myatt, undrained~~	~~L~~	
~~Myatt variant, drained~~	~~M~~	~~Leaching~~
~~Myatt variant, Undrained~~	~~L~~	
~~Myersville~~	~~M~~	~~Leaching~~
~~Nahunta~~	~~L~~	
~~Nanford~~	~~L~~	
~~Nansemond~~	~~M~~	~~Leaching~~
~~Nason~~	~~L~~	
~~Nathalie~~	~~L~~	
~~Nawney~~	~~L~~	
~~Neabsco~~	~~L~~	
~~Needmore~~	~~M~~	~~Shallow~~
~~Nestoria~~	~~H~~	~~Shallow~~
~~Nevarc~~	~~L~~	
~~Newark variant~~	~~L~~	
~~Newark~~	~~L~~	
~~Newark, undrained~~	~~L~~	
~~Newbern~~	~~H~~	~~Shallow~~
~~Newflat~~	~~L~~	
~~Newhan~~	~~H~~	~~Leaching~~
~~Newmarc~~	~~L~~	
~~Nicelytown~~	~~L~~	
~~Nicholson~~	~~L~~	
~~Nikwasi~~	~~H~~	~~Drainage~~
~~Nimmo~~	~~H~~	~~Drainage~~
~~Nixa~~	~~L~~	
~~Nolichucky~~	~~M~~	~~Leaching~~
~~Nolin~~	~~L~~	
~~Nollville~~	~~L~~	
~~Nomberville~~	~~L~~	

~~Soil Series~~	~~Environmental Sensitivity~~	~~Category~~
~~Norfolk~~	~~M~~	~~Leaching~~
~~Oak Level~~	~~L~~	
~~Oakhill~~	~~H~~	~~Leaching~~
~~Oaklet~~	~~L~~	
~~Oatlands~~	~~M~~	~~Leaching~~
~~Occoquan~~	~~M~~	~~Leaching~~
~~Ochlockonee~~	~~H~~	~~Leaching~~
~~Ochlockonee variant~~	~~L~~	
~~Ochraquults~~	~~L~~	
~~Ochrepts, A/D~~	~~L~~	
~~Ochrepts, B/D~~	~~L~~	
~~Ochrepts, D~~	~~L~~	
~~Ocilla~~	~~L~~	
~~Ogles~~	~~H~~	~~Leaching~~
~~Okeetee~~	~~L~~	
~~Opequon~~	~~H~~	~~Shallow~~
~~Orange~~	~~L~~	
~~Orange variant~~	~~L~~	
~~Orangeburg~~	~~M~~	~~Leaching~~
~~Orenda~~	~~L~~	
~~Oriskany~~	~~H~~	~~Leaching~~
~~Orrville, Drained~~	~~M~~	~~Leaching~~
~~Orrville, Undrained~~	~~L~~	
~~Orrville variant Drained~~	~~M~~	~~Leaching~~
~~Orriville vairant undrained~~	~~L~~	
~~Orthents~~	~~L~~	
~~Osier~~	~~H~~	~~Drainage~~
~~Ostin~~	~~M~~	~~Leaching~~
~~Othello~~	~~L~~	
~~Ott~~	~~M~~	~~Leaching~~
~~Pacolet~~	~~L~~	
~~Pactolus~~	~~L~~	
~~Paddyknob~~	~~H~~	~~Shallow~~
~~Pagebrook~~	~~L~~	
~~Palms variant~~	~~H~~	~~Drainage~~
~~Pamlico~~	~~H~~	~~Drainage~~
~~Pamunkey~~	~~M~~	~~Leaching~~
~~Pamunkey Variant~~	~~M~~	~~Leaching~~
~~Panorama~~	~~M~~	~~Leaching~~
~~Pantego~~	~~L~~	
~~Parker~~	~~H~~	~~Leaching~~
~~Partlow~~	~~M~~	~~Drainage~~
~~Pasquotank~~	~~H~~	~~Drainage~~
~~Peaks~~	~~H~~	~~Shallow~~
~~Peawick~~	~~L~~	
~~Pecktonville~~	~~L~~	

Table 1-4
Nitrogen Loss Risk and Environmental Sensitivity Ratings for Virginia Soils & Soil Series Associated With Environmentally Sensitive Sites

Soil Series	Environmental Sensitivity	Category
Penhook	L	
Penn	M	Leaching
Philo (Dr.)	M	Leaching
Philomont	H	Leaching
Pigeonroost	H	Shallow
Pilot Mountain	H	Leaching
Pineola	M	Leaching
Pineville	M	Leaching
Pineywoods	L	
Pinkston	H	Leaching
Pinoka	M	Leaching
Pisgah	L	
Plummer	M	Drainage
Pocalla	M	Leaching
Pocaty	L	
Pocomoke	M	Drainage
Poindexter	M	Leaching
Polawana	H	Drainage
Pooler variant	L	
Pooler	L	
Pope	H	Leaching
Poplimento	L	
Porters	M	Leaching
Portsmouth	M	Drainage
Pouncey	L	
Poynor	H	Leaching
Psamments, mod well	L	
Psamments, somewhat poorly	L	
Psamments, well drained	H	Leaching
Pungo	H	Drainage
Purcellville	L	
Purdy	L	
Quantico	L	
Rabun	L	
Rains	L	
Ramsey	H	Shallow
Rapidan	L	
Rappahannock	H	Drainage
Raritan	L	
Rasalo	L	
Rayne	M	Leaching
Readington	L	
Reaville	L	
Redbrush	L	
Remlik	H	Leaching
Rhodhiss	M	Leaching
Rigley	H	Leaching
Rion	M	Leaching

Soil Series	Environmental Sensitivity	Category
Riverview	M	Leaching
Rixeyville	H	Shallow
Roanoke	L	
Robertsville	L	
Rockbarn	L	
Rohrersville	L	
Ross	M	Leaching
Rough	H	Shallow
Rowland	L	
Rumford	H	Leaching
Rushtown	H	Leaching
Ruston	M	Leaching
Saffell	H	Shallow
Santuc	L	
Sassafras	M	Leaching
Saunook	M	Leaching
Sauratown	M	Leaching
Savannah	L	
Scattersville	L	
Schaffenaker	H	Leaching
Seabrook	L	
Seagate	H	Drainage
Sedgefield	L	
Sekil	H	Leaching
Seneca	L	
Sequatchie	L	
Sequoia	H	Shallow
Sewell	H	Shallow
Shelocta	M	Leaching
Shelocta variant	L	
Shenval	L	
Sherando	H	Leaching
Sheva	L	
Shottower	L	
Siloam	L	
Sindion	L	
Skeeterville	L	
Slabtown	L	
Slagle	L	
Snowdog	L	
Spears Mountain	L	
Speedwell	M	Leaching
Spessard	H	Leaching
Spivey	H	Leaching
Spotsylvania	L	
Spray	M	Leaching
Spriggs	M	Leaching
Springwood	L	
Starr	M	Leaching

~~**Table 1-4**~~

~~**Nitrogen Loss Risk and Environmental Sensitivity Ratings for Virginia Soils & Soil Series Associated With Environmentally Sensitive Sites**~~

~~Soil Series~~	~~Environmental Sensitivity~~	~~Category~~
~~Starr Dyke~~	~~L~~	
~~Stasser~~	~~L~~	
~~State~~	~~M~~	~~Leaching~~
~~Statler~~	~~M~~	~~Leaching~~
~~Steinsburg~~	~~H~~	~~Leaching~~
~~Stonecoal~~	~~H~~	~~Shallow~~
~~Stoneville~~	~~L~~	
~~Stott Knob~~	~~M~~	~~Leaching~~
~~Stough~~	~~L~~	
~~Straightstone~~	~~L~~	
~~Strawfield~~	~~L~~	
~~Stumptown~~	~~H~~	~~Leaching~~
~~Suches~~	~~M~~	~~Leaching~~
~~Sudley~~	~~M~~	~~Leaching~~
~~Suffolk~~	~~M~~	~~Leaching~~
~~Sugarhol~~	~~L~~	
~~Sulfaquents~~	~~L~~	
~~Summers~~	~~H~~	~~Shallow~~
~~Susquehanna~~	~~L~~	
~~Swamp~~	~~H~~	~~Drainage~~
~~Swampoodle~~	~~L~~	
~~Sweetapple~~	~~H~~	~~Leaching~~
~~Swimley~~	~~L~~	
~~Sycoline~~	~~L~~	
~~Sylco~~	~~H~~	~~Shallow~~
~~Sylvatus~~	~~H~~	~~Shallow~~
~~Talladega~~	~~H~~	~~Shallow~~
~~Tallapoosa~~	~~L~~	
~~Tallapoosa variant~~	~~L~~	
~~Tanasee~~	~~H~~	~~Leaching~~
~~Tankerville~~	~~H~~	~~Shallow~~
~~Tarboro~~	~~H~~	~~Leaching~~
~~Tarrus~~	~~L~~	
~~Tate~~	~~M~~	~~Leaching~~
~~Tatum~~	~~L~~	
~~Terric Haplohemists~~	~~H~~	~~Drainage~~
~~Tetotum~~	~~L~~	
~~Tetotum variant~~	~~L~~	
~~Thunder~~	~~H~~	~~Leaching~~
~~Thurmont~~	~~M~~	~~Leaching~~
~~Tifton~~	~~L~~	
~~Timberville~~	~~L~~	
~~Timberville variant~~	~~M~~	~~Leaching~~
~~Tioga~~	~~H~~	~~Leaching~~
~~Tipples~~	~~H~~	~~Shallow~~
~~Toast~~	~~L~~	
~~Toddstav~~	~~L~~	
~~Tomotley~~	~~L~~	
~~Toms~~	~~L~~	

~~Soil Series~~	~~Environmental Sensitivity~~	~~Category~~
~~Torhunta~~	~~H~~	~~Drainage~~
~~Totier~~	~~L~~	
~~Toxaway~~	~~M~~	~~Drainage~~
~~Trappist~~	~~M~~	~~Shallow~~
~~Trego~~	~~M~~	~~Leaching~~
~~Trenholm~~	~~L~~	
~~Trimont~~	~~M~~	~~Leaching~~
~~Trussell~~	~~L~~	
~~Tuckahoe~~	~~M~~	~~Leaching~~
~~Tuckasegee~~	~~M~~	~~Leaching~~
~~Tugglesgap~~	~~L~~	
~~Tumbling~~	~~L~~	
~~Turbeville~~	~~L~~	
~~Tusquitee, coarse loamy~~	~~H~~	~~Leaching~~
~~Tusquitee, fine loamy~~	~~M~~	~~Leaching~~
~~Tygart~~	~~L~~	
~~Typic Udorthents~~	~~L~~	
~~Uchee~~	~~H~~	~~Leaching~~
~~Udalfs~~	~~H~~	~~Drainage~~
~~Udifluvents, fine loamy~~	~~L~~	
~~Udipsamments, mod well~~	~~L~~	
~~Udipsamments, well~~	~~L~~	
~~Udults, well drained~~	~~L~~	
~~Unison~~	~~L~~	
~~Unison variant~~	~~L~~	
~~Vance~~	~~L~~	
~~Vandalla~~	~~L~~	
~~Varina~~	~~L~~	
~~Vaucluse~~	~~M~~	~~Leaching~~
~~Vertrees~~	~~L~~	
~~Virgilina~~	~~L~~	
~~Wadesboro~~	~~L~~	
~~Wadesboro~~	~~L~~	
~~Wagram~~	~~M~~	~~Leaching~~
~~Wahee~~	~~L~~	
~~Wallen~~	~~H~~	~~Shallow~~
~~Walnut~~	~~H~~	~~Leaching~~
~~Wando~~	~~H~~	~~Leaching~~
~~Warminster~~	~~L~~	
~~Watahala~~	~~M~~	~~Leaching~~
~~Watauga~~	~~M~~	~~Leaching~~
~~Wateree~~	~~H~~	~~Leaching~~
~~Watt~~	~~H~~	~~Shallow~~
~~Watt variant~~	~~H~~	~~Shallow~~
~~Waxpool~~	~~L~~	

~~Table 1-4~~
~~Nitrogen Loss Risk and Environmental Sensitivity Ratings for Virginia Soils & Soil Series Associated With Environmentally Sensitive Sites~~

~~Soil Series~~	~~Environmental Sensitivity~~	~~Category~~
~~Waynesboro~~	~~L~~	
~~Weaver~~	~~L~~	
~~Webbtown~~	~~H~~	~~Shallow~~
~~Wedowee~~	~~L~~	
~~Weeksville~~	~~M~~	~~Drainage~~
~~Wehadkee~~	~~L~~	
~~Weikert~~	~~H~~	~~Shallow~~
~~Westfield~~	~~L~~	
~~Westmoreland~~	~~M~~	~~Leaching~~
~~Weston~~	~~H~~	~~Drainage~~
~~Westphalia~~	~~H~~	~~Leaching~~
~~Weverton~~	~~H~~	~~Leaching~~
~~Wharton~~	~~L~~	
~~Wheeling~~	~~M~~	~~Leaching~~
~~White Store~~	~~L~~	
~~White Store variant~~	~~L~~	
~~Whiteford~~	~~M~~	~~Leaching~~
~~Wickham~~	~~M~~	~~Leaching~~
~~Wickham variant~~	~~M~~	~~Leaching~~
~~Widgett~~	~~H~~	~~Leaching~~
~~Wilkes~~	~~L~~	
~~Wingina~~	~~M~~	~~Leaching~~
~~Winnsboro~~	~~L~~	
~~Wintergreen~~	~~L~~	

~~Soil Series~~	~~Environmental Sensitivity~~	~~Category~~
~~Winton~~	~~L~~	
~~Wolfgap~~	~~M~~	~~Leaching~~
~~Wolftrap~~	~~L~~	
~~Woodington~~	~~H~~	~~Drainage~~
~~Woodstown~~	~~L~~	
~~Woolwine~~	~~L~~	
~~Worsham~~	~~L~~	
~~Worsham variant~~	~~L~~	
~~Wrightsboro~~	~~L~~	
~~Wurno~~	~~H~~	~~Shallow~~
~~Wyrick~~	~~M~~	~~Leaching~~
~~Yellowbottom~~	~~L~~	
~~Yemasse, drained~~	~~H~~	~~Drainage~~
~~Yemasse, undrained~~	~~L~~	
~~Yeopim~~	~~L~~	
~~Yogaville~~	~~L~~	
~~York~~	~~L~~	
~~Zepp~~	~~H~~	~~Leaching~~
~~Zion~~	~~L~~	
~~Zion variant~~	~~L~~	
~~Zoar~~	~~L~~	

Section II~~.B Recommended Setback Areas~~ Soil Test Analysis

Analysis Results for Plan Writing in Virginia

The results of soil testing labs approved by the Department must be correlated to Virginia Tech Mehlich I using Table 2-1, and the conversion procedures in Section II. Only the Virginia Tech soil test scale and the conversion of other approved labs to the Virginia Tech soil test scale can be used to develop phosphorus and potassium recommendations when developing Virginia nutrient management plans.

Approved soil test labs correlated to the Mehlich I soil test procedure using the Mehlich III procedure for phosphorus analysis can be found on the DCR Nutrient Management Website at the following link: https://www.dcr.virginia.gov/soil-and-water/document/nmlablist.pdf.

Soil Test Conversion Factors for Mehlich I

lbs./ac converted to ppm
P lbs./ac x 0.5 = P ppm
K lbs./ac x 0.5 = K ppm

Table 2-1
Virginia Tech Soil Test Calibrations Mehlich I
Calibration of Phosphorus (P)

Fertility Rating [1]	P - lbs./ac	P - PPM	P_2O_5 - lbs./ac
L-	0-3	0-2	0-7
L	4-8	3-4	9-18
L+	9-11	5-6	21-25
M-	12-20	7-10	28-46
M	21-30	11-15	48-69
M+	31-35	16-18	71-80
H-	36-55	19-28	82-126
H	56-85	29-43	128-195
H+	86-110	44-55	197-252
VH	110+	55+	252+

Table 2-2
Virginia Tech Soil Test Calibrations Mehlich I
Calibration of Potassium (K)

Fertility Rating [1]	K - lbs./ac	K - PPM	K_2O - lbs./ac
L-	0-15	0-8	0-18
L	16-55	9-28	19-66
L+	56-75	29-38	68-90
M-	76-100	39-50	92-121
M	101-150	51-75	122-181
M+	151-175	76-88	182-211
H-	176-210	89-105	212-253
H	211-280	106-140	254-337
H+	281-310	141-155	339-373
VH	310+	156+	373+

[1] Gaps exist between the fertility ratings because of the conversion from elemental lbs./ac to the phosphate and potash forms. When converting from another lab into the phosphate and potash forms choose the closest Fertility Rating to the converted value.

Sources: Maguire, R.O. and S.E. Heckendorn. 2023. Soil Test Recommendations for Virginia. Virginia Cooperative Extension, Virginia Tech, Blacksburg, VA. p. 7. Available at: www.soiltest.vt.edu/content/dam/soiltest_vt_edu/PDF/recommendation-guidebook.pdf

~~In addition to other management practices discussed in this section, animal waste or biosolids shall not be applied within the following setback areas around the specific features listed. Select the category which applies to the plan you are writing. The set-back requirements exist for animal waste and biosolids primarily to reduce the potential for pathogens (such as fecal coliform) to enter surface and ground waters.~~

- ~~Setbacks for plans **not** associated with Biosolids applications, VPA permitted animal operations or DEQ industrial waste application permits.~~

  - ~~100 feet from wells or springs~~
  - ~~50 feet from surface water if surface applied~~
  - ~~25 feet from surface water if injected~~
  - ~~50 feet from sinkholes*~~
  - ~~50 feet from limestone rock outcrops~~
  - ~~25 feet from other rock outcrops~~

~~* In addition to the 50 feet setback, manure and biosolids should **not** be applied in areas subject to concentrated flow generated by runoff from storm events that drains into sinkholes.~~

- ~~Setback distances for manure applications in plans written as part of a VPA or VPDES permit for confined animal feeding operations.~~

  - ~~100 feet from wells or springs~~
  - ~~100 feet from surface waters (no vegetated buffer) or 35 feet with a vegetated buffer** in place or a DEQ approved conservation practice that will achieve at least equivalent pollutant reductions.~~
  - ~~50 feet from sinkholes*~~
  - ~~50 feet from limestone rock outcrops~~
  - ~~25 feet from other rock outcrops~~
  - ~~10 feet from agricultural drainage ditches (5 feet if injected)~~
  - ~~200 feet from occupied dwellings (unless waived in writing by the occupant)~~

~~* Waste shall not be applied in such a manner that it would discharge into sinkholes.~~

~~** Vegetated buffer is a permanent strip of dense vegetation established parallel to the contours of and perpendicular to the dominant slope of the field.~~

- ~~Setback distances for fields receiving Biosolids applications in nutrient management plans.~~

~~Minimum distances to Land Application Area~~			
~~Adjacent Features~~	~~Surface Application (ft)~~ (1)	~~Incorporation (ft)~~	~~Winter (ft)~~ (2)
~~Occupied Dwellings~~	~~200~~	~~200~~	~~200~~
~~Water Supply wells and springs~~	~~100~~	~~100~~	~~100~~
~~Property Lines~~	~~100~~	~~50~~	~~100~~
~~Perennial streams and other surface waters except intermittent streams~~	~~50~~	~~35~~	~~100~~
~~Intermittent streams/drainage ditches~~	~~25~~	~~25~~	~~50~~
~~All improved roadways~~	~~10~~	~~5~~	~~10~~
~~Rock outcrops~~	~~25~~	~~25~~	~~25~~
~~Limestone rock outcrops and sinkholes~~	~~25~~	~~25~~	~~25~~
~~Agricultural drainage ditches with slopes equal to or less than 2.0%~~	~~10~~	~~5~~	~~10~~

~~Notes:~~

~~If slopes are greater than 7.0% and biosolids will be applied between November 16 and March 15, standard buffer distances to perennial streams other surface water bodies shall be doubled.~~

~~(1) Not plowed or disked to incorporate within 48 hours~~
~~(2) Application occurs on a verage site slope greater than 7.0% during the time between November 16 of one year and March 15 of the following year~~

~~The stated setbacks to adjacent property boundaries and dr ainage ditches constructed for agricultural operations may be reduced by 50% for subsurface application (includes same day incorporation) unless state or federal regulations provide more stringent requirements.~~

~~In cases where more than one bu ffer distance is involved, only the single most restrictive distance shall be used.~~

~~Section II. Soil Test Calibrations and Correlations~~

~~Table 2-1~~
~~Virginia Tech Soil Test Calibrations~~

~~Calibration of Phosphorus (P) & Potassium (K) Tests, Mehlich I~~
~~Virginia Tech Soil Testing Laboratory~~

Fertility Rating	P – lbs/ac	P - PPM	P_2O_5 – lbs/ac*
L-	0-3	0-2	0-7
L	4-8	2-4	9-18
L+	9-11	5-6	21-25
M-	12-20	6-10	28-46
M	21-30	11-15	48-69
M+	31-35	16-18	71-80
H-	36-55	18-28	82-126
H	56-85	28-43	128-195
H+	86-110	43-55	197-252
VH	110+	55+	252+

Fertility Rating	K – lbs/ac	K - PPM	K_2O – lbs/ac*
L-	0-15	0-8	0-18
L	16-55	8-28	19-66
L+	56-75	28-38	68-90
M-	76-100	38-50	92-121
M	101-150	51-75	122-181
M+	151-175	76-88	182-211
H-	176-210	88-105	212-253
H	211-280	106-140	254-337
H+	281-310	141-155	339-373
VH	310+	155+	373+

~~* Gaps exist between the fertility ratings because of the conversion from elemental lbs/ac to the phosphate and potash forms. When converting from another lab into the phosphate and potash forms choose the closest Fertility Rating to the converted value.~~

~~Virginia Tech Soil Test results - lbs/ac converted to ppm~~

~~Va Tech P lbs/ac x 0.5 = Va Tech P ppm Va Tech K lbs/ac x 0.5 = Va Tech K ppm~~

~~Correlation of Soil Analysis Results for Plan Writing in Virginia~~

~~Soil test results dated after 12/31/05 which are used to write nutrient management plans in Virginia shall use the Mehlich I procedure to determine the phosphorus soil level. Mehlich III to Mehlich I is the only acceptable correlation, using the following criteria.~~

~~Approved soil test labs correlated to the Va Tech soil test lab using the Mehlich III procedure for phosphorus analysis are A & L Agricultural Laboratories, Brookside Laboratories, and Spectrum Analytical Laboratories.~~

~~Waters Agricultural Laboratories uses the Mehlich I procedure therefore the phosphorus soil test results can be interpreted the same as Va Tech phosphorus soil test results.~~

~~**Table 2-2**~~

~~**Correlation of Soil Analysis Results for Phosphorus from**~~**Soil Test Conversion Factors for**

Mehlich III to Mehlich I

When converting Mehlich III ppm soil test phosphorus to Mehlich I ppm soil test phosphorus**, two different formulas are used**. One is used for soil test values up to and including **205 ppm** Mehlich III phosphorus, as shown in the table below. **Mehlich III Phosphorus Soil Test Conversions to Mehlich III Phosphorus ppm**

P_2O_5 #/ac. (Mehlich III) X 0.22 = P ppm (Mehlich III)

P #/ac. (Mehlich III) X 0.5 = P ppm (Mehlich III)

Conversion Formula for Mehlich III Phosphorus ppm to Mehlich I Phosphorus ppm

To calculate the Mehlich I ppm, if not expressed on the soil test report, use the following formula. Mehlich I ppm phosphorus must be used when determining the Applied Fertilizer Dissolved Reactive Orthophosphate factor in a P-Index calculation.

[Mehlich III (206 ppm P or greater) X 0.945] - 103.5 = Mehlich I P ppm

Table 2-3 shows a sample of soil test values converting Mehlich III to Mehlich I. The Mehlich I upper limit, above which no phosphorus shall be applied to a field, based on either the Threshold Method or the P - Index and the associated physiographic region are shown in bold.

Table 2-3

Mehlich III Phosphorus (206 ppm and greater) Conversion to Mehlich I

Mehlich III			**Mehlich I**		**Phosphorus Procedure/Physiographic Regions**
P_2O_5 lbs./ac	P lbs./ac	P ppm	P lbs./ac	P ppm	
948	412	206	182	91	
1164	506	253	270	**135**	PET/ Eastern Shore & Lower Coastal Plain
1168	508	254	272	**136**	PET/ Middle & Upper Coastal Plain & Piedmont
1293	562	281	324	**162**	PET/ Ridge and Valley
1380	600	300	320	180	
1610	700	350	454	227	
1840	800	400	550	275	
2070	900	450	644	322	
2332	1014	507	750	**375**	P- Index/ Middle & Upper Coastal Plain & Piedmont
2737	1190	595	916	**458**	P-Index/ Eastern Shore & Lower Coastal Plain
3064	1332	666	1050	**525**	P-Index/ Ridge and Valley

~~When converting Mehlich III ppm soil test phosphorus to Mehlich I ppm soil test phosphorus~~**~~, two different formulas are used~~**~~. One is used for soil test values up to and including~~ **~~205 ppm~~** ~~Mehlich III phosphorus, as shown in the table below.~~

~~For phosphorus soil test values of 206 ppm Mehlich III and greater, use the formula shown under the heading Mehlich III Phosphorus (206 ppm and greater) Conversion to Mehlich I. When converting the soil test phosphorus values from labs using the Mehlich III procedure, be sure to use the appropriate formula.~~

~~Mehlich III (0-205 ppm) Conversion to Mehlich I~~

~~Mehlich III~~			~~Mehlich I~~		
~~P_2O_5 #/ac~~	~~P #/ac~~	~~P ppm~~	~~P #/ac~~	~~P ppm~~	~~Fertility Rating~~
0	0	0	0	0	
46	20	**10**	2	1	L-
53	23	12	4	2	
74	32	16	8	4	L
83	36	18	10	5	L+
92	40	**20**	12	6	
138	60	**30**	20	10	M-
143	62	31	22	11	M
184	80	**40**	30	15	
193	84	42	32	16	M+
212	92	46	36	18	
230	100	**50**	40	20	H-
276	120	**60**	48	24	
313	136	68	56	28	
322	140	**70**	58	29	
368	160	**80**	66	33	H
414	180	**90**	76	38	
460	200	**100**	86	43	
506	220	**110**	94	47	H+
552	240	**120**	104	52	
584	254	127	110	55	
598	260	**130**	112	56	
644	280	**140**	122	61	
690	300	**150**	130	65	
736	320	**160**	140	70	VH
782	340	**170**	150	75	
828	360	**180**	158	79	
874	380	**190**	168	84	
920	400	**200**	176	88	
943	410	**205**	181	90.6	

~~For soil test values not shown in the table above, use the following formula to convert Mehlich III to Mehlich I and select the closest fertility rating for the Mehlich I ppm from the table above:~~

~~Mehlich III Phosphorus less than or equal to 205:~~

~~[Mehlich III (205 ppm P or less) X 0.458] - 3.26 = Mehlich I ppm~~

~~Mehlich III Phosphorus (206 ppm and greater) Conversion to Mehlich I~~

~~Mehlich III Phosphorus Soil Test Conversions to Mehlich III Phosphorus ppm~~

~~P_2O_5 #/ac. (Mehlich III) X 0.22 = P ppm (Mehlich III)~~
~~P #/ac. (Mehlich III) X 0.5 = P ppm (Mehlich III)~~

~~Conversion Formula for Mehlich III Phosphorus ppm to Mehlich I Phosphorus ppm~~

~~To calculate the Mehlich I ppm, if not expressed on the soil test report, use the following formula. Mehlich I ppm phosphorus must be used when determining the Applied Fertilizer Dissolved Reactive Orthophosphate factor in a P-Index calculation.~~

~~[Mehlich III (206 ppm P or greater) X 0.945] - 103.5 = Mehlich I P ppm~~

~~The table below shows a sample of soil test values converting Mehlich III to Mehlich I. The Mehlich I upper limit, above which no phosphorus shall be applied to a field, based on either the Threshold Method or the P - Index and the associated physiographic region are shown in bold.~~

~~Mehlich III~~			**~~Mehlich I~~**		
~~P_2O_5 #/ac~~	~~P #/ac~~	~~P ppm~~	~~P #/ac~~	~~P ppm~~	**~~Phosphorus Procedure/Physiographic Regions~~**
~~948~~	~~412~~	~~206~~	~~182~~	~~91~~	
~~1164~~	~~506~~	~~253~~	~~270~~	**~~135~~**	~~Threshold/ Eastern Shore & Lower Coastal Plain~~
~~1168~~	~~508~~	~~254~~	~~272~~	**~~136~~**	~~Threshold/Middle & Upper Coastal Plain & Piedmont~~
~~1293~~	~~562~~	~~281~~	~~324~~	**~~162~~**	~~Threshold/Ridge and Valley~~
~~1380~~	~~600~~	~~300~~	~~320~~	~~180~~	
~~1610~~	~~700~~	~~350~~	~~454~~	~~227~~	
~~1840~~	~~800~~	~~400~~	~~550~~	~~275~~	
~~2070~~	~~900~~	~~450~~	~~644~~	~~322~~	
~~2332~~	~~1014~~	~~507~~	~~750~~	**~~375~~**	~~P- Index/ Middle & Upper Coastal Plain & Piedmont~~
~~2737~~	~~1190~~	~~595~~	~~916~~	**~~458~~**	~~P-Index/ Eastern Shore & Lower Coastal Plain~~
~~3064~~	~~1332~~	~~666~~	~~1050~~	**~~525~~**	~~P-Index/ Ridge and Valley~~

~~Table 2-3~~
~~Correlation of Soil Analysis Results for Potassium from Mehlich III to Mehlich I~~

~~A & L Laboratories:~~

~~A & L Potassium ppm X 0.71 = Va Tech - K ppm~~

~~Brookside Laboratories:~~

~~Brookside K lbs/acre X 0.36 = Va Tech - K ppm~~

~~Spectrum Analytical Laboratories:~~

~~Spectrum Available Potassium (K) lbs/acre X 0.31 = Va Tech - K ppm~~

~~Waters Agricultural Laboratories:~~

~~Waters Potassium (K) lbs/acre X 0.53 = Va Tech - K ppm~~

~~Section III. Lime Recommendations for Virginia Crops (Except Commercial Turf, Surface-Mined Area Crops, Greenhouse, and Nursery Production)~~

~~Optimum pH for Various Crops~~

~~Tobacco-The target pH 5.8 column shows recommendations applicable to mainly tobacco, where the lower pH is desired.~~

~~Most Agronomic Crops - Lime rates shown for target pH 6.2 column are recommendations that provide an adequate rate of agricultural limestone to adjust the pH to an acceptable range for most agronomic crops.~~

~~Alfalfa - Lime rates shown for target pH 6.8 column are recommendations that provide an adequate rate of agricultural limestone to adjust the pH to an acceptable range for alfalfa.~~

~~Lime Stabilized Biosolids~~

~~The target pH 6.5 column shall be used as one factor to determine maximum rates for lime stabilized biosolids applied **within** the Coastal Plain area. This table shows higher rates of lime stabilized biosolids, than would normally be applied to meet the lime need, to get more use out of the other nutrients contained in the biosolids. Exceeding the rates shown for target pH 6.5 may exceed the desirable pH range, and this may cause induced deficiencies of some nutrients while increasing availability of other nutrients to a toxic level for the crop being grown.~~

~~The target pH 6.8 column shall be used as one factor to determine maximum rates for lime stabilized biosolids **outside** the Coastal Plain area of Virginia. This table shows higher rates of lime stabilized biosolids than would normally be applied to meet the lime need for most agronomic crops, to get more use out of the other nutrients contained in the biosolids. Exceeding the rates shown for target pH 6.8 may exceed the desirable pH range and this may cause induced deficiencies of some nutrients while increasing availability of other nutrients to a toxic level for the crop being grown.~~

~~While these are higher than normal application of lime, application rates of biosolids can not exceed the nitrogen or phosphorus needs, which ever is less, as established in the nutrient management plan.~~

~~Virginia Tech Soil analysis showing a Buffer pH test~~

~~For Virginia Tech soil samples showing a soil pH and a buffer pH use the table designated as Lime Rates based on Va Tech Soil buffer pH. The Lime Recommendations for Virginia Crops table can only be used with soil test buffer pH readings from Virginia Tech soil test.~~

~~**Table 3-1**~~
~~**Lime Recommendations for Virginia Crops (tons/acre)**~~
~~Lime Rates based on Va Tech Soil buffer pH~~

Buffer pH	Target Soil pH 5.2	5.8.	6.2	6.5	6.8	Acidity meq/100g
6.60	0.00	0.00	0.00	0.00	0.00	0.00
6.50	0.00	0.00	0.00	0.00	0.00	0.03
6.40	0.00	0.00	0.00	0.00	0.50	0.06
6.38	0.00	0.00	0.25	0.25	0.50	0.12
6.36	0.00	0.00	0.25	0.25	0.75	0.24
6.34	0.00	0.00	0.25	0.50	0.75	0.36
6.32	0.00	0.00	0.50	0.50	0.75	0.48
6.30	0.00	0.00	0.50	0.75	1.00	0.59
6.28	0.00	0.25	0.75	0.75	1.00	0.71
6.26	0.00	0.25	0.75	1.00	1.25	0.83
6.24	0.00	0.25	0.75	1.00	1.25	0.95
6.22	0.00	0.50	1.00	1.00	1.50	1.07
6.20	0.00	0.50	1.00	1.25	1.50	1.19
6.18	0.00	0.75	1.25	1.25	1.75	1.30
6.16	0.00	0.75	1.25	1.50	1.75	1.42
6.14	0.25	0.75	1.50	1.50	2.00	1.54
6.12	0.25	1.00	1.50	1.75	2.00	1.66
6.10	0.50	1.00	1.50	1.75	2.25	1.78
6.08	0.50	1.25	1.75	2.00	2.25	1.90
6.06	0.50	1.25	1.75	2.00	2.25	2.02
6.04	0.75	1.25	2.00	2.00	2.50	2.13
6.02	0.75	1.50	2.00	2.25	2.50	2.25
6.00	1.00	1.50	2.00	2.25	2.75	2.37
5.95	1.00	1.75	2.25	2.50	3.00	2.67
5.90	1.25	2.00	2.50	3.00	3.25	2.96
5.85	1.50	2.25	2.75	3.25	3.50	3.26
5.80	1.75	2.50	3.25	3.50	3.75	3.56
5.75	2.00	2.75	3.50	3.75	4.25	3.85
5.70	2.25	3.00	3.75	4.00	4.50	4.15
5.65	2.50	3.25	4.00	4.25	4.75	4.45
5.60	2.75	3.50	4.25	4.50	5.00	4.74
5.55	3.00	3.75	4.50	4.75	5.25	5.04
5.50	3.25	4.00	4.75	5.25	5.50	5.34
5.40	3.75	4.50	5.25	5.75	6.25	5.93
5.30	4.25	5.00	5.75	6.25	6.75	6.52

~~Lime recommendations in the table above are based on the use of a liming material equivalent in neutralizing power to 100% $CaCO_3$. For application rates of liming material that is less than 100% neutralizing power of $CaCO_3$ (pure calcium carbonate) use the table in this section, Lime Rate Adjustment for CCE.~~

~~Lime Recommendations Using Other Testing Labs~~

~~For approved labs other than Virginia Tech, use the lime recommendations given by the lab.~~ **~~IF~~** ~~there are no recommendations with the soil analysis, use the table below for A&L Agricultural, Spectrum Analytical, and Brookside Laboratories.~~

~~Table 3-2~~
~~Lime Application Rate[1] (tons/acre) to achieve desired pH based on SMP Buffer Test~~

~~Soil-Buffer pH~~	**~~Target Soil pH~~** 5.2	5.8	6.2	6.5	6.8
6.9	0	0.25	0.50	0.50	0.75
6.8	0.50	0.75	1.00	1.00	1.25
6.7	1.00	1.50	1.50	1.75	2.00
6.6	1.50	1.75	2.00	2.25	2.50
6.5	2.00	2.25	2.50	3.00	3.25
6.4	2.75	3.00	3.25	3.75	4.00
6.3	3.25	3.50	4.00	4.50	5.00

~~[1] Ag-ground lime of 90% plus total neutralizing power (TNP) or $CaCO_3$ equivalent, and fineness of 40% < 100 mesh, 50% < 60 mesh, 70% < 20 mesh and 95% < 8 mesh. Adjustments in the application rate should be made for liming materials with different particle sizes, or neutralizing value.~~

~~Waters Agricultural Laboratories~~ ~~uses the Adams and Evans single buffer method which uses a different table for recommendations than the Mehlich or the SMP tables supplied here. In the event you would have lab reports from Waters Lab, which do not have lime recommendations, contact the lab for recommendations based on their analysis procedure.~~

~~Lime Rate Adjustment for CCE~~

~~Using the lime application rate to achieve the desired target pH based on the soil test buffer pH, use the table below to adjust that rate based on the % CCE of the liming material to be applied.~~

~~Table 3-3~~
~~Lime Application Rate Adjustment Based on % CCE of Material~~

	~~% CCE of Your Liming Material~~										
~~T/ac*~~	**~~50~~**	**~~60~~**	**~~70~~**	**~~80~~**	**~~90~~**	**~~100~~**	**~~110~~**	**~~120~~**	**~~130~~**	**~~140~~**	**~~150~~**
~~0.5~~	~~1.00~~	~~0.75~~	~~0.75~~	~~0.75~~	~~0.50~~	~~0.50~~	~~0.50~~	~~0.50~~	~~0.50~~	~~0.25~~	~~0.25~~
~~1.0~~	~~2.00~~	~~1.75~~	~~1.50~~	~~1.25~~	~~1.00~~	~~1.00~~	~~1.00~~	~~0.75~~	~~0.75~~	~~0.75~~	~~0.75~~
~~1.5~~	~~3.00~~	~~2.50~~	~~2.25~~	~~2.00~~	~~1.75~~	~~1.50~~	~~1.25~~	~~1.25~~	~~1.25~~	~~1.00~~	~~1.00~~
~~2.0~~	~~4.00~~	~~3.25~~	~~2.75~~	~~2.50~~	~~2.25~~	~~2.00~~	~~1.75~~	~~1.75~~	~~1.50~~	~~1.50~~	~~1.25~~
~~2.5~~	~~5.00~~	~~4.25~~	~~3.50~~	~~3.25~~	~~2.75~~	~~2.50~~	~~2.25~~	~~2.00~~	~~2.00~~	~~1.75~~	~~1.75~~
~~3.0~~	~~6.00~~	~~5.00~~	~~4.25~~	~~3.75~~	~~3.25~~	~~3.00~~	~~2.75~~	~~2.50~~	~~2.25~~	~~2.25~~	~~2.00~~
~~3.5~~	~~7.00~~	~~5.75~~	~~5.00~~	~~4.50~~	~~4.00~~	~~3.50~~	~~3.25~~	~~3.00~~	~~2.75~~	~~2.50~~	~~2.25~~
~~4.0~~	~~8.00~~	~~6.75~~	~~5.75~~	~~5.00~~	~~4.50~~	~~4.00~~	~~3.75~~	~~3.25~~	~~3.00~~	~~2.75~~	~~2.75~~

~~* Lime recommendation to adjust pH as determined from soil test analysis.~~

~~Limestone Application Methods~~

~~**Applications of 2 tons or less per acre** - Adding this amount in a single application either before or after plowing will usually give best results. Limestone applied before plowing should be disked into the soil and then plowed. Limestone applied after plowing should be disked into the soil as thoroughly as possible.~~

~~**Applications of more than 2 tons per acre** - For the best results, apply one-half of the limestone, disk into the soil, plow under and then apply the second-half and disk into the soil. This method offers the best incorporation of limestone into the soil and is particularly important when the soil pH is very low and large amounts of limestone are needed.~~

~~**For no-till cropping systems** - Where incorporation of limestone is not possible, single applications should be limited to no more than 2 tons per acre. Where more than 2 tons per acre are recommended (indicating very low pH), limestone should be incorporated as mentioned above for best results. If incorporation is not feasible, apply one-half the total amount one year and the other half the next year.~~

~~**Time of application** - The best time to apply limestone is several months ahead of planting. This allows for more complete reaction of the limestone with the soil. However, if this cannot be done, apply it as early as possible, before the crop is planted. Failing to apply limestone because it could not be applied at the best time is worse than applying it late.~~

Section II~~V~~:~~.~~ Phosphorus Management

Management of Phosphorus

Phosphorus application rates shall be managed to minimize adverse water quality impacts consistent with procedures contained in this section.

