

# Nutrient Management Training and Certification Regulations 4