Phosphorus applications from inorganic nutrient sources shall not exceed crop nutrient needs over the crop rotation based on a soil test.

Phosphorus applications shall be indicated as zero in nutrient management plans for soils exceeding 65% phosphorus saturation levels as listed in Table 3-1 regardless of the outcome of other procedures specified in this section.

All Soil Test P values in this table are shown as elemental phosphorus, expressed as a Mehlich I Virginia soil test value. Section II. provides conversion formulas for approved labs which report results as Mehlich III.

A single phosphorus application may be recommended to address multiple crops in the crop rotation identified within the nutrient management plan if; (a) the single application does not exceed the sum of the appropriate application rates for individual crops as determined by this subsection.

Table 3-1
Virginia Tech Mehlich 1 Phosphorus (ppm P)
for 65% Phosphorus Saturation Level
where Phosphorus Shall Not be Applied [1]

Region	Mehlich I Soil Test P (ppm)
Eastern Shore and Lower Coastal Plain	>458
Middle and Upper Coastal Plain and Piedmont	>375
Ridge and Valley	>525

[1] Must use approved conversion factors if results are from another lab

Sources: Beck, M.A., L.W. Zelazny, W.L. Daniels, and G.L. Mullins. 2004. "Using the Mehlich-1 Extract to Estimate Soil Phosphorus Saturation for Environmental Risk Assessment." *Soil Science Society of America Journal* 68:1762-1771.

For fields that do not exceed the maximum phosphorus saturation levels listed in Table 3-1, one of the following options must be used to determine maximum organic nutrient source phosphorus applications for fields contained in nutrient management plans. The Environmental Threshold and the Virginia Phosphorus Index Version 2.0 Technical Guide, Revised October 2005, are only applicable to organic nutrient sources. Additionally, plant available nitrogen in nutrient management plans shall not exceed the crop nutrient needs for any individual crop.

~~Phosphorus application rates shall be managed to minimize adverse water quality impacts consistent with procedures contained in this section.~~

- ~~Phosphorus applications from inorganic nutrient sources shall not exceed crop nutrient needs over the crop rotation based on a soil test.~~

- ~~Phosphorus applications shall be indicated as zero in nutrient management plans~~

~~for soils exceeding 65% phosphorus saturation levels as listed in Table 4-1 regardless of the outcome of other procedures specified in this section.~~

~~Table 4-1~~
~~Virginia Tech Mehlich 1 Phosphorus (as ppm P) for 65% Phosphorus Saturation Level where Phosphorus Shall Not be Applied~~
~~(Must use approved conversion factors if results are from another lab)~~

~~**Region**~~	~~**Mehlich I Soil Test P** (ppm)~~
~~Eastern Shore and Lower Coastal Plain~~	~~>458~~
~~Middle and Upper Coastal Plain and Piedmont~~	~~>375~~
~~Ridge and Valley~~	~~>525~~

~~**Note**: All Soil Test P values in this table are shown as elemental phosphorus, expressed as a Mehlich I Virginia soil test value. Section II. provides conversion formulas for approved labs which report results as Mehlich III.~~

- ~~A single phosphorus application may be recommended to address multiple crops in the crop rotation identified within the nutrient management plan if; (a) the single application does not exceed the sum of the appropriate application rates for individual crops as determined by this subsection.~~

~~For fields that do not exceed the maximum phosphorus saturation levels listed in Table 4-1, one of the following options must be used to determine maximum organic nutrient source phosphorus applications for fields contained in nutrient management plans. The Environmental Threshold and the Virginia Phosphorus Index Version 2.0 Technical Guide, Revised October 2005, are only applicable to organic nutrient sources. Additionally, plant available nitrogen in nutrient management plans shall not exceed the crop nutrient needs for any individual crop.~~

Soil Test Method

With this method phosphorus recommendations are made using: (1) the soil test level for the field and (2) recommendations for the crop.

Environmental Threshold Method

Tables 3-2 can be used to determine allowable phosphorus applications rates for organic materials. ~~With this method phosphorus recommendations are made using: (1) the soil test level for the field and (2) recommendations for the crop as shown in Section V.~~

Table 3-2a Phosphorus Environmental Thresholds Eastern Shore and Lower Coastal Plain	
Va Tech Soil Test P ppm	**Maximum Phosphorus Application Rate**
<55	Nitrogen cannot exceed N needs; Phosphorus applications should be managed to reduce adverse water quality impacts.
55 - 135	Nitrogen cannot exceed N needs; Phosphorus applications shall not exceed crop removal.[1]
>135	Nitrogen cannot exceed N needs; no Phosphorus shall be applied during the life of the plan.

Table 3-2b Phosphorus Environmental Thresholds Middle and Upper Coastal Plain and Piedmont	
Va Tech Soil Test P ppm	**Maximum Phosphorus Application Rate**
<55	Nitrogen cannot exceed N needs; Phosphorus applications should be managed to reduce adverse water quality impacts.
55- 136	Nitrogen cannot exceed N needs; Phosphorus applications shall not exceed crop removal.
>136	Nitrogen cannot exceed N needs; no Phosphorus shall be applied during the life of the plan.

Table 3-2c Phosphorus Environmental Thresholds Ridge and Valley	
Va Tech Soil Test P ppm	**Maximum Phosphorus Application Rate**
<55	Nitrogen cannot exceed N needs; Phosphorus applications should be managed to reduce adverse water quality impacts.
55 - 162	Nitrogen cannot exceed N needs; Phosphorus applications shall not exceed crop removal.[1]
>162	Nitrogen cannot exceed N needs; no Phosphorus shall be applied during the life of the plan.

[1] Phosphorus crop removal may be calculated as an application to meet each crop need or a single application per rotation to meet the total removal of all the crop needs for that rotation within the valid life of the nutrient management plan**.** The Virginia Nutrient Management Planning P_2O_5 Removal Table for Grain and Forage Crops, Table 3-7, must be used to calculate the crop removal of phosphorus in this method.

Sources: Beck, M.A., L.W. Zelazny, W.L. Daniels, and G.L. Mullins. 2004. "Using the Mehlich-1 Extract to

Estimate Soil Phosphorus Saturation for Environmental Risk Assessment." *Soil Science Society of America Journal* 68:1762-1771.

~~**Alternative phosphorus application methods when the Soil Test Method cannot address management of organic nutrient sources.**~~

~~Environmental Threshold Method~~

~~Table 4-2 can be used to determine allowable phosphorus applications rates for organic materials.~~

~~Table 4-2~~
~~Phosphorus Environmental Thresholds~~

~~Eastern Shore and Lower Coastal Plain~~	
~~**VPI&SU Soil Test (Mehlich I) P ppm**~~	~~**Maximum Phosphorus Application Rate**~~
~~<55~~	~~Nitrogen cannot exceed N needs; Phosphorus applications should be managed to reduce adverse water quality impacts.~~
~~55 - 135~~	~~Nitrogen cannot exceed N needs; Phosphorus applications shall not exceed crop removal.**~~
~~>135~~	~~Nitrogen cannot exceed N needs; no Phosphorus shall be applied during the life of the plan.~~

~~Middle and Upper Coastal Plain and Piedmont~~	
~~**VPI&SU Soil Test (Mehlich I) P ppm**~~	~~**Maximum Phosphorus Application Rate**~~
~~<55~~	~~Nitrogen cannot exceed N needs; Phosphorus applications should be managed to reduce adverse water quality impacts.~~
~~55- 136~~	~~Nitrogen cannot exceed N needs; Phosphorus applications shall not exceed crop removal.**~~
~~>136~~	~~Nitrogen cannot exceed N needs; no Phosphorus shall be applied during the life of the plan.~~

~~Ridge and Valley~~	
~~**VPI&SU Soil Test (Mehlich I) P ppm**~~	~~**Maximum Phosphorus Application Rate**~~
~~<55~~	~~Nitrogen cannot exceed N needs; Phosphorus applications should be managed to reduce adverse water quality impacts.~~
~~55 - 162~~	~~Nitrogen cannot exceed N needs; Phosphorus applications shall not exceed crop removal**~~
~~>162~~	~~Nitrogen cannot exceed N needs; no Phosphorus shall be applied during the life of the plan~~

~~** Phosphorus crop removal may be calculated as an application to meet each crop need or a single application per rotation to meet the total removal of all the crop needs for that rotation within the valid life of the nutrient management plan. The Virginia Nutrient Management Planning P_2O_5 Removal Table for Grain and Forage Crops, Table 4-7, must be used to calculate the crop removal of phosphorus in this method.~~

~~Notes explaining criteria associated with the Environmental Threshold Method continued on next page.~~

~~Phosphorus Environmental Threshold (notes continued)~~

~~An index to counties and cities by region can be found in the Virginia Phosphorus Index Version 2.0 Technical Guide, Revised October 2005.~~

~~Other laboratories' results shall only be us ed if conversion factors are published in Virginia Nutrient Management Standards and C riteria, Revised July 2014 and the appropriate conversion factor is utilized.~~

~~The Virginia Nutrient Management Planning P_2O_5 Removal Table for Grain and Forage Crops, Table 4-7, must be used to calculate the crop removal of phosphorus in this method.~~

Phosphorus Index Method

This method consists of a series of calculations to determine a Phosphorus Index Value which is then used to determine a management strategy for phosphorus sources that are land applied. The complete description of the Phosphorus Index methodology with supporting instructions and data tables is found in the Virginia Phosphorus Index Version 2.0 Technical Guide, Revised October 2005. T he determination of acceptable phosphorus rates of application with this method must be consistent with the Virginia Phosphorus Index Version 2.0 Technical Guide, Revised October 2005 unless otherwise specified below. Any use of the term "should" contained in the "Summary Interpretation of Phosphorus Index" table and in Table 2 – "Screening criteria based on phosphorus saturation levels for application of the Virginia Phosphorus Index", as contained in the Virginia Phosphorus Index Version 2.0 Technical Guide, Revised October 2005 must be treated as "shall" (mandatory requirements) by certified nutrient management planners.

Phosphorus Index Formula

(Erosion Risk Factor[1] X 8.5) + (Runoff Risk Factor X 8.5) + (Subsurface Risk Factor X 8.5) = Phosphorus Index Value

~~(Erosion Risk Factor* X 8.5)~~

~~+ (Runoff Risk Factor X 8.5)~~

~~+ (Subsurface Risk Factor X 8.5) = Phosphorus Index Value~~

~~Table 4-3~~

Table 3-3

Interpretation of Phosphorus Index Value

P Index Value	Potential Water Quality Impact	Phosphorus Management Strategy based on factors used in P-Index calculations
0-30	Low	Nitrogen cannot exceed N needs; Phosphorus applications should be managed to reduce adverse water quality impacts.
31-60	Medium	Nitrogen cannot exceed N needs; Phosphorus applications shall not exceed 1.5 times crop removal [2]
61-100	High	Nitrogen cannot exceed N needs; Phosphorus applications shall not exceed crop removal [2]
> 100	Very High	Nitrogen cannot exceed N needs; no Phosphorus shall be applied during the life of the plan

~~Interpretation of Phosphorus Index Value~~		
~~P Index Value~~	**~~Potential Water Quality Impact~~**	**~~Phosphorus Management Strategy based on factors used in P-Index calculations~~**
~~0-30~~	~~Low~~	~~Nitrogen cannot exceed N needs; Phosphorus applications should be managed to reduce adverse water quality impacts.~~
~~31-60~~	~~Medium~~	~~Nitrogen cannot exceed N needs; Phosphorus applications shall not exceed 1.5 times crop removal**~~
~~61-100~~	~~High~~	~~Nitrogen cannot exceed N needs; Phosphorus applications shall not exceed crop removal**~~
~~> 100~~	~~Very High~~	~~Nitrogen cannot exceed N needs; no Phosphorus shall be applied during the life of the plan~~

* In the Erosion Risk Factor calculation of the Phosphorus Index the soil loss must be determined by using either the RUSLE 2 method or the "Erosion Risk Assessment Procedure (ERA)" outlined below. If soil loss for use in the Phosphorus Index is developed using RUSLE2, the crop rotations and tillage practices in the nutrient management plan shall be c onsistent with RUSLE2 inputs as documented on the RUSLE2 Profile Erosion Calculation Record.

** Phosphorus crop removal may be calculated as an application to meet each crop need or a single application per rotation to meet the total removal of all the crop needs for that rotation within the valid life of the nutrient management plan. The Virginia Nutrient Management Planning P_2O_5 Removal Table for Grain and Forage Crops, Table 4-7, must be used to calculate the crop removal of phosphorus in this method.

Note: If risk factor components vary within an individual field (for example-a portion of the field has subsurface tile drains, but the remainder of the field has a subsurface risk factor of zero), the planner shall either subdivide the management of the field or use a weighted average of the sub-field areas for the risk factor.

~~*** If risk factor components vary within an individual field (for example-a portion of the field has subsurface tile drains, but the remainder of the field has a subsurface risk factor of zero), the~~

~~planner shall either subdivide the management of the field or use a weighted average of the sub-field areas for the risk factor.~~

Erosion Risk Assessment Procedure (ERA)

The following procedure may be us ed to determine the ERA soil loss value which can be substituted for the soil loss value in the Erosion Risk Factor equation, which is part of the Phosphorus Index determination.

Note~~OTE~~: This Erosion Risk Assessment can only be used to determine this factor and should not be s ubstituted for the RUSLE 2 s~~-~~oil loss method in any other program.

~~$$\left[\sum_{i=1}^{i=n} (\text{Map Unit } TC_i \times \text{Map Unit } K_i \times \%\text{Map Unit}_i) \right] \times TM = \text{Erosion Risk Assessment (ERA)}$$~~

Where: **TC -** Topography and Climate Factor
K - Soil Erodibility Factor
TM -Tillage Management Factor

For each field, estimate the area for each soil map unit and use the table below as a template to calculate the Topography and Climate Factor and the K Factor, using the tables provided, as a weighted average for the field, then apply the remaining factor to the entire field.

~~**Table 4-4**~~
~~**Erosion Risk Assessment Formula**~~

~~Topography & Climate (TC)~~	~~X~~	~~Soil Erodibility (K)~~	~~X~~	~~% Area of Field = Subtotal (express as a decimal)~~	
				~~0.~~	
				~~0.~~	
				~~0.~~	
				~~0.~~	
~~Total of Weighted Averages for TC and K~~					

~~__________ x TM = __________Tons/ac. (ERA soil loss value)~~

Table 3-4 **Erosion Risk Assessment Formula**					
Topography & Climate (TC)	**X**	**Soil Erodibility (K)**	**X**	**% Area of Field = Subtotal (express as a decimal)**	
				0.__	
				0.__	
				0.__	
				0.__	
Total of Weighted Averages for TC and K					

__________ x TM = __________ Tons/ac. (ERA soil loss value)

Erosion Risk Assessment-Topography and Climate Factors

These factors represent a combination of the Topography and Climate factors for the areas of Virginia listed below designated by map unit slope. See Appendix 1 for County location information.

Table 3-5a
Topography and Climate Factors Coastal Plain (East of I-95)

Soil Survey Map Unit Slope	Hay/Pasture TC	Crop TC
A	0.40	0.44
B	1.24	1.41
C	2.48	2.78
D	4.35	4.92
E	7.80	8.57
F	11.58	10.87

Table 3-5b
Northern Piedmont (North of James River-West of I-95)

Soil Survey Map Unit Slope	Hay/Pasture TC	Crop TC
A	0.29	0.33
B	0.96	1.17
C	2.40	2.67
D	4.63	5.17
E	7.17	7.20
F	11.33	11.07

Table 3-5c
Southern Piedmont (South of James River-West of I-95)

Soil Survey Map Unit Slope	Hay/Pasture TC	Crop TC
A	0.33	0.37
B	1.08	1.32
C	2.69	3.00
D	5.20	5.80
E	8.05	8.09
F	12.72	12.43

Table 3-5d
Mountain and Valley

Soil Survey Map Unit Slope	Hay/Pasture TC	Crop TC
A	0.26	0.28
B	0.85	0.97
C	2.19	2.40
D	4.35	4.59
E	7.99	8.42
F	11.20	11.25

~~**Table 4-5**~~
~~**Topography and Climate Factors**~~

~~**Coastal Plain (East of I-95)**~~

~~Soil Survey Map Unit Slope~~	~~Hay/Pasture TC~~	~~Crop TC~~
~~A~~	~~.40~~	~~.44~~
~~B~~	~~1.24~~	~~1.41~~
~~C~~	~~2.48~~	~~2.78~~
~~D~~	~~4.35~~	~~4.92~~
~~E~~	~~7.80~~	~~8.57~~
~~F~~	~~11.58~~	~~10.87~~

~~Northern Piedmont (North of James River-West of I-95)~~

~~Soil Survey Map Unit Slope~~	~~Hay/Pasture TC~~	~~Crop TC~~
~~A~~	~~.29~~	~~.33~~
~~B~~	~~.96~~	~~1.17~~
~~C~~	~~2.40~~	~~2.67~~
~~D~~	~~4.63~~	~~5.17~~
~~E~~	~~7.17~~	~~7.20~~
~~F~~	~~11.33~~	~~11.07~~

~~Southern Piedmont (South of James River-West of I-95)~~

~~Soil Survey Map Unit Slope~~	~~Hay/Pasture TC~~	~~Crop TC~~
~~A~~	~~.33~~	~~.37~~
~~B~~	~~1.08~~	~~1.32~~
~~C~~	~~2.69~~	~~3.00~~
~~D~~	~~5.20~~	~~5.80~~
~~E~~	~~8.05~~	~~8.09~~
~~F~~	~~12.72~~	~~12.43~~

~~Mountain and Valley~~

~~Soil Survey Map Unit Slope~~	~~Hay/Pasture TC~~	~~Crop TC~~
~~A~~	~~.26~~	~~.28~~
~~B~~	~~.85~~	~~.97~~
~~C~~	~~2.19~~	~~2.40~~
~~D~~	~~4.35~~	~~4.59~~
~~E~~	~~7.99~~	~~8.42~~
~~F~~	~~11.20~~	~~11.25~~

K Factor

This factor represents the soil erodibility factor based on soil texture and designated by county and map unit symbol. The K factor for specific soils can be found in the USDA-NRCS electronic Field Office Technical Guide.

Erosion Risk Assessment - Tillage Management Factors

This factor represents the Tillage Management designated by crop or crop rotation being grown.

Table 3-6
Tillage Management

Annual Crop Rotation	Tilled	Mixed [1]	No-till
Corn Silage - Continuous	30	-	15
Corn Silage / Small Grain Silage	22	19	16
Corn Silage / Small Grain	18	9	7
Corn Grain - Continuous	12	-	3
Corn Grain / Small Grain	6	5	1
Corn Grain / Small Grain Silage	13	7	6
Small Grain / DC Soybeans	10	6	4
Soybeans – Full Season	17	-	8
Peanuts	19	-	-
Peanuts / Small Grain	11	8	3
Cotton	20	-	12
Cotton / Small Grain	11	8	3
Tobacco	46	-	-
Tobacco / Small Grain	30	25	18
Vegetables	35	-	16
Vegetables / Small Grain	20	16	8
Other Row Crops (Grain)	17	-	8
Other Summer Annuals with Small Grain	13	8	7
Other Summer Annuals with Small Grain Silage	22	19	16
Hay – Legume (maintenance)	-	-	2
Hay – Grass or Mixed (maintenance)	-	-	1
Pasture < 50% cover or heavily grazed	-	-	4
Pasture 50-75% cover not heavily grazed	-	-	2
Pasture >75% cover and lightly grazed	-	-	1
Hay or Pasture Establishment[2]	11	-	3

[1] Mixed is double crop with one crop tilled and one crop no-till
[2] For Fall establishment-use previous crop sequence TM Factor or Establishment Factor whichever is greater. For Spring establishment use number shown

.

Notes: The TM factor is determined by the rotation and the tillage types, regardless of the beginning season of the plan.

Add the TM factor for each year of the rotation, not to exceed a the plan life, and divide by the number of years to determine the TM factor to be used for that field during the life of the plan.

If tillage or crop rotation is changed, the TM must be re-calculated and the P-Index must be re-calculated.

Corn Grain assumes all stalks remain on field after harvest.

Small Grain is a cover crop or grain harvest only, no straw removal. If straw is removed use silage TM Factor

~~Table 4-6 Tillage Management~~

~~Annual Crop Rotation~~	~~Tilled~~	~~Mixed *~~	~~No-till~~
~~Corn Silage - Continuous~~	~~30~~	~~-~~	~~15~~
~~Corn Silage / Small Grain Silage~~	~~22~~	~~19~~	~~16~~
~~Corn Silage / Small Grain~~	~~18~~	~~9~~	~~7~~
~~Corn Grain - Continuous~~	~~12~~	~~-~~	~~3~~
~~Corn Grain / Small Grain~~	~~6~~	~~5~~	~~1~~
~~Corn Grain / Small Grain Silage~~	~~13~~	~~7~~	~~6~~
~~Small Grain / DC Soybeans~~	~~10~~	~~6~~	~~4~~
~~Soybeans – Full Season~~	~~17~~	~~-~~	~~8~~
~~Peanuts~~	~~19~~	~~-~~	~~-~~
~~Peanuts / Small Grain~~	~~11~~	~~8~~	~~3~~
~~Cotton~~	~~20~~	~~-~~	~~12~~
~~Cotton / Small Grain~~	~~11~~	~~8~~	~~3~~
~~Tobacco~~	~~46~~	~~-~~	~~-~~
~~Tobacco / Small Grain~~	~~30~~	~~25~~	~~18~~
~~Vegetables~~	~~35~~	~~-~~	~~16~~
~~Vegetables / Small Grain~~	~~20~~	~~16~~	~~8~~
~~Other Row Crops (Grain)~~	~~17~~	~~-~~	~~8~~
~~Other Summer Annuals with Small Grain~~	~~13~~	~~8~~	~~7~~
~~Other Summer Annuals with Small Grain Silage~~	~~22~~	~~19~~	~~16~~
~~Hay – Legume (maintenance)~~	~~-~~	~~-~~	~~2~~
~~Hay – Grass or Mixed (maintenance)~~	~~-~~	~~-~~	~~1~~
~~Pasture < 50% cover or heavily grazed~~	~~-~~	~~-~~	~~4~~
~~Pasture 50-75% cover not heavily grazed~~	~~-~~	~~-~~	~~2~~
~~Pasture >75% cover and lightly grazed~~	~~-~~	~~-~~	~~1~~
~~Hay or Pasture Establishment**~~	~~11~~	~~-~~	~~3~~

~~***Mixed** = double crop with one crop tilled and one crop no-till~~

~~**Fall Establishment-use previous crop sequence TM Factor or Establishment Factor – whichever is greater. For Spring Establishment use number shown.~~

- ~~The TM factor is determined by the rotation and the tillage types, regardless of the beginning season of the plan.~~
  ~~(Notes continued on next page)~~

- ~~Add the TM factor for each year of the rotation, not to exceed a three year plan life, and divide by the number of years to determine the TM factor to be used for that field during the life of the plan.~~
- ~~If the crop rotation is not included in the table above, RUSLE 2 must be used to determine the soil loss for that rotation.~~
- ~~If tillage or crop rotation is changed, the TM must be re-calculated and the P-Index must be re-calculated.~~
- ~~Corn Grain assumes all stalks remain on field after harvest.~~
- ~~Small Grain = cover crop or grain harvest only, no straw removal. If straw is removed use silage TM Factor~~

Crop P_2O_5 Removal

Use the following table to determine the pounds of P_2O_5 removed per unit of harvest.

~~Table 4-7~~

~~Virginia Nutrient Management Planning P2O5 Removal Table for Grain and Forage Crops~~

~~Use the following table to determine the pounds of P2O5 removed per unit of harvest. See Note 1 for yield moisture criteria.~~

Table 3-7a

Virginia Nutrient Management Planning P_2O_5 Removal Table for Grains

CROP	YIELD UNIT	Lbs. P_2O_5 PER YIELD UNIT
Barley (cover crop)	NA	0
Barley	bushels	0.40
Barley straw (per bushel grain)	bushels	0.11
Barley-soybean double crop	bushels	**
Buckwheat	bushels	0.36
Canola	bushels	1.3
Corn	bushels	0.38
Oat (cover crop)	NA	0
Oat	bushels	0.33
Oat straw (per bushel grain)	bushels	0.09
Proso millet	bushels	0.39
Rye (cover crop)	NA	0
Rye	bushels	0.45
Rye straw (per bushel grain)	bushels	0.17
Sorghum	bushels	0.4
Soybean	bushels	0.89
Sunflower	tons	27
Triticale (cover crop)	NA	0
Triticale	bushels	0.39
Wheat (cover crop)	NA	0
Wheat	bushels	0.51
Wheat straw (per bushel grain)	bushels	0.11

Table 3-7b Virginia Nutrient Management Planning P_2O_5 Removal Table for Silage		
CROP	YIELD UNIT	Lbs. P_2O_5 PER YIELD UNIT
Barley silage	tons	5.1
Corn silage	tons	4.2
Grass silage	tons	5.7
Oats silage	tons	5
Rye silage	tons	5.6
Sorghum silage	tons	5.4
Soybean silage	tons	10
Triticale silage	tons	5.6
Wheat silage	tons	4.2

Table 3-7c Virginia Nutrient Management Planning P_2O_5 Removal Table for Forages		
CROP	YIELD UNIT	Lbs. P_2O_5 PER YIELD UNIT
Alfalfa hay		14.5*
Alfalfa-grass hay	tons	14.5*
Bermudagrass hay	tons	10.4*
Bermudagrass pasture	NA	****
Birdsfoot trefoil	tons	21*
Bluegrass	tons	18*
Bromegrass	tons	13*
Bluestem species	tons	10*
Clover and grass	tons	14*
Fescue grass hay	tons	16*
Fescue grass-Ladino clover hay	tons	14*
Gamagrass	tons	11
Hay/Pasture	***	16*
Hairy vetch	tons	14
Indiangrass	tons	10
Legume cover crop	NA	0

Table 3-7c Virginia Nutrient Management Planning P_2O_5 Removal Table for Forages		
CROP	YIELD UNIT	Lbs. P_2O_5 PER YIELD UNIT
Lespedeza	tons	10*
Millet	tons	8.4
Native/unimproved pasture	NA	****
Orchardgrass hay	tons	16*
Orchardgrass hay-Ladino clover		16*
Orchardgrass/Fescue pasture		****
Perennial ryegrass		17*
Red clover	tons	10*
Red clover-grass hay	tons	14*
Reed canarygrass	tons	12*
Small grain hay	tons	10
Sorghum	tons	8.4
Sorghum x sudangrass (Sudax)	tons	10
Sorghum-sudan, millet, sudan (hay)	tons	10
Soybean and sorghum	tons	9.2
Soybean hay	tons	10
Soybean and millet	tons	9.2
Soybean and Sudangrass	tons	10
Switchgrass	tons	10*
Sudangrass	tons	10
Tall fescue hay	tons	16*
Timothy	tons	14*
Weeping lovegrass	tons	10*

Table 3-7d Virginia Nutrient Management Planning P_2O_5 Removal Table for Seed Crops		
CROP	YIELD UNIT	Lbs. P_2O_5 PER YIELD UNIT

Crimson clover seed	pounds	0.018
Lespedeza seed	pounds	0.016
Red clover seed	pounds	0.016
White clover seed	pounds	0.030

Table 3-7e
Virginia Nutrient Management Planning P_2O_5 Removal Table for Vegetables

CROP	YIELD UNIT	Lbs. P_2O_5 PER YIELD UNIT
Asparagus	cwt	0.13
Beet (root)	cwt	0.092
Beet (top)	cwt	0.12
Broccoli	cwt	0.18
Brussels sprout	cwt	0.29
Cabbage	tons	1.8
Carrot	cwt	0.092
Cauliflower	cwt	0.14
Celery	cwt	0.083
Chive	cwt	0.12
Collard	cwt	0.13
Cucumber	tons	1.1
Eggplant	cwt	0.050
Endive	cwt	0.051
Escarole	cwt	0.032
Garlic	cwt	0.39
Kale	cwt	0.13
Leek	cwt	0.080
Lettuce (head)	cwt	0.79
Lettuce (leaf)	cwt	0.10
Lima bean	cwt	0.34
Mustard green	cwt	0.10
Okra	cwt	0.15
Onion (dry)	cwt	0.60
Onion (green)	cwt	0.084
Parsley	cwt	0.092
Parsnip	cwt	0.16
Pea	cwt	0.57

Table 3-7e Virginia Nutrient Management Planning P_2O_5 Removal Table for Vegetables		
CROP	YIELD UNIT	Lbs. P_2O_5 PER YIELD UNIT
Pepper	cwt	0.066
Potato	cwt	0.14
Pumpkin	tons	1.7
Radish	cwt	0.064
Rutabaga	cwt	0.092
Snap bean	cwt	0.23
Spinach	cwt	0.15
Squash (summer)	cwt	0.064
Squash (winter)	cwt	0.079
Sweet corn	cwt	0.14
Sweet potato	cwt	0.12
Tomato	tons	2.0
Turnip (root)	cwt	0.065
Turnip (green)	cwt	0.14

Table 3-7f Virginia Nutrient Management Planning P_2O_5 Removal Table for Fruits		
CROP	YIELD UNIT	Lbs. P_2O_5 PER YIELD UNIT
Apple	bushels	0.020
Grape	tons	2.0
Honeydew melon	tons	1.3
Muskmelon	tons	3.5
Peach	bushels	0.033
Watermelon	tons	0.47
Strawberry	cwt	0.043

Table 3-7g Virginia Nutrient Management Planning P_2O_5 Removal Table for Miscellaneous		
CROP	YIELD UNIT	Lbs. P_2O_5 PER YIELD UNIT
Cotton (seed & lint)	tons	26

Cotton (stalk, leaf & bur)	tons	10
Tobacco (leaf & stalk - based on harvest leaf weight)	lb leaves	0.009
Peanuts	pounds	0.007

* Use 1/2 of the yield from VALUES if planted in the spring, 0 if planted in the fall, to calculate crop removal for the establishment year.
** For double crops, add removal for each crop
*** Use 2/3 hay yield from VALUES or use the actual yield from field records, to calculate crop removal.
**** Use 30 lbs P_2O_5 Removal for Productivity Group I
Use 30 lbs P_2O_5 Removal for Productivity Group II
Use 25 lbs P_2O_5 Removal for Productivity Group III
Use 20 lbs P_2O_5 Removal for Productivity Group IV

NOTE: Yields are based on the following moisture levels: grain-corn-15.5%, wheat-13.5%, barley-14%, oats-14%, grain sorghum-13%, soybeans-14.5%; all silage-65%; all hay-15%. For all other crops, yield should be based on moisture at which, no deduction would be accessed when sold, crop can be safely stored without any additional drying, or in the case of fresh market vegetables crop has reached marketable stage of growth.

Source: Brann, D.E. et al. 2023. Agronomy Handbook. Publication 424-100 (SPES-299P). Virginia Cooperative Extension, Virginia Tech, Blacksburg, VA. Available at: www.pubs.ext.vt.edu/content/dam/pubs_ext_vt_edu/424/424-100/spes-299.pdf

~~CROP~~	~~YIELD UNIT~~	~~LBS P_2O_5 PER YIELD UNIT~~
~~GRAINS~~		
~~Barley (cover crop)~~	~~NA~~	~~0~~
~~Barley~~	~~bushels~~	~~0.40~~
~~Barley straw (per bushel grain)~~	~~bushels~~	~~0.11~~
~~Barley-soybean dbl crop~~	~~bushels~~	~~**~~
~~Buckwheat~~	~~bushels~~	~~0.36~~
~~Canola~~	~~bushels~~	~~1.3~~
~~Corn~~	~~bushels~~	~~0.38~~
~~Oat (cover crop)~~	~~NA~~	~~0~~
~~Oat~~	~~bushels~~	~~0.33~~
~~Oat straw (per bushel grain)~~	~~bushels~~	~~0.09~~
~~Proso millet~~	~~bushels~~	~~0.39~~
~~Rye (cover crop)~~	~~NA~~	~~0~~
~~Rye~~	~~bushels~~	~~0.45~~
~~Rye straw (per bushel grain)~~	~~bushels~~	~~0.17~~
~~Sorghum~~	~~bushels~~	~~0.4~~
~~Soybean~~	~~bushels~~	~~0.89~~
~~Sunflower~~	~~tons~~	~~27~~

~~Triticale (cover crop)~~	~~NA~~	~~0~~
~~Triticale~~	~~bushels~~	~~0.39~~
~~Wheat (cover crop)~~	~~NA~~	~~0~~
~~Wheat~~	~~bushels~~	~~0.51~~
~~Wheat straw (per bushel grain)~~	~~bushels~~	~~0.11~~

~~CROP~~	~~YIELD UNIT~~	~~LBS P_2O_5 PER YIELD UNIT~~
~~**SILAGE**~~		
~~Barley silage~~	~~tons~~	~~5.1~~
~~Corn silage~~	~~tons~~	~~4.2~~
~~Grass silage~~	~~tons~~	~~5.7~~

~~Table 4-7~~
~~Virginia Nutrient Management Planning P_2O_5 Removal Table for Grain and Forage Crops~~

~~CROP~~	~~YIELD UNIT~~	~~LBS P_2O_5 PER YIELD UNIT~~
~~SILAGE~~		
~~Oats silage~~	~~tons~~	~~5~~
~~Rye silage~~	~~tons~~	~~5.6~~
~~Sorghum silage~~	~~tons~~	~~5.4~~
~~Soybean silage~~	~~tons~~	~~10~~
~~Triticale silage~~	~~tons~~	~~5.6~~
~~Wheat silage~~	~~tons~~	~~4.2~~

~~CROP~~	~~YIELD UNIT~~	~~LBS P_2O_5 PER YIELD UNIT~~
~~FORAGES~~		
~~Alfalfa hay~~	~~tons~~	~~14.5*~~
~~Alfalfa-grass hay~~	~~tons~~	~~14.5*~~
~~Bermudagrass hay~~	~~tons~~	~~10.4*~~
~~Bermudagrass pasture~~	~~NA~~	~~****~~
~~Birdsfoot trefoil~~	~~tons~~	~~21*~~
~~Bluegrass~~	~~tons~~	~~18*~~
~~Bromegrass~~	~~tons~~	~~13*~~
~~Bluestem species~~	~~tons~~	~~10*~~
~~Clover and grass~~	~~tons~~	~~14*~~
~~Fescue grass hay~~	~~tons~~	~~16*~~
~~Fescue grass-Ladino clover hay~~	~~tons~~	~~14*~~
~~Gamagrass~~	~~tons~~	~~11~~
~~Hay/Pasture~~	~~***~~	~~16*~~
~~Hairy vetch~~	~~tons~~	~~14~~
~~Indiangrass~~	~~tons~~	~~10~~
~~Legume cover crop~~	~~NA~~	~~0~~
~~Lespedeza~~	~~tons~~	~~10*~~
~~Millet~~	~~tons~~	~~8.4~~
~~Native/unimproved pasture~~	~~NA~~	~~****~~
~~Orchardgrass hay~~	~~tons~~	~~16*~~
~~Orchardgrass hay-Ladino clover~~	~~tons~~	~~16*~~
~~Orchardgrass/Fescue pasture~~	~~NA~~	~~****~~
~~Perennial ryegrass~~	~~tons~~	~~17*~~

~~Table 4-7~~
~~Virginia Nutrient Management Planning P_2O_5 Removal Table for Grain and Forage Crops~~

~~CROP~~	~~YIELD UNIT~~	~~LBS P_2O_5 PER YIELD UNIT~~
~~FORAGES~~		
~~Red clover~~	~~tons~~	~~10*~~
~~Red clover-grass hay~~	~~tons~~	~~14*~~
~~Reed canarygrass~~	~~tons~~	~~12*~~
~~Small grain hay~~	~~tons~~	~~10~~
~~Sorghum~~	~~tons~~	~~8.4~~
~~Sorghum x sudangrass (Sudax)~~	~~tons~~	~~10~~
~~Sorghum-sudan, millet, sudan (hay)~~	~~tons~~	~~10~~
~~Soybean and sorghum~~	~~tons~~	~~9.2~~
~~Soybean hay~~	~~tons~~	~~10~~
~~Soybean and millet~~	~~tons~~	~~9.2~~
~~Soybean and Sudangrass~~	~~tons~~	~~10~~
~~Switchgrass~~	~~tons~~	~~10*~~
~~Sudangrass~~	~~tons~~	~~10~~
~~Tall fescue hay~~	~~tons~~	~~16*~~
~~Timothy~~	~~tons~~	~~14*~~
~~Weeping lovegrass~~	~~tons~~	~~10*~~

~~CROP~~	~~YIELD UNIT~~	~~LBS P_2O_5 PER YIELD UNIT~~
~~SEED CROPS~~		
~~Crimson clover seed~~	~~pounds~~	~~0.018~~
~~Lespedeza seed~~	~~pounds~~	~~0.016~~
~~Red clover seed~~	~~pounds~~	~~0.016~~
~~White clover seed~~	~~pounds~~	~~0.030~~

~~CROP~~	~~YIELD UNIT~~	~~LBS P_2O_5 PER YIELD UNIT~~
~~VEGETABLES~~		
~~Asparagus~~	~~cwt~~	~~0.13~~
~~Beet (root)~~	~~cwt~~	~~0.092~~
~~Beet (top)~~	~~cwt~~	~~0.12~~
~~Broccoli~~	~~cwt~~	~~0.18~~
~~Brussels sprout~~	~~cwt~~	~~0.29~~
~~Cabbage~~	~~tons~~	~~1.8~~

~~Table 4-7~~
~~Virginia Nutrient Management Planning P_2O_5 Removal Table for Grain and Forage Crops~~

~~CROP~~	~~YIELD UNIT~~	~~LBS P_2O_5 PER YIELD UNIT~~
~~**VEGETABLES**~~		
~~Carrot~~	~~cwt~~	~~0.092~~
~~Cauliflower~~	~~cwt~~	~~0.14~~
~~Celery~~	~~cwt~~	~~0.083~~
~~Chive~~	~~cwt~~	~~0.12~~
~~Collard~~	~~cwt~~	~~0.13~~
~~Cucumber~~	~~tons~~	~~1.1~~
~~Eggplant~~	~~cwt~~	~~0.050~~
~~Endive~~	~~cwt~~	~~0.051~~
~~Escarole~~	~~cwt~~	~~0.032~~
~~Garlic~~	~~cwt~~	~~0.39~~
~~Kale~~	~~cwt~~	~~0.13~~
~~Leek~~	~~cwt~~	~~0.080~~
~~Lettuce (head)~~	~~cwt~~	~~0.79~~
~~Lettuce (leaf)~~	~~cwt~~	~~0.10~~
~~Lima bean~~	~~cwt~~	~~0.34~~
~~Mustard green~~	~~cwt~~	~~0.10~~
~~Okra~~	~~cwt~~	~~0.15~~
~~Onion (dry)~~	~~cwt~~	~~0.60~~
~~Onion (green)~~	~~cwt~~	~~0.084~~
~~Parsley~~	~~cwt~~	~~0.092~~
~~Parsnip~~	~~cwt~~	~~0.16~~
~~Pea~~	~~cwt~~	~~0.57~~
~~Pepper~~	~~cwt~~	~~0.066~~
~~Potato~~	~~cwt~~	~~0.14~~
~~Pumpkin~~	~~tons~~	~~1.7~~
~~Radish~~	~~cwt~~	~~0.064~~
~~Rutabaga~~	~~cwt~~	~~0.092~~
~~Snap bean~~	~~cwt~~	~~0.23~~
~~Spinach~~	~~cwt~~	~~0.15~~
~~Squash (summer)~~	~~cwt~~	~~0.064~~
~~Squash (winter)~~	~~cwt~~	~~0.079~~
~~Sweet corn~~	~~cwt~~	~~0.14~~
~~Sweet potato~~	~~cwt~~	~~0.12~~

~~**Table 4-7**~~

~~**Virginia Nutrient Management Planning P_2O_5 Removal Table for Grain and Forage Crops**~~

~~CROP~~	~~YIELD UNIT~~	~~LBS P_2O_5 PER YIELD UNIT~~
~~**VEGETABLES**~~		
~~Tomato~~	~~tons~~	~~2.0~~
~~Turnip (root)~~	~~cwt~~	~~0.065~~
~~Turnip (green)~~	~~cwt~~	~~0.14~~

~~CROP~~	~~YIELD UNIT~~	~~LBS P_2O_5 PER YIELD UNIT~~
~~**FRUITS**~~		
~~Apple~~	~~bushels~~	~~0.020~~
~~Grape~~	~~tons~~	~~2.0~~
~~Honeydew melon~~	~~tons~~	~~1.3~~
~~Muskmelon~~	~~tons~~	~~3.5~~
~~Peach~~	~~bushels~~	~~0.033~~
~~Watermelon~~	~~tons~~	~~0.47~~
~~Strawberry~~	~~cwt~~	~~0.043~~

~~CROP~~	~~YIELD UNIT~~	~~LBS P_2O_5 PER YIELD UNIT~~
~~**MISCELLANEOUS**~~		
~~Cotton (seed & lint)~~	~~tons~~	~~26~~
~~Cotton (stalk, leaf & bur)~~	~~tons~~	~~10~~
~~Tobacco (leaf & stalk - based on harvest leaf weight)~~	~~lb leaves~~	~~.009~~
~~Peanuts~~	~~pounds~~	~~.007~~

~~**NOTES:**~~

~~1.Yields are based on the following moisture levels: grain-corn-15.5%, wheat-13.5%, barley-14%, oats-14%, grain sorghum-13%, soybeans-14.5%; all silage-65%; all hay-15%. For all other crops, yield should be based on moisture at which, no deduction would be accessed when sold, crop can be safely stored without any additional drying, or in the case of fresh market vegetables crop has reached marketable stage of growth.~~

~~* Use 1/2 of the yield from VALUES if planted in the spring, 0 if planted in the fall, to calculate crop removal for the establishment year.~~

~~** For double crops, add removal for each crop~~

~~*** Use 2/3 hay yield from VALUES or use the actual yield from field records, to calculate crop removal.~~

~~**** 30 lbs P_2O_5 Removal for Productivity Group I~~
~~30 lbs P_2O_5 Removal for Productivity Group II~~
~~25 lbs P_2O_5 Removal for Productivity Group III~~
~~20 lbs P_2O_5 Removal for Productivity Group IV~~

~~Section V. Crop Nutrient Needs~~

~~Phosphorus and potash soil test levels in this table are based on Mehlich I soil test results. Only soil test levels correlated to Mehlich I using methods contained in this document are acceptable.~~

~~Corn Grain Nutrient Needs*~~

~~Productivity Group~~	~~N - Nutrient Needs~~
~~IA~~	~~180~~
~~IB~~	~~170~~
~~IIA~~	~~160~~
~~IIB~~	~~150~~
~~IIIA~~	~~140~~
~~IIIB~~	~~130~~
~~IVA~~	~~120~~
~~IVB~~	~~100~~
~~V~~	~~80~~

~~*See nitrogen management recommendations for Corn.~~

~~Soil Productivity Groups I , II~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~100-140~~	~~100-140~~
~~M~~	~~60-100~~	~~60-100~~
~~H~~	~~20-60~~	~~20-60~~
~~VH~~	~~0~~	~~0~~

~~Soil Productivity Groups III, IV, V~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~80 -120~~	~~80 -120~~
~~M~~	~~40 - 80~~	~~40 - 80~~
~~H~~	~~20 - 40~~	~~20 - 40~~
~~VH~~	~~0~~	~~0~~

~~Corn Silage Nutrient Needs*~~

~~Productivity Group~~	~~N - Nutrient Needs (a)~~
~~IA~~	~~200~~
~~IB~~	~~185~~
~~IIA~~	~~175~~
~~IIB~~	~~165~~
~~IIIA~~	~~155~~
~~IIIB~~	~~145~~
~~IVA~~	~~130~~
~~IVB~~	~~110~~
~~V~~	~~90~~

~~*See nitrogen management recommendations for Corn.~~

~~Corn Silage Nutrient Needs (cont)~~

~~Soil Productivity Groups I , II~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~140-200~~	~~240-300~~
~~M~~	~~100-140~~	~~180-240~~
~~H~~	~~40-100~~	~~100-180~~
~~VH~~	~~0~~	~~0~~

~~Soil Productivity Groups III , VI, V~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~120-160~~	~~200-240~~
~~M~~	~~80-120~~	~~140-200~~
~~H~~	~~40-80~~	~~60-140~~
~~VH~~	~~0~~	~~0~~

~~When using documented farmer records, corn silage yield may be calculated using the following formula: Corn Grain Yield (bu/ac) X 0.0985 + 7.6964 = **Corn Silage Yield** Tons/acre.~~

~~Nitrogen Management Recommendations for Corn~~

~~On soils with a High nitrogen loss risk, at least 50% of the inorganic nitrogen applications shall be applied as a sidedress application. On Moderate and Low nitrogen loss risk soils this management method is preferred, but not required. The combination of row starter, at planting nitrogen applications and sidedress applications cannot exceed the nitrogen need listed for that crop in that field.~~

~~It is recommended that fields which contain high environmental risk soils for nitrogen loss where organic nutrient sources are used to meet most of the nitrogen need for corn should include a split application of nitrogen which is at least 33% of the nitrogen needs to be applied as a sidedress application. If no pre-plant nitrogen will be broadcast and planting conditions exist where the cold soil temperatures may be limiting mineralization of nitrogen, starter nitrogen may aid in plant establishment and ear ly season growth. The combination of row starter, at planting nitrogen applications, plant available nitrogen supplied from organic sources, and sidedress applications cannot exceed the nitrogen need listed for that crop in that field.~~

~~For cereal silage/corn silage rotations only, 20 lbs/acre of nitrogen may be applied as part of a banded starter application at planting, in addition to the nitrogen need designated for the field. IF no starter is applied as a banded appl ication, only the nitrogen need des ignated for the field shall be recommended.~~

~~To determine nitrogen needs for corn yields above those listed in Table 1-2, Estimated Yields in Bushels or Tons per Acre of Various Non-Irrigated Crops for Identified Soil Productivity Groups, use 1 lb of nitrogen per bushel for grain yields, and 1.1 lbs of nitrogen per bushel of grain yield for silage corn tonnage converted back to bushels using the formula:~~

$$\cancel{\frac{(\text{corn silage tons/acre} - 7.6964)}{0.0985} = \text{Corn grain yield}}$$

~~Irrigated Corn~~

~~These expected yields and nitrogen recommendations in the table below should not be used for fields where manure is applied through an irrigation system unless supplemental clean water irrigation is utilized, since manure applications should usually occur prior to the times of peak moisture demand by crops to allow time for mineralization. Irrigated nitrogen recommendations shall only be used when the water source can supply at least 6 inches of water to the entire field per growing season.~~

~~Corn Grain production using Center Pivot Irrigation *~~

~~Soil Management Groups~~	~~Expected Corn Yield, Bu/Ac~~	~~N - Nutrient Needs~~
~~A,B,D~~	~~210~~	~~210~~
~~C,E,F,G,J,K,L,M,N,O,Q,R,S,T~~	~~200~~	~~200~~
~~I,DD~~	~~190~~	~~190~~
~~V,W,X~~	~~180~~	~~180~~
~~AA,BB,II~~	~~170~~	~~170~~
~~Y~~	~~160~~	~~160~~
~~KK~~	~~140~~	~~140~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~130 - 170~~	~~130 - 170~~
~~M~~	~~80 - 120~~	~~80 - 120~~
~~H~~	~~30 - 70~~	~~30 - 70~~
~~VH~~	~~0~~	~~0~~

~~*An adjustment to irrigated grain yields is needed for traveling gun systems, because typically yield response will be highly variable depending upon management of the system. A reasonable estimate of planning yield is 90% of the above estimates for properly scheduled irrigation.~~

~~Corn Silage Production using Traveling Gun Irrigation~~

~~Soil Management Groups~~	~~Expected Corn Yield, Tons/Ac~~	~~N - Nutrient Needs~~
~~A,B,D~~	~~26.3~~	~~210~~
~~C,E,F,G,J,K,L,M,N,O,Q,R,S,T~~	~~25.4~~	~~200~~
~~I,DD~~	~~24.5~~	~~190~~
~~V,W,X~~	~~23.6~~	~~180~~
~~AA,BB,II~~	~~22.7~~	~~170~~
~~Y~~	~~21.9~~	~~160~~
~~KK~~	~~20.1~~	~~140~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~140-200~~	~~240-300~~
~~M~~	~~100-140~~	~~180-240~~
~~H~~	~~40-100~~	~~100-180~~
~~VH~~	~~0~~	~~0~~

~~**<u>Notes for all irrigated corn silage and corn grain fields</u>:**~~

~~Irrigation of soils in the following soil management groups is not recommended; factors other than water-holding capacity may be the yield limiting factor; H, P, U, Z, CC, EE, FF, GG, HH, LL, MM, NN, OO, PP, QQ. Use dryland yields in Table 1-2.~~

~~Nitrogen use efficiency by irrigated corn can be increased by splitting the total sidedress rate of nitrogen into two applications, with the second of the two applications occurring just before the corn is too tall to drive through with the application equipment. If this second application is applied through the irrigation system, it should be applied about 7-10 days before silking, or split into smaller multiple applications.~~

~~Pre-Sidedress Soil Nitrate Test (PSNT)~~

~~**<u>Sample collection essentials for PSNT for corn:</u>**~~

~~Select fields where organic sources of nitrogen have been applied, according to the timing criteria listed in the Virginia Nutrient Management Training and Certification Regulations under Nutrient Application Timing, to supply nitrogen to the present corn crop~~

~~**Sample collection** - At least 10-20 cores per field, 12 inches deep, between rows to avoid starter bands and areas where roots have not depleted nitrogen.~~

~~**Sample time** - corn should be 10" to 15" tall at the whorl as it stands, **NOT** to the tallest part of the plant.~~

~~Only **<u>one</u>** of the following options can be us ed to determine sidedress rate adjustment in any one season, based on the criteria outlined for each option.~~

~~Option 1 - Adjustment of Nitrogen Sidedress Recommendations~~

~~Nitrogen needs and timing of applications for corn shall be calculated based on criteria outlined in Section VAC 5-15-150.A.2.e. of the Virginia Nutrient Management Training and Certification Regulations. When organic nutrient sources have been used to supply a significant portion of the nitrogen need i n present or past years and a nitrogen sidedress application rate has been recommended, the PSNT results and the guidance below shall be used to adjust the sidedress rate when applicable. This guidance should be us ed as one factor along with rate of organic material applied, field history, seasonal conditions, and an understanding of the effects of soil properties and management practices related to nitrogen availability to corn. All these factors need to be considered to adjust the sidedress nitrogen rate stated in the nutrient management plan to improve the economics of crop production and to enhance water quality.~~

~~**Nitrate-N Conc.**~~	~~**N Rate Recommendation**~~
~~< 11 ppm~~	~~Apply full rate of sidedress N that is specified for the field in the nutrient management plan.~~
~~11-20 ppm~~	~~Apply 50 - 75% of sidedress N that is specified for the field in the nutrient management plan. The decision to reduce the recommended nitrogen rate must be made on a site-by site basis and s hould take into account previous field history, organic N additions, and management practices.~~
~~> 20 ppm~~	~~Nitrate nitrogen at a level to meet the yield goal without any sidedress nitrogen needed.~~

~~Option 2 - Adjustment of Nitrogen Sidedress Recommendations Considering suspected high nitrogen leaching loss or low mineralization of organic nitrogen sources(s).~~

~~**If:** (a) extreme weather conditions occur, such as two or more rainfall events exceeding 2 inches since the nitrogen application, which have caused significant amounts of nitrogen to be l eached below the root zone, or (b) mineralization of organic nitrogen sources are much lower than expected, a one t ime corrective nitrogen sidedress application can be m ade consistent with the following table **if:** a) nitrogen applications have been made such that rate and timing of applications have been consistent with the criteria in 4VAC 5-15-150, b) and corn shows visual signs of nitrogen deficiency, c) and a PSNT indicates NO_3-N is below 20 ppm in the top 12" of the soil profile.~~

~~**Nitrate-N Conc.**~~	~~**N Rate Recommendation**~~
~~< 6 ppm~~	~~Apply planned sidedress N that is specified for the field **OR** 70% of the nitrogen needs shown in the nutrient management plan for that field, whichever is greater.~~
~~6 - 11 ppm~~	~~Apply planned sidedress N that is specified for the field **OR** 40% of the nitrogen needs shown in the nutrient management plan for that field, which ever is greater.~~
~~12 - 20 ppm~~	~~Apply 50 - 75% of sidedress N that is specified for the field **OR** 30% of the nitrogen needs shown in the nutrient management plan for that field.~~
~~> 20 ppm~~	~~Nitrate nitrogen at a level to meet the yield goal without any sidedress nitrogen needed.~~

~~Grain Sorghum~~

~~Productivity Group~~	~~Nitrogen Needs~~
~~IA~~	~~140~~
~~IB~~	~~130~~
~~IIA~~	~~120~~
~~IIB~~	~~110~~
~~IIIA~~	~~100~~
~~IIIB~~	~~90~~
~~IVA~~	~~90~~
~~IVB~~	~~90~~
~~V~~	~~80~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~80 -120~~	~~80 -120~~
~~M~~	~~40 - 80~~	~~40 - 80~~
~~H~~	~~20 - 40~~	~~20 - 40~~
~~VH~~	~~0~~	~~0~~

~~Soybeans -~~ ~~All Productivity Groups~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~80 -120~~	~~80 -120~~
~~M~~	~~40 - 80~~	~~40 - 80~~
~~H~~	~~20 - 40~~	~~20 - 40~~
~~VH~~	~~0~~	~~0~~

~~**Small Grain Management Options:** Choose nutrient needs based on the intended use of the crop by the farmer.~~

1. ~~**Small Grain Silage** - this crop is planted for the intended purpose of harvest in early spring for silage. Similar fall tiller management practices should be applied as used in Standard/Intensive Management of Wheat and Barley.~~

2. ~~**Wheat and B arley**- Standard/Intensive Grain Production- this crop is to be m anaged based on a program to maximize grain yield by planting within the window of acceptable dates according to location within the state, careful tiller management through the fall and winter months and s pring split application rates of nitrogen based on tiller counts and tissue tests.~~

3. ~~**Cover Crop** - this crop is grown for the purpose of scavenging any residual nitrogen from the previous crop due to lower than expected yield, or mineralization of organic nutrient materials applied to the previous crop is expected to occur after the crop is harvested. Cover crop may also be used to manage on farm manure storage facilities by application of low rates of manure in the fall and winter when needed.~~

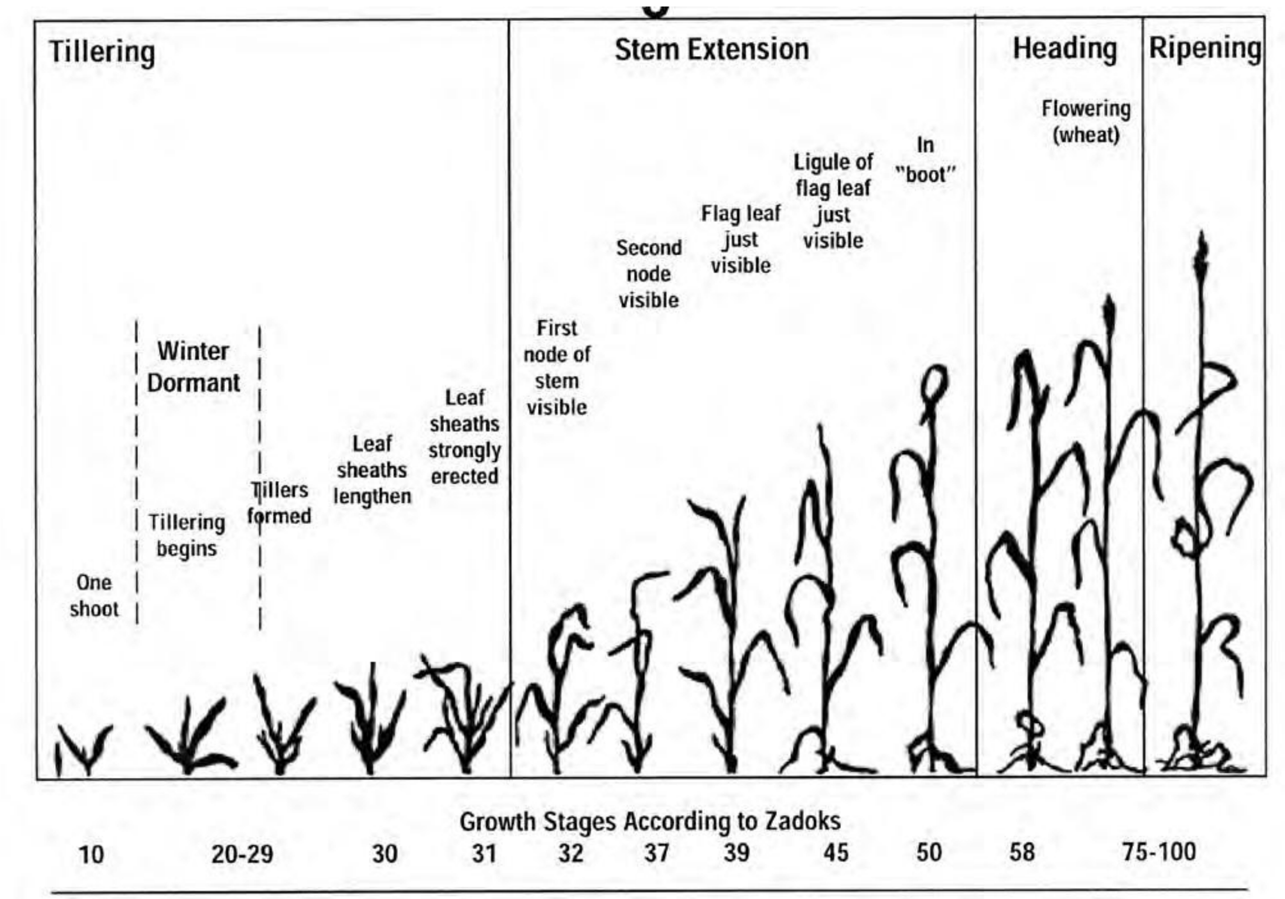
4. ~~**Trap Crop** - the sole purpose of this crop is to provide fields which can receive manure, biosolids, or other organic nutrient source applications through the fall and winter months for management of limited storage facilities of these materials.~~

   ~~This is a less desirable option because the nitrogen need for the following spring crop, or some part of the nitrogen need, may be used to determine rate of nitrogen for the winter application. **IF** the intention is to base the application rate of nitrogen on the total nitrogen need of the following spring crop, then application shall be in compliance with Timing of Organic Nutrient Sources in Section I.A and at least 30 pounds of nitrogen need must be withheld at the time of application to be used as part of a banded starter at planting. Also, all phosphorus applied though this application will be credited to the Spring crop or to the phosphorus application of the rotation.~~

   ~~The only purpose of the trap crop is for the management of organic nutrient sources where limited or no s torage facilities are available. Fall or winter application of a ni trogen rate based on a s pring crop, commits the farmer to planting that crop in a t imely manner to assure successful establishment of the intended spring crop.~~

~~**Zadoks Scale of Small Grain Growth Stages**~~

~~Many nutrient applications are based on timing related to the growth stage of the small grain crop. The figure below is provided as reference for planners when writing plans and explaining application times to clients.~~



~~Detailed description of pertinent nutrient management program Growth Stages are:~~

- ~~GS 23 - Main Shoot and 3 Tillers~~
- ~~GS 25 - Main Shoot and 5 Tillers~~
- ~~GS 30 - Leaf Sheaths lengthened with Erect Stems~~

~~A tiller may be counted when it has three fully developed leaves on its stem.~~

~~Nutrient Recommendations by Small Grain Program~~

~~Cover Crop~~

~~Crop should be pl anted early enough in the fall to be q uickly established after the harvested crop. The main purpose of the Cover Crop is to scavenge residual nitrogen from the previous crop. However, fields designated to be pl anted to a c over crop may also be us ed to spread manure at low rates (less than 40 pounds of nitrogen) through the fall and winter to properly manage on farm storage manure facilities, to assure adequate storage capacity is available until the spring applications can begin.~~

~~1. Eligible Fields:~~

~~a. Acceptable small grains are barley, wheat, rye, triticale~~
~~b. Seeding of all seed types must be established by the dates indicated in the table below.~~

~~Region~~	~~Established Date~~
~~Cites of Chesapeake & VA Beach~~	~~November 30~~
~~Coastal Plain~~	~~November 15~~
~~Piedmont~~	~~November 1~~
~~Mountain and Valley~~	~~October 25~~

~~2. Fall - Winter Nitrogen Rates~~

~~Nitrogen rates will be calculated using Spring or early Fall applied coefficients for manures and Year of Application coefficient for biosolids to calculate the PAN for the organic fraction and appropriate coefficient for PAN ammonium fraction for all materials.~~

~~Nitrogen rate for application to manage on farm manure storage facilities~~:

~~Nutrient Needs (lbs/ac)~~		
~~Nitrogen~~	~~P_2O_5~~	~~K_2O~~
~~0-40~~	~~0~~	~~0~~

~~All phosphorus applied though this application will be credited to the spring crop or the phosphorus application of the rotation.~~

~~3. Late Winter - Early Spring Nitrogen Rates~~

~~a. Cover crop will be killed before Spring crop is planted - No Nitrogen applied~~

~~OR~~

~~If at any time the management of this crop is changed from the original cover crop status, then the following nitrogen management recommendations shall be us ed. Performance and final yield of this crop may not be comparable to proper management of the specific crop outlined in other parts of this booklet.~~

~~NOTE: This change in management of the cover crop will affect eligibility for state and/or federal cost-share payments.~~

~~a. Cover crop will be harvested for silage:~~

~~Triticale~~ ~~- Maximum of 70 lbs/ac.~~
~~Rye~~ ~~- Maximum of 70 lbs/ac.~~
~~Wheat~~ ~~- Maximum of 60 lbs/ac.~~
~~Barley~~ ~~- Maximum of 50 lbs/ac.~~

~~OR~~

~~b. Cover crop will be harvested for grain - Follow recommendations in table below.~~
~~Warning~~ ~~- Using maximum N rates listed in table below may cause lodging of crop when a high rate of Nitrogen was applied in the Fall.~~

~~(Feb. - Early March)~~	~~Tiller Count:~~	~~N Application Program~~
~~Single Application:~~	~~<70/sq. ft.~~	~~80 lbs/acre-Feb.(Growth Stage 25)~~
	~~>100; plants dark green; tissue N levels >3.75%~~	~~30-40 lbs/acre-late March (Zadoks Growth Stage 30)~~
~~Split Application:~~		
~~February (Zadoks Growth Stage 25)~~	~~<60/sq. ft.~~	~~60 lbs N/acre~~
	~~60-100/sq. ft.~~	~~40 lbs N/acre~~
	~~>100/sq. ft. and dark green color~~	~~none; tissue test at growth stage 30~~
~~March (growth stage 30 tissue test)~~		~~No more than 120 lbs N/acre;~~ **~~the total of Growth Stages 25 and 30~~**

~~**Trap Crop**~~

~~**Nutrient Needs (lbs/ac)***~~

~~**Nitrogen**~~	~~**P_2O_5**~~	~~**K_2O**~~
~~0~~	~~0~~	~~0~~

~~*Specific to the Trap Crop itself.~~

~~The purpose of the following recommendations are to provide fields which can receive manure, biosolids and other organic nutrient source applications through the fall and winter months if the priority is for management of limited storage facilities, rather than achieving expected yield of future crops. Applications shall not occur before the trap crop reaches Zadoks growth stage 23 (one main shoot and 3 tillers) or greater AND having a uniform stand throughout the entire area to be spread of at least 20 plants per square foot. Application rate shall not exceed the nutrient needs described below and shall not smother the crop. Application shall only occur when the spreading equipment and associated operations will cause minimal damage to the crop during application.~~

~~**Nitrogen rate for application based on Spring Crop nitrogen needs:**~~
~~Nitrogen needs of spring crop to be planted minus at least 30 pounds of nitrogen to be applied as a banded application at planting.~~

~~Nitrogen rates will be calculated using Spring or Early Fall Applied coefficients for manures and Year of Application coefficient for biosolids to calculate the PAN for the organic fraction and appropriate coefficient for PAN ammonium fraction for all materials.~~

~~No more nitrogen shall be applied to the trap crop or the following spring crop using this option, with the exception of the amount of nitrogen deducted from the nitrogen needs at the time of application. This remaining nitrogen shall be applied as a banded application at planting of the spring crop. It should be noted that this program of nitrogen application may result in a lack of adequate nitrogen available to the spring crop to produce the expected yield. Less than adequate nitrogen would be due to immobilization of nitrogen by the trap crop and loss of the applied nitrogen through runoff and leaching.~~

~~All phosphorus applied though this application will be credited to the spring crop or the phosphorus application of the rotation.~~

~~**Rye Grown for Grain**~~

~~1. Soil productivity groups are the same as for wheat and barley~~

~~2. Nitrogen recommendations:~~

~~a. At planting - 25-30 lbs N/acre~~

~~b. Late winter - a single application made in February~~
~~(1) For grain production - 45 lbs N/acre~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~80 -120~~	~~80 -120~~
~~M~~	~~40 - 80~~	~~40 - 80~~
~~H~~	~~20 - 40~~	~~20 - 40~~
~~VH~~	~~0~~	~~0~~

~~**Small Grain for Silage**~~

~~1. Soil productivity groups are the same as for wheat and barley~~

~~2. Nitrogen recommendations:~~

~~a. At planting - 0-30 lbs N/acre~~
~~- use lower rate on fields, which will be timely planted, with a history of frequent manure applications, and good growing conditions are expected 10 days after planting.~~

~~b. Late winter - a single application made in February~~
~~(1) Triticale, Rye, Wheat silage production - 40-90 lbs N/acre~~
~~(2) Barley, Oats silage production - 40-70 lbs N/acre~~
~~(a) Preferred application period would be after green-up occurs and before first joint has emerged.~~
~~(b) Use lower rates on field which are well established, have dark green color, and a history of lodging.~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~80 -120~~	~~80 -120~~
~~M~~	~~40 - 80~~	~~40 - 80~~
~~H~~	~~20 - 40~~	~~20 - 40~~
~~VH~~	~~0~~	~~0~~

~~Wheat and Barley for Grain - Nitrogen Management Applications~~

~~Standard/Intensive~~

~~1. At planting:~~

~~a. With NO_3^- soil test from top 6 inches measuring above 30 ppm, no nitrogen needed at planting.~~

~~b. If soil test is below 30 ppm, apply 15-30 pounds of nitrogen.~~
~~c. Without NO_3^- soil test results:~~

~~(1) Conventional tillage: broadcast and i ncorporate 1-2 inches, 25-30 lbs N/acre during land preparation for planting. R educe N application if high residual N levels are expected.~~

~~(2) No-till: broadcast 30-40 lbs N/acre shortly before planting, if heavy residue (60% or greater cover) is present. Follow N recommendations for conventional planting if light residue (less than 60% cover) or no residue is present.~~

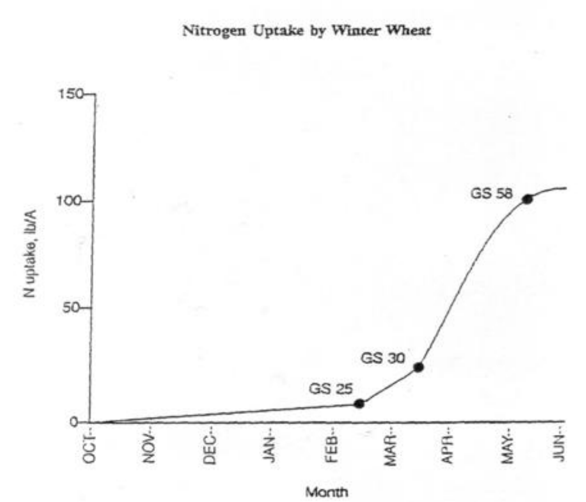
~~Intensive Management Only~~

~~2. Midwinter (December-January)~~

~~**If:**~~

~~a. Significant leaching rains have occurred during the October-December period, i.e., two or more rainfall events of 2.0 inches or more, and~~
~~b. there has been very little tiller development, i.e., less than 3 tillers per plant, and the crop has a pale green color, and~~
~~c. there is an expectation of several days during January and February when maximum daily temperature will exceed 50⁰F; **apply:** 30 lbs N/acre as a topdress.~~

~~**Figure 5-1**~~



Source: Alley, M. M., Peter Scharf, D. E. Brann, W. E. Beathgen, S. J. Donohue. 1991. Efficient N Fertilization of Winter Wheat, Principles and Recommendations. Virginia Cooperative Extension Service.

~~Management of Spring Nitrogen~~

~~3. Late Winter (February-early March)~~

~~a. Single Spring application of N, (Standard management):~~

~~(1) Fields with less than 70 tillers per sq.ft.,~~ **~~apply~~** ~~80 lbs/acre in February. Fertilize those fields with less than 60 tillers per sq.ft. first.~~

~~OR~~

~~(2) Fields with 70 to 100 tillers per sq.ft., and plants are pale green and tissue test levels are lower than 3.75%,~~ **~~apply:~~** ~~60 lbs/acre in February.~~

~~OR~~

~~(3) Fields have 70 to 100 tillers per sq.ft., plants are dark green and N tissue test levels are 3.75% or higher,~~ **~~apply:~~** ~~30-40 lbs/acre in late March (Zadoks growth stage 30.)~~

~~OR~~

~~(4) Fields have more than 100 tillers per sq.ft., plants are dark green and tissue test levels are 3.75% or higher~~ **~~apply:~~** ~~30-40 lbs/acre in late March (Zadoks growth stage 30.)~~

~~b. Split applications of Spring N (Intensive small grain management):~~

~~(1) February (Zadoks growth stage 25.)~~

~~(a) Fields with less than 60 tillers per sq. ft. - apply 60 lbs N/acre.~~

~~OR~~

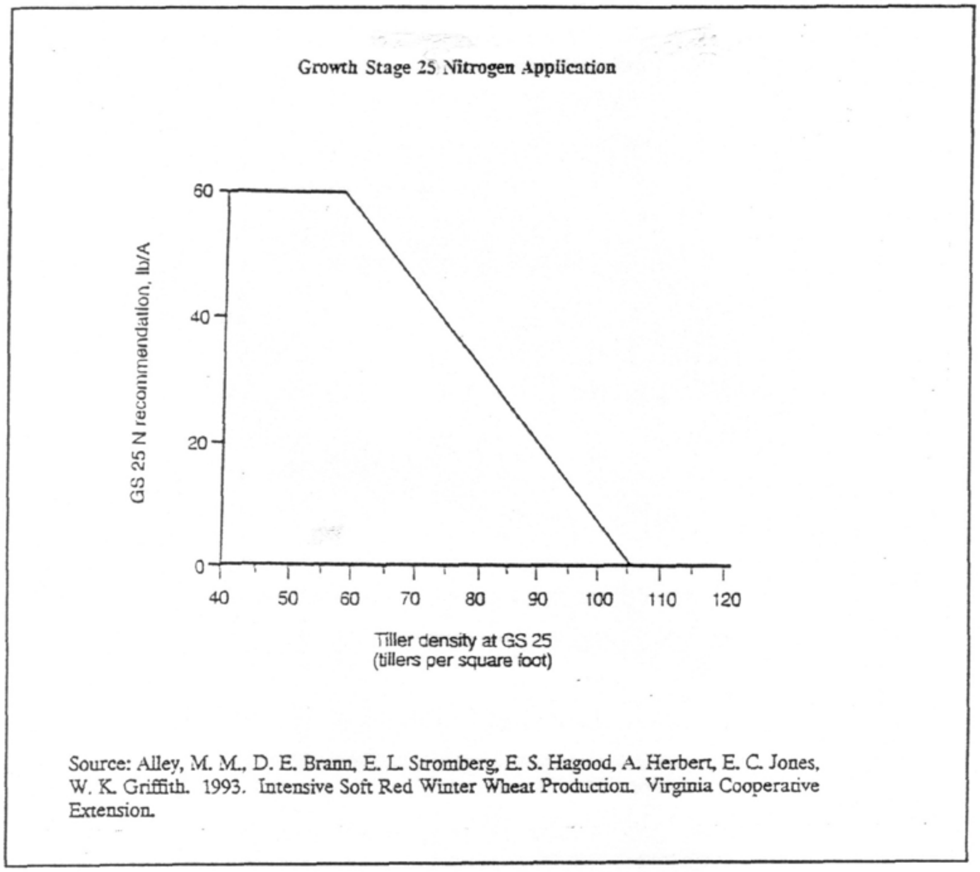
~~(b) Fields with 60 to 100 tillers per sq. ft. - apply 40 lb N/acre.~~

~~OR~~

~~(c) Fields with more than 100 tillers per sq. ft. and the crop has a good green color - do not apply nitrogen at this time. Tissue test at Zadoks growth stage 30 to determine N application needs.~~

~~Use~~ **~~Figure 5-2~~** ~~for more detailed nitrogen application rates based on exact tiller counts.~~

~~**Figure 5-2**~~



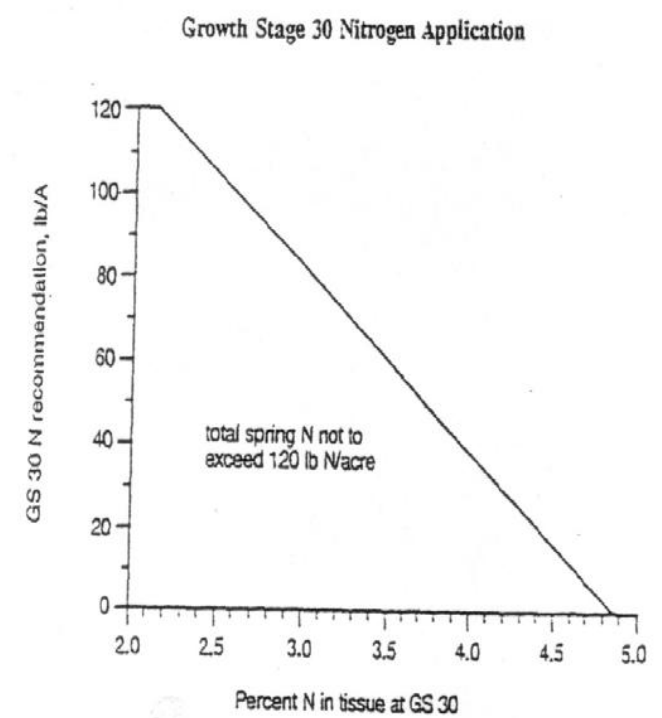
~~To determine the rate for the growth stage 25 application, one needs to determine the number of tillers per square foot in the field. If there are less than 60 per square foot, apply 60 pounds per acre at growth stage 25. If there are between 60 and 100 tillers, determine the rate from Figure 5-2. If there are more than 100 tillers per square foot and the crop has a dark green color, do not apply any nitrogen at this time.~~

~~(Spring N management continued on next page)~~

~~(2) March (Zadoks growth stage 30).~~

~~(a) N application rate for wheat based on the % N in a plant tissue sample taken at Zadoks growth stage 30 using Fig. 5-3.~~ ~~**NOTE:**~~ ~~Observations have shown that barley topdress rate should be decreased by 0.5% N.~~

~~**Figure 5-3**~~



Source: Alley, M. M., D. E. Brann, E. L. Stromberg, E. S. Hagood, A. Herbert, E. C. Jones, W. K. Griffith. 1993. Intensive Soft Red Winter Wheat Production. Virginia Cooperative Extension.

~~Nitrogen Application Recommendations for Wheat and Barley (Summary)~~

~~Season~~	~~Application Criteria~~	~~N Application Program~~
~~**I. Planting**~~	~~**Nitrate Soil Test**~~	
	~~>30 ppm (top 6 inches)~~	~~None~~
	~~<30 ppm (top 6 inches)~~	~~Apply 15-30 lbs/ac. N~~
	~~None~~	~~Conventional Tillage-broadcast & incorporate to 1-2 inches, 25-30 lbs/ac N; No-Till-broadcast 25-30 lb N/acre~~
~~II. Midwinter (Dec.-January)~~		
~~Precipitation~~	~~2 or more rainfalls >2.0 inches **AND**~~	
~~Tiller Development~~	~~<3 tillers per plant; pale green **AND**~~	
~~Max. Daily Temp.~~	~~>50^{0}F~~	~~**THEN:** Apply 30 lbs N/acre topdressed~~
~~**III. Late Winter** (Feb. - Early March)~~	~~**Tiller Count:**~~	
~~Single Application:~~	~~<70/sq. ft.~~	~~80 lbs/ac. N-Feb.(Growth Stage 25)~~
	~~>100; plants dark green; tissue N levels >3.75%~~	~~30-40 lbs/ac. N- late March (Zadoks Growth Stage 30)~~
~~Split Application:~~		
~~February (Zadoks Growth Stage 25)~~	~~<60/sq. ft.~~	~~60 lbs ac.N~~
	~~60-100/sq. ft.~~	~~40 lbs/ac. N~~
	~~>100/sq. ft. and dark green color~~	~~none; tissue test at growth stage 30~~
~~March (growth stage 30 tissue test)~~	~~Refer to Figure 5-3 for N rates based on tissue test~~	~~No more than 120 lbs N/acre - **total of Growth Stages 25 and 30**~~

~~Phosphorus and Potassium Nutrient Needs~~

~~(Standard/Intensive Small Grain Management)~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~80 – 120~~	~~80 – 120~~
~~M~~	~~40 – 80~~	~~40 – 80~~
~~H~~	~~20 – 40~~	~~20 – 40~~
~~VH~~	~~0~~	~~0~~

~~Canola~~

~~Nitrogen Fertilization:~~

~~1. Apply 30 - 40 lbs/ac. N at planting time. Broadcast and disc-in before planting.~~

~~2. Apply 90 - 120 lbs/ac. N in late February just before spring growth begins. For soils which are a High environmental risk for nitrogen loss, the late winter application should be s plit with the first 45 to 60 lbs/ac being applied in late February and the second 45 to 60 lbs/ac being applied 4 weeks later.~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~80 -120~~	~~80 -120~~
~~M~~	~~40 - 80~~	~~40 - 80~~
~~H~~	~~20 - 40~~	~~20 - 40~~
~~VH~~	~~0~~	~~0~~

~~Peanuts~~

~~Phosphorus and Potassium Nutrient Needs:~~

~~The phosphorus and potassium nutrient needs for peanuts can be applied at the same time the crop preceding peanuts in the rotation is fertilized. If not applied at that time, it should be plowed down before peanuts are planted.~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~100-200~~	~~80 -120~~
~~M~~	~~55 – 85~~	~~0~~
~~H~~	~~0 - 40*~~	~~0~~
~~VH~~	~~0~~	~~0~~

~~*Apply 40 lbs/ac at H-. No P_20_5 recommended at H and H+.~~

~~Apply ½ pound of elemental boron per acre per year at early bloom stage in a compatible labeled pesticide spray or dust or as a separate foliar application. (Va. Tech Soil Test Note 4).~~

~~Cotton~~

~~**Nitrogen Needs:**~~

~~The planned rate of total nitrogen application should take into consideration the crop that cotton will be following and the soil on which it will be grown. The following suggestions consider both:~~

~~Soil Management Groups on Which Cotton Will Be Grown~~		~~Total N Application Lbs/Acre~~
~~I.~~	~~A, AA, B, C, E, J, K~~	~~50-60~~
~~II.~~	~~F, Q, R, S, T, DD, II~~	~~60-90~~
~~III.~~	~~N, O, V, X~~	~~50-70~~
~~IV.~~	~~Soil Management Groups that are not suited for cotton production: P, Z, BB, CC, EE, FF, HH, JJ, KK, LL, MM, NN, OO, PP, QQ.*~~	
~~V.~~	~~Soil Management Groups on which cotton will not be grown: D, G, H, I, J, L, M, U, W, Y, GG.~~	

~~* **"Soils in this field are not suited for cotton production. If at all possible, select another field, but if cotton will be grown, apply 50-70 lbs of N per acre."**~~

~~Reduce the planned rate of nitrogen application by 10 pounds per acre if cotton will be following soybeans and by 20 pounds per acre if it will follow peanuts.~~

~~Timing of Nitrogen Application on Cotton~~

~~Only about 20 per cent of the total nitrogen uptake will have occurred by early square formation (approximately 45 days after planting). To avoid possible stimulation of excessive vegetative growth and loss of unneeded nitrogen through leaching, apply only one third of the planned nitrogen application rate at planting. The most effective method of application of this nitrogen is in a starter fertilizer which would also supply 20 to 40 pounds of~~ ~~P_2O_5~~ ~~depending upon~~ ~~P_2O_5~~ ~~needs as shown by a soil test. This can be done by using either a 1:1:0 ratio fertilizer such as 15-15-0, a 1:2:0 ratio fertilizer such as 18-46-0 or a 1: 3:0 fertilizer such as 10-34-0. Use of a starter fertilizer has been shown to stimulate the early growth rate and increase lint cotton yields by 60 to 100 pounds per acre, both of which are desirable.~~

~~The preferred placement of this starter fertilizer is two inches to one side of the seed and at least as deep as the seeds are planted but preferably one to two inches below seed level. P lacing the starter fertilizer in the row behind the subsoiler shank while ripping under the row has also been shown to be an effective placement. However, applying the starter fertilizer in a 3 to 4 inch wide band on the soil surface in front of the press wheel has not proven to be an e ffective placement method in research conducted in North Carolina.~~

~~The remainder of the planned nitrogen application can be applied at first square formation (approximately 45 days after planting).~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~80 – 120~~	~~80 -120~~
~~M~~	~~40 – 80~~	~~40 - 80~~
~~H~~	~~20 – 40~~	~~20 - 40~~
~~VH~~	~~0~~	~~0~~

~~Apply ½ pound of elemental boron per acre per year in a compatible labeled pesticide spray or dust or as a separate foliar application. (Va. Tech Soil Test Note 4).~~

~~White Potatoes - All Soil Productivity Groups~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~125-150*~~	~~200~~	~~300~~
~~M~~	~~125-150*~~	~~150~~	~~200~~
~~H~~	~~125-150*~~	~~100~~	~~100~~
~~VH~~	~~125-150*~~	~~30**~~	~~50~~

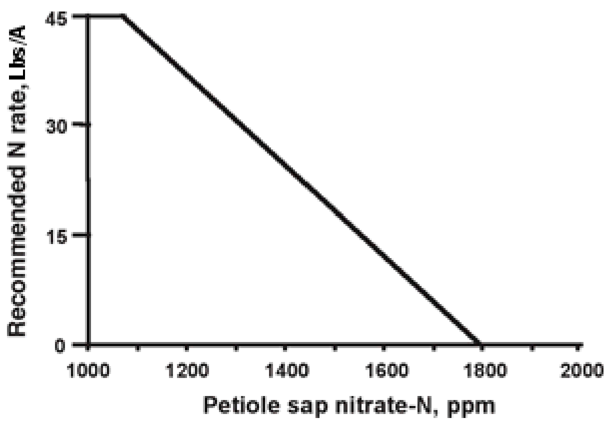
~~* Nitrogen recommendation for yields up to 250 cwt/acre. Split apply nitrogen with 1/3 of the rate applied at planting and remaining 2/3 to be applied 1-2 weeks after emergence.~~

~~** For phosphorus soil test levels exceeding 65% saturation as shown in Table 4-1,Section IV, or if the Phosphorus Index rating is greater than 100, no phosphorus application shall be made to the field, including starter.~~

~~When documented yields for the field (average of the high 3 yields in the last 5 years) indicate an expected yield of greater than 250 cwt/acre use .6 (six-tenths) X the expected tuber yield (cwt/ac) to determine the nitrogen recommendation. At this higher nitrogen recommendation, use a three way split as follows, 1/6 -1/3 of the total recommendation at planting, 1/2 to 2/3 of the total recommendation at emergence, and 1/6 of the total recommendation at flowering. The combination of nitrogen applications applied before flowering shall not exceed 5/6 of the total nitrogen need when using this program.~~

~~For more efficient nitrogen management application at flowering, apply the remaining nitrogen from the 3-way nitrogen split, or use the figure below showing petiole sap concentrations at flowering to adjust nitrogen application rate.~~

~~Figure 5-4 White Potato Petiole Sap Nitrate Concentration before Flowering~~



~~**Note:** At greater than 1500 ppm, response to additional nitrogen is unlikely.~~

~~**Sudangrass, Sudan-Sorghum Hybrids and Millet Plantings**~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~70*~~	~~100-120~~	~~100-120~~
~~M~~	~~70*~~	~~70-90~~	~~70-90~~
~~H~~	~~70*~~	~~40-60~~	~~40-60~~
~~VH~~	~~70*~~	~~0~~	~~0~~

~~* The N recommendation is for application at planting. If additional pasture, hay, silage production is desired, apply 40-60 lbs/A N after each cutting, or 30-40 lbs/ac. N after each grazing. Do not apply more than 130 lbs/A N per year.~~

~~**Alfalfa and Alfalfa-Orchardgrass Establishment**~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~150-170~~	~~150-170~~
~~M~~	~~120-140~~	~~120-140~~
~~H~~	~~50-110~~	~~50-110~~
~~VH~~	~~0~~	~~0~~

~~**Alfalfa and Alfalfa-Grass Hay Maintenance, Soil Productivity Group I**~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~100-120~~	~~390-450*~~
~~M~~	~~70-90~~	~~300-360*~~
~~H~~	~~40-60~~	~~40-210*~~
~~VH~~	~~0~~	~~0~~

~~* For K_2O rates greater than 200 lbs/ac, split the application, applying 1/2 in the fall and 1/2 in the spring. (Alternate recommendation where field sampled in spring - apply 1/2 in early spring, and 1/2 after the first cutting).~~

~~Apply 2 to 4 pounds of elemental boron per acre per year with a broadcast fertilizer.(Va. Tech Soil Test Note 4).~~

~~**Alfalfa and Alfalfa-Grass Hay Maintenance, Soil Productivity Group II**~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~100-120~~	~~280-330*~~
~~M~~	~~70-90~~	~~220-270*~~
~~H~~	~~40-60~~	~~60-200~~
~~VH~~	~~0~~	~~0~~

~~* For K_2O rates greater than 200 lbs/acre, split the application, applying 1/2 in the fall and 1/2 in the spring. (Alternate recommendation where field sampled in spring - apply 1/2 in early spring, and 1/2 after the first cutting).~~

~~Apply 2 to 4 pounds of elemental boron per acre per year with a broadcast fertilizer.(Va. Tech Soil Test Note 4).~~

Alfalfa and Alfalfa-Grass Hay Maintenance, Soil Productivity Group III, IV, V

Soil Test Level	Nutrient Needs (lbs/ac)	
	P_2O_5	K_2O
L	70-90	200-240*
M	40-60	160-180
H	40	40-140
VH	0	0

* For K_2O rates greater than 200 lbs/ac, split the application, applying 1/2 in the fall and 1/2 in the spring. (Alternate recommendation where field sampled in spring - apply 1/2 in early spring, and 1/2 after the first cutting).

Apply 2 to 4 pounds of elemental boron per acre per year with a broadcast fertilizer.(Va. Tech Soil Test Note 4).

Red Clover-Orchardgrass, Orchardgrass/Fescue-Ladino Clover, Orchardgrass and Fescue Establishment

Soil Test Level	Nutrient Needs (lbs/ac)		
	N	P_2O_5	K_2O
L	40*	150-170	150-170
M	40*	120-140	120-140
H	40*	40-110	40-110
VH	40*	0	0

* Apply the nitrogen at the time the grass is seeded in late summer, early fall or early spring. Overseed the grass with clover the following February.

Red Clover-Grass Hay Maintenance, Soil Productivity Groups I, II

Soil Test Level	Nutrient Needs (lbs/ac)		
	N	P_2O_5	K_2O
L	0	100-120	200-240
M	0	70-90	160-180
H	0	40-60	40-140
VH	0	0	0

Red Clover-Grass Hay Maintenance, Soil Productivity Groups III, IV

Soil Test Level	Nutrient Needs (lbs/ac)		
	N	P_2O_5	K_2O
L	0	70-90	120-150
M	0	40-60	80-110
H	0	40	40-70
VH	0	0	0

~~Stockpiled Tall Fescue, Soil Productivity Groups I, II~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~60-100*~~	~~100-120~~	~~100-120~~
~~M~~	~~60-100*~~	~~40-90~~	~~40-90~~
~~H~~	~~60-100*~~	~~0~~	~~0~~
~~VH~~	~~60-100*~~	~~0~~	~~0~~

~~* Remove animals by early August and apply the N between August 1-15. Keep animals off pasture until November to allow stand to mature. Where clover makes up more than 25% of the stand, use the 60 l bs/ac. N rate. I f clover is not present and y ou desire maximum production, apply the 100 lbs/ac. N rate.~~

~~Stockpiled Tall Fescue, Soil Productivity Groups III, IV, V~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~50-80*~~	~~40-60~~	~~60-80~~
~~M~~	~~50-80*~~	~~30~~	~~30-50~~
~~H~~	~~50-80*~~	~~0~~	~~0~~
~~VH~~	~~50-80*~~	~~0~~	~~0~~

~~* Remove animals by early August and apply the N between August 1-15. Keep animals off pasture until November to allow stand to mature. Where clover makes up more than 25% of the stand, use the 50 l bs/ac. N rate. I f clover is not present and y ou desire maximum production, apply the 80 lbs/ac. N rate.~~

~~Orchardgrass/Fescue-Clover Pastures, Soil Productivity Groups I, II~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~0*~~	~~100-120~~	~~100-120~~
~~M~~	~~0*~~	~~40-90~~	~~40-90~~
~~H~~	~~0*~~	~~0~~	~~0~~
~~VH~~	~~0*~~	~~0~~	~~0~~

~~* If stand contains less than 25% clover, apply 50-80 lbs/ac. of N.~~

~~If additional production is needed later on, apply 40 to 60 lbs/ac. of N in late summer.~~

~~If you are planning to overseed a legume into the stand, do not apply any N.~~

~~If organic nutrient sources are utilized, up t o 120 l bs/ac. of N may be appl ied if the application is no m ore frequent than once every 2 years. When applying organic nutrient sources pasture should be maintained at no less than three inches in height in order to reduce runoff and assure adequate regrowth of crop.~~

~~Orchardgrass/Fescue-Clover Pastures, Soil Productivity Groups III, IV, V~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~0*~~	~~40-60~~	~~60-80~~
~~M~~	~~0*~~	~~30~~	~~30-50~~
~~H~~	~~0*~~	~~0~~	~~0~~
~~VH~~	~~0*~~	~~0~~	~~0~~

~~* If stand contains less than 25% clover, apply 40-60 lbs/ac. of N.~~

~~If additional production is needed later on, apply 40 to 60 lbs/ac. of N in late summer.~~

~~If you are planning to overseed a legume into the stand, do not apply any N.~~

~~If organic nutrient sources are utilized, up to 100 lbs of N may be applied if the application is no more frequent than once every 2 years When applying organic nutrient sources, pasture should be maintained at no less than three inches in height in order to reduce runoff and assure adequate regrowth of crop.~~

~~Native or Unimproved Pastures, Soil Productivity Groups I, II~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~0*~~	~~150-200~~	~~150-200~~
~~M~~	~~0*~~	~~75-125~~	~~75-125~~
~~H~~	~~0*~~	~~0~~	~~0~~
~~VH~~	~~0*~~	~~0~~	~~0~~

~~* If stand contains less than 25% clover, apply 40-60 lbs/ac. of N.~~

~~For phosphorus and potassium - apply once every three or four years.~~
~~If you are planning to overseed a legume into the stand, omit the N application.~~

~~When applying organic nutrient sources, pasture should be maintained at no less than three inches in height in order to reduce runoff and assure adequate regrowth of crop.~~

~~Native or Unimproved Pastures, Soil Productivity Groups III, IV~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~0*~~	~~100-120~~	~~100-120~~
~~M~~	~~0*~~	~~40-90~~	~~40-90~~
~~H~~	~~0*~~	~~0~~	~~0~~
~~VH~~	~~0*~~	~~0~~	~~0~~

~~* If stand contains less than 25% clover, apply 40-60 lbs/ac. N.~~

~~When applying organic nutrient sources, pasture should be maintained at no less than three inches in height in order to reduce runoff and assure adequate regrowth of crop.~~

~~For phosphorus and potassium - apply once every three or four years.~~

~~Orchardgrass/Fescue (Tall Grass) Hay Production, Soil Productivity Groups I, II~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~80-100*~~	~~100-120~~	~~200-240~~
~~M~~	~~80-100*~~	~~70-90~~	~~160-180~~
~~H~~	~~80-100*~~	~~40-60~~	~~40-140~~
~~VH~~	~~80-100*~~	~~0~~	~~0~~

~~* The N recommendation is for a March application of commercial fertilizer.~~

~~If additional hay production is needed, apply 80 lbs/ac N after each cutting during the growing season. Use the number of cuttings to determine total nitrogen rate with a maximum annual rate not to exceed 250 lbs/acre per year.~~

~~Organic nutrient sources may be applied in one or more applications, not to exceed 250 lbs/acre plant available nitrogen annually. If applied after 9/1 of any year until 3/1 of the following year, application rates during this period shall not exceed ½ of the total nitrogen rate (125 lbs/acre).~~

~~When applying organic nutrient sources, fields should be m aintained at no l ess than three inches in height in order to reduce runoff and assure adequate regrowth of crop.~~

~~Orchardgrass/Fescue (Tall Grass) Hay Production, Soil Productivity Groups III, IV~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~60-80*~~	~~70-90~~	~~120-150~~
~~M~~	~~60-80*~~	~~40-60~~	~~80-110~~
~~H~~	~~60-80*~~	~~40~~	~~40-70~~
~~VH~~	~~60-80*~~	~~0~~	~~0~~

~~* N recommendation is for a March application of commercial fertilizer.~~

~~For additional fall hay production apply 60-80 lbs N/acre in late August/early September. Do not apply more than 160 lbs N/acre/year.~~

~~Organic nutrient sources may be applied in one or more applications, not to exceed 160 lbs/acre plant available nitrogen annually. If applied after 9/1 of any year until 3/1 of the following year, application rates during this period shall not exceed ½ of the total nitrogen rate (80 lbs/acre).~~

~~When applying organic nutrient sources, fields should be maintained at no less than three inches in height in order to reduce runoff and assure adequate regrowth of crop.~~

~~Bermudagrass Establishment~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~70~~	~~100-120~~	~~100-120~~
~~M~~	~~70~~	~~70-90~~	~~70-90~~
~~H~~	~~70~~	~~40-60~~	~~40-60~~
~~VH~~	~~70~~	~~0~~	~~0~~

~~Bermudagrass Pastures - Soil Productivity Groups I, II~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~175-225*~~	~~100-120~~	~~100-120~~
~~M~~	~~175-225*~~	~~40-90~~	~~40-90~~
~~H~~	~~175-225*~~	~~0~~	~~0~~
~~VH~~	~~175-225*~~	~~0~~	~~0~~

~~* The N recommendation represents the total amount of Nitrogen to be applied during the season. Split the N into three applications - April, June and July.~~

~~Organic nutrient sources may be applied in one or more applications, not to exceed 225 lbs./ac. plant available nitrogen annually. If applied after 7/1, application rates shall not exceed ½ the total nitrogen rate (112 lbs/ac.) based on above criteria while crop is still actively growing up to 9/15, with the remaining rate not to be applied until after 4/1 of the following year.~~

~~When applying organic nutrient sources, pastures should be maintained at no less than three inches in height in order to reduce runoff and assure adequate regrowth of crop.~~

~~Bermudagrass Pastures - Soil Productivity Groups III, IV, V~~**

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~120-180*~~	~~100-120~~	~~100-120~~
~~M~~	~~120-180*~~	~~40-90~~	~~40-90~~
~~H~~	~~120-180*~~	~~0~~	~~0~~
~~VH~~	~~120-180*~~	~~0~~	~~0~~

~~* The N recommendation represents the total amount of N to be applied during the season. Split the N into three applications - April, June and July.~~

~~** Use the lower end of range for Group V soils.~~

~~Organic nutrient sources may be applied in one or more applications, not to exceed 180 lbs/ac. plant available nitrogen annually. If applied after 7/1 application rates shall not exceed ½ the total nitrogen rate (90 lbs/ac.) based on above criteria while crop is still actively growing up to 9/15, with the remaining rate not to be applied until after 4/1 of the following year.~~

~~When applying organic nutrient sources, pastures should be maintained at no less than three inches in height in order to reduce runoff and assure adequate regrowth of crop.~~

~~Bermudagrass Hay Production, Soil Productivity Groups I, II~~
~~(Use Tall Grass Productivity Group)~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~240-300*~~	~~100-120~~	~~235-275~~
~~M~~	~~240-300*~~	~~70-90~~	~~185-225~~
~~H~~	~~240-300*~~	~~40-60~~	~~40-165~~
~~VH~~	~~240-300*~~	~~0~~	~~0~~

~~* Total application of N should be divided equally between an early April application and applications made after the first and second harvests.~~

~~Organic nutrient sources may be applied in one or more applications, not to exceed 300 lbs/ac. plant available nitrogen annually. If applied after 7/1, application rates shall not exceed ½ the total nitrogen rate (150 lbs/ac.) based on above criteria while crop is still actively growing up to 9/15, with the remaining rate not to be applied until after 4/1 of the following year.~~

~~When applying organic nutrient sources, fields should be maintained at no less than three inches in height in order to reduce runoff and assure adequate regrowth of crop.~~

~~Bermudagrass Hay Production, Soil Productivity Groups III, IV, V~~**
~~(Use Tall Grass Productivity Group)~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~210-260*~~	~~100-120~~	~~235-275~~
~~M~~	~~210-260*~~	~~70-90~~	~~185-225~~
~~H~~	~~210-260*~~	~~40-60~~	~~40-165~~
~~VH~~	~~210-260*~~	~~0~~	~~0~~

~~* Total application of N should be divided equally between an early April application and applications made after the first and second harvests.~~

~~** Use the lower end of range for Group V soils.~~

~~Organic nutrient sources may be applied in one or more applications, not to exceed 260 lbs/ac. plant available nitrogen annually. If applied after 7/1 application rates shall not exceed ½ the total nitrogen rate (130 lbs/ac.) based on above criteria while crop is still actively growing up to 9/15, with the remaining rate not to be applied until after 4/1 of the following year.~~

~~When applying organic nutrient sources fields should be maintained at no less than three inches in height in order to reduce runoff and assure adequate regrowth of crop.~~

~~Annual Ryegrass Hay Production, Soil Productivity Groups I and II~~
~~(Use Tall Grass Productivity Group)~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~40-50*~~	~~100-120~~	~~200-240~~
~~M~~	~~40-50*~~	~~70-90~~	~~160-180~~
~~H~~	~~40-50*~~	~~40-60~~	~~40-140~~
~~VH~~	~~40-50*~~	~~0~~	~~0~~

~~* The above N rates are recommended at seeding during the Fall. For additional production 30-40 lbs/ac of N should be a dded after each grazing, not to exceed 160 lbs/ac. annually. For hay production 40-60 lbs/ac N after each cutting, not to exceed 200 lbs/ac. annually.~~

~~When applying organic nutrient sources, fields should be maintained at no less than three inches in height in order to reduce runoff and assure adequate regrowth of crop.~~

~~Annual Ryegrass Hay Production, Soil Productivity Groups III and IV~~
~~(Use Tall Grass Productivity Group)~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~40-50*~~	~~70-90~~	~~120-150~~
~~M~~	~~40-50*~~	~~40-60~~	~~80-110~~
~~H~~	~~40-50*~~	~~40~~	~~40-70~~
~~VH~~	~~40-50*~~	~~0~~	~~0~~

~~* The above N rates are recommended at seeding during the Fall. For additional production, 30-40 lbs/ac of N should be added after each grazing, not to exceed 140 lbs/ac annually. For hay production, 40-60 lbs/ac N after each cutting, not to exceed 180 lbs/ac annually.~~

~~When applying organic nutrient sources, fields should be maintained at no less than three inches in height in order to reduce runoff and assure adequate regrowth of crop.~~

~~Prairie Grass (Matua) Hay Production, Soil Productivity Groups I and II~~
~~(Use Tall Grass Productivity Group)~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~80-100*~~	~~100-120~~	~~280-330~~
~~M~~	~~80-100*~~	~~70-90~~	~~220-270~~
~~H~~	~~80-100*~~	~~40-60~~	~~60-200~~
~~VH~~	~~80-100*~~	~~0~~	~~0~~

~~* The N recommendation is for a March application. Apply 40-60 lbs/ac after hay or silage cutting. Do not exceed 300 lbs/ac per year for hay. When pastured after hay harvest, apply 30-40 lbs/ac after each grazing. Do not exceed 200 lbs/ac per year for intensive rotational grazing.~~

~~When applying organic nutrient sources, fields should be maintained at no less than three inches in height in order to reduce runoff and assure adequate regrowth of crop.~~

~~Prairie Grass (Matua) Hay Production, Soil Productivity Groups III and IV (Use Tall Grass Productivity Group)~~

Soil Test Level	Nutrient Needs (lbs/ac)		
	N	P_2O_5	K_2O
L	60-80*	100-120	200-240
M	60-80*	70-90	160-180
H	60-80*	40-60	40-140
VH	60-80*	0	0

~~* The N recommendation is for a March application. Apply 40-60 lbs/A after hay or silage cutting. Do not exceed 250 lbs/A per year for hay. When pastured after hay harvest, apply 30-40 lbs/ac after each grazing. Do not exceed 180 lbs/ac per year for intensive rotational grazing.~~

~~When applying organic nutrient sources, fields should be maintained at no less than three inches in height in order to reduce runoff and assure adequate regrowth of crop.~~

~~Switchgrass - All Soil Productivity Groups~~

Soil Test Level	Nutrient Needs (lbs/ac)		
	N*	P_2O_5	K_2O
L	40-60	100-120	100-120
M	40-60	40-90	40-90
H	40-60	0	0
VH	40-60	0	0

~~*If stand contains greater than 25% legumes, no Nitrogen is required.~~

~~For establishment no Nitrogen is needed, follow P_2O_5 and K_2O soil test recommendations shown above.~~

~~When applying organic nutrient sources, fields should be maintained at no less than three inches in height in order to reduce runoff and assure adequate regrowth of crop.~~

Caucasian Bluestem (hay or pasture), All Soil Productivity Groups

Soil Test Level	Nutrient Needs (lbs/ac) N	P_2O_5	K_2O
L	60-120*	100-120	100-120
M	60-120*	40-90	40-90
H	60-120*	0	0
VH	60-120*	0	0

*This is an annual nitrogen rate. Annual nitrogen rate should be applied in split applications, such as between grazings or cuttings if used for hay.

If organic nutrient sources are utilized, up to 120 lbs of N may be applied if the application is no more frequent than once every 2 years.

When applying organic nutrient sources, fields should be maintained at no less than three inches in height in order to reduce runoff and assure adequate regrowth of crop.

Tobacco Recommendations:

Flue-Cured

Soil Test Level	Nutrient Needs (lbs/ac) N	P_2O_5	K_2O
L		290-330	150-175
M	60-70	60-100	100-150
H		40	100
VH		40*	100

* For phosphorus soil test levels exceeding 65% saturation as shown in Table 4-1,Section IV, or if the Phosphorus Index is greater than 100, no phosphorus application shall be made to the field, including starter.

- 50% of the total nitrogen need should be in the nitrate nitrogen form.
- Pre-plant broadcast fertilizer should not exceed 40 lbs/ac of nitrogen and 120 lbs/ac. of potash. Balance of nutrient recommendation can be applied as a sidedress application.
- Use of soluble fertilizer in transplant water is discouraged where soil test levels are M+ and higher. For phosphorus soil test levels Medium or below, soluble fertilizer may be used. Select a product approved for direct application in the row with the plant. Total phosphorus applied can not exceed phosphorus nutrient need.
- Potassium source should not contain any chloride compounds.

~~**Dark-Fired**~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~		~~290-330~~	~~150-175~~
~~M~~	~~135~~	~~60-100~~	~~100-150~~
~~H~~		~~40~~	~~100~~
~~VH~~		~~40*~~	~~100~~

~~* For phosphorus soil test levels exceeding 65% saturation as shown in Table 4-1,Section IV, or if the Phosphorus Index is greater than 100, no phosphorus application shall be made to the field, including starter.~~

- ~~50% of the total nitrogen need should be in the nitrate nitrogen form.~~
- ~~Pre-plant broadcast fertilizer should not exceed 60-70 lbs/ac. of nitrogen and 120 lbs/ac. of potash. Balance of nutrient recommendation can be applied as a sidedress application.~~
- ~~Use of soluble fertilizer in transplant water is discouraged where soil test levels are M+ and higher. For phosphorus soil test levels Medium or below, soluble fertilizer may be used. Select a product approved for direct application in the row with the plant. Total phosphorus applied can not exceed phosphorus nutrient need.~~
- ~~Potassium source should not contain any chloride compounds.~~

~~**Burley**~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~		~~290-330~~	~~250-350~~
~~M~~	~~175 - 200~~	~~60-100~~	~~200-250~~
~~H~~		~~40~~	~~100-200~~
~~VH~~		~~40*~~	~~100~~

~~* For phosphorus soil test levels exceeding 65% saturation as shown in Table 4-1,Section IV, or if the Phosphorus Index is greater than 100, no phosphorus application shall be made to the field, including starter.~~

- ~~50% of the total nitrogen need should be in the nitrate nitrogen form.~~
- ~~Pre-plant broadcast fertilizer should not exceed 100 lbs/ac. of nitrogen and 120 lbs/ac. of potash. Balance of nutrient recommendation can be applied as a sidedress application.~~
- ~~Use of soluble fertilizer in transplant water is discouraged where soil test levels are M+ and higher. For phosphorus soil test levels Medium or below, soluble fertilizer may be used. Select a product approved for direct application in the row with the plant. Total phosphorus applied can not exceed phosphorus nutrient need.~~
- ~~Potassium source should not contain any chloride compounds.~~

~~Hardwood and Pine Nutrient Application Rates and Timing~~

~~All references to age of trees or stands starts as of the time the trees were planted at the site and not the age of the seedling tree at planting.~~

~~Hardwood and Pine Plantation Establishment (0 - 3 years of age) - All Soil Productivity Groups~~

~~Soil Test Level~~	~~Nutrient Needs, (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_20~~
~~L~~	~~0~~	~~50-70~~	~~50-80~~
~~M~~	~~0~~	~~10-40~~	~~10-40~~
~~H~~	~~0~~	~~0~~	~~0~~
~~VH~~	~~0~~	~~0~~	~~0~~

- ~~Phosphorus and potassium may be applied by incorporation before planting, or by broadcast on the soil surface or by banding along the planting row.~~

- ~~Acceptable pH ranges for pines are pH 4.5 to 6 and should not exceed pH 6.5. Acceptable pH ranges for hardwoods are pH 5 to 7 and should not exceed pH 7.5. If the soil pH falls within these ranges, it is not necessary to apply lime.~~

- ~~Control of competing vegetation, including both woody and herbaceous species, may be required within the stand following planting to avoid overtopping of the seedlings and thus decrease tree survival.~~

~~Pine* and Hardwood Maintenance (3 to 10 years of age) – All Soil Productivity Groups~~

~~Soil Test Level~~	~~Nutrient Needs, (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_20~~
~~L~~	~~See detailed nitrogen management below~~	~~50-70~~	~~50-80~~
~~M~~		~~10-40~~	~~10-40~~
~~H~~		~~0~~	~~0~~
~~VH~~		~~0~~	~~0~~

~~*Pines Species includes loblolly, short leaf, Virginia, and white pine.~~
~~Long leaf pine should not exceed 100 lbs/ac N at any age.~~

~~Nitrogen intervals and rates for Pine and Hardwood Maintenance~~

- ~~**Between ages 3-10**, one application of N at a rate of 50 to 100 lbs/acre can be made to the stand. Applications in pines at this stage of growth shall be made no sooner than one month before the average date of the last killing frost in the Spring (Fig. 6-2, Section VI) and ending no later than two months before the average date of the first killing frost in the Fall. (Fig 6-1, Section VI).~~

- ~~**After age 10**, applications of nitrogen can be made using one of the nitrogen rates and application intervals listed in the table below. The applications can continue at the selected interval and rate until approximately 5 years before expected harvest of the trees.~~

~~**Interval between Nitrogen applications**~~	~~**Nitrogen Application Rate (lbs/ac)per Application Interval[a]**~~
~~4-6 yrs.~~	~~100~~
~~OR~~	
~~6-8 yrs.~~	~~150~~
~~OR~~	
~~8-10 yrs.~~	~~200~~

~~[a] - Long leaf pine may receive no more than 100 lbs/ac of nitrogen after age >10 years, every 4-6 years.~~

~~Season of Nitrogen Application~~

- ~~No applications shall be made when the soil is saturated or standing water is present on the surface of the soil, regardless of the time of year.~~

- ~~Pine: Applications in pine stands greater than 10 years of age may be made at any time of the year that the soil is not saturated or standing water is not present on the soil surface.~~

- ~~Hardwood: Applications in hardwoods shall be limited to the growing season. Applications in hardwood forests shall be made no sooner than one month before the average date of the last killing frost in the Spring (Fig. 6-2, Section VI) and ending no later than two months before the average date of the first killing frost in the Fall. (Fig 6-1, Section VI).~~

~~Understory vegetation~~

~~Moderate amounts of understory vegetation that is below the canopy of the planted trees is acceptable in mid-rotation stands. This vegetation will take up nutrients and reduce runoff. However, if understory vegetation is excessive, that is, it is as tall or taller than the planted trees, suppression of the understory vegetation may be needed. Consult a local Virginia Department of Forestry forester to develop an understory management program.~~

- ~~In all cases Best Management Practices for nutrient applications, such as adhering to buffers for wells and surface waters is required.~~

~~Christmas Trees - Establishment (broadcast before planting) White Pine, Virginia Pine, Scotch Pine~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~100-120~~	~~90-150~~	~~100-160~~
~~M~~	~~100-120~~	~~40-80~~	~~50-90~~
~~H~~	~~100-120~~	~~30~~	~~40~~
~~VH~~	~~100-120~~	~~0~~	~~0~~

~~Christmas Trees – Establishment (broadcast before planting) Fraser Fir, Norway Spruce, Hemlock, Blue Spruce, Red Cedar~~

~~Soil Test Level~~	~~Nutrient Needs (lbs/ac)~~		
	~~N~~	~~P_2O_5~~	~~K_2O~~
~~L~~	~~100-120~~	~~160-300~~	~~150-250~~
~~M~~	~~100-120~~	~~60-150~~	~~60-150~~
~~H~~	~~100-120~~	~~30-50~~	~~30-50~~
~~VH~~	~~100-120~~	~~0~~	~~0~~

~~Christmas Trees – Maintenance~~

- ~~A nitrogen application of 50-60 lbs/acre should be made with the first Spring application to be made about 2 weeks before budbreak. A Fall application of 50-60 lbs/acre can be made anytime beginning in September, but no later than the end of October.~~

- ~~Use the Fertilizer Recommendations table under **Establishment** for the appropriate rate for the specific species. Base P_2O_5 and K_2O applications on soil test results taken before planned maintenance applications.~~

- ~~Maintenance fertilizer applications should be uniformly applied in 2 to 3 foot wide bands between the trees along the planted row.~~

~~OR~~

- ~~For a rate per tree, determine the fertilizer rate in ounces (lbs/ac X 16) then divide by the number of trees per acre. (100 lbs/ac of N X 16 ozs/lb = 1600 ozs. Then 1600 ozs ÷ no. of trees/ac = ozs/tree).~~

Coefficients for Calculating Nitrogen Residuals in Legumes

Table 3-8 Estimated Nitrogen Availability to Succeeding Crops From Legumes			
Crop	**% Stand**	**Description**	**Residual N (lbs./ac)**
Alfalfa	50-75	Good (>4 T/A)	90
	25-49	Fair (3-4 T/A)	70
	<25	Poor (<3 T/A)	50
Red Clover or Crimson Clover	>50	Good (>3 T/A)	80
	25-49	Fair (2-3 T/A)	60
	<25	Poor (<2 T/A)	40
Hairy Vetch (cover crop)	80-100	Good	100
	50-79	Fair	75
	<50	Poor	50
Peanuts	-	-	45
Soybeans	1/2 lb. N per bushel of yield, if previous yield unknown, 20 lbs.		

Source: Maguire, R.O. and S.E. Heckendorn. 2023. Soil Test Recommendations for Virginia. Virginia Cooperative Extension, Virginia Tech, Blacksburg, VA. p. 7. Available at: www.soiltest.vt.edu/content/dam/soiltest_vt_edu/PDF/recommendation-guidebook.pdf

Section IV – Nutrient Management Recommendations for Turf for Home Lawns, Office Parks, Public Lands, and Other Similar Residential/Commercial

~~VI. Turfgrass Nutrient Recommendations for Home Lawns, Office Parks, Public Lands and Other Similar Residential/Commercial Grounds~~

~~Definitions~~

~~For the purposes of this section, the following definitions, as presented by the Association of American Plant Food Control Officials (AAPFCO), apply:~~

~~"Enhanced efficiency fertilizer" describes fertilizer products with characteristics that allow increased plant nutrient availability and reduce the potential of nutrient losses to the environment when compared to an appropriate reference product.~~

~~"Slow or controlled release fertilizer" means a fertilizer containing a plant nutrient in a form which delays its availability for plant uptake and use after application, or which extends its availability to the plant significantly longer than a reference "rapidly available nutrient fertilizer" such as ammonium nitrate, urea, ammonium phosphate or potassium chloride. A slow or controlled release fertilizer must contain a minimum of 15 percent slowly available forms of nitrogen.~~

~~"Water soluble nitrogen", "WSN", or "readily available nitrogen" means: Water soluble nitrogen in either ammonical, urea, or nitrate form that does not have a controlled release, or slow response.~~

Recommended Season of Application For Nitrogen Fertilizers - Applies to all Turf

A nitrogen fertilization schedule weighted toward fall application is recommended and preferred for agronomic quality and persistence of cool season grass; however, the acceptable window of applications is much wider than this for nutrient management. The nutrient management recommended application season for nitrogen fertilizers to cool season grass begins six weeks prior to the last spring average killing frost date and ends six weeks past the first fall average killing frost date (see Figures 4-1 and 4-2). Applications of nitrogen during the intervening late fall and winter period should be avoided due to higher potential leaching or runoff risk, but where necessary, apply no more than 0.5 pounds per 1,000 ft^2 of water soluble nitrogen within a 30-day period. Higher application rates may be used during this late fall and winter period by using materials containing slowly available sources of nitrogen, if the water soluble nitrogen contained in the fertilizer does not exceed the recommended maximum of 0.5 pounds per 1,000 ft^2 rate. Do not apply nitrogen or phosphorus fertilizers when the ground is frozen.

~~A nitrogen fertilization schedule weighted toward fall application is recommended and preferred for agronomic quality and persistence of cool season turfgrass; however, the acceptable window of applications is much wider than this for nutrient management. T he nutrient management recommended application season for nitrogen fertilizers to cool season turfgrasses begins six weeks prior to the last spring average killing frost date and ends six weeks past the first fall average killing frost date (see Figures 6-1 & 6-2). Applications of nitrogen during the intervening late fall and winter period should be avoided due to higher potential leaching or runoff risk, but where necessary, apply no more than 0.5 pounds per 1,000 ft2 of water soluble nitrogen within a 30-day period. Higher application rates may be used during this late fall and winter period by using materials containing slowly available sources of nitrogen, if the water soluble nitrogen contained in the fertilizer does not exceed the recommended maximum of 0.5 pounds per 1,000 ft2 rate. Do not apply nitrogen or phosphorus fertilizers when the ground is frozen.~~

The acceptable nitrogen fertilizer application season for non-overseeded warm season grass begins no earlier than the last spring average killing frost date and ends no later than one month prior to the first fall average killing frost date (see Figures 4-1 and 4-2).
~~The acceptable nitrogen fertilizer application season for non-overseeded warm season turfgrass begins no earlier than the last spring average killing frost date and ends no later than one month prior to the first fall average killing frost date (see Figures 6-1 & 6-2).~~

~~Figure 6-1~~

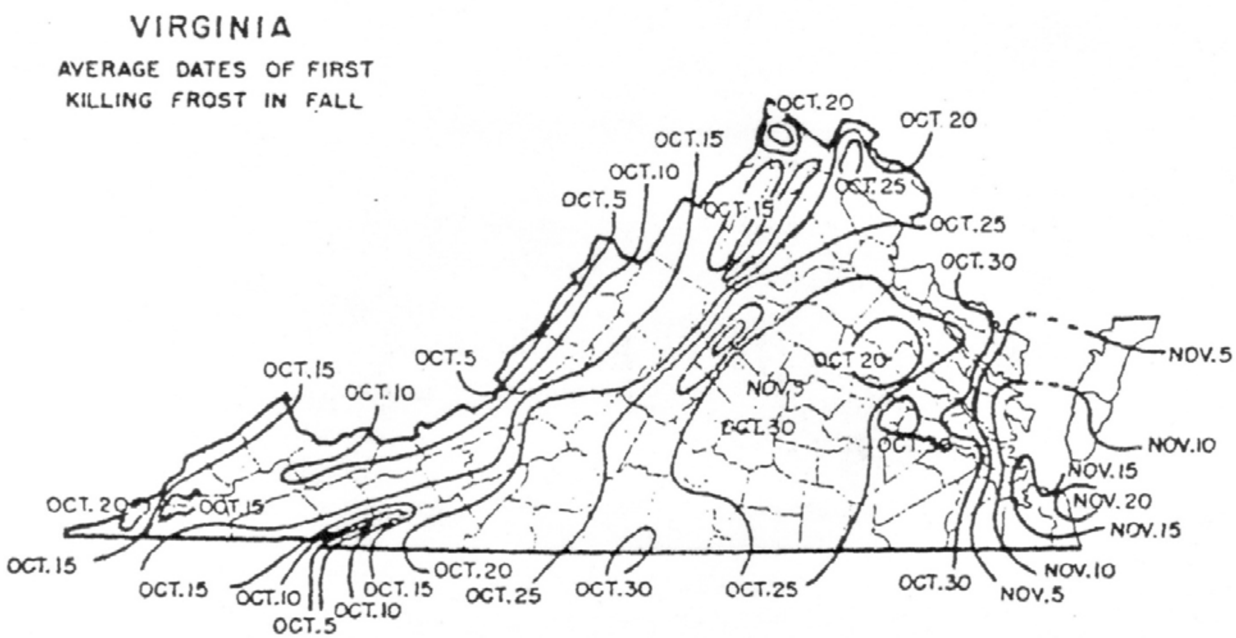
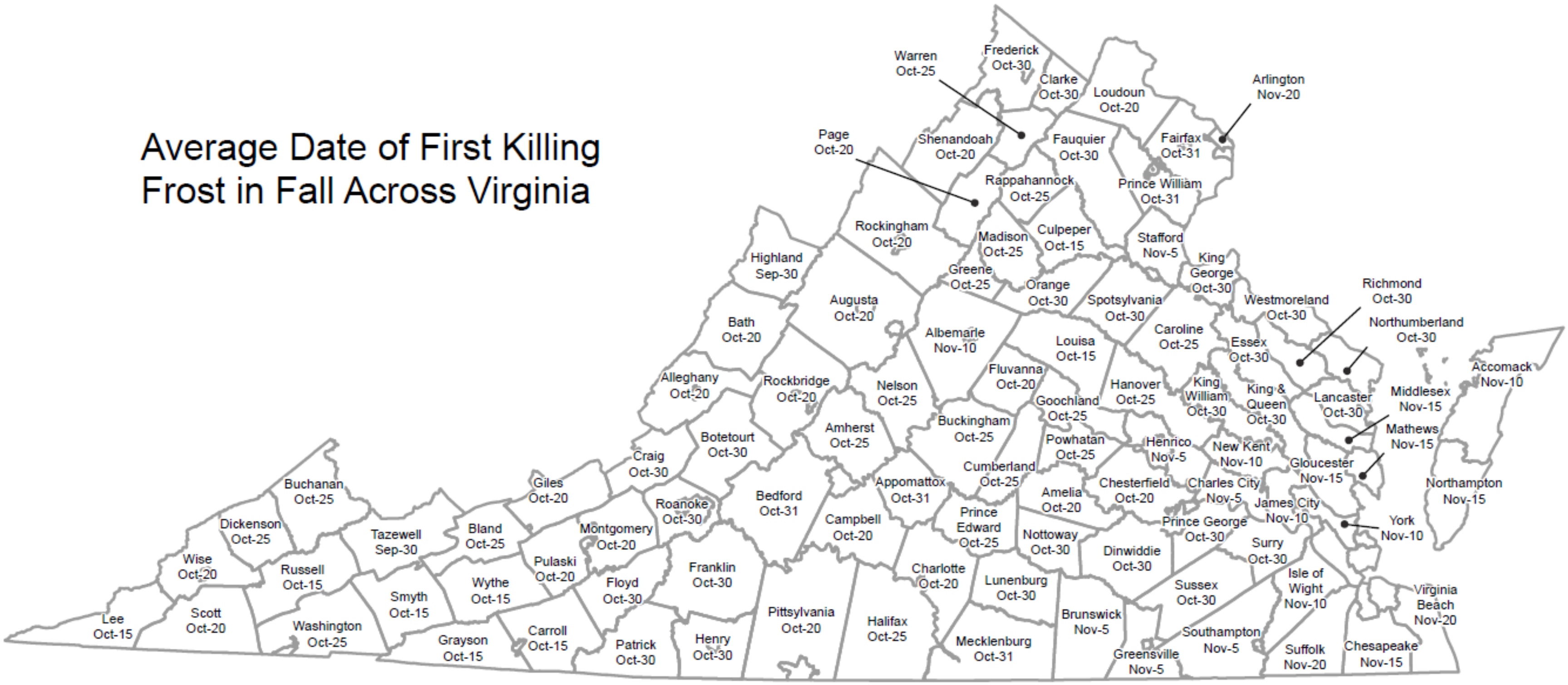

VIRGINIA
AVERAGE DATES OF FIRST KILLING FROST IN FALL
OCT. 20
OCT. 20
OCT. 15
OCT. 10
OCT. 5
OCT. 25
OCT. 15
OCT. 25
OCT. 30
NOV. 5
OCT. 20
NOV. 5
OCT. 30
OCT. 5
OCT. 15
OCT. 10
NOV. 10
NOV. 15
NOV. 20
NOV. 15
OCT. 20
OCT. 15
OCT. 15
OCT. 15
OCT. 10
OCT. 5
OCT. 10
OCT. 15
OCT. 20
OCT. 25
OCT. 30
OCT. 25
OCT. 30
NOV. 5
NOV. 10

Figure 4-1

Average Date of First Killing Frost in Fall Across Virginia

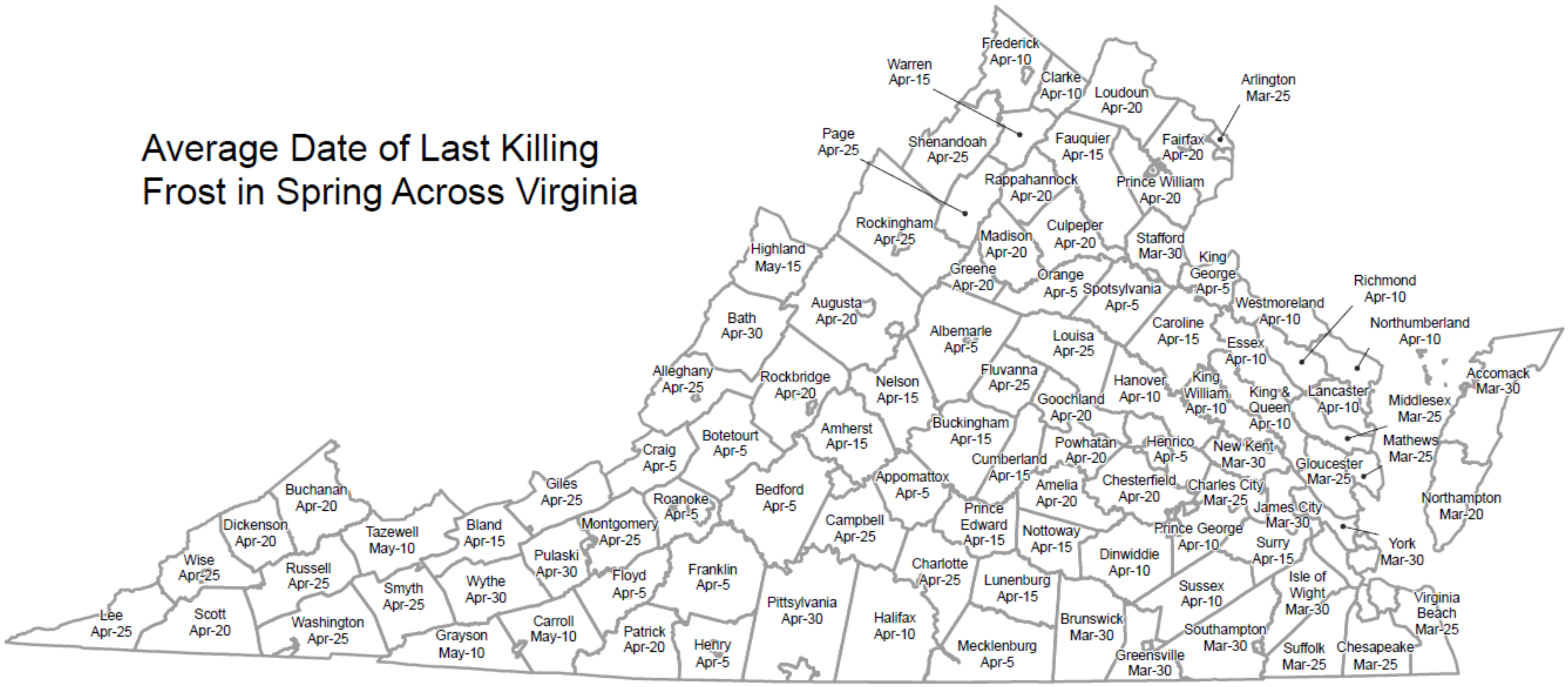


Unlisted Cities

Cities	Frost Date	Cities	Frost Date	Cities	Frost Date	Cities	Frost Date	Cities	Frost Date
Alexandria	Nov-20	Emporia	Nov-5	Harrisonburg	Oct-20	Newport News	Nov-10	Richmond	Nov-5
Bristol	Oct-20	Fairfax	Oct-31	Hopewell	Nov-5	Norfolk	Nov-20	Roanoke	Oct-30
Buena Vista	Oct-20	Falls Church	Oct-31	Lexington	Oct-20	Norton	Oct-20	Salem	Oct-30
Charlottesville	Nov-10	Franklin	Oct-30	Lynchburg	Oct-25	Petersburg	Nov-5	Staunton	Oct-25
Colonial Heights	Nov-5	Fredericksburg	Oct-30	Manassas	Oct-31	Poquoson	Nov-10	Waynesboro	Oct-25
Covington	Oct-20	Galax	Oct-15	Manassas Park	Oct-31	Portsmouth	Nov-20	Williamsburg	Nov-10
Danville	Oct-25	Hampton	Nov-10	Martinsville	Oct-20	Radford	Oct-20	Winchester	Oct-30

Figure 4-2

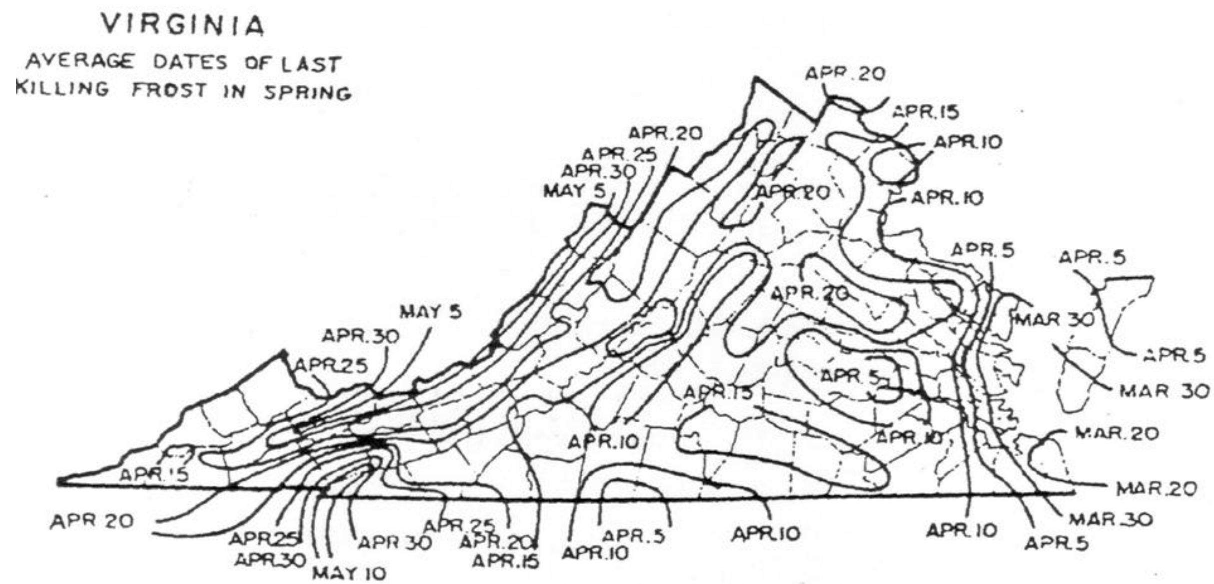
Average Date of Last Killing Frost in Spring Across Virginia



Unlisted Cities

Cities	Frost Date	Cities	Frost Date	Cities	Frost Date	Cities	Frost Date	Cities	Frost Date
Alexandria	Mar-25	Emporia	Mar-30	Harrisonburg	Apr-25	Newport News	Mar-30	Richmond	Apr-5
Bristol	Apr-20	Fairfax	Apr-20	Hopewell	Mar-25	Norfolk	Mar-25	Roanoke	Apr-5
Buena Vista	Apr-20	Falls Church	Apr-10	Lexington	Apr-20	Norton	Apr-25	Salem	Apr-5
Charlottesville	Mar-31	Franklin	Apr-5	Lynchburg	Apr-15	Petersburg	Apr-5	Staunton	Apr-15
Colonial Heights	Apr-5	Fredericksburg	Apr-5	Manassas	Apr-20	Poquoson	Mar-30	Waynesboro	Apr-20
Covington	Apr-25	Galax	May-10	Manassas Park	Apr-20	Portsmouth	Mar-20	Williamsburg	Mar-30
Danville	Apr-15	Hampton	Mar-30	Martinsville	Apr-25	Radford	Apr-25	Winchester	Apr-10

~~Figure 6-2~~


VIRGINIA
AVERAGE DATES OF LAST
KILLING FROST IN SPRING
APR.20
APR.15
APR.10
APR.20
APR.25
APR.30
MAY 5
APR.20
APR.10
APR.5
APR.5
APR.20
MAR 30
APR.5
MAR 30
MAY 5
APR.30
APR.25
APR.5
APR.15
APR.10
APR.10
MAR.20
APR.15
MAR.20
APR 20
APR.25
APR 30
APR.20
APR.5
APR.10
APR.10
MAR.30
APR25
APR.15
APR.10
APR.5
APR30
MAY 10

Per Application Rates

Do not apply more than 0.7 pounds of water soluble nitrogen per 1,000 ft^2 within a 30-day period. For cool season grasses, do not apply more than 0.9 pounds of total nitrogen per 1,000 ft^2 within a 30 -day period. For warm season grasses, do no t apply more than 1.0 pounds of total nitrogen per 1,000 ft^2 within a 30-day period. Lower per application rates of water soluble nitrogen sources or use of slowly available nitrogen sources should be ut ilized on very permeable sandy soils, shallow soils over fractured bedrock, or areas near water wells.

~~Annual Application Rates for Home Lawns and Commercial Turf~~

~~Up to 3.5 pounds per 1,000 ft^2 of nitrogen may be applied annually to cool season grass species or up to 4 pounds per 1,000 ft^2 may be applied annually to warm season grass species using 100 percent water soluble nitrogen sources. Lower rates of nitrogen application may be desirable on those mature stands of grasses that require less nitrogen for long-term quality. As a result, lower application rates will probably be more suited to the fine leaf fescues (hard fescue, chewings fescue, creeping red fescue, and sheep fescue) and non-overseeded zoysiagrass. Lower rates should also be used on less intensively managed areas.~~

Use of Slowly Available Forms of Nitrogen

~~For s~~Slow or controlled release fertilizer sources, or enhanced efficiency fertilizer sources may be ~~, no more than 0.9 pounds of nitrogen per 1,000 ft^2 may; be~~ applied to cool season grasses within a 30-day period and no more than 1.0 pounds of nitrogen per 1,000 ft^2 may be applied to warm season grasses within a 30-day period.

Provided the fertilizer label ~~guarantees~~ states that the product can be used in such a way that it will not release more than 0.7 pounds of nitrogen per 1,000 ft^2 in a 30-day period, no more than 2.5 pounds of nitrogen per 1,000 ft^2 may be applied in a single application. Additionally, total annual applications shall not exceed 80 percent of the annual nitrogen rates for cool or warm season grasses.

~~Phosphorus and Potassium Nutrient Needs (Established Turf)~~

~~Apply phosphorus (P_2O_5) and potassium (K_2O) fertilizers as indicated necessary by a soil test using the following guidelines:~~

~~Soil Test Level~~	~~Nutrient Needs (pounds per 1,000 ft^2)*~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~2-3~~	~~2-3~~
~~M~~	~~1-2~~	~~1-2~~
~~H~~	~~0.5-1~~	~~0.5-1~~
~~VH~~	~~0~~	~~0~~

~~* For the lower soil test level within a rating, use the higher side of the range and for higher soil test level within a rating use the lower side of the recommendation range. (For example the recommendation for a P_2O_5 soil test level of L- would be 3 pounds per 1,000 ft^2.)~~

~~Do not use high phosphorus ratio fertilizers such as 10-10-10 or 5-10-10, unless soil tests indicate phosphorus availability below the M+ level.~~

~~Recommendations for Establishment of Turf~~

~~These recommendations are for timely planted turfgrass, that is, the seed or vegetative material (sod, plugs, and /or sprigs), are planted at a time of the year when temperatures and moisture are adequate to maximize turfgrass establishment. These recommended establishment periods would be late summer to early fall for cool-season turfgrasses and late spring through mid-summer for warm-season turfgrasses.~~

~~Nitrogen Applications~~

~~At the time of establishment, apply no more than 0.9 pounds per 1,000 ft^2 of total nitrogen for cool season grasses or 1.0 pounds per 1,000 ft^2 of total nitrogen for warm season grasses, using a material containing slowly available forms of nitrogen, followed by one or two applications beginning 30 days after planting, not to exceed a total of 1.8 pounds per 1,000 ft^2 total for cool season grasses and 2.0 pounds per 1,000 ft^2 for warm season grasses for the establishment period. Applications of WSN cannot exceed more than 0.7 pounds per 1,000 ft^2 within a 30-day period.~~

~~Phosphorus and Potassium Recommendations for Establishment~~

~~Soil Test Level~~	~~Nutrient Needs (pounds per 1,000 ft^2) *~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~3-4~~	~~2-3~~
~~M~~	~~2-3~~	~~1-2~~
~~H~~	~~2-1~~	~~0.5-1~~
~~VH~~	~~0~~	~~0~~

~~* For the lower soil test level within a rating, use the higher side of the range and for higher soil test level within a rating use the lower side of the recommendation range.~~

~~Nutrient Recommendations for Golf Courses~~

~~Nitrogen Timing~~

~~The beginning and ending dates for application of nitrogen shall be determined using guidance and frost date maps contained in the Season of Application for Nitrogen section, Figures 6-1 and 6-2.~~

~~If the full rate or the highest rate of the recommendation range for a monthly application is applied in a single application, then the interval of application for nitrogen shall be at least 30 days to allow turf to utilize previous nitrogen applications. If several applications are to be made for the monthly nitrogen rate, then the timing of the applications shall be at approximately even intervals, with the rate per application to be evenly divided between each application with the total nitrogen applied not to exceed the maximum monthly rate. Use of Water Insoluble Nitrogen forms of Nitrogen is encouraged.~~

~~Nitrogen Rates~~

	~~Grass Type~~	~~Maximum WSN Rate Per Application - pounds per 1,000 ft^2~~	~~Total Annual Nitrogen Rate - pounds per 1,000 ft^2 [a]~~
~~Greens~~		~~0.7 [b]~~	~~3-6~~
~~Tees~~		~~0.7 [b]~~	~~2-5~~
~~Fairways~~	~~Cool Season~~	~~0.7 [c]~~	~~2-3~~
	~~Warm Season~~	~~0.7 [c]~~	~~3-4~~
~~Fairways – Intensive Management~~	~~Cool Season~~	~~0.5 [d]~~	~~3-4~~
	~~Warm Season~~	~~0.5 [d]~~	~~3.5-4.5~~
~~Overseeding Warm Season Fairways~~		~~.5~~	~~1.25~~
~~Roughs~~		~~0.7 [e]~~	~~1-3~~

~~Fairways-Overseeding Warm Season Fairways~~

- ~~For warm season grasses, up to 0.7 pounds of nitrogen per 1,000 ft^2 in a 30-day period may be applied in the Fall after perennial ryegrass overseeding is well established. An additional nitrogen application of 0.7 pounds per 1,000 ft^2 may be made in February-March to overseeded perennial ryegrass if growth and color indicate need. Applications using WSN may not exceed 0.7 pounds per 1,000 ft^2 within a 30-day period.~~

- ~~Soluble nitrogen rates of 0.25 pounds per 1,000 ft^2 or less which may be a component of a pesticide or minor element application, may be applied any time during the application windows described in Recommended Season of Application for Nitrogen Fertilizers of this section, but must be considered with the total annual nitrogen application rate.~~

~~(a) Use higher rates for intensively used turf where accelerated growth and/or rapid recovery are required, use lower rates for maintenance of lesser used areas; do not exceed total annual nitrogen levels as stated above.~~

~~(b) Greens and Tees – Per application timing must be a minimum of 30 days between applications. A rate of 0.9 pounds per 1,000 ft^2 of total nitrogen may be applied for cool season grasses or 1.0 pounds per 1,000 ft^2 of total nitrogen may be applied for warm season grasses using a material containing slowly available forms of nitrogen.~~

~~(c) Fairways-Normal Management (Non-Irrigated or Irrigated) - Per Application timing must be a minimum of 30 days between applications. Total nitrogen application rates of 0.9 pounds per 1,000 ft^2 of total nitrogen may be applied for cool season grasses or 1.0 pound per 1,000 ft^2 of total nitrogen may be applied for warm season grasses using a material containing slowly available forms of nitrogen.~~

~~(d) Fairways-Intensive Management (Irrigated)- Per Application timing must be a minimum of 15 days between applications. This option requires optimized timing of more frequent applications of nitrogen with lesser rates per application. Alternatively, a maximum application rate of 0.9 pounds per 1,000 ft^2 of total nitrogen for cool season grasses or 1.0 pounds per 1,000 ft^2 of total nitrogen for warm season grasses using a material containing slowly available forms of nitrogen may be applied with a minimum of 30 days between applications.~~

~~(e) Foliar fertilizer may be applied to warm season grasses within 30 days prior to the first killing frost in the fall, at a rate not to exceed 0.1 pounds per 1,000 ft^2 of nitrogen per application. This application must be accounted for in the total annual nitrogen rate.~~

~~Phosphorus and Potassium Recommendations for Established Golf Courses~~

~~Apply phosphorus (P_2O_5) and potassium (K_2O) fertilizers as indicated by a soil test using the following guidelines:~~

~~Soil Test Level~~	~~Nutrient Needs (pounds per 1,000 ft^2)*~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~2-3~~	~~2-3~~
~~M~~	~~1-2~~	~~1-2~~
~~H~~	~~0.5-1~~	~~0.5-1~~
~~VH~~	~~0~~	~~0~~

~~* For the lower soil test level within a rating, use the higher side of the range and for higher soil test level within a rating use the lower side of the recommendation range.~~

- ~~For irrigated turf grown on Naturally Occurring and Modified Sand Based soils only, up to 0.5 pounds of P_2O_5 per 1,000 ft^2 may be applied, if needed, to aid in recovery of damaged turf during times of extreme use. No phosphorus applications shall be made when the soil phosphorus test level is above 65% saturation, based on the soil test phosphorus values and region as listed in Table 4-1 of Section IV.~~

- ~~Avoid the general use of high phosphorus ratio fertilizers such as 10-10-10 or 5-10-10, unless soil tests indicate phosphorus availability below the M+ level.~~

~~Nitrogen Management on Athletic Fields - Cool Season Grasses~~

- ~~This program is intended for those fields which are under heavy use.~~

- ~~Nitrogen recommendations are based on the assumption that there is adequate soil moisture to promote good turf growth at the time of application. If no rainfall has occurred since the last application, further applications should be delayed until significant soil moisture is available.~~

~~Cool Season Grasses~~	~~Maintenance Program~~[a] ~~Normal~~	~~Intensive~~
~~When to Apply~~[b]	~~Pounds per 1,000 ft^2 Nitrogen~~	
~~After August 15~~	~~------~~	~~0.5~~
~~September~~	~~0.7~~	~~0.7~~[c]
~~October~~	~~0.7~~[c]	~~0.7~~[c]
~~November~~	~~0.5~~	~~0.7~~[c]
~~April 15 - May 15~~	~~0.5~~	~~0.5~~
~~June 1 - June 15~~	~~----~~	~~0.5~~

~~**Notes**:~~

- ~~Soluble nitrogen rates of 0.25 pounds per 1,000 ft^2 or less which may be a component of a pesticide or minor element application may be applied any time the turf is actively growing, but must be considered with the total annual nitrogen application rate.~~
- ~~WSN = water soluble nitrogen; WIN = water insoluble nitrogen~~

~~(a) Intensive managed areas must be irrigated.~~

~~(b) The beginning and endi ng dates for application of nitrogen shall be det ermined using guidance and frost date maps contained in the preceding Season of Application for Nitrogen section, using Figures 6-1 and 6-2.~~

~~(c) Rates up t o 0.9 pounds per 1,000 ft^2 of total nitrogen can be applied using a m aterial containing slowly available forms of nitrogen, with a minimum of 30 days between applications.~~

~~(d) Make this application only if turf use warrants additional nitrogen for sustaining desirable growth and /or color.~~

~~Nitrogen Management on Athletic Fields - Warm Season Grasses~~

~~The following comments apply to both Naturally Occurring or Modified Sand based Fields and Predominantly Silt/Clay Soil Fields:~~

- ~~Annual nitrogen rates for warm season grasses shall not exceed **4 pounds** in areas which have the average first killing frost on or before October 20, and shall not exceed **5 pounds** in areas which have the average first killing frost after October 20 as shown in Figure 6-1. Nitrogen rates and timings for overseeding warm season grasses are not included in these rates.~~

- ~~April 15 - May 15 applications should not be made until after complete green-up of turf.~~

- ~~Nitrogen applications June through August should be coordinated with anticipated rainfall if irrigation is not available.~~

- ~~Use the lower end of the ranges for non-irrigated fields and the higher end of the ranges should be used on fields with irrigation.~~

- Nitrogen rates towards the higher end of the ranges may be applied on heavily used fields to accelerate recovery, however per application and annual rates cannot be exceeded.

Bermudagrass - Predominantly Silt/Clay Soil Fields [a]		
When to Apply[b]	Pounds per 1,000 ft² Nitrogen[c]	First Fall Killing Frost Date[b]
April 15 - May 15	0.5- 0.7[(c)]	Before Oct. 20
June	0.7	
July	0.5 – 0.7 [(d)]	
August	0.5 - 0.7 [(d)]	
Sept 1 - Sept 15	0.5 -0.7 [(c)]	After Oct. 20
If overseeded with perennial ryegrass		
Oct - Nov	0.5 [(e)]	
Feb-Mar	0.5 [(e)]	

Bermudagrass - Naturally Occurring or Modified Sand based Fields [a]		
When to Apply[b]	Pounds per 1,000 ft² Nitrogen	First Fall Killing Frost Date[b]
April 15 - May 15	0.5 -0.7[(c)]	Before Oct. 20
June1	0.7[(c)]	
July	0.7[(c)]	
August	0.7[(c))]	
Sept 1 - Sept 15	0.7[c]	After Oct. 20
If overseeded with perennial ryegrass		
Oct - Nov	0.5 [(e)]	
Feb - Mar	0.5 [(e)]	

The following notes apply to both of the Bermudagrass tables above:

(a) In the Piedmont and the Ridge and Valley areas of Virginia, the existing native soil will normally be comprised predominantly of clay and/or silt and these soils have inherently lower water infiltration and percolation rates and greater nutrient holding capacity. However, most areas of the Coastal Plain have existing native soils that are predominantly sandy textured soils and other facilities throughout the state may choose to install modified soil root zones that are predominantly sand (>50%) in order to maximize drainage and reduce compaction tendency. If subsurface drain tile surrounded by sand and/or gravel has been installed under the playing surface of any of these fields, their nitrogen programs should be m anaged as predominantly sand-based systems to minimize nutrient leaching.

(b) The beginning and ending dates for application of nitrogen shall be det ermined using guidance and frost date maps contained in the Season of Application for Nitrogen section, Figures 6-1 and 6-2.

(c) WSN must be applied as two applications not to exceed 0.35 pounds per 1,000 ft² each with a minimum of 15 days between applications. Alternatively, using a material that contains slowly available nitrogen sources, split applications of 0.5 pounds per 1,000 ft² may be applied with a minimum of 15 days between applications.

~~(d) If a material containing slowly available forms of nitrogen is used, rates up to 1.0 pounds of nitrogen per 1,000 ft^2 may be applied in a single application with a minimum of 30 days between applications.~~

~~(e) For overseeded warm season grasses, an additional 0.7 pounds per 1,000ft^2 of WSN may be applied in the Fall after the perennial ryegrass overseeding is well established. The WSN must be applied as two applications not to exceed 0.35 pounds per 1,000 ft^2 of nitrogen each, with a minimum of 15 days between applications. Additional WSN application of 0.5 pounds per 1,000 ft^2 may be made in February-March to overseeded perennial ryegrass if growth and color indicate need. Alternatively, split applications of 0.5 pounds of nitrogen per 1,000 ft^2 each with a minimum of 15 days between applications may be applied using a material containing slowly available nitrogen sources.~~

~~Phosphorus and Potassium Recommendations Athletic Fields~~

~~Apply phosphorus (P_2O_5) and potassium (K_2O) fertilizers as indicated by a soil test using the following guidelines:~~

~~Soil Test Level~~	~~Nutrient Needs (pounds per 1,000 ft^2)*~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~2-3~~	~~2-3~~
~~M~~	~~1-2~~	~~1-2~~
~~H~~	~~0.5-1~~	~~0.5-1~~
~~VH~~	~~0~~	~~0~~

~~* For the lower soil test level within a rating, use the higher side of the range and for higher soil test level within a rating use the lower side of the recommendation range.~~

- ~~For irrigated turf grown on Naturally Occurring and Modified Sand Based soils only, up to 0.5 pounds of P_2O_5 per 1,000 ft^2 may be applied, if needed, to aid in recovery of damaged turf during times of extreme use. No phosphorus applications shall be made when the soil phosphorus test level is above 65% saturation, based on the soil test phosphorus values and region as listed in Table 4-1 of Section IV.~~

- ~~Avoid the general use of high phosphorus ratio fertilizers such as 10-10-10 or 5-10-10, unless soil tests indicate phosphorus availability below the M+ level.~~

~~Establishment/Grow-In Recommendations for Golf Courses, Athletic Fields, and Sod Production~~

~~(These rates replace normal maintenance fertilizer applications that would have occurred during these time periods.)~~

~~Warm Season Grasses:~~

~~Predominantly Silt/Clay Soils~~

- ~~Plant Date - late May -June for sprigs, plugs, sod, or seeding.~~
- ~~Apply P_2O_5 and K_2O as needed based on soil test recommendations, incorporate into the top 2 inches if possible.~~
- ~~At Planting - Up to 1.0 pounds of nitrogen per 1,000 ft^2 using a material containing slowly available forms of nitrogen may be applied as one application or lesser amounts applied at regular intervals, through the first 4 weeks, not to exceed a total of 1.0 pounds of nitrogen per 1,000ft^2.~~
- ~~Four weeks after planting - 0.25 pounds.of WSN per 1,000 ft^2 per week for the next 4 weeks.~~

~~Naturally Occurring or Modified Sand Based Soils~~

- ~~Plant Date - late May -June for sprigs, plugs, sod, or seeding.~~
- ~~Apply P_2O_5 and K_2O as needed based on soil test recommendations, incorporate into the top 2 inches if possible.~~
- ~~At Planting - Up to 1.0 pounds of nitrogen per 1,000 ft^2 using a material containing slowly available forms of nitrogen may be applied as one application or lesser amounts at regular intervals through the first 4 weeks, not to exceed a total of 1.0 pounds of nitrogen per 1,000 ft^2.~~
- ~~Four weeks after planting - 0.25 pounds per1,000 ft^2 using a material containing slowly available forms of nitrogen per week for the next 4 weeks.~~

~~Cool Season Grasses:~~

~~Predominantly Silt/Clay Soils~~

- ~~Plant Date - August - September (preferred)~~
- ~~Apply P_2O_5 and K_2O as needed based on soil test recommendations, incorporate into the top 2 inches if possible.~~
- ~~At Planting - up to 0.9 pounds of nitrogen per 1,000 ft^2 using a material containing slowly available forms of nitrogen may be applied; 30 days after planting, apply up to 0.5 pounds of nitrogen per 1,000 ft^2 every week for the next 4 weeks.~~

~~Naturally Occurring or Modified Sand Based Soils~~

- ~~Plant Date - August -September (preferred)~~
- ~~Apply P_2O_5 and K_2O as needed based on soil test recommendations, incorporate into the top 2 inches if possible.~~
- ~~At Planting - up to 0.9 pounds of nitrogen per 1,000 ft^2 using a material containing slowly available forms of nitrogen may be applied.~~
- ~~Apply up to 0.25 pounds of nitrogen per 1,000 ft^2 per week after germination is complete, for the next 8 weeks. If using a material that contains slowly available forms of nitrogen, up to 0.5 pounds of nitrogen per 1,000 ft^2 every two weeks may be applied after germination is complete for the next 8 weeks.~~

~~Sod Installations:~~

~~Site preparation should include a soil test, which can be done several months before the project begins in order to have time to get test results back. Phosphorus, potassium and lime applications should be based on soil test analysis to increase the likelihood of a successful installation. Shallow incorporation of material into the top 2 inches of the soil is preferred prior to sod installation, especially if lime is required.~~

~~No more than 0.7 pounds of nitrogen per 1,000 ft^2 of WSN may be applied before sod is installed. Alternatively, using a material with slowly available forms of nitrogen, 0.9 pounds of nitrogen per 1,000 ft^2 for cool season grasses or 1.0 pounds of nitrogen per 1,000 ft^2 for warm season grasses may be applied before sod is installed.~~

~~After installation apply adequate amounts of water to maintain sufficient soil moisture (i.e. to prevent visible wilt symptoms). Excessive water will limit initial root development. After roots begin to establish (as verified by lightly tugging on the sod pieces), shift irrigation strategy to a deep and infrequent program in order to encourage deep root growth. Apply approximately 1 inch of water per week (either by rainfall or irrigation), making sure that the water is being accepted by the soil profile without running off. This will insure thorough wetting of the soil profile.~~

~~After sod has completed rooting and is well established, initiate the normal nitrogen management program as described for the appropriate use shall be recommended.~~

~~Phosphorus and Potassium Recommendations for Establishment/Grow-In/Installation~~

~~Soil Test Level~~	~~Nutrient Needs (pounds per 1,000 ft^2) *~~	
	~~P_2O_5~~	~~K_2O~~
~~L~~	~~3-4~~	~~2-3~~
~~M~~	~~2-3~~	~~1-2~~
~~H~~	~~2-1~~	~~0.5-1~~
~~VH~~	~~0~~	~~0~~

~~* For the lower soil test level within a rating, use the higher side of the range and for higher soil test level within a rating use the lower side of the recommendation range.~~

~~Other Turf Management Considerations for Golf Courses, Athletic fields, and Home Lawns~~

~~Lime Recommendations~~

~~Lime should be r ecommended based on a soil test to maintain soil pH within an ag ronomic range for turfgrass.~~

~~For new seedings where lime is recommended, incorporate the lime into the topsoil for best results.~~

~~Returning Grass Clippings~~

~~Recycling of clippings on turf should be encouraged as an effective means of recycling nitrogen, phosphorus, and potassium. Proper mowing practices that ensure no more than 1/3 of the leaf blade is removed in any cutting event will enhance turf appearance and performance when clippings are returned. Return all leaf clippings from mowing events to the turf rather than discharging them onto sidewalks or streets. Rotary mulching mowers can further enhance clipping recycling by reducing the size of clippings being returned to the turfgrass canopy.~~

~~Management of Collected Clippings~~

~~If clippings are collected they should be di sposed of properly. They may be c omposted or spread uniformly as a thin layer over other turf areas or areas where the nutrient content of the clippings can be recycled through actively growing plants. They should not be blown onto impervious surfaces or surface waters, dumped down stormwater drains, or piled outside where rainwater will leach out the nutrients creating the potential for nutrient loss to the environment.~~

~~Use of Iron~~

~~Iron applications (particularly foliar applications) may periodically be used for enhanced greening as an alternative to nitrogen. These applications are most beneficial if applied in late spring through summer for cool season grasses and in late summer/fall applications for warm- season grasses.~~

~~Impervious Surfaces~~

~~Do not apply fertilizers containing nitrogen or phosphorus to impervious surfaces (sidewalks, streets, etc.). Remove any granular materials that land on impervious surfaces by sweeping and collecting, and either put the collected material back in the bag, or spread it onto the turf and /or using a leaf blower etc. to return the fertilizer back to the turfgrass canopy.~~

~~Section VII. Estimated Nitrogen Availability to Succeeding Crops From Legumes~~

~~Table 7-1~~

~~Estimated Nitrogen Availability to Succeeding Crops From Legumes~~

~~Crop~~	~~% Stand~~	~~Description~~	~~Residual N (Lbs/ac)~~
~~Alfalfa~~	~~50-75~~	~~Good (>4 T/A)~~	~~90~~
	~~25-49~~	~~Fair (3-4 T/A)~~	~~70~~
	~~<25~~	~~Poor (<3 T/A)~~	~~50~~
~~Red Clover or Crimson Clover~~	~~>50~~	~~Good (>3 T/A)~~	~~80~~
	~~25-49~~	~~Fair (2-3 T/A)~~	~~60~~
	~~<25~~	~~Poor (<2 T/A)~~	~~40~~
~~Hairy Vetch (cover crop)~~	~~80-100~~	~~Good~~	~~100~~
	~~50-79~~	~~Fair~~	~~75~~
	~~<50~~	~~Poor~~	~~50~~
~~Peanuts~~	~~-~~	~~-~~	~~45~~
~~Soybeans~~	~~1/2 lb. N per bushel of yield, if previous yield unknown, 20 lbs.~~		

~~Table 8-1~~
~~Manure Ammonium Nitrogen Availability Coefficients~~

~~Method of Application~~	~~Semi-Solid Manure~~	~~Liquid Manure Slurry~~	~~Lagoon Liquid~~	~~Dry Litter~~
~~Injection~~	~~-~~	~~0.95~~	~~0.95~~	~~-~~
~~Broadcast with incorporation immediate~~	~~0.75~~	~~0.75~~	~~0.90~~	~~0.90~~
~~Incorporated after 2 days~~	~~0.65~~	~~0.65~~	~~0.80~~	~~0.80~~
~~Incorporated after 4 days~~	~~0.40~~	~~0.40~~	~~0.60~~	~~0.65~~
~~Incorporated after 7 days or no incorporation~~	~~0.25~~	~~0.25~~	~~0.45~~	~~0.50~~
~~Irrigation without incorporation~~	~~-~~	~~0.20~~	~~0.50~~	~~-~~

~~To utilize the table, the pounds of NH_4-N per ton or 1000 gallons of manure is determined from a manure test. Multiply the NH_4-N content of the manure by the availability coefficient in the table to obtain plant available nitrogen from the manure ammonium content.~~

Table 5-1
Manure Ammonium Nitrogen Availability Coefficients

Method of Application	Semi-Solid Manure	Liquid Manure Slurry	Lagoon Liquid	Dry Litter
Injection	-	0.95	0.95	-
Broadcast with incorporation immediate	0.75	0.75	0.90	0.90
Incorporated after 2 days	0.65	0.65	0.80	0.80
Incorporated after 4 days	0.40	0.40	0.60	0.65
Incorporated after 7 days or no incorporation	0.25	0.25	0.45	0.50
Irrigation without incorporation	-	0.20	0.50	-

Note: To utilize the table, the pounds of NH_4-N per ton or 1000 gallons of manure is determined from a manure test. Multiply the NH_4-N content of the manure by the availability coefficient in the table to obtain plant available nitrogen from the manure ammonium content.

Source: Meisinger, J.J. and W.E. Jokela. 2000. "Ammonia volatilization from dairy and poultry manure." In: *Managing Nutrients and Pathogens from Animal Agriculture*, pp. 334-354. NRAES-130. Natural Resource, Agriculture, and Engineering Service, Cornell University, Ithaca, NY.

~~Table 8-2~~
~~Coefficients for Organic N Availability in Manures[1]~~

	~~Spring or Early[2] Fall Applied~~	~~Winter Topdress/ Spring Residual[3]~~	~~Perennial Grass~~
~~Dairy Manure~~	~~.35~~	~~.20/.15~~	~~.35~~
~~Poultry Manure~~	~~.60~~	~~.30/.30~~	~~.60~~
~~Swine Manure~~	~~.50~~	~~.25/.25~~	~~.50~~

~~1. Multiply the organic nitrogen content by the coefficient in the table to obtain expected available nitrogen.~~

2. ~~Manure applied in spring for summer annuals such as corn, or early fall (prior to December 1) for small grains. This coefficient shall also be used to calculate Orgainc N availability when the nitrogen need of the next spring crop is being used to determine a nitrogen application rate for fall or winter applications to a trap crop.~~

3. ~~Use the first coefficient to calculate Organic N released from manure applied in early winter on w inter annuals such as rye, wheat, or barley as a topdressing. Use the second coefficient to calculate Organic N released the following Spring.~~

Table 5-2
Coefficients for Organic Nitrogen Availability in Manures[1]

	Spring or Early[2] Fall Applied	Winter Topdress/ Spring Residual[3]	Perennial Grass
Dairy Manure	0.35	0.20/0.15	0.35
Poultry Manure	0.60	0.30/0.30	0.60
Swine Manure	0.50	0.25/0.25	0.50

[1] Multiply the organic nitrogen content by the coefficient in the table to obtain expected available nitrogen.

[2] Manure applied in spring for summer annuals such as corn, or early fall (prior to December 1) for small grains. This coefficient shall also be used to calculate Organic N availability when the nitrogen need of the next spring crop is being used to determine a nitrogen application rate for fall or winter applications to a trap crop.

[3] Use the first coefficient to calculate Organic N released from manure applied in early winter on winter annuals such as rye, wheat, or barley as a topdressing. Use the second coefficient to calculate Organic N released the following Spring.

~~Table 8-3~~
~~Manure Residual Factors for Previous Applications*~~

~~Historical Frequency of Manure Application on the Field~~	~~Residual Factor~~
~~Rarely Received Manure in Past (0-1 years in last 5)~~	~~0~~
~~Frequent Past Applications (2-3 out of 5 years)~~	~~0.10~~
~~Continuously Received Manure (4-5 out of 5 years)~~	~~0.20~~

~~* The appropriate rate of manure to use in residual calculations is generally the average rate applied for years in which manure was land applied to the field.~~

~~* Multiply the initial organic N content by the appropriate manure residual factor to obtain an estimate of residual nitrogen from past manure applications.~~

~~* If more detailed manure history information is available, a residual availability of the initial organic nitrogen content of .12, .05, .02 may be used for one, two, and three years respectively following application.~~

Coefficients for Calculating Nitrogen Residuals in Manure

Table 5-3
Manure Residual Factors for Previous Applications

Historical Frequency of Manure Application on the field	Residual Factor
Rarely Received Manure in Past (0-1 years in last 5)	0
Frequent Past Applications (2-3 out of 5 years)	0.10
Continuously Received Manure (4-5 out of 5 years)	0.20

Notes: The appropriate rate of manure to use in residual calculations is generally the average rate applied for years in which manure was land applied to the field.

Multiply the initial organic N content by the appropriate manure residual factor to obtain an estimate of residual nitrogen from past manure applications.

Primary Nutrient Availability for Manures

Manure Phosphorus

Available P_2O_5 = Manure Analysis P_2O_5

If soils are testing M+ or above in phosphorus and the manure will supply enough phosphorus for the crop according to the formula Available P_2O_5 = Total P_2O_5, no fertilizer phosphorus should be used due to unlikely crop response and water quality concerns.

For soils testing Medium or below, starter applications of fertilizer phosphorus should be made even if the manure contains sufficient phosphorus since it is contained in slow release organic forms. For soils testing low, higher levels of phosphorus starter fertilizer are recommended.

Manure Potassium

Available K_2O = Manure Analysis K_2O

~~Table 8-4~~
~~Average Analysis for Manure Tested in Virginia~~

~~Manure Type~~	~~TKN~~	~~NH_4~~	~~P_2O_5~~	~~K_2O~~	~~% Moisture~~
~~Liquid Dairy Slurry (518)*~~	~~19.22~~	~~8.88~~	~~9.08~~	~~17.35~~	~~94.60~~
~~Semi-Solid Dairy (167)~~	~~15.34~~	~~3.47~~	~~7.58~~	~~14.33~~	~~67.35~~
~~Semi-Solid Beef (47)~~	~~18.00~~	~~2.36~~	~~9.88~~	~~19.02~~	~~63.13~~
~~Dry Chicken Broiler Litter (937)~~	~~64.86~~	~~11.48~~	~~52.18~~	~~53.36~~	~~27.83~~
~~Dry Chicken Layer/Breeder (172)~~	~~47.87~~	~~8.51~~	~~60.79~~	~~43.68~~	~~29.49~~
~~Dry Turkey Litter (475)~~	~~62.03~~	~~13.05~~	~~50.23~~	~~38.31~~	~~28.64~~
~~Dry Turkey Breeder (62)~~	~~58.82~~	~~12.64~~	~~61.23~~	~~36.18~~	~~25.48~~
~~Liquid Swine Lagoon (250)*~~	~~7.20~~	~~5.66~~	~~2.81~~	~~12.23~~	~~99.35~~
~~Liquid Swine Pit (38)*~~	~~23.56~~	~~15.29~~	~~16.71~~	~~15.74~~	~~97.48~~

~~* Nutrient values presented in pounds/1000 gallons. All other nutrient values in pounds/ton.~~

~~The above table is a compilation of average values for Virginia manure samples from October 2001 through October 2004, analyzed by Clemson University Agricultural Service Lab. Numbers in parentheses indicate the number of samples analyzed for each category.~~

~~Table 8-5~~

Animal Manure Production Rates~~[1]~~

~~Animal~~	~~Daily Manure Production Per 1,000 lb weight~~ ~~Animal Size~~	~~lbs.~~	~~cu. ft.~~	~~gals~~	~~% Dry Matter~~
~~**Cattle**~~					
~~Dairy~~	~~150 - 1,500~~	~~82~~	~~1.4~~	~~10.0~~	~~13~~
~~Beef~~	~~400 – 1,400~~	~~60~~	~~1.0~~	~~7.5~~	~~12~~
~~Veal~~	~~100 – 350~~	~~63~~	~~1.0~~	~~7.5~~	~~1.6~~
~~**Swine**~~					
~~Pigs~~	~~35 – 200~~	~~65~~	~~1.1~~	~~7.5~~	~~9~~
~~Gestation Sow~~	~~275~~	~~32~~	~~0.5~~	~~4.0~~	~~9~~
~~Sow and 8 pigs~~	~~375~~	~~88~~	~~1.4~~	~~10.6~~	~~9~~
~~Boar~~	~~350~~	~~31~~	~~0.5~~	~~4.0~~	~~9~~
~~**Sheep**~~	~~100~~	~~40~~	~~0.6~~	~~4.6~~	~~25~~
~~**Horse**~~	~~1,000~~	~~45~~	~~0.7~~	~~5.6~~	~~20~~
~~**Poultry**~~					
~~Poultry[2] Liquid~~	~~-~~	~~300~~	~~-~~	~~-~~	~~5~~
~~Fresh, wet, sticky and caked~~	~~-~~	~~61~~	~~-~~	~~-~~	~~25~~
~~Moist crumbly to sticky~~	~~-~~	~~32~~	~~-~~	~~-~~	~~50~~
~~Crumbly~~	~~-~~	~~22~~	~~-~~	~~-~~	~~70~~
~~Dry~~	~~-~~	~~18~~	~~-~~	~~-~~	~~85~~

Table 5-4
Animal Manure Production Rates[1]
Daily Manure Production Per 1,000 lbs. weight

Animal	Animal Size	lbs.	cu. ft.	gals	% Dry Matter
Cattle					
Dairy	150 - 1,500	82	1.4	10.0	13
Beef	400 – 1,400	60	1.0	7.5	12
Veal	100 – 350	63	1.0	7.5	1.6
Swine					
Pigs	35 – 200	65	1.1	7.5	9
Gestation Sow	275	32	0.5	4.0	9
Sow and 8 pigs	375	88	1.4	10.6	9
Boar	350	31	0.5	4.0	9
Sheep	100	40	0.6	4.6	25
Horse	1,000	45	0.7	5.6	20
Poultry					
Poultry[2] Liquid	-	300	-	-	5
Fresh, wet, sticky and caked	-	61	-	-	25
Moist crumbly to sticky	-	32	-	-	50
Crumbly	-	22	-	-	70
Dry	-	18	-	-	85

[1] Does not include bedding, wash water, runoff water and other inputs which increase manure volume.

[2] Storage losses already deducted.

Notes: Broiler houses generate approximately 1.25 tons of litter per 1,000 birds during each cycle. Six cycles per year is average. Houses are cleaned out at variable intervals ranging from after each cycle to once every two years.

Turkey Tom production generates approximately 10 tons of litter per 1,000 birds during each cycle for 4 cycles per year. Turkey hens produce about 8 tons per 1,000 birds during each of 5 cycles per year.

1. ~~Does not include bedding, wash water, runoff water and o ther inputs which increase manure volume.~~

2. ~~Storage losses already deducted.~~

~~Broiler houses generate approximately 1.25 tons of litter per 1000 birds during each cycle. S ix cycles per year is average. H ouses are cleaned out at variable intervals ranging from after each cycle to once every two years.~~

~~Turkey Tom production generates approximately 10 tons of litter per 1000 birds during each cycle for 4 c ycles per year. T urkey hens produce about 8 t ons per 1000 bi rds during each of 5 cycles per year.~~

~~Complete clean outs of poultry houses should be scheduled during spring or summer, consistent with the availability of a suitable crop for uptake of N, unless covered storage is available, to minimize water quality impacts and maximize agronomic efficiency.~~

~~Table 8-6~~
~~Annual Liquid Animal Waste Volume Available for Land Application~~
Annual Liquid Animal Waste Volume Calculations

~~A. Manure Production~~

~~Animal Type~~	~~Ave. Wt*~~		~~Gal/Yr~~		~~# Animals~~		~~% Confined~~		~~Volume (Gals)~~
~~Feeder Swine~~		~~x~~	~~2.74~~	~~x~~		~~x~~	~~.~~	~~=~~	
~~Sow & Litter~~		~~x~~	~~3.84~~	~~x~~		~~x~~	~~.~~	~~=~~	
~~Gestation Sow~~		~~x~~	~~1.46~~	~~x~~		~~x~~	~~.~~	~~=~~	
~~Boar~~		~~x~~	~~1.46~~	~~x~~		~~x~~	~~.~~	~~=~~	
~~Beef Cattle~~		~~x~~	~~2.74~~	~~x~~		~~x~~	~~.~~	~~=~~	
~~Dairy Cattle~~		~~x~~	~~3.65~~	~~x~~		~~x~~	~~.~~	~~=~~	
			~~Subtotal Annual Manure Production~~						~~gallons~~

~~*Typical Weights~~					
	~~Lbs.~~				~~Lbs.~~
~~Feeder Swine~~	~~145~~		~~Dairy Cattle~~		
~~Sow & Litter~~	~~375~~		~~Mature~~		~~1400~~
~~Gestation Sow~~	~~275~~		~~Heifers~~	~~16-24 Mo~~	~~1050~~
~~Boar~~	~~350~~			~~9-16 Mo~~	~~680~~
~~Beef Cattle (Finishing)~~	~~1000~~			~~2-9 Mo~~	~~350~~
			~~Calves~~	~~0-2 Mo~~	~~150~~

Calculation 5-1 Annual Liquid Animal Waste Volume Available for Land Application Manure Production									
Animal Type	Ave. Wt.*		Gal/Yr		# Animals		% Confined		Volume (Gals)
Feeder Swine		x	2.74	x		x	.	=	
Sow & Litter		x	3.84	x		x	.	=	
Gestation Sow		x	1.46	x		x	.	=	
Boar		x	1.46	x		x	.	=	
Beef Cattle		x	2.74	x		x	.	=	
Dairy Cattle		x	3.65	x		x	.	=	
			Subtotal Annual Manure Production						gallons

Typical Weights					
	Lbs.				Lbs.
Feeder Swine	145		Dairy Cattle		
Sow & Litter	375		Mature		1400
Gestation Sow	275		Heifers	16-24 Mo	1050
Boar	350			9-16 Mo	680
Beef Cattle (Finishing)	1000			2-9 Mo	350
			Calves	0-2 Mo	150

~~B. Process Wastewater~~

~~Type~~	~~# Animals~~		~~Gals. Per Day~~		~~365 Days/Yr.~~		~~Total Wastewater~~	
~~Dairy~~		~~x~~		~~x~~	~~365~~	~~=~~		~~gals~~
~~Hogs~~		~~x~~		~~x~~	~~365~~	~~=~~		~~gals~~
~~Other~~		~~x~~		~~x~~	~~365~~	~~=~~		~~gals~~

~~Dairy Cows Milked~~	~~Wastewater (Gal/Cow/Day)~~
~~0 - 50~~	~~5 - 8~~
~~50 - 150~~	~~4 - 6~~
~~150+~~	~~2 – 4~~

~~* Typical Wastewater — excludes flushing systems~~

~~**Note**: Most modern swine operations with lagoons use recirculated flush water for some of the production areas, therefore, when calculating process wastewater, you should consider only the clean water that is added during each flush.~~

Calculation 5-2 Annual Liquid Animal Waste Volume Available for Land Application Process Wastewater								
Type	# Animals		Gals. Per Day		365 Days/Yr.		Total Wastewater	
Dairy	-	x		x	365	=		gals
Hogs		x		x	365	=		gals
Other		x		x	365	=		gals

~~C. Feedlot Runoff~~

~~(A x ROF x AnnPrec) x 7.48 = Feedlot Runoff~~
~~12~~

~~**Where:** A = lot area in square feet~~
~~ROF = runoff factor~~
~~ROF for paved lot = .60~~
~~ROF for unpaved lot = .25~~
~~AnnPrec = annual average precipitation from Table 8-7~~
~~7.48 converts cubic feet to gallons~~
~~(______________________________) x 7.48 = ____________________gallons~~
~~12~~

~~D. Net Precipitation Excess Over Pit or Lagoon (Precipitation less Evaporation)~~

~~**Lagoons:** NPE = Rainfall - (Lake Evaporation x .9)*~~
~~NPE = _________ - (_________ x __________)~~
~~NPE = _________~~

~~**Pits:** NPE = Rainfall - (Lake Evaporation X .3)*~~
~~NPE = _________ - (__________ x __________)~~
~~NPE = _________~~

~~*See Table 8-7~~

~~(SA x NPE) x 7.48 = **Total NPE (gallons)**~~
~~12~~

~~**where:** SA = surface area of pit or lagoon at the top,~~
~~NPE = net precipitation excess as calculated above,~~
~~7.48 converts cubic feet to gallons~~

~~(___________________________) x 7.48 = _____________________gallons~~
~~12~~

~~**Total Annual Liquid Animal Waste Volume Produced =**~~
~~(A. Manure + B. Process Wastewater + C. Feedlot Runoff + D. Net Precipitation Excess) ________________ **gallons**~~

Average Wastewater Production excludes flushing systems	
Dairy Cows Milked	**Wastewater (Gal/Cow/Day)**
0 - 50	5 - 8
50 - 150	4 - 6
150+	2 – 4

Note: Most modern swine operations with lagoons use recirculated flush water for some of the production areas, therefore, when calculating process wastewater, you should consider only the clean water that is added during each flush.

Calculation 5-3
Annual Liquid Animal Waste Volume Available for Land Application
Feedlot Runoff

$$\frac{(A \times ROF \times AnnPrec)}{12} \times 7.48 = \text{Feedlot Runoff}$$

Where: A = lot area in square feet
ROF = runoff factor
ROF for paved lot = .60
ROF for unpaved lot = .25
AnnPrec = annual average precipitation from Table 8-7
7.48 converts cubic feet to gallons

(______________________________) x 7.48 = ____________________ gallons
12

Calculation 5-4
Annual Liquid Animal Waste Volume Available for Land Application
Net Precipitation Excess Over Pit or Lagoon
(Precipitation less Evaporation)

Lagoons: **NPE = Rainfall - (Lake Evaporation x .9)***
NPE = _________ - (_________ x __________)
NPE = _________

Pits: **NPE = Rainfall - (Lake Evaporation X .3)***
NPE = _________ - (__________ x __________)
NPE = _________

*See Table 8-7

$$\frac{(SA \times NPE)}{12} \times 7.48 = \textbf{Total NPE (gallons)}$$

where: SA = surface area of pit or lagoon at the top,
NPE = net precipitation excess as calculated above,
7.48 converts cubic feet to gallons

(_____________________________) x 7.48 = ______________________ gallons
12

Total Annual Liquid Animal Waste Volume Produced =
(A. Manure + B. Process Wastewater + C. Feedlot Runoff + D. Net Precipitation Excess)
________________ gallons

Table 8-7
Virginia Annual Normal Precipitation and Lake Evaporation

County	Annual Precip.	Lake Evaporation
Accomack	42	38
Albemarle	44	36
Alleghany	37	32
Amelia	42	40
Amherst	45	36
Appomatox	40	38
Augusta	38	33
Bath	41	32
Bedford	43	37
Bland	39	32
Botetourt	42	34
Brunswick	42	41
Buchanan	42	31
Buckingham	41	38
Campbell	38	38
Caroline	42	38
Carroll	41	35
Charles City	42	40
Charlotte	43	40
Chesapeake	48	40
Chesterfield	42	40
Clarke	37	34
Craig	38	32
Culpeper	40	36
Cumberland	41	39
Dickenson	42	32
Dinwiddie	42	40
Essex	44	39
Fairfax	42	37
Fauquier	40	36
Floyd	44	35
Fluvanna	39	38
Franklin	43	38
Frederick	37	33
Giles	35	32
Gloucester	43	40
Goochland	40	39
Grayson	43	33
Greene	41	36
Greensville	43	41
Halifax	42	40
Hanover	42	39
Henrico	43	40
Henry	44	39
Highland	39	32
Isle of Wight	44	40
James City	42	40
King & Queen	44	39
King George	40	38
King William	44	39
Lancaster	42	39
Lee	50	33
Loudoun	40	37
Louisa	42	38
Lunenburg	42	40
Madison	41	36
Mathews	43	40
Mecklenburg	42	41
Middlesex	42	39
Montgomery	37	34
Nelson	46	36
New Kent	44	40
Northampton	41	39
Northumberland	42	38
Nottoway	42	40
Orange	40	37
Page	39	34
Patrick	44	38
Pittsylvania	41	39
Powhatan	40	40
Prince Edward	41	40
Prince George	42	40
Prince William	36	37
Pulaski	35	33
Rappahannock	40	35
Richmond	43	38
Roanoke	40	34
Rockbridge	38	34
Rockingham	34	33
Russell	45	31
Scott	45	32
Shenandoah	34	33
Smyth	43	32
Southampton	45	41
Spotsylvania	40	38
Stafford	38	37
Suffolk	47	40
Surry	44	40
Sussex	44	40
Tazewell	42	31
Virginia Beach	46	40
Warren	35	34
Washington	45	32
Westmoreland	41	38
Wise	46	32
Wythe	37	32
York	44	40

~~Table 8-8~~
~~Maximum Wastewater Irrigation Application Rates for Different Soil Types~~

~~Soil Characteristics~~	~~0%-5% Slope Inches per hour~~	
	~~Cover~~	~~Bare~~
~~Clay; very poorly drained~~	~~0.30~~	~~0.15~~
~~Silty Surface; poorly drained clay or claypan subsoil~~	~~0.40~~	~~0.25~~
~~Medium textured surface soil; moderate to imperfectly drained profile~~	~~0.50~~	~~0.30~~
~~Silt loam; loam, and very fine sandy loam; well to moderately well drained~~	~~0.60~~	~~0.40~~
~~Loamy sand, sandy loam or peat; well drained~~	~~0.90~~	~~0.60~~

~~Reduce hydraulic application rates on sloping ground:~~

~~Slope~~	~~Application Rate Reduction~~
~~0% - 5%~~	~~0%~~
~~6% - 8%~~	~~20%~~
~~9% -12%~~	~~40%~~
~~13% -20%~~	~~60%~~
~~Over 20%~~	~~75%~~

~~Caution:~~ ~~Check application rates to insure that desired nutrient levels are not exceeded. Use the most restrictive criteria.~~

~~Do not irrigate wastewater to sites where soil moisture will exceed field capacity immediately following irrigation. Field capacity is defined as the amount of water held in the soil after the excess gravitational water has drained away and after free drainage has practically ceased.~~

~~Allow sufficient drying time between subsequent irrigations so that field capacity is not exceeded due to the irrigation events.~~

~~Source:~~ ~~Pennsylvania Department of Environmental Resources, 1990. "***Assessment of Field Manure Nutrient Management.***"~~

~~**Section IX. Biosolids Management**~~

~~**Table 9-1**~~
~~**Estimated Nitrogen Mineralization Rates for Biosolids**~~[1]

~~**Biosolids Type**~~	~~**Application Year**~~			
	~~**Application Year**~~	~~**1 Year After Application**~~	~~**2 Years After Application**~~	~~**3 Years After Application**~~
~~Lime Stabilized~~	~~0.30~~	~~0.10~~	~~0.10~~	~~0.05~~
~~Aerobic Digestion~~	~~0.30~~	~~0.10~~	~~0.10~~	~~0.05~~
~~Anaerobic Digestion~~	~~0.30~~	~~0.10~~	~~0.10~~	~~0.05~~
~~Composted~~[2]	~~0.10~~	~~0.05~~	~~0.03~~	~~0.00~~

1. ~~To determine nitrogen available from previous Biosolids applications, multiply the percent organic nitrogen by the appropriate mineralization factor.~~

2. ~~Total organic nitrogen content of 2% or less and no significant ammonia nitrogen.~~

~~**Table 9-2**~~
~~**Biosolids Ammonium Nitrogen Availability Coefficients**~~[1]
Coefficients for Calculating Plant Available Nitrogen in Biosolids

Table 5-5
Biosolids Ammonium Nitrogen Availability Coefficients[1]

Method of Application	**Biosolids pH < 10**	**Biosolids pH > 10**
Injection	1.00	1.00
Incorporated within 24 hours	0.85	0.75
Incorporated within 1-7 days	0.70	0.50
Incorporated after 7 days or no incorporation	0.50	0.25

~~**Method of Application**~~	~~**Biosolids pH < 10**~~	~~**Biosolids pH > 10**~~
~~Injection~~	~~1.00~~	~~1.00~~
~~Incorporated within 24 hours~~	~~0.85~~	~~0.75~~
~~Incorporated within 1-7 days~~	~~0.70~~	~~0.50~~
~~Incorporated after 7 days or no incorporation~~	~~0.50~~	~~0.25~~

1. ~~To determine the plant-available Biosolids ammonium nitrogen in the soil, multiply the Biosolids ammonium nitrogen concentration or total weight applied by the appropriate availability coefficient.~~
1. [1] To determine the plant-available Biosolids ammonium nitrogen in the soil, multiply the Biosolids ammonium nitrogen concentration or total weight applied by the appropriate availability coefficient.

Table 5-6 **Estimated Nitrogen Mineralization Rates for Biosolids**[1]				
Application Year				
Biosolids Type	**Application Year**	**1-Year After Application**	**2-Years After Application**	**3-Years After Application**
Lime Stabilized	0.30	0.10	0.10	0.05
Aerobic Digestion	0.30	0.10	0.10	0.05
Anaerobic Digestion	0.30	0.10	0.10	0.05
Composted[2]	0.10	0.05	0.03	0.00

[1] To determine nitrogen available from previous Biosolids applications, multiply the percent organic nitrogen by the appropriate mineralization factor.

[2] Total organic nitrogen content of 2% or less and no significant ammonia nitrogen.

Source: Evanylo, G.K. 2023. Land Application of Biosolids. In: Agronomy Handbook. Publication 424-100 (SPES-299P), Part XII, p. 163. Virginia Cooperative Extension, Virginia Tech, Blacksburg, VA. Available at: www.pubs.ext.vt.edu/content/dam/pubs_ext_vt_edu/424/424-100/spes-299-L.pdf

Primary Nutrient Availability for Biosolids

Biosolids Phosphorus

Available P_2O_5 = Biosolids Analysis P_2O_5

If soils are testing M+ or above in phosphorus and the Biosolids will supply enough phosphorus for the crop according to the formula Available P_2O_5 = Total P_2O_5, no fertilizer phosphorus should be used due to unlikely crop response and water quality concerns.

For soils testing Medium or below, starter applications of fertilizer phosphorus should be made even if the Biosolids contain sufficient phosphorus, since it is contained in slow release organic forms. For soils testing low, higher levels of phosphorus starter fertilizer are recommended.

Biosolids Potassium

Available K_2O = Biosolids analysis K_2O

Appendix; County Information

County	Annual Precip.	Lake Evaporation	Physiographic Region
Accomack	46	38	Eastern Shore and Lower Coastal Plain
Albemarle	44	36	Piedmont and Upper Coastal Plain
Alleghany	43	32	Ridge and Valley
Amelia	46	40	Piedmont and Upper Coastal Plain
Amherst	48	36	Piedmont and Upper Coastal Plain
Appomatox	45	38	Piedmont and Upper Coastal Plain
Augusta	43	33	Ridge and Valley
Bath	44	32	Ridge and Valley
Bedford	46	37	Piedmont and Upper Coastal Plain
Bland	44	32	Ridge and Valley
Botetourt	44	34	Ridge and Valley
Brunswick	46	41	Piedmont and Upper Coastal Plain
Buchanan	48	31	Ridge and Valley
Buckingham	45	38	Piedmont and Upper Coastal Plain
Campbell	44	38	Piedmont and Upper Coastal Plain
Caroline	45	38	Piedmont and Upper Coastal Plain
Carroll	50	35	Piedmont and Upper Coastal Plain
Charles City	49	40	Piedmont and Upper Coastal Plain
Charlotte	46	40	Piedmont and Upper Coastal Plain
Chesapeake	49	40	Eastern Shore and Lower Coastal Plain
Chesterfield	47	40	Piedmont and Upper Coastal Plain
Clarke	41	34	west of the Blue Ridge: Ridge and Valley the Blue Ridge and east: Piedmont and Upper Coastal Plain
Craig	44	32	Ridge and Valley
Culpeper	43	36	Piedmont and Upper Coastal Plain
Cumberland	45	39	Piedmont and Upper Coastal Plain
Dickenson	47	32	Ridge and Valley
Dinwiddie	47	40	Piedmont and Upper Coastal Plain
Essex	46	39	Eastern Shore and Lower Coastal Plain
Fairfax	42	37	Piedmont and Upper Coastal Plain
Fauquier	42	36	Piedmont and Upper Coastal Plain
Floyd	48	35	Piedmont and Upper Coastal Plain
Fluvanna	45	38	Piedmont and Upper Coastal Plain
Franklin	46	38	Piedmont and Upper Coastal Plain
Frederick	40	33	Ridge and Valley
Giles	43	32	Ridge and Valley
Gloucester	49	40	Eastern Shore and Lower Coastal Plain
Goochland	46	39	Piedmont and Upper Coastal Plain
Grayson	49	33	Piedmont and Upper Coastal Plain
Greene	45	36	Piedmont and Upper Coastal Plain
Greensville	48	41	Piedmont and Upper Coastal Plain
Halifax	46	40	Piedmont and Upper Coastal Plain
Hanover	46	39	Piedmont and Upper Coastal Plain
Henrico	47	40	Piedmont and Upper Coastal Plain
Henry	47	39	Piedmont and Upper Coastal Plain
Highland	46	32	Ridge and Valley
Isle of Wight	50	40	Eastern Shore and Lower Coastal Plain

County	Annual Precip.	Lake Evaporation	Physiographic Region
James City	50	40	Eastern Shore and Lower Coastal Plain
King & Queen	48	39	Eastern Shore and Lower Coastal Plain
King George	42	38	Piedmont and Upper Coastal Plain
King William	47	39	Piedmont and Upper Coastal Plain
Lancaster	48	39	Eastern Shore and Lower Coastal Plain
Lee	52	33	Ridge and Valley
Loudoun	42	37	Piedmont and Upper Coastal Plain
Louisa	45	38	Piedmont and Upper Coastal Plain
Lunenburg	47	40	Piedmont and Upper Coastal Plain
Madison	44	36	Piedmont and Upper Coastal Plain
Mathews	48	40	Eastern Shore and Lower Coastal Plain
Mecklenburg	46	41	Piedmont and Upper Coastal Plain
Middlesex	48	39	Eastern Shore and Lower Coastal Plain
Montgomery	43	34	Ridge and Valley
Nelson	46	36	Piedmont and Upper Coastal Plain
New Kent	48	40	Eastern Shore and Lower Coastal Plain
Northampton	46	39	Eastern Shore and Lower Coastal Plain
Northumberland	46	38	Eastern Shore and Lower Coastal Plain
Nottoway	46	40	Piedmont and Upper Coastal Plain
Orange	43	37	Piedmont and Upper Coastal Plain
Page	42	34	west of the Blue Ridge: Ridge and Valley the Blue Ridge and east: Piedmont and Upper Coastal Plain
Patrick	52	38	Piedmont and Upper Coastal Plain
Pittsylvania	46	39	Piedmont and Upper Coastal Plain
Powhatan	46	40	Piedmont and Upper Coastal Plain
Prince Edward	46	40	Piedmont and Upper Coastal Plain
Prince George	49	40	Piedmont and Upper Coastal Plain
Prince William	41	37	Piedmont and Upper Coastal Plain
Pulaski	42	33	Ridge and Valley
Rappahannock	43	35	Piedmont and Upper Coastal Plain
Richmond	46	38	Eastern Shore and Lower Coastal Plain
Roanoke	45	34	Ridge and Valley
Rockbridge	45	34	Ridge and Valley
Rockingham	42	33	Ridge and Valley
Russell	48	31	Ridge and Valley
Scott	50	32	Ridge and Valley
Shenandoah	40	33	Ridge and Valley
Smyth	48	32	Ridge and Valley
Southampton	50	41	Eastern Shore and Lower Coastal Plain
Spotsylvania	43	38	Piedmont and Upper Coastal Plain
Stafford	41	37	Piedmont and Upper Coastal Plain
Suffolk	50	40	Eastern Shore and Lower Coastal Plain
Surry	50	40	Eastern Shore and Lower Coastal Plain
Sussex	49	40	Eastern Shore and Lower Coastal Plain
Tazewell	49	31	Ridge and Valley
Virginia Beach	48	40	Eastern Shore and Lower Coastal Plain
Warren	42	34	west of the Blue Ridge: Ridge and Valley the Blue Ridge and east: Piedmont and Upper Coastal Plain
Washington	47	32	Ridge and Valley

Westmoreland	45	38	Eastern Shore and Lower Coastal Plain
Wise	51	32	Ridge and Valley
Wythe	44	32	Ridge and Valley
York	49	40	Eastern Shore and Lower Coastal Plain

Sources: National Oceanic and Atmospheric Administration, National Centers for Environmental Information. 2025. Climate at a Glance: County Time Series. 26-year average annual precipitation (2000-2025), Virginia counties. Available at: www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/county/time-series/VA-001/pcp/12/12/2000-2026

Form: TH-02
August 2022

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Proposed Regulation
Agency Background Document

Agency name	Virginia Soil and Water Conservation Board
Virginia Administrative Code (VAC) Chapter citation(s)	4VAC50-85
VAC Chapter title(s)	Nutrient Management Training and Certification Regulations
Action title	Amendments to the Nutrient Management Training and Certification Regulations
Date this document prepared	September 15, 2026

This information is required for executive branch review and the Virginia Registrar of Regulations, pursuant to the Virginia Administrative Process Act (APA), Executive Order 19 (2022) (EO 19), any instructions or procedures issued by the Office of Regulatory Management (ORM) or the Department of Planning and Budget (DPB) pursuant to EO 19, the Regulations for Filing and Publishing Agency Regulations (1 VAC 7-10), and the *Form and Style Requirements for the Virginia Register of Regulations and Virginia Administrative Code*.

Brief Summary

Provide a brief summary (preferably no more than 2 or 3 paragraphs) of this regulatory change (i.e., new regulation, amendments to an existing regulation, or repeal of an existing regulation). Alert the reader to all substantive matters. If applicable, generally describe the existing regulation.

The Virginia Soil and Water Conservation Board (Board) is amending the Nutrient Management Training and Certification Regulations (4VAC50-85), which establish the minimum qualifications for individuals who prepare nutrient management plans and the minimum components and content of a nutrient management plan. Nutrient management plans address nutrient applications to both urban landscape and agricultural operations; these plans improve and protect water quality using best management practices such as timing, rate and placement of fertilizer, manure and biosolids for agricultural and urban purposes.

The Board is proposing substantial revisions to the Virginia Nutrient Management Standards and Criteria, which are incorporated by reference in these regulations. Amendments have been made to definitions (4VAC50-85-10) to reflect current agricultural operational practices, to ensure consistent implementation across the state, and to reflect current permit requirements.

Amendments also update the fee provisions in 4VAC50-85-50 to expressly authorize recovery of payment processing costs. The reporting requirements (4VAC50-85-100) have been simplified and revisions recognize that a significant portion of the data can be provided through the Department's Nutrient Management Module in the Conservation Application Suite. The nutrient management plan content requirements in 4VAC50-85-130 are amended to add required plan components for precision nutrient management plans and transfer nutrient management plans. Revisions throughout the regulations clarify the minimum requirements; language that is strictly a recommendation has been stricken. Requirements with expired implementation dates have been stricken throughout the regulations to reduce confusion for planners and agricultural producers.

Acronyms and Definitions

Define all acronyms used in this form, and any technical terms that are not also defined in the "Definitions" section of the regulation.

The following acronyms are used in this form:

Department: Department of Conservation and Recreation

DEQ: Virginia Department of Environmental Quality

RAP: Regulatory Advisory Panel

Standards and Criteria: Virginia Nutrient Management Standards and Criteria.

There are no technical terms used in the regulation that are not defined within the regulations.

Technical terms used in the Standards and Criteria are defined in that document.

Mandate and Impetus

Identify the mandate for this regulatory change and any other impetus that specifically prompted its initiation (e.g., new or modified mandate, petition for rulemaking, periodic review, or board decision). For purposes of executive branch review, "mandate" has the same meaning as defined in the ORM procedures, "a directive from the General Assembly, the federal government, or a court that requires that a regulation be promulgated, amended, or repealed in whole or part."

The Virginia Soil and Water Conservation Board initiated a Notice of Intended Regulatory Action at their September 16, 2025 meeting in response to comments received during a periodic review and to further Department initiatives. The public comment period for the NOIRA was held from December 15, 2025 through January 14, 2026. No comments were received. A Regulatory Advisory Panel (RAP) was established to assist the Board and the Department with the regulatory review and development of recommendations. The RAP, composed of representatives from agriculture, academia, environmental organizations, and government, held three public meetings beginning on March 30, 2026.

Information about the NOIRA may be found at:
https://townhall.virginia.gov/L/viewstage.cfm?stageid=11013.

Legal Basis

Identify (1) the promulgating agency, and (2) the state and/or federal legal authority for the regulatory change, including the most relevant citations to the Code of Virginia and Acts of Assembly chapter number(s), if applicable. Your citation must include a specific provision, if any, authorizing the promulgating agency to regulate this specific subject or program, as well as a reference to the agency's overall regulatory authority.

Section 10.1-104.2 A. of the *Code of Virginia* requires the Department of Conservation and Recreation to "operate a voluntary nutrient management training and certification program to certify, in accordance with regulations adopted by the Virginia Soil and Water Conservation Board pursuant to subsection D, the competence of persons preparing nutrient management plans…"

Additional requirements for the *Nutrient Management Training and Certification Regulations* (4VAC50-85) are set out in §10.1-104.2 D of the *Code of Virginia*, which states:

> D. The Virginia Soil and Water Conservation Board shall adopt regulations:
>
> 1. Specifying qualifications and standards for individuals to be deemed competent in nutrient management plan preparation, and providing for the issuance of documentation of certification to such individuals;
>
> 2. Specifying conditions under which a certificate issued to an individual may be suspended or revoked;
>
> 3. Providing for criteria relating to the development of nutrient management plans for various agricultural and urban agronomic practices, including protocols for use by laboratories in determining soil fertility, animal manure nutrient content, or plant tissue nutrient uptake for the purpose of nutrient management;
>
> 4. Establishing fees to be paid by individuals enrolling in the training and certification programs;
>
> 5. Providing for the performance of other duties and the exercise of other powers by the Director as may be necessary to provide for the training and certification of individuals preparing nutrient management plans; and
>
> 6. Giving due consideration to relevant existing agricultural certification programs.

Purpose

Explain the need for the regulatory change, including a description of: (1) the rationale or justification, (2) the specific reasons the regulatory change is essential to protect the health, safety or welfare of citizens, and (3) the goals of the regulatory change and the problems it is intended to solve.

The amendments to 4VAC50-85 are intended to clarify the minimum requirements for nutrient management plans and to ensure that the regulations reflect current scientific understanding, changes in agricultural operations, and developments in nutrient management technology since the regulations were last substantively amended in 2006. These regulatory revisions are essential to ensuring that the technical requirements governing the development and implementation of nutrient management plans remain current and scientifically defensible.

Specific goals include: (i) removing outdated definitions and clarifying existing definitions to ensure consistent development and implementation of nutrient management plans; (ii) incorporating precision nutrient management as a planning approach and establishing minimum plan content requirements for precision plans; (iii) simplifying reporting requirements for planners; (iv) updating fee provisions to expressly authorize recovery of payment processing costs incurred by the department; and (v) ensuring the Standards and Criteria contain the minimum technical criteria required for the development of nutrient management plans, rather than incorporating recommendations as well.

Precision nutrient management is implemented throughout Virginia and typically provides more precise fertilizer placement, timing, and application rates for growing crops. Incorporating precision nutrient management into the regulations reflects the growing use of these practices and enables the use of certain data developed for an agricultural operation to be utilized in a nutrient management plan. Restructuring the Standards and Criteria ensures that the minimum critical technical criteria related to the development and implementation of nutrient management plans is clearly outlined. Much of the information currently included in the Standards and Criteria is recommendations, which creates confusion about the minimum standards that must be included in a nutrient management plan and what information is able to be based on the expertise of the planner and the producer. Virginia's land grant universities routinely update the planting standards (ex. crop yield and nutrient needs) related to agricultural production. Removing these standards from the Standards and Criteria enables planners and producers to utilize the most recent research, as well as the producer's own records, in the development and implementation of nutrient management plans.

Substance

Briefly identify and explain the new substantive provisions, the substantive changes to existing sections, or both. A more detailed discussion is provided in the "Detail of Changes" section below.

There are numerous amendments to 4VAC50-85-10 (Definitions) to delete outdated definitions, clarify existing definitions, and include definitions for terms that have gained use since these regulations were last substantially amended. Example of terms that have been added include "precision nutrient management" and "transfer management plan". Other definitions have been amended to reflect the current usage of the term such as "broadcast", "biosolids" and "field". Definitions that are more appropriate in the Standards and Criteria have been deleted from the regulations and included in the Standards and Criteria including "cool season grass", "hydrologic soil group", "soil management group", "soil series", "tillering", "tissue test", and "topdress".

Section 4VAC50-85-50 (Fees) has been reorganized to include both the certification and recertification fees and to authorize recovery of payment processing costs when electronic payments are made. The reporting requirements (4VAC50-85-100) have been simplified and revisions recognize that a significant portion of the data can be provided through the Department's Nutrient Management Module in the

Conservation Application Suite. Section 4VAC50-85-130 (Nutrient management plan content) is amended to include requirements for plan updates on nonagricultural land in certain situations, to fully incorporate precision nutrient management activities, and to reflect the information necessary in a transfer nutrient management plan. Section 4VAC50-85-140 (Required nutrient management plan procedures) is amended to clarify how to determine expected crop yield for new or unrecorded fields. Additional details are also provided about when plans must be modified for agricultural and nonagricultural lands.

The Documents Incorporated by Reference section is amended to revise the date of the incorporated Virginia Nutrient Management Standards and Criteria from the prior edition to the September 2026 revised edition. The Standards and Criteria has been significantly revised to only include minimum technical requirements, rather than including recommendations as well.

Revisions have been made throughout the regulations to remove references to expired implementation dates. As examples, 4VAC50-85-140 2.c.2 includes a reference to December 31, 2005 and 2.c.4 includes requirements related to December 31, 2010.

Issues

Identify the issues associated with the regulatory change, including: 1) the primary advantages and disadvantages to the public, such as individual private citizens or businesses, of implementing the new or amended provisions; 2) the primary advantages and disadvantages to the agency or the Commonwealth; and 3) other pertinent matters of interest to the regulated community, government officials, and the public. If there are no disadvantages to the public or the Commonwealth, include a specific statement to that effect.

These revisions will continue to advance the implementation of nutrient management plans by being more reflective of the changing technology utilized by Virginia's agricultural operations, improving regulatory clarity, and acknowledging the importance of ongoing scientific research related to agricultural activities. Nutrient management planners will have clearly defined requirements for plans and will be able to utilize the most current scientific research to determine the most appropriate time, rate, and placement of fertilizers. Agricultural producers will be able to more fully integrate precision nutrient management into their nutrient management plans.

With the removal of many of the recommendations from the Standards and Criteria, there will need to be additional efforts made by the Board to determine the most appropriate scientific data and sources to utilize in nutrient management plans. After discussions with the RAP, it was determined that a technical work group should be convened to develop guidance regarding the appropriate scientific data and sources. This work group will be convened in the fall of 2026 and will likely be an ongoing effort as the research and technology continue to evolve.

Several amendments in nutrient management plan content more actively reflect the potential connection between nutrient management plans and permits issued by DEQ. Transfer nutrient management plans meet DEQ requirements and reflect a reduced workload for the planner, the producer, and both the Department and DEQ. Ensuring the permit number, if applicable, is included in a nutrient management plan allows for greater collaboration between the Department and DEQ when permit compliance concerns are identified.

There will be costs associated with updating training materials and communicating these regulatory changes to certified planners and producers. These costs are expected to be minimal and absorbable within existing program resources.

The amendments do not alter planner certification eligibility requirements, examination requirements, continuing education requirements, or the basic structure of the nutrient management planning program. Existing certified planners are not required to recertify.

Requirements More Restrictive than Federal

Identify and describe any requirement of the regulatory change which is more restrictive than applicable federal requirements. Include a specific citation for each applicable federal requirement, and a rationale for the need for the more restrictive requirements. If there are no applicable federal requirements, or no requirements that exceed applicable federal requirements, include a specific statement to that effect.

There are no directly applicable federal requirements governing the Virginia Nutrient Management Training and Certification regulations. The program operates under state authority pursuant to § 10.1-104.2 of the Code of Virginia.

Agencies, Localities, and Other Entities Particularly Affected

Consistent with § 2.2-4007.04 of the Code of Virginia, identify any other state agencies, localities, or other entities particularly affected by the regulatory change. Other entities could include local partners such as tribal governments, school boards, community services boards, and similar regional organizations. "Particularly affected" are those that are likely to bear any identified disproportionate material impact which would not be experienced by other agencies, localities, or entities. "Locality" can refer to either local governments or the locations in the Commonwealth where the activities relevant to the regulation or regulatory change are most likely to occur. If no agency, locality, or entity is particularly affected, include a specific statement to that effect.

Other State Agencies Particularly Affected

The Virginia Department of Environmental Quality (DEQ) issues permits for animal feeding operations that require nutrient management plans to be prepared in accordance with these regulations. The amendments made in this regulatory action do not impact the intent or language of those permits. Incorporating transfer nutrient management plans addresses permit requirements for certain agricultural producers and will simplify the plans submitted to DEQ. Additionally, the Virginia Department of Agriculture and Consumer Services (VDACS) administers the contractor-applicator program for individuals that apply fertilizers to non-agricultural lands. The amendments to this regulation do not impact that program, although education outreach about the revisions may be needed to be provided by the Department.

State agencies, including colleges and universities, that own or maintain lands where fertilizer is applied (ex. athletic field or golf courses) are required to develop and implement a nutrient management plan under §10.1-104.4; however, these amendments will clarify the content for those plans and allow the use of the most current scientific data to determine the appropriate placement, timing, and rate of fertilizer applications. These revisions may lead to cost savings in fertilizer applications and may reduce the time (and cost) associated with the development of a plan.

Localities Particularly Affected

No specific locality is expected to bear a disproportionate material impact. Localities that are subject to a Municipal Separate Storm Sewer System Permit (MS4) and that own or maintain lands where fertilizer is applied (ex. athletic field or golf courses) are required to develop and implement a nutrient management plan by their permit. However, these amendments will clarify the content for those plans and allow the use of the most current scientific data to determine the appropriate placement, timing, and rate of fertilizer applications. These revisions may lead to cost savings in fertilizer applications and may reduce the time (and cost) associated with the development of a plan.

Other Entities Particularly Affected

Certified nutrient management planners are the primary regulated entities. Approximately 380 active certified planners in Virginia will need to familiarize themselves with the updated regulations.

Economic Impact

Consistent with § 2.2-4007.04 of the Code of Virginia, identify all specific economic impacts (costs and/or benefits) anticipated to result from the regulatory change. When describing a particular economic impact, specify which new requirement or change in requirement creates the anticipated economic impact. Keep in mind that this is the proposed change versus the status quo.

Impact on State Agencies

For your agency: projected costs, savings, fees, or revenues resulting from the regulatory change, including: a) fund source / fund detail; b) delineation of one-time versus on-going expenditures; and c) whether any costs or revenue loss can be absorbed within existing resources.	The Department will incur one-time costs to update training materials, revise examination content where it is affected by the regulatory changes, and communicate the amendments to certified planners. The Nutrient Management Module of the Conservation Application Suite may need to be updated to reflect the revisions made to the Standards and Criteria. These costs are able to be absorbed within the existing resources of the Department. The new authorization in 4VAC50-85-50 for a payment processing charge will offset processing costs that the Department would have to absorb with electronic payment options. This is an ongoing, self-adjusting charge tied to contracted payment processing rates.
For other state agencies: projected costs, savings, fees, or revenues resulting from the regulatory change, including a delineation of one-time versus on-going expenditures.	There are state agencies that are required by §10.1-104.4 to develop and implement nutrient management plans. These plans are required to be updated every three years. These amendments will clarify the content for those plans and allow the use of the most current scientific data to determine the appropriate placement, timing, and rate of fertilizer applications. These revisions may lead to cost savings

	in fertilizer applications and may reduce the time (and cost) associated with the development of a plan. Both DEQ and VDACS have regulatory programs that incorporate nutrient management plans. Neither agency is expected to bear any additional costs associated with the revisions included in this proposed regulation. More closely coordinating permit requirements and nutrient management plans may result in a time savings for both DEQ and the Department.
For all agencies: Benefits the regulatory change is designed to produce.	Clearer regulatory requirements and updated technical standards reduce the time (and cost) for state agencies subject to §10.1-104.4. The revisions reflect potential efficiency savings for DCR and DEQ in addressing potential permit compliance issues when they are identified. Modernized definitions and updated technical guidance support Virginia's efforts to improve water quality throughout the state.

Impact on Localities

If this analysis has been reported on the ORM Economic Impact form, indicate the tables (1a or 2) on which it was reported. Information provided on that form need not be repeated here.

Projected costs, savings, fees, or revenues resulting from the regulatory change.	No significant cost impacts to localities are anticipated. Localities that own or manage land subject to nutrient management plans (e.g., publicly owned parks or golf courses) or localities subject MS4 permit conditions will need to work with planners to update required plans at the next scheduled revision cycle. However, these amendments will clarify the content for those plans and allow the use of the most current scientific data to determine the appropriate placement, timing, and rate of fertilizer applications. These revisions may lead to cost savings in fertilizer applications and may reduce the time (and cost) associated with the development of a plan.
Benefits the regulatory change is designed to produce.	Localities that own nonagricultural land covered by nutrient management plans will benefit from clearer plan content requirements applicable to turf and nonagricultural settings. Water quality improvements from more current and accurate nutrient management planning support the interests of localities and their residents.

Impact on Other Entities

If this analysis has been reported on the ORM Economic Impact form, indicate the tables (1a, 3, or 4) on which it was reported. Information provided on that form need not be repeated here.

Description of the individuals, businesses, or other entities likely to be affected by the regulatory change. If no other entities will be affected, include a specific statement to that effect.	Certified nutrient management planners are the primary entities directly affected by this regulatory change. Agricultural producers implement the plans developed by their planners; certain agricultural producers are required by environmental permits to implement nutrient management plans. Golf course owners are required by §10.1-104.5 to implement nutrient management plans. Consulting firms and sole proprietors operating as certified nutrient management planning businesses are affected as small businesses.
Agency's best estimate of the number of such entities that will be affected. Include an estimate of the number of small businesses affected. Small business means a business entity, including its affiliates, that: a) is independently owned and operated, and; b) employs fewer than 500 full-time employees or has gross annual sales of less than $6 million.	There are currently approximately 380 certified nutrient management planners. A portion of these certified planners operate as independent consultants or employees of small agricultural consulting firms and are expected to qualify as small businesses under the definition in §2.2-4007.1.
All projected costs for affected individuals, businesses, or other entities resulting from the regulatory change. Be specific and include all costs including, but not limited to: a) projected reporting, recordkeeping, and other administrative costs required for compliance by small businesses; b) specify any costs related to the development of real estate for commercial or residential purposes that are a consequence of the regulatory change; c) fees; d) purchases of equipment or services; and e) time required to comply with the requirements.	Certified planners will need to become familiar with the updated definitions, plan content requirements, and other revisions. The Department will provide training for planners on the revisions. The proposed regulations do not require all active nutrient management plans to be updated upon the effective date of the regulations; planners will be able to revise plans with the new provisions as plans expire or need to be updated for other operational reasons. Planners will be able to address any workload impacts in a staggered, appropriate way for their individual clients and business. Reporting and recordkeeping requirements have been simplified and recognize that information may be available from the Department's Nutrient Management Module. No equipment purchases are required. No costs related to real estate development result from this regulatory change. The fee associated with initial certification or recertification is not changed; the new payment processing charge applies to all applicants and is expected to be a nominal amount.
Benefits the regulatory change is designed to produce.	These regulatory revisions will reduce confusion for planners by more clearly articulating the requirements for a plan. The revisions to the Standards and Criteria recognize the technical knowledge of the planner and provide increased flexibility for the planner to choose the most appropriate, scientifically-defensible recommendations related to fertilizer applications in the plan. Revisions aligned with actual field practice reduce unnecessary documentation burdens. Formal recognition of precision nutrient management and transfer plans reduces uncertainty for planners and operators using those approaches.

Alternatives to Regulation

Describe any viable alternatives to the regulatory change that were considered, and the rationale used by the agency to select the least burdensome or intrusive alternative that meets the essential purpose of the regulatory change. Also, include discussion of less intrusive or less costly alternatives for small businesses, as defined in § 2.2-4007.1 of the Code of Virginia, of achieving the purpose of the regulatory change.

There are no alternatives to these regulatory changes. The Board is required by §10.1-104.2 to adopt regulations to implement a nutrient management training and certification program. These regulations have not been significantly revised since 2006 and currently contain outdated regulatory language and fail to recognize the technological advances within agricultural operations. The revisions made to these regulations address both of these critical issues. Additionally, the revisions provide additional flexibility to planners by removing recommendations from the regulations; this will allow planners to use the most appropriate science to develop the nutrient management plan, which will make the plan more applicable to the specific agricultural operation. Many planners and agricultural operations are small businesses. Clarifying the requirements will provide efficiency savings and utilizing current scientific data may result in cost-savings in reduced fertilizer applications.

If this analysis has been reported on the ORM Economic Impact form, indicate the tables on which it was reported. Information provided on that form need not be repeated here.

Regulatory Flexibility Analysis

Consistent with § 2.2-4007.1 B of the Code of Virginia, describe the agency's analysis of alternative regulatory methods, consistent with health, safety, environmental, and economic welfare, that will accomplish the objectives of applicable law while minimizing the adverse impact on small business. Alternative regulatory methods include, at a minimum: 1) establishing less stringent compliance or reporting requirements; 2) establishing less stringent schedules or deadlines for compliance or reporting requirements; 3) consolidation or simplification of compliance or reporting requirements; 4) establishing performance standards for small businesses to replace design or operational standards required in the proposed regulation; and 5) the exemption of small businesses from all or any part of the requirements contained in the regulatory change.

Amendments do not impose new reporting or recordkeeping requirements for small businesses. The reporting requirements have been simplified and revisions recognize that a significant portion of the data can be provided through the Department's Nutrient Management Module in the Conservation Application Suite.

If this analysis has been reported on the ORM Economic Impact form, indicate the tables on which it was reported. Information provided on that form need not be repeated here.

Periodic Review and Small Business Impact Review Report of Findings

If you are using this form to report the result of a periodic review/small business impact review that is being conducted as part of this regulatory action, and was announced during the NOIRA stage, indicate whether the regulatory change meets the criteria set out in EO 19 and the ORM procedures, e.g., is necessary for the protection of public health, safety, and welfare; minimizes the economic impact on small businesses consistent with the stated objectives of applicable law; and is clearly written and easily understandable. In addition, as required by § 2.2-4007.1 E and F of the Code of Virginia, discuss the agency's consideration of: (1) the continued need for the regulation; (2) the nature of complaints or comments received concerning the regulation; (3) the complexity of the regulation; (4) the extent to the which the regulation overlaps, duplicates, or conflicts with federal or state law or regulation; and (5) the length of time since the regulation has been evaluated or the degree to which technology, economic conditions, or other factors have changed in the area affected by the regulation. Also, discuss why the agency's decision, consistent with applicable law, will minimize the economic impact of regulations on small businesses.

This form is not being used to report the result of a periodic review. The results of the periodic review of these regulations is available at: https://townhall.virginia.gov/L/ViewPReview.cfm?PRid=2606.

Public Comment

Summarize all comments received during the public comment period following the publication of the previous stage, and provide the agency's response. Include all comments submitted: including those received on Town Hall, in a public hearing, or submitted directly to the agency. If no comment was received, enter a specific statement to that effect.

No public comments were received.

Public Participation

Indicate how the public should contact the agency to submit comments on this regulation, and whether a public hearing will be held, by completing the text below.

The Virginia Soil and Water Conservation Board is providing an opportunity for comments on this regulatory proposal, including but not limited to (i) the costs and benefits of the regulatory proposal, (ii) any alternative approaches, (iii) the potential impacts of the regulation, and (iv) the agency's regulatory flexibility analysis stated in that section of this background document.

Anyone wishing to submit written comments for the public comment file may do so through the Public Comment Forums feature of the Virginia Regulatory Town Hall web site at: https://townhall.virginia.gov. Comments may also be submitted by mail, email, or phone to Christine Watlington Jones at 600 E. Main Street, 24th floor, Richmond, VA 23219, christine.watlington@dcr.virginia.gov, or 804-564-1897. In order to be considered, comments must be received by 11:59 pm on the last day of the public comment period.

A public hearing will not be held following the publication of this stage of this regulatory action.

Detail of Changes

List all regulatory changes and the consequences of the changes. Explain the new requirements and what they mean rather than merely quoting the text of the regulation. For example, describe the intent of the language and the expected impact. Describe the difference between existing requirement(s) and/or agency practice(s) and what is being proposed in this regulatory change. Use all tables that apply, but delete inapplicable tables.

If an existing VAC Chapter(s) is being amended or repealed, use Table 1 to describe the changes between the existing VAC Chapter(s) and the proposed regulation. If the existing VAC Chapter(s) or sections are being repealed and replaced, ensure Table 1 clearly shows both the current number and the new number for each repealed section and the replacement section.

Table 1: Changes to Existing VAC Chapter(s)

Current chapter-section number	New chapter-section number, if applicable	Current requirements in VAC	Change, intent, rationale, and likely impact of new requirements
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Banding" or "sideband" means the placement of fertilizer approximately two inches to the side and two inches below the seed.	Renamed "Banded starter fertilizer." The current definition does not reflect all banding equipment in use. Definition has been revised to remove the overly prescriptive placement specification while preserving the agronomic intent.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Biosolids" means a sewage sludge that has received an established treatment for required pathogen control and is treated or managed to reduce vector attraction to a satisfactory level and contains acceptable levels of pollutants, such that it is acceptable for use for land application, marketing, or distribution in accordance with 9VAC25-31 and 9VAC25-32.	"Biosolids" is redefined to align with current regulatory usage under state law, removes the prior cross-reference to specific permit regulation titles, and broadens the definition to capture the full range of materials subject to biosolids management requirements.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Broadcast" means the uniform application of a material over a field.	Revisions clarify that broadcast refers to surface application and acknowledges that in precision nutrient management the relevant application unit may be smaller than a whole field.

4VAC50-85-10		This section defines technical terms that are used in the regulation. "Cereal crop" or "small grain" means barley, rye, triticale, or wheat.	Added "oats" to the definition. Oats are grown in Virginia and used in cover crop and grain rotations.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Cool season grass" means grass species of temperate zone origin which exhibit the greatest rates of dry matter production in the day/night temperature range of 60°/50°F to 80°/70°F. Examples of cool season grasses include fescue, bluegrass, and ryegrass.	Definition has been deleted as it is not used in the regulations. The term is used in the Standards and Criteria and the definition has been added there.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Commonwealth" means the Commonwealth of Virginia.	This definition has been deleted as it is unnecessary. Its meaning is established by state law and common usage throughout the Code of Virginia.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Cover crop" definition included a bulleted list of two purposes: (1) seasonal protection of soil, or (2) assimilation of residual soil nitrogen.	The definition remains the same. It has been reformatted to be consistent with Virginia regulatory drafting style and eliminates an unnecessary list structure.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Crop" means cultivated plants or agricultural produce such as grain, silage, forages, oilseeds, vegetables, fruit, nursery stock, or turfgrass.	“Sod" to the list of crops. "Turfgrass" in the definition is replaced by "turf" to conform with the terms used in the *Code*.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Crop nutrient needs" and "Crop nutrient removal" each referenced "Virginia Nutrient Management Standards and Criteria, revised July 2014" as the governing document.	The reference to the Standards and Criteria has been updated in both definitions to reflect the revisions made in September 2026.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Crop rotation" means one complete sequence of one or more	“May” has been deleted to avoid confusion with the definition and to reflect current understanding of the term..

		crops grown in succession that may assist in minimizing disease, insects and weeds.	
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Dry manure" or "semisolid manure" means manure containing less than 85.5% moisture. "Liquid manure" means manure containing at least 85.5% moisture or which can be applied through subsurface injection or surface application with liquid application equipment.	Both definitions changed from moisture-content-based definitions to handling-method-based definitions. The moisture-threshold approach required laboratory measurement to categorize manure type and did not reflect how planners and producers distinguish manure in practice. The handling-method approach aligns with actual field management, reduces compliance ambiguity, and eliminates the need for moisture testing solely for definitional categorization purposes.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Environmentally sensitive site" definition included a bulleted list of six site characteristics (soils with high leaching potential; shallow soils; subsurface tile drains; soils with lateral flow potential; floodplains; slopes greater than 15%).	The definition remains the same. It has been reformatted to be consistent with Virginia regulatory drafting style and eliminates an unnecessary list structure.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Field" means a unit of contiguous nonwooded land generally used for crop production that is separated by permanent boundaries, such as fences, permanent waterways, woodlands, croplines not subject to change because of farming practices, and other similar features or as determined by the United States Department of Agriculture Farm Service Agency.	The definition was revised to provide clarification and to reflect the use of the land by the producer. Clarification was provided to ensure management areas are equivalent to fields for nonagricultural lands.
4VAC50-85-10	4VAC50-85-10	This section defines technical terms that are used in the regulation. "Field identification number" means a number used by a farmer (or the United States Department of Agriculture Farm Service Agency) to distinguish or	This term was renamed "field identifier: and was revised to remove reference to the number used by the Farm Service Agency. The term now recognizes the wide variety of identifying designations used by planners and producers and applies more appropriately to agricultural and nonagricultural plans.

		identify the location of a field on a farm.	
4VAC50-85-10	4VAC50-85-10	This section defines technical terms that are used in the regulation. "Hydrologic soil group" means a classification of soils into one of four groups, A, B, C, or D, according to their hydrologic properties, ranging from low runoff potential (high infiltration potential) in group A to high runoff potential (low infiltration potential) in group D.	Definition has been deleted as it is not used in the regulations. The term is used in the Standards and Criteria and the definition has been added there.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Industrial waste" means liquid or other waste resulting from any process of industry, manufacture, trade or business, or from the development of any natural resources. The term "industrial waste" appears throughout the current regulations in provisions governing nutrient application timing, application methods, setbacks, and plan modification triggers.	The term "industrial waste" is replaced throughout the regulations with "industrial residuals”. The revised definition is substantively narrower than the current definition and only applies to residues that contain nutrient value and are suitable for use as a fertilizer.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Irrigation" means the application of water to land to assist in crop growth.	A second sentence was added to address irrigation on nonagricultural land. The current definition addresses only crop production contexts; the revised definition also addresses the establishment and maintenance of turf.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Irrigation scheduling" means the time and amount of irrigation water to be applied to an area for optimum crop growth and to minimize leaching and runoff.	The definition has been revised to reference the maintenance of turf as part of irrigation scheduling, instead of simply including crop growth.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Nutrient management plan" or "plan" means a plan prepared by a Virginia certified nutrient management planner to manage the amount,	The definition has been revised to recognize nutrient management plans developed for turf production and to incorporate transfer management plans.

		placement, timing, and application of manure, fertilizer, biosolids, or other materials containing plant nutrients in order to reduce nutrient loss to the environment and to produce crops.	
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Organic nutrient source" or "organic source" means manure, biosolids, sludge, industrial waste, green manure, compost, or other plant or animal residues which contain plant nutrients.	"Sludge" is removed from this definition and "industrial waste" is replaced with "industrial residuals". The scope of the definition is unchanged; the revisions simply update the terminology that is used. .
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Organic residuals" means nutrients released over time from manure, biosolids, industrial wastes, legumes, or other organic sources of nutrients.	The revision simplifies the definition by cross-referencing the defined term "organic nutrient source" rather than listing source types individually.
4VAC50-85-10		This section defines technical terms that are used in the regulation.	A definition of "precision nutrient management" has been added that reflects the use of data and technology used to manage nutrients at the sub-field level.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Runoff" means that part of precipitation, snow melt, or irrigation water that runs off the land into streams or other surface water which can carry pollutants from the land.	The revision simplifies the definition by removing reference to specific water sources in favor of a general description of how the water flows..
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Sewage sludge" or "sludge" means any solid, semisolid, or liquid residues which contain materials removed from municipal or domestic wastewater during treatment including primary and secondary residues. Other residuals or solid wastes consisting of materials collected and removed by	The definition of "sewage sludge" or "sludge" is deleted and replaced throughout the regulations by the term "biosolids," which is separately defined. References to "sewage sludge," "sludge," "liquid sewage sludge," "dewatered sludge," "dewatered anaerobically digested sewage sludge," and "dewatered lime stabilized sewage sludge" are updated to "biosolids," "liquid biosolids," or "dewatered biosolids" as appropriate.. The revision aligns the regulations with current environmental permit language.

		sewage treatment, septage, and portable toilet wastes are also included in this definition. The term "sewage sludge," "sludge," and related terms appear throughout the current regulations in provisions governing application timing, application methods, setbacks, frozen ground restrictions, and plan modification triggers.	
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Shall" means a mandatory requirement. "Should" means a recommendation.	Both definitions are deleted. The distinction between mandatory requirements and recommendations has been addressed throughout the regulations by removing "should" provisions from the regulatory text.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Soil management group" means a grouping of soils based on their similarity in profile characteristics which affect crop production and require specific soil and crop management practices.	Definition has been deleted as it is not used in the regulations. The term is used in the Standards and Criteria and the definition has been added there.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Soil pH level" means the negative logarithm of the hydrogen-ion activity of a soil which measures the relative acidity or alkalinity of the soil. The pH level affects the availability and plant utilization of nutrients.	The term is shortened to "soil pH" and to reflect how the term is currently referenced in nutrient management plans. The meaning is unchanged.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Soil series" means a classification of a specific soil type by name based on the morphological, chemical and physical properties of the soil.	Definition has been deleted as it is not used in the regulations. The term is used in the Standards and Criteria and the definition has been added there.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Soil survey" means a published or electronically available document developed by a governmental entity using the standards and protocols of the National Cooperative Soil	The revision broadens the scope of the definition to reflect that soil surveys are used in nutrient management planning for a range of purposes beyond crop and tree production, including nonagricultural and urban land uses.

		Survey that includes detailed descriptions and classifications of soils, mapping of various soil series, and the interpretation of soils according to their adaptability for various crops and trees.	
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Split application" means utilizing a sequence of two or more nutrient applications, separated by approximately three weeks or more, to a single crop in order to improve nutrient uptake efficiency.	The definition has been clarified by removing "approximately".
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Tillering" means the formation of lateral shoots from the axillary buds of small grains and grasses.	Definition has been deleted as it is not used in the regulations.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Tissue test" means an analysis of crop tissue for the percentage of nitrogen at key growth stages, and used as an intensive nutrient management technique with small grain crops.	Definition has been deleted as it is not used in the regulations. The term is used in the Standards and Criteria and the definition has been added there.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Topdress" means broadcast applications of fertilizer on crops such as small grains or forage after crop emergence has occurred.	Definition has been deleted as it is not used in the regulations. The term is used in the Standards and Criteria and the definition has been added there.
4VAC50-85-10		This section defines technical terms that are used in the regulation.	A definition of transfer nutrient management plan has been added. The definition recognizes a plan type that meets environmental permit requirements, but has not been fully recognized by these regulations.
4VAC50-85-10		" This section defines technical terms that are used in the regulation. Turfgrass" means selected grass species planted or sodded and managed for such uses as home lawns, golf	The term is renamed "Turf" and now mirrors the definition provided in §3.2-3600.

		courses, office parks and rights-of-way.	
4VAC50-85-10		This section defines technical terms that are used in the regulation.	A definition of “verifiable crop yield records” has been added. This definition provides an additional way for planners and producers to document and anticipate the crop yield when field-specific yield records are unavailable.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Warm season grass" means a grass species of tropical origin that exhibits the highest rate of dry matter production in the day/night temperature range of 90°/79°F at a minimum to a maximum of 97°/88°F. Examples of warm season grasses include zoysia and bermuda grasses.	Definition has been deleted as it is not used in the regulations. The term is used in the Standards and Criteria and the definition has been added there.
4VAC50-85-10		This section defines technical terms that are used in the regulation. "Water insoluble nitrogen" or "WIN" means the amount of a type of slowly available nitrogen listed on fertilizer bags and reported as a percentage.	Definition has been deleted as it is not used in the regulations. The term is used in the Standards and Criteria and the definition has been added there.
4VAC50-85-20		This section describes the purpose of these regulations. 4VAC50-85-20 B states that a nutrient management plan is prepared "to indicate how primary nutrients are to be managed on farm fields and other land for crop production and in ways which protect groundwater and surface water from excessive nutrient enrichment."	The revisions reflect the statutory applicability of nutrient management plans to both agricultural and nonagricultural land uses. The current language implies that only lands that are used for crop production require nutrient management plans.
4VAC50-85-40		This section describes the eligibility requirements to become a certified nutrient management planner. 4VAC50-85-40 A 4 requires submission of "a $100 certification fee by check or money order to the department."	The phrase "by check or money order" is deleted. The revision removes restrictions on payment methods that are inconsistent with the Department's current practice of accepting multiple forms of payment.
4VAC50-85-50		This section outlines the fees collected for training and certification. 4VAC50-85-50	Subsection A is revised to include reference to the recertification fee; the initial certification fee is already

		contains the following provisions: (A) fees shall be collected for certification and recertification; (B) a fee may be charged to supply training materials; (C) fees are nonrefundable and shall not be prorated; (D) the certification fee of $100 shall be due with the application for certification, and applicants may retake the examination one time with no additional charge; and (E) all fees collected shall be deposited in the Nutrient Management Training and Certification Fund. The section does not address payment processing charges or expressly state the recertification fee amount.	referenced in this section. The language concerning the fees has been moved within the section; however, no fees have been increased. A new subsection B is added authorizing a payment processing charge, subject to contracted rates incurred by the department, to defray costs of payment processing services. The exam retake language currently in subsection D is relocated to 4VAC50-85-60 F. The remaining subsections are reordered accordingly.
4VAC50-85-60		4VAC50-85-60 addresses examination administration, eligibility, content, scheduling, passing scores, and notification of results. The section contains no provision governing exam retakes; that provision currently appears in 4VAC50-85-50 D. The list of biosolids management concepts addressed by the examination references "types of sludges" (subsection C 8).	A new subsection F has been added, which relocates the exam retake provision from 4VAC50-85-50 D to 4VAC50-85-60, where it more logically fits alongside the other examination provisions. The reference to "types of sludges" in subsection C 8 is updated to "types of biosolids," consistent with the replacement of "sewage sludge" terminology throughout the regulations.
4VAC50-85-80		4VAC50-85-80 sets out renewal requirements including a transitional provision requiring persons certified prior to January 11, 2006, to attend a department-approved training course in phosphorus nutrient management planning methods prior to certificate renewal, with those hours applicable toward other continuing education requirements.	The transitional provision requiring pre-2006 certified planners to attend a phosphorus management training course prior to renewal is deleted. This deletion removes obsolete regulatory text as the provision has expired.
4VAC50-85-100		4VAC50-85-100 A requires certified planners to file an annual activity report by September 30 of each year on	The annual report due date is changed from September 30 to August 15. The report format is changed from "a form supplied by the department" to "a format

		a form supplied by the department. The report must contain six specified categories of information. Subsection B requires planners to maintain a complete copy of each plan and to also separately maintain a detailed set of supporting records for each plan including soil analysis results, soil survey maps, yield records, livestock information, manure production calculations, and organic nutrient source analyses. A summary listing of all plans is required under subsection B. Subsection C references "regulations promulgated under § 62.1-44.19:3 for sewage sludge."	specified by the department," providing greater flexibility in how the department collects required information and allowing information to be submitted electronically or through the Nutrient Management Module. A new item 7 is added to the required report contents - a summary listing of all plans prepared, including plan number, landowner or operator's name, and the date the plan was prepared or revised. This item is moved from subsection B recordkeeping to subsection A reporting. Subsection B is substantially simplified: the requirement to maintain a complete copy of each plan is retained, but the detailed list of additional supporting records is removed. Subsection C is updated to replace "sewage sludge" with "biosolids," consistent with terminology updates throughout the regulations.
4VAC50-85-110		The section heading reads "Compliance wi regulations and disciplinary action," which appears to be a typographical error in the current regulatory text. Subdivision 6 references "regulations promulgated under § 62.1-44.19:3 of the Code of Virginia for sewage sludge."	The section heading is corrected to read "Compliance with regulations and disciplinary action," adding the missing letter "t." The reference to "sewage sludge" in subdivision 6 is updated to "biosolids," consistent with the terminology updates throughout the regulations.
4VAC50-85-130		This section details the contents of a complete nutrient management plan. A plan cover sheet is required to list any permits, if applicable, without specifying the issuing agency or requiring the permit number (subsection B).	Subdivision B 8 is revised to require the applicable permit number if the nutrient management plan is developed to cover an activity that requires a permit issued by the Department of Environmental Quality. The revision increases the link between the required permit and the nutrient management plan, which improves the abilities of the Department and DEQ to coordinate when there are potential permit compliance issues identified.
4VAC50-85-130		This section details the contents of a complete nutrient management plan. A plan narrative is required to identify circumstances requiring plan update, such as an increase in animal numbers (subdivision F 7 b).	Subdivision F 7 b is revised to expand the description of triggers that require an update to the plan including changes in animal type and "any changes that would impact the amount of manure available from the operation." These revisions ensure that a plan update occurs when there are material changes in manure availability, such as changes in feeding

			systems, waste treatment, or manure export arrangements, even when animal numbers and animal types remain unchanged.
4VAC50-85-130		This section details the contents of a complete nutrient management plan There are currently no plan content requirements for precision nutrient management plans or transfer plans as distinct plan types within 4VAC50-85-130.	New subsections G, H, and I have been added. Subsection G establishes the core components required in a precision nutrient management plan including identification information, soil sample data by management zone, georeferenced yield records, and planned nutrient application rates by zone in an electronic format acceptable to the department. Rates in each zone may not exceed those allowable under 4VAC50-85-140 A 2 calculated at the sub-field level. Subsection H establishes detailed plan structure requirements for fields managed under precision nutrient management including map or georeferenced data requirements, summary narrative requirements, organic nutrient source requirements where applicable, phosphorus index data information, and plan update triggers specific to precision management. Subsection I establishes the required components of a transfer nutrient management plan: farmer and planner identification, county and watershed code, plan date, livestock type and approximate numbers, a map identifying the farm location and manure or waste storage locations, manure production estimates and the most recent manure analysis, and the applicable requirements of subsection G. These provisions provide regulatory clarity for planners preparing these plan types and for permit reviewers evaluating plan compliance.
4VAC50-85-140		This section outlines the required procedures that must be followed to determine the appropriate nutrient application rates, timing, and placement. Subdivision A 2 a: determination of crop nutrient	The reference to the Commercial Vegetable Production Recommendations, 2005, has been removed from subdivision A 2 a and the reference to the Standards and Criteria has been updated to reflect the current revisions. The Commercial Vegetable Production Recommendations

		needs was required to be consistent with the Virginia Nutrient Management Standards and Criteria, revised July 2014, and the Commercial Vegetable Production Recommendations, 2005 (VCE Publication 456-420).	has been stricken from the Documents Incorporated by Reference as well; it is an outdated reference.
4VAC50-85-140		This section outlines the required procedures that must be followed to determine the appropriate nutrient application rates, timing, and placement. Subdivision A 2 e: expected crop yield determined from one of two methods: (1) soil productivity group expected yields from the Standards and Criteria; or (2) the farmer's past experience with crop yields in specific fields, which may be used to make reasonable adjustments to expected crop yields in lieu of verifiable yield records, provided the upward adjustments impact no more than 20% of the acreage of any crop on a particular farm.	Flexibility has been added to address situations where field-specific yield records are unavailable. Where field-specific yield records are unavailable, expected crop yields for new or unrecorded fields may be determined by the planner by using verified crop yield records from similar fields under the same management, with adjustments made for soil productivity data. Clear justification and recordkeeping must be provided and field-specific records must be used once sufficient data is collected. The subsection has been renumbered to account for this methodology. This addition addresses a gap in the regulations that provided limited flexibility when field-specific yield records genuinely do not exist for new or unrecorded fields.
4VAC50-85-140		This section outlines the required procedures that must be followed to determine the appropriate nutrient application rates, timing, and placement. Subdivision A 2 f: established very prescriptive requirements for a soil sample - a single standard applied to all fields, requiring a composite soil sample representing up to approximately 20 acres, with cores from 0-4 inches for fields not tilled within the past three years and from 0-6 inches for tilled or recently tilled fields.	The section is restructured into subparagraphs i (agricultural fields) and ii (nonagricultural land), and the prescriptive soil sampling depth requirements are removed from both. Soil sample requirements and protocols are established by the laboratories that analyze the samples, not these regulations. The planner and producer determine which laboratory to use.
Documents Incorporated by Reference		This section includes the reference materials that are incorporated into these regulations. The Virginia Nutrient Management Standards and Criteria, revised	The date of the Virginia Nutrient Management Standards and Criteria has been updated to September 2026 to reflect the current revisions to the document. The revised Standards and Criteria updates agronomic tables,

		July 2014, the Virginia Commercial Vegetable Production Recommendations for 2005, and several other citations are included.	mineralization coefficients, nutrient availability data, setback criteria, and other technical guidance to reflect current research and recommended practices. Reference to the Virginia Commercial Vegetable Production Recommendations for 2005 has been stricken as it is outdated.

<u>Repeal of Guidance Document related to FOIA requirements for Resource Management Plans Program</u>

§ 2.2-4101. Definitions.
"Guidance document" means any document developed by a state agency or staff that provides information or guidance of general applicability to the staff or public to interpret or implement statutes or the agency's rules or regulations, excluding agency minutes or documents that pertain only to the internal management of agencies. Nothing in this definition shall be construed or interpreted to expand the identification or release of any document otherwise protected by law.

§ 10.1-104.8. Resource management plans; criteria.
A. The Soil and Water Conservation Board shall by regulation, and in consultation with the Department of Agriculture and Consumer Services and the Department of Environmental Quality, specify the criteria to be included in a resource management plan.

§ 10.1-505. Duties of Board.
In addition to other duties and powers conferred upon the Board, it shall have the following duties and powers:
3. To oversee the programs of the districts.

<u>Recommended Motion:</u>

The Virginia Soil and Water Conservation Board approves the repeal of the guidance document “Virginia Soil and Water Conservation Board Guidance Document on Freedom of Information Act Requirements for Resources Management Plans Program Implementation by Soil and Water Conservation District Boards and Technical Review Committees”.

VIRGINIA SOIL AND WATER CONSERVATION BOARD GUIDANCE DOCUMENT ON FREEDOM OF INFORMATION ACT REQUIREMENTS FOR RESOURCE MANAGEMENT PLANS PROGRAM IMPLEMENTATION BY SOIL AND WATER CONSERVATION DISTRICT BOARDS AND TECHNICAL REVIEW COMMITTEES

Approved May 20, 2015 (Effective July 1, 2015); revised September 27, 2018

Summary:
This document serves to provide guidance to Resource Management Plan (RMP) review authorities regarding the review of RMPs in a manner which protects personal, proprietary, and confidential information while also remaining in compliance with Virginia Freedom of Information Act (FOIA) (§2.2-3700 et seq. of the *Code of Virginia*) requirements. The document outlines procedures to be utilized in accordance with closed meeting allowances provided for in § 2.2-3711 (A) (45) and referenced in § 10.1-104.7 (E) of the *Code of Virginia* in order to protect such information.

Electronic Copy:
An electronic copy of this guidance in PDF format is available on the Regulatory Town Hall under the Virginia Soil and Water Conservation Board at http://townhall.virginia.gov/L/GDocs.cfm.

Contact Information:
Please contact the Department of Conservation and Recreation's Division of Soil and Water at rmp@dcr.virginia.gov or by calling 804-371-0297 with any questions regarding the application of this guidance.

Disclaimer:
This document is provided as guidance and, as such, sets forth standard operating procedures for Virginia's Soil and Water Conservation Districts (Districts) and their Technical Review Committees (TRCs) that administer the RMP Program on behalf of the Virginia Soil and Water Conservation Board (VSWCB) and the Department of Conservation and Recreation (Department). This guidance provides a general interpretation of the applicable Code and Regulations but is not meant to be exhaustive in nature. Each situation may differ and may require additional interpretation of the Resource Management Plans Act and attendant regulations.

FOIA Requirements for RMP Review by District Boards and TRCs

I. Background:

The RMP program provides a voluntary way to promote the use of conservation practices that improve farming operations and water quality. RMPs can help farm owners and operators take advantage of all the conservation measures at their disposal. The plans are designed to encourage farmers, either the farm owner or operator, to use a high level of best management practices (BMPs) that reduce runoff pollution to local waters and, in many cases, improve the farmer's financial bottom line.

Section 4VAC50-70-70 (A) of the RMP regulations stipulates that "[u]pon completion of a new or revised RMP in accordance with 4VAC50-70-50 and 4VAC50-70-60, the owner or operator or the RMP developer on behalf of the owner or operator, shall submit the RMP to the review authority."

Section 4VAC50-70-70 (B) of the RMP regulations stipulates that "[e]ach soil and water conservation district shall establish a Technical Review Committee (TRC). RMPs received by a soil and water conservation district shall be referred to the TRC for review to ensure the RMP fully meets the minimum standards set forth in 4VAC50-70-40 and the components specified in 4VAC50-70-50."

The definition of Technical Review Committee set out in 4VAC50-70-10 specifies that a TRC is a committee established by a Soil and Water Conservation District Board to review RMPs and provide recommendations to the Soil and Water Conservation District Board regarding RMPs.

FOIA [§ 2.2-3705.6 (25) of the *Code of Virginia*] provides an exclusion for information of a proprietary nature furnished by an agricultural landowner or operator pursuant to an RMP, and the Resource Management Plans Act [§ 10.1-104.7 (E) of the *Code of Virginia*] specifies that any personal or proprietary information collected pursuant to the Act shall be exempt from FOIA, except where specifically permitted in accordance with the section. Further, § 2.2-220.3 of the *Code of Virginia* specifies that information collected pursuant to voluntary actions taken by the agricultural and silvicultural sectors shall be maintained as confidential and is also exempt from FOIA.

As it relates to RMP review and discussion, TRCs and District Boards are, by definition, public bodies, and meetings of the TRC or the District Board are required to be open meetings, unless the subject of the RMP item being discussed would result in the disclosure of personal or proprietary information which allows for such information to be discussed in a closed meeting as provided for in § 2.2-3711 (A) (45) and referenced in § 10.1-104.7 (E) of the *Code of Virginia*.

This guidance serves to clarify procedures that TRCs and District Boards as public bodies should follow regarding the management and discussion of personal, proprietary, and confidential information associated with RMPs and the RMP program.

II. Definitions

"Closed meeting" means a meeting from which the public is excluded. (Pursuant to § 2.2-3701 of the *Code of Virginia*)

“Department” means the Department of Conservation and Recreation.

“Director” means the officially appointed individual who directs, and is ultimately responsible for, the overall operations of the Department of Conservation and Recreation.

“Meeting” or “Meetings" means the meetings including work sessions, when sitting physically, or through telephonic or video equipment pursuant to § 2.2-3708 or 2.2-3708.1, as a body or entity, or as an informal assemblage of (i) as many as three members or (ii) a quorum, if less than three, of the constituent membership, wherever held, with or without minutes being taken, whether or not votes are cast, of any public body. The gathering of employees of a public body shall not be deemed a "meeting" subject to the provisions of this chapter. (Pursuant to § 2.2-3701 of the *Code of Virginia*)

"Open meeting" or "public meeting" means a meeting at which the public may be present. (Pursuant to § 2.2-3701 of the *Code of Virginia*)

"Operator" means a person who exercises managerial control over the management unit. (Pursuant to 4VAC50-70-10)

"Owner" means a person who owns land included in a management unit. (Pursuant to 4VAC50-70-10)

“Public body” means any legislative body, authority, board, bureau, commission, district or agency of the Commonwealth or of any political subdivision of the Commonwealth, including cities, towns and counties, municipal councils, governing bodies of counties, school boards and planning commissions; governing boards of public institutions of higher education; and other organizations, corporations or agencies in the Commonwealth supported wholly or principally by public funds. It shall include ... (ii) any committee, subcommittee, or other entity however designated, of the public body created to perform delegated functions of the public body or to advise the public body. It shall not exclude any such committee, subcommittee or entity because it has private sector or citizen members. … (Pursuant to § 2.2-3701 of the *Code of Virginia*)

“Review authority” means a soil and water conservation district or the department where applicable that is authorized under this chapter [the RMP Regulations] to determine the adequacy of a resource management plan and perform other duties specified by this chapter. (Pursuant to 4VAC50-70-10)

"RMP developer" means an individual who meets the qualifications established by this chapter to prepare or revise a resource management plan. (Pursuant to 4VAC50-70-10)

"Soil and water conservation district" or "district" means a political subdivision of the Commonwealth organized in accordance with the provisions of Chapter 5 (§ 10.1-500 et seq.) of Title 10.1 of the Code of Virginia. (Pursuant to 4VAC50-70-10)

“Technical Review Committee” or “TRC” means a committee established by a soil and water conservation district board to review RMPs and provide recommendations to the soil and water conservation district board regarding RMPs. A TRC may include, but not be limited to, the following members: soil and water conservation district directors, associates, and personnel; Virginia Cooperative Extension personnel; department nutrient management specialists; and such other technical resources available to the district. (Pursuant to 4VAC50-70-10)

III. Authority:

The Resource Management Plan Act (§ 10.1-104.7 et seq. of the *Code of Virginia*) contains the following authorities applicable to this guidance:

> **§ 10.1-104.7 Resource Management Plans; effect of implementation; exclusions.**
> E. Any personal or proprietary information collected pursuant to this article shall be exempt from the Virginia Freedom of Information Act (§ 2.2-3700 et seq.), except that the Director may release information that has been transformed into a statistical or aggregate form that does not allow identification of the persons who supplied, or are the subject of, particular information. This subsection shall not preclude the application of the Virginia Freedom of Information Act (§ 2.2-3700 et seq.) in all other instances of federal or state regulatory actions. Pursuant to subdivision A 45 of § 2.2-3711, public bodies may hold closed meetings for discussion or consideration of certain records excluded from the provisions of this article and the Virginia Freedom of Information Act (§ 2.2-3700 et seq.).

The FOIA Act (§ 2.2-3700 et seq. of the *Code of Virginia*) contains the following authorities applicable to this guidance:

> **§ 2.2-3705.6. Exclusions to application of chapter; proprietary records and trade secrets.**
> The following information contained in a public record is excluded from the mandatory disclosure provisions of this chapter but may be disclosed by the custodian in his discretion, except where such disclosure is prohibited by law: ….
>
> 25. Information of a proprietary nature furnished by an agricultural landowner or operator to the Department of Conservation and Recreation, the Department of Environmental Quality, the Department of Agriculture and Consumer Services or any political subdivision, agency, or board of the Commonwealth pursuant to §§ 10.1-104.7, 10.1-104.8, and 10.1-104.9, other than when required as part of a state or federal regulatory enforcement action.

§ 2.2-3711. Closed meetings authorized for certain limited purposes.
A. Public bodies may hold closed meetings only for the following purposes: ….

45. Discussion or consideration of personal and proprietary information related to the resource management plan program and subject to the exclusion in (i) subdivision 25 of § 2.2-3705.6 or (ii) subsection E of § 10.1-104.7. This exclusion shall not apply to the discussion or consideration of records that contain information that has been certified for release by the person who is the subject of the information or transformed into a statistical or aggregate form that does not allow identification of the person who supplied, or is the subject of, the information.

Consideration for maintaining the confidentiality of information included in an RMP regarding voluntary actions taken by the agricultural and silvicultural sectors must also be made.

§ 2.2-220.3. Development of strategies to collect land use and conservation information.
The Secretary of Natural Resources, with assistance from the Secretary of Agriculture and Forestry, shall establish and maintain a database of the critical data attributes for onsite best management practices implemented in the Commonwealth that limit the amount of nutrients and sediment entering state waters. The database shall document voluntary actions taken by the agricultural and silvicultural sectors and should enable the application of the collected data towards projections of progress towards Virginia's water quality goals by sharing the data with the appropriate federal or state agencies. To the extent possible or appropriate, the database shall (i) be uniform in content and format to applications in the other states of the Chesapeake Bay watershed, (ii) maintain the confidentiality of information, and (iii) use existing methods of data collection including reports to the U.S. Department of Agriculture's Farm Service Agency, soil and water conservation districts, and localities for the purpose of land use valuation. Any information collected pursuant to this section shall be exempt from the Freedom of Information Act (§ 2.2-3700 et seq.).

The Resource Management Plans Regulations contain the following authorities applicable to this guidance:

4VAC50-70-70. Review of a Resource Management Plan.
A. Upon completion of a new or revised RMP in accordance with 4VAC50-70-50 and 4VAC50-70-60, the owner or operator or the RMP developer on behalf of the owner or operator, shall submit the RMP to the review authority. If the RMP developer is a district employee or district board member of the district that is the designated review authority, the department shall serve as the review authority for that RMP.
B. Each soil and water conservation district shall establish a Technical Review Committee (TRC). RMPs received by a soil and water conservation district shall be referred to the TRC for review to ensure the RMP fully meets the minimum standards set forth in 4VAC50-70-40 and the components specified in 4VAC50-70-50. [Following review, the TRC provides recommendations to the soil and water conservation district board regarding RMPs.] …

IV. Discussion and Interpretation:

The Department's RMP regulations (4VAC50-70-10 et seq.) require a District Board to set up a TRC, which will review the RMPs and provide recommendations to the District Board. The District board votes on the RMP. While conducting the review and associated meetings, the TRC and District Board must protect personal and proprietary information associated with an RMP.

FOIA [§ 2.2-3705.6 (25) of the *Code of Virginia*] provides an exclusion for information of a proprietary nature furnished by an agricultural landowner or operator pursuant to an RMP, and the Resource Management Plans Act [§ 10.1-104.7 (E) of the *Code of Virginia*] specifies that any personal or proprietary information collected pursuant to the Act shall be exempt from FOIA, except where specifically permitted in accordance with the section. Further, § 2.2-220.3 of the *Code of Virginia* specifies that information collected pursuant to voluntary actions taken by the agricultural and silvicultural sectors shall be maintained as confidential and is also exempt from FOIA.

In order to prevent public disclosure of such protected information, a closed meeting to discuss such information as it relates to RMPs is provided for in § 2.2-3711 (A) (45) and referenced in § 10.1-104.7 (E) of the *Code of Virginia*.

For the purposes of the closed meeting exemption, "personal information" should be understood as information that reveals the identity of the applicant or location of the tract: for example, any and all maps or geographic references. The applicant's suite of BMPs (including the specifics of each component) is not "proprietary information" so long as those BMPs, and any associated soil studies and other information, are not linked to the applicant or the tract's location thus the release of such information would not inhibit a business or have an economic impact on it should such information be generally disclosed. Where a FOIA question arises, the Districts should consult with legal counsel at the Office of the Attorney General.

Documents furnished by an owner or operator are excluded from FOIA and should not be released. Other documents (not furnished by an owner or operator) that contain personal or proprietary information should not be released or should be redacted. Districts should contact legal counsel as questions arise regarding what can be disclosed and in what manner.

Below is a list of items not subject to FOIA:
<u>General Information</u>

- Any 1619 information (farm, tract, and field) [available as a USDA Section 1619 Cooperator]; and
- Social security numbers and tax id numbers.

<u>Specific RMP Information</u>

- RMP-1 and RMP-2 BMP applications/approvals/contracts;
- RMPs and associated documents and plans;
- Farm assessment for an RMP;
- Attachments (pdf, pics, etc) to an RMP;

- Maps developed for an RMP; and
- RMP data contained in the Conservation Planning and RMP Modules.

Below is a list of items that will contain protected personal or proprietary information and which must be redacted if released:

- RMP inspection documents;
- RMP corrective action agreements;
- E-mails and letters associated with a specific RMP regarding RMP development, review, Certificate issuance, modification, and revocation;
- RMP developer applications; and
- Any information regarding an RMP developer except information released on the Department's website.

Because the law specifies a permissible way to release the RMP gathered information (i.e., in statistical or aggregate form) by the Director or upon the certification for release by the person who is the subject of the information, release in other forms is prohibited by law. Thus, if a District receives a FOIA request for an RMP or list of applicants, it should, pursuant to § 2.2-3704 (B) (1) or (B) (3) of the *Code of Virginia*, timely respond that the District is prohibited by law from releasing the RMP information and refer the requester to the Department.

FOIA also requires that all meetings of public bodies shall be open, unless otherwise exempted. A District Board falls within the FOIA definition of a public body. Additionally, a TRC also qualifies as a public body under FOIA, as it is a committee created to advise a public body (despite including citizen members).

However, in accordance with § 2.2-3711 (A) (45) of the Code of Virginia, the discussion or consideration of personal and proprietary information that is excluded from the provisions of FOIA pursuant to (i) subdivision 25 of § 2.2-3705.6 or (ii) subsection E of § 10.1-104.7 by a TRC or District Board may be handled in a closed meeting, or other options to protect the disclosure of personal and proprietary information may also be considered.

A TRC or District Board may utilize either one or a combination of the following three options to discuss the RMP. It is important to realize; however, that the TRC or District Board must always conduct the recommendation for approval or RMP approval vote, respectively, in an open meeting. This document will provide further guidance regarding each of the options listed below:

1. A TRC or District Board may go into closed session to discuss personal and proprietary information regarding an RMP. (This option will provide for the most streamlined process and create the least opportunity for the accidental disclosure of personal, proprietary, or confidential information.)
2. A TRC or District Board may redact personal, proprietary, and otherwise confidential information from the discussion packet and conduct the entire meeting in an open meeting. In an open meeting, the plan must be referenced only by a plan number.
3. A District Board may delegate RMP approval (following TRC review and recommendation) to a single individual who would approve the RMP outside of a meeting. [It is strongly recommended that such actions should be reported back to the

District Board and be reflected in District Board minutes to ensure continuity of RMP records.]

1) CLOSED MEETING GUIDELINES FOR DISCUSSION OF PERSONAL AND PROPRIETARY INFORMATION ASSOCIATED WITH A RESOURCE MANAGEMENT PLAN

Closed meetings of public bodies are permitted only for one or more of the purposes specified in the Virginia Freedom of Information Act (FOIA), § 2.2-3711 (A). Any exemption from public access to meetings or records shall be narrowly construed.

A TRC or District Board may go into closed session to discuss personal and proprietary information regarding an RMP. Section 2.2-3711 of the *Code of Virginia* authorizes a closed meeting for discussion or consideration of personal and proprietary information related to the resource management plan program and subject to the exclusion in (i) subdivision 25 of Code § 2.2-3705.6 or (ii) subsection E of Code § 10.1-104.7. This exclusion shall not apply to the discussion or consideration of records that contain information that has been authorized for release by the person who is the subject of the information. It also does not apply to information that has been transformed into statistical or aggregate form that does not allow identification of the person who supplied, or is the subject of, the information.

This exclusion will allow the TRC or District Board to go into closed session to discuss only the portions of an RMP that are considered personal and proprietary information. Any motion to recommend a plan or decline a plan by the TRC, or to approve or decline a plan by the District Board, must happen in open session. The vote must also occur in open session. Members may state on the record why they voted the way they did, but may not reveal any personal or proprietary information. The meeting minutes for the open session must be in writing and must capture: (i) the date, time, and location of the meeting; (ii) the members of the public body recorded as present and absent; and (iii) a summary of the discussion on matters proposed, deliberated, or decided, and a record of any votes taken (§ 2.2-3707 (H) of the *Code of Virginia*). When the meeting becomes open, the plan should be referenced by the plan number. Only redacted plans should be allowed in the open meeting. If the person who is subject of the information has authorized release of such information, the exemption no longer applies.

<u>Going Into Closed Meetings:</u>

1. A motion by a public body to hold a Closed Meeting must specifically state the purpose(s) for the session and reasonably identify the subject matters to be discussed. Specific reference must be made to the statutory authority for the Closed Meeting. A general reference alone is not sufficient. § 2.2-3712 (A) of the *Code of Virginia*. *See sample motion 1 below.

2. Nothing may be discussed in the Closed Meeting except matters included in the motion to go into Closed Meeting. § 2.2-3712 (C) of the *Code of Virginia*.

3. Minutes during a Closed Meeting are not required, and if taken are not subject to public disclosure. § 2.2-3712 (I) of the *Code of Virginia*.

4. Only public body members and those individuals with relevant information useful in the plan review process invited by the public body shall be included in the Closed Meeting. § 2.2-3712 (F) of the *Code of Virginia*.

5. Though not specifically required by law, an estimated time to reconvene should be announced or included in the motion so that the public will know when to return.

<u>*Sample Motion 1</u>

I move the [*public body*] go into Closed Meeting in accordance with the Virginia Freedom of Information Act § 2.2-3711 (A) (45) for discussion or consideration of personal and proprietary information excluded from the provisions of this chapter pursuant to (i) subdivision 25 of § 2.2-3705.6 or (ii) subsection E of §10.1-104.7, Review of a Resource Management Plan.

This closed meeting will be attended only by members of the [*public body*]. However, pursuant to § 2.2-3712 (F), the [*public body*] requests [ex. *the RMP developer for plan # XXX*] to also attend this meeting, as it believes their presence will reasonably aid the [*public body*] in its consideration of topics that are the subject of the meeting.

<u>**Coming Out of Closed Meetings:**</u>

1. At the conclusion of any closed meeting, the public body must reconvene into the open meeting. § 2.2-3712 (D) of the *Code of Virginia*.

2. The public body must have a roll call and recorded vote of a motion to be included in the minutes that states the members in the Closed Meeting heard, discussed or considered only:
**See sample motion 2 below

    (1) Public business matters specifically identified in the original motion to convene into Closed Meeting

    AND

    (2) Public business matters lawfully exempted from open meeting requirements. § 2.2-3712 (D) of the *Code of Virginia*.

3. A Certification of Closed Meeting that becomes a part of the official minutes must be adopted when the open meeting reconvenes. This resolution assures the public body fulfills the obligations set forth in FOIA. (See attached Certification example.)

4. Any resolution, motion, or decision made during the Closed Meeting must be presented and voted on during an open meeting of the public body. §§ 2.2-3711(B) and 2.2-3712(H) of the *Code of Virginia*.

5. Any member of the public body who believes that there was a departure from the requirements of clauses 2. (1) and (2) outlined above shall so state prior to the vote, indicating the substance of the departure that, in his judgment, has taken place. The statement shall be recorded in the minutes of the public body. § 2.2-3712 (D) of the *Code of Virginia*. [The Certification of Closed Meeting document included below may be used to certify the meeting].

<u>*Sample Motion 2</u>

> Pursuant to the § 2.2-3712 (D) of the *Code of Virginia*, I move to certify that, to the best of each member's knowledge, only matters lawfully exempted and identified in the motion by which the Closed Meeting was convened were heard or discussed by this [*public body*] during the Closed Meeting. (This motion is considered a Certification of a Closed Meeting)
>
> I move for the adoption of resolution #[*X*], Certification of Closed Meeting, which confirms that only those matters that were identified and lawfully exempted were discussed during the Closed Meeting. (A sample Certification is included below.)

<u>**Certification of Closed Meeting**</u>

MEETING DATE: ____________

RESOLUTION # ______________

MOTION:

WHEREAS, the [*public body*] has convened a closed meeting on this date pursuant to an affirmative recorded vote and in accordance with the provisions of The Virginia Freedom of Information Act; and

WHEREAS, § 2.2-3712 of the Code of Virginia requires a certification by the [public body] that a closed meeting was conducted in conformity with Virginia law;

NOW, THEREFORE, BE IT RESOLVED that the [*public body*] hereby certifies that, to the best of each member's knowledge, (i) only public business matters lawfully exempted from open meeting requirements by Virginia law were discussed in the closed meeting to which this certification resolution applies, and (ii) only such public business matters as identified in the motion convening the closed meeting were heard, discussed or considered by the [*public body*].

MOTION BY: ____________________

SECOND BY: ____________________

<u>VOTES </u>**(requires roll call vote)**
AYES:

NAYS:
[For each nay vote, the substance of the departure from the requirements of the Act should be described]

ABSENT DURING VOTE:
ABSENT DURING MEETING:

____
Secretary of [public body]

2) OPEN MEETING GUIDELINES FOR DISCUSSION OF A RESOURCE MANAGEMENT PLAN

A TRC or District Board may redact personal information from the information packet and conduct the entire meeting in an open meeting. Confidential information regarding voluntary BMPs must also be redacted. In an open meeting, the RMP must be referenced only by a plan number and personal and proprietary information must be protected from disclosure to the public.

If the TRC or District Board reviews or discusses personal or proprietary RMP information in an open meeting, District staff should mask or otherwise redact personal information (name, address, etc.) from the RMP packet before it is copied and provided to the TRC. To the extent it is possible to redact other identifying information without compromising the TRC's ability to evaluate the RMP, District staff should do so.

Each RMP should have an assigned plan number to be referenced in public meetings of the TRC and District Board.

Staff should attach a cover page or header reminding the TRC or District Board that disclosure of identifying information is prohibited by law.

TRC and District Board members should be reminded at the meeting that personal and proprietary information is protected from disclosure and that they should tailor their discussion accordingly. The following announcement, or one like it, would be appropriate: "It is prohibited by law to disclose personal or proprietary identifying information of an RMP applicant. Members are reminded to take care to ensure that identifying information is not disclosed."

In open meetings where the public is present, reference should be made to page/line numbers ("the BMP identified on page 4, line 10" or "the acreage identified on page 7 line 2", etc.) to the extent reasonably possible. Common sense should be utilized to discuss each RMP in a fashion that will not reveal personal or proprietary information of the protected individuals.

3) DELEGATION OF RMP APPROVAL TO A SINGLE INDIVIDUAL
Following development of a recommendation by the TRC, and in lieu of action by the full District Board, a District Board may delegate RMP approval to a single individual who would approve the RMP outside of a meeting. District directors "may delegate to their chairman or to one or more district directors, agents or employees such powers and duties as they may deem proper." § 10.1-533 of the *Code of Virginia*. A District Board is therefore empowered to delegate to one director, agent, or employee the power and duty of RMP approval. [It is strongly recommended that such actions should be reported back to the District Board and be reflected in District Board minutes, in accordance with the delegation charge, to ensure continuity of RMP records.]

MEETING PACKETS
FOIA requires that "[a]t least one copy of the proposed agenda and all agenda packets and, **unless exempt**, all materials furnished to members of a public body for a meeting shall be made available for public inspection at the same time such documents are furnished to the members of the public body." (§ 2.2-3707 (F) of the *Code of Virginia*). However, the protected RMP documents printed for the TRC and District Board (unless properly redacted) **need not be provided to the public**. Because the information remains protected after a meeting, it is also advisable that the packets provided to the members be collected at the close of a meeting.

V Adoption, Amendments, and Repeals:

This document will remain in effect until repealed or superseded.

Soil and Water Conservation District Director Appointments and Resignations

§ 10.1-529. District directors constitute governing body; qualifications.

The governing body of the district shall consist of five or more district directors, elected and appointed as provided in this article.

The two district directors appointed by the Board shall be persons who are by training and experience qualified to perform the specialized skilled services which will be required of them in the performance of their duties. One of the appointed district directors shall be the extension agent of the county or city, or one of the counties or cities constituting the district, or a part thereof. Other appointed and elected district directors shall reside within the boundaries of the district.

§ 10.1-530. Designation of chairman; terms of office; filling vacancies

A. The district directors shall designate a chairman from the elected members, or from the Board-appointed members, of the district board and may change such designation.

B. The term of office of each district director shall be four years. A district director shall hold office until his successor has been elected or appointed and has qualified. The selection of successors to fill a full term shall be made in accordance with the provisions of this article. Beginning in the year 2003, the election of district directors shall be held at the November 2003 general election and each fourth year thereafter. The terms of office of elected district directors shall begin on January 1 following the November general election. The term of office of any district director elected in November 1999 shall be extended to the January 1 following the November 2003 general election. The term of office of any district director elected in November 2000 shall expire on the January 1 following the November 2003 general election. The term of office of any district director elected in November 2001 or 2002 shall be extended to expire on the January 1 following the November general election in 2007. Appointments made by the Board to the at-large position held by an extension agent shall be made to commence January 1, 2005, and each fourth year thereafter. Appointments made by the Board to the other at-large position shall be made to commence January 1, 2007, and each fourth year thereafter. Any appointment made by the Board prior to January 1, 2005, to an at-large position held by an extension agent shall be made to expire January 1, 2005; and any appointment made by the Board prior to January 1, 2007, to the other at-large position shall be made to expire January 1, 2007.

C. A vacancy shall exist in the event of the death, resignation or removal of residence from the district of any director or the elimination or detachment from the district of the territory in which a director resides, or by the removal of a director from office by the Board. Any vacancy in an elected or appointed director's position shall be filled by an appointment made by the Board for the unexpired term. In the event of the creation of a new district, the transfer of territory from an existing district to an existing district, or the addition of territory not previously within an existing district to an existing district, the Board may appoint directors to fill the vacancies of elected directors prescribed by § 10.1-515 in the newly created district or in the territory added to an existing district. Such appointed directors shall serve in office until the elected directors prescribed by § 10.1-515 take office after the next general election at which directors for the entire district are selected.

Recommended Motion:

The Virginia Soil and Water Conservation Board approves the appointments of the individuals being recommended.

Soil and Water Conservation District Director Appointments and Resignations

Appomattox River
Appointment of Ms. Hannah Bishop, of Dinwiddie County, effective 9/15/2026, to fill the vacant Extension Agent Director position (term of office expires 12/31/2028).

Colonial
Appointment of Mr. Robert Jeremiah, of James City County, effective 9/15/2026, to fill the vacant At-Large Director position (term of office expires 12/31/2026).

Mr. Jeremiah currently serves the Colonial SWCD as an active Associate Director.

Resignation of Mr. Robert Lund, of James City County, effective 12/31/2026, Elected Director position (term of office expires 12/31/2027).

Appointment of Mr. Robert Jeremiah, of James City County, effective 1/01/2027, to fill the vacant Elected Director position (term of office expires 12/31/2027).

New River
Appointment of Ms. Allison Brown, of Carroll County, effective 9/15/2026, to fill the vacant Extension Agent Director position (term of office expires 12/31/2028).

Soil and Water Conservation District Director (At-Large) Appointments and Resignations

§ 10.1-529. District directors constitute governing body; qualifications.

The governing body of the district shall consist of five or more district directors, elected and appointed as provided in this article.

The two district directors appointed by the Board shall be persons who are by training and experience qualified to perform the specialized skilled services which will be required of them in the performance of their duties. One of the appointed district directors shall be the extension agent of the county or city, or one of the counties or cities constituting the district, or a part thereof. Other appointed and elected district directors shall reside within the boundaries of the district.

§ 10.1-530. Designation of chairman; terms of office; filling vacancies

A. The district directors shall designate a chairman from the elected members, or from the Board-appointed members, of the district board and may change such designation.

B. The term of office of each district director shall be four years. A district director shall hold office until his successor has been elected or appointed and has qualified. The selection of successors to fill a full term shall be made in accordance with the provisions of this article. Beginning in the year 2003, the election of district directors shall be held at the November 2003 general election and each fourth year thereafter. The terms of office of elected district directors shall begin on January 1 following the November general election. The term of office of any district director elected in November 1999 shall be extended to the January 1 following the November 2003 general election. The term of office of any district director elected in November 2000 shall expire on the January 1 following the November 2003 general election. The term of office of any district director elected in November 2001 or 2002 shall be extended to expire on the January 1 following the November general election in 2007. Appointments made by the Board to the at-large position held by an extension agent shall be made to commence January 1, 2005, and each fourth year thereafter. Appointments made by the Board to the other at-large position shall be made to commence January 1, 2007, and each fourth year thereafter. Any appointment made by the Board prior to January 1, 2005, to an at-large position held by an extension agent shall be made to expire January 1, 2005; and any appointment made by the Board prior to January 1, 2007, to the other at-large position shall be made to expire January 1, 2007.

Recommended Motion:

The Virginia Soil and Water Conservation Board approves the appointments of the individuals being recommended.

Soil and Water Conservation District At-Large Director Appointments
(Terms expire December 31, 2030)

SWCD	Current Incumbent Director	County/City	Requested Appointment	County/City
APPOMATTOX RIVER	Franklin Zitta	Dinwiddie	Franklin Zitta	Dinwiddie
BIG SANDY	Ruth Horn	Buchanan	Ruth Horn	Buchanan
BIG WALKER	Matthew K. Heldreth	Wythe	Matthew K. Heldreth	Wythe
BLUE RIDGE	Byron Brooks	Franklin	Byron Brooks	Franklin
CHOWAN BASIN	Walter W. Robinson, Jr.	Greensville	Walter W. Robinson, Jr.	Greensville
CLINCH VALLEY	Jason Bush	Russell	Jason Bush	Russell
***COLONIAL**	**Robert Jeremiah**	**James City County**	**Robert Lund**	**James City County**
CULPEPER	Steven D. Morris	Greene	Steven. D Morris	Greene
DANIEL BOONE	Robert V. Burchett	Lee	Robert V. Burchett	Lee
EASTERN SHORE	Nicholas Thomas	Accomack	Nicholas Thomas	Accomack
EVERGREEN	Clegg Williams	Smyth	Clegg Williams	Smyth
HALIFAX	Adam Davis	Halifax	Adam Davis	Halifax
HANOVER-CAROLINE	Grayson Kirby	Hanover	Grayson Kirby	Hanover
HEADWATERS	Walter Hebb, III	Augusta	Walter Heeb, III	Augusta
***HENRICOPOLIS**	**Herbert Dunford, Jr.**	**Henrico**	**Anne-Marie Leake**	**Henrico**
HOLSTON RIVER	Michael Countiss	Washington	Michael Countiss	Washington
JAMES RIVER	Gregory Powers	Chesterfield	**VACANT**	
JOHN MARSHALL	Edmond DeBerry	Fauquier	Edmond DeBerry	Fauquier
LAKE COUNTRY	William Austin Puryear	Mecklenburg	William Austin Puryear	Mecklenburg
LONESOME PINE	Glenn Graham	Dickenson	Glenn Graham	Dickenson
LORD FAIRFAX	James W. Fagan	Shenandoah	James W. Fagan	Shenandoah
LOUDOUN	James B. Christian	Loudoun	James B. Christian	Loudoun

SWCD	Current Incumbent Director	County/City	Requested Appointment	County/City
MONACAN	Matthew Dabney	Powhatan	Matthew Dabney	Goochland
MOUNTAIN	Ellen Ford	Bath	Ellen Ford	Bath
MOUNTAIN CASTLES	Walter Nelson	Botetourt	Walter Nelson	Botetourt
NATURAL BRIDGE	Robert Beard	Rockbridge	Robert Beard	Rockbridge
NEW RIVER	Gary Boring	Carroll	Gary Boring	Carroll
NORTHERN NECK	Louis Gregory Basye	Northumberland	Louis Gregory Basye	Northumberland
NORTHERN VIRGINIA	Scott Cameron	Fairfax	Scott J. Cameron	Fairfax
PATRICK	John Wood	Patrick	John Wood	Patrick
PEAKS OF OTTER	W. Stacy Simmons	Bedford	W. Stacy Simmons	Bedford
PEANUT	Carey M. Copeland	City of Suffolk	Carey M. Copeland	City of Suffolk
PETER FRANCISCO	Barbara Teeple	Buckingham	Barbara Teeple	Buckingham
***PIEDMONT**	**VACANT**		**J. Colin Whittington**	**Amelia**
PITTSYLVANIA	Thomas Keatts	Pittsylvania	Thomas Keatts	Pittsylvania
PRINCE WILLIAM	John B. Price	Prince William	John B. Price	Prince William
ROBERT E. LEE	Kia Scott	Campbell	Kia Scott	Campbell
SCOTT COUNTY	William L. Johnson	Scott	William L. Johnson, III	Scott
SHENANDOAH VALLEY	Keith Sheets	Rockingham	Keith Sheets	Rockingham
SKYLINE	Charles P. Shorter	Montgomery	Charles P. Shorter	Montgomery
SOUTHSIDE	Terry Rutledge	Charlotte	Cornell “Brick” Goldman	Charlotte
***TAZEWELL**	**Donna Kirby**	**Tazewell**	**Harry Phipps**	**Tazewell**
THOMAS JEFFERSON	John E. Easter II	Fluvanna	**VACANT**	
THREE RIVERS	Robert Bland	King & Queen	Robert Bland	King & Queen
TIDEWATER	William Richardson, Jr.	Middlesex	William Richardson, Jr.	Middlesex
TRI-COUNTY/CITY	Ray Simms	Fredericksburg	Ray Simms	Fredericksburg
VIRGINIA DARE	Francis J. Drumm, Jr.	Virginia Beach	Francis J. Drumm, Jr.	Virginia Beach

*** New Recommended Appointments for the At-Large Position**

Henricopolis
Anne-Marie Leake
Ms. Leake served as an elected Director on the Henricopolis SWCD from 2020-2023 and has been serving as an Associate Director since 2024. She is very involved with the VASWCD, currently serving as the Marketing Committee Chair and was previously the VASWCD Area III Chair.

Colonial
Robert Lund
Mr. Lund currently serves as an elected director for Colonial SWCD. He serves as a member of the Districts Urban Committee and actively promotes the VCAP program within the service area and adjacent localities.

Piedmont
J. Colin Whittington
Mr. Whittington is the owner/operator of Featherstone Farm Seed, a family operation specializing in seed production. He has worked in the agricultural field for over 20 years with a special interest in conservation farming, including no-till, cover crops, and cattle management. He currently serves on the VA Soybean Checkoff Board and has previously served on the VA Crop Improvement Board of Directors and as Chairman of the VA Soybean Association. In his spare time he enjoys farming, coaching basketball and softball, fishing, and hunting.

Tazewell
Harry Phipps
Mr. Phipps has been an Associate Director for Tazewell SWCD for many years and sits on the Executive and Conservation Education committees. He has been an Earth Team Volunteer as was awarded the Earth Team Volunteer Award for Russel County in 2001. His hobbies include gardening, farming, four wheeling, bird watching, and traveling.

Charles Green
Commissioner

COMMONWEALTH of VIRGINIA
Department of Agriculture and Consumer Services
PO Box 1163, Richmond, Virginia 23218
www.vdacs.virginia.gov

August 31, 2026

Nikki Rovner, Director
Virginia Department of Conservation and Recreation

Charles Newton, Chair
Virginia Soil and Water Conservation Board

Virginia Soil and Water Conservation Districts

The Agricultural Stewardship Act (ASA) program recently completed 29 years of responding to water pollution complaints involving agricultural operations in the Commonwealth. As required by the ASA, I am providing the attached annual report of the ASA program for the period April 1, 2025, through March 31, 2026. The report offers a summary of the complaints received and processed by ASA staff.

I would also like to take this opportunity to acknowledge and express my gratitude for the continued support of Virginia's agricultural communities; local soil and water conservation districts; and local, state, and federal government partners who assisted in carrying out the provisions of the ASA.

The ASA program continues to provide a very practical and positive approach to addressing water pollution problems on farms in Virginia. VDACS remains committed to the goals and objectives of the ASA and to assisting farmers with addressing water quality issues.

I welcome your comments and questions regarding this report and the ASA program.

Sincerely,

Charles Green
Commissioner

ATTACHMENT

ANNUAL REPORT
ON THE
AGRICULTURAL STEWARDSHIP ACT

Charles Green

Commissioner

August 31, 2026

VIRGINIA AGRICULTURAL STEWARDSHIP ACT
ANNUAL REPORT
For Program Year April 1, 2025 - March 31, 2026

BACKGROUND

The 1996 Session of the General Assembly enacted the Agricultural Stewardship Act (ASA) (Va. Code § 3.2-400 et seq.), which requires the Commissioner of Agriculture and Consumer Services (Commissioner) to administer and enforce the ASA program. Through an effort of cooperation and coordination involving Virginia's Soil and Water Conservation Districts (SWCD), the Virginia Department of Agriculture and Consumer Services (VDACS), and the agricultural community, the ASA program provides a common-sense solution to water pollution problems caused by agricultural operations.

Subsection B of Va. Code § 3.2-408 requires the Commissioner to compile a report by August 31 of each year listing the number of complaints received, the nature of each complaint, the actions taken in resolution of each complaint, and any penalties that may have been assessed. Additionally, the Commissioner is required to (i) provide this report to the Soil and Water Conservation Board, the Department of Conservation and Recreation, and to every SWCD; (ii) publish notice in the Virginia Register that the report is available; and (iii) make the report available to the public upon request.

The following report on the ASA program is for the program year April 1, 2025, through March 31, 2026.

PROGRAM OBJECTIVES

The ASA Program is designed to:

- Identify water quality problems and help farmers correct them in a common-sense manner that accommodates both the farmer and the environment;
- Establish a system that respects both the farmer and the person voicing concerns about water quality;
- Educate farmers about stewardship and encourage them to enhance it even in instances in which a water quality problem cannot be proven;
- Support farmers in their efforts to strengthen their stewardship practices, provide them with the information they need, and help link them to resources that can provide assistance; and
- Educate Virginia citizens about normal farming practices and the impact those practices may or may not have on the environment.

HOW THE PROGRAM WORKS

Complaints alleging that a specific agricultural activity is causing or will cause water pollution are received by the Commissioner. If a complaint meets the criteria for investigation, the Commissioner, through ASA program staff, contacts the appropriate SWCD about investigating the complaint. If the district declines, ASA program staff conducts the investigation on behalf of the Commissioner. In most cases, a joint investigation involving local district staff and ASA program staff is performed.

The purpose of the investigation is to determine whether the agricultural activity is causing or will cause water pollution. If no causal link is found, the Commissioner determines that the complaint is unfounded. If the Commissioner determines that the activity is the cause of pollution, the farmer is given up to 60 days to develop an agricultural stewardship plan to correct the identified water pollution problems. The local district typically reviews the plan, and the Commissioner will approve the plan when he determines that it meets the necessary requirements to solve the water pollution problem.

The ASA provides the farmer up to six months from the date of the Commissioner's determination that a complaint is founded to start implementing the agricultural stewardship plan and up to 18 months from the date to complete plan implementation. The timing allows the farmer to take advantage of suitable weather conditions for outside work or required construction. If a farmer fails to submit a plan for approval, implement a plan within the given timeline, or maintain an approved plan, the Commissioner is required by law to take enforcement action.

AGRICULTURAL ACTIVITIES

The ASA program received numerous inquiries regarding possible agricultural pollution during the program year of April 1, 2025, through March 31, 2026. Thirty of these cases became official complaints. The official complaints fell into 13 categories according to the type of agricultural activity:

- Beef (10)
- Land Conversion (5)
- Equine (4)
- Cropland (2)
- Beef, Sheep (1)
- Beef, Land Conversion (1)
- Beef, Dairy, Goats, Sheep (1)
- Beef, Goats, Poultry, Swine (1)
- Beef, Other (1)
- Cropland, Land Conversion (1)
- Dairy (1)
- Goats, Swine (1)
- Swine (1)

TYPES OF POLLUTION

The ASA addresses water pollution problems caused by nutrients, sediment, and toxins entering state waters from agricultural activities. The ASA program received complaints based on the following five pollution categories during the program year of April 1, 2025, through March 31, 2026:

- Sediment (9)
- Nutrients, Sediment (8)
- Bacteria, Nutrients, Sediment (6)
- Bacteria, Nutrients (4)
- Nutrients (3)

COMMISSIONER'S FINDINGS

During the program year, 12 (40 percent) of the 30 official complaints were determined to be founded and required agricultural stewardship plans to address water pollution problems. In each founded case, there was sufficient evidence to support the allegations that the agricultural activities were causing or would cause water pollution.

Twelve (40 percent) of the 30 official complaints received during the program year were determined to be unfounded because there was either insufficient evidence or no evidence of water pollution. In some instances, farmers involved in the unfounded complaints voluntarily incorporated best management practices into their operations to prevent more complaints or to prevent potential problems from becoming founded complaints.

Six (20 percent) of the 30 official complaints received during the program year were dismissed for various reasons. Three of the complaints that were dismissed were situations where a water quality concern existed but was remedied prior to the completion of the investigation process. Two were cases that were forwarded to the local Erosion and Sediment Control Authority because the ASA program had no jurisdiction in the matter. In one of the cases, the operator was already engaged in a conservation project to address the water pollution concern. Other reasons for dismissal can include the complaint being withdrawn by the complainant or dismissal because insufficient information was provided by the complainant.

In general, farmers involved in the complaint and correction process were cooperative in meeting the deadlines established by the ASA. Under the ASA, the Commissioner is required to issue a corrective order when an owner or operator fails to submit, implement, or maintain an agricultural stewardship plan based on the findings of a conference held to receive the facts on a case. One corrective order was issued during the 2025 - 2026 program year for failure to submit an agricultural stewardship plan, and civil penalties were assessed. An emergency corrective order was issued on a past complaint site due to a recurring pollution condition that is the subject of an approved plan. The emergency corrective order was affirmed by the Commissioner following an opportunity for the owner to provide additional information regarding the emergency order, and civil penalties were assessed due to the violations. The emergency corrective order and associated civil penalties were appealed to the Virginia Soil and Water

Conservation Board (Board) and are awaiting decision. A founded complaint case decision from the 2025-2026 program year was also appealed and is currently awaiting decision by the Board.

ASA CASE DECISIONS

The following tables provide information about the individual ASA cases that were received, investigated, and decided during the 2025 - 2026 program year.

CASE DECISIONS April 1, 2025 - March 31, 2026 **Founded Complaints**			
Complaint Number	**Locality of Complaint**	**Activities Category**	**Complaint Type**
1372	Smyth County	Swine	Nutrients, Sediment
1375	Fauquier County	Beef, Dairy, Goats, Sheep	Bacteria, Nutrients
1376	Warren County	Beef	Bacteria, Nutrients, Sediment
1378	Page County	Beef	Bacteria, Nutrients
1382	Spotsylvania County	Equine	Nutrients, Sediment
1383	Franklin County	Land Conversion	Sediment
1388	Page County	Beef	Bacteria, Nutrients, Sediment
1389	Page County	Beef	Bacteria, Nutrients, Sediment
1392	Page County	Beef	Bacteria, Nutrients, Sediment
1396	Page County	Beef	Bacteria, Nutrients, Sediment
1398	Augusta County	Beef	Bacteria, Nutrients, Sediment
1399	Franklin County	Beef, Other	Nutrients, Sediment

CASE DECISIONS April 1, 2025 - March 31, 2026 **Unfounded Complaints**			
Complaint Number	**Locality of Complaint**	**Activities Category**	**Complaint Type**
1371	Cumberland County	Land Conversion	Sediment
1374	Rockingham County	Cropland	Nutrients
1379	Brunswick County	Dairy	Bacteria, Nutrients
1381	Shenandoah County	Beef, Sheep	Nutrients
1385	Brunswick County	Cropland, Land Conversion	Sediment
1386	Franklin County	Beef	Sediment
1387	Westmoreland County	Beef	Nutrients, Sediment
1390	Loudoun County	Beef, Land Conversion	Nutrients, Sediment
1394	Loudoun County	Equine	Nutrients
1395	Albemarle County	Equine	Sediment
1397	Lee County	Goats, Swine	Nutrients, Sediment
1400	Accomack County	Cropland	Sediment

CASE DECISIONS April 1, 2025 - March 31, 2026 Dismissed Complaints			
Complaint Number	**Locality of Complaint**	**Activities Category**	**Complaint Type**
1373	Albemarle County	Land Conversion	Sediment
1377	Shenandoah County	Beef	Nutrients, Sediment
1380	Accomack County	Equine	Bacteria, Nutrients
1384	Albemarle County	Land Conversion	Sediment
1391	Chesterfield County	Beef, Goats, Poultry, Swine	Nutrients, Sediment
1393	Halifax County	Land Conversion	Sediment

CASE TRENDS

Compared to the previous program year, the ASA program experienced a 23 percent reduction in official complaints received, from 39 to 30. There was a 29 percent decline in the total number of founded complaints requiring plans, from 17 to 12. Unfounded complaints increased 20 percent, from 10 to 12, while the overall percentage of unfounded complaints increased from 26 percent to 40 percent of the total number of official complaints. There was a 50 percent decrease in dismissed complaints, from 12 to 6.

COMPLAINT TRACKING

With the assistance of the Virginia Department of Conservation and Recreation (DCR), the ASA program utilizes a module in DCR's Conservation Application Suite to track and report certain best management practices implemented to address water pollution on founded complaint sites. This ASA module assists staff in the verification process and contributes to the goals outlined in the Chesapeake Bay Phase III Watershed Implementation Plan. The ASA program has prioritized visiting past complaint sites to measure, document, and verify the livestock exclusion fencing that was implemented as a result of stewardship plan implementation prior to the ASA program having the capability to track best management practices. During the 2025-2026 program year, ASA program staff recorded a total of 4,690 linear feet of livestock exclusion fencing and 17.7 acres of buffer installed from current and past complaint sites statewide. These figures include only the livestock exclusion fencing and buffer acres installed on ASA complaint sites without cost-sharing assistance. Since the ASA program began tracking best management practices on complaint sites, 77,990 linear feet of livestock exclusion fencing have been recorded, and 312.9 acres of buffer installed without cost-share assistance.

CONTACTS

Questions regarding this report should be directed to the ASA office as 804-786-2658 or to darrell.marshall@vdacs.virginia.gov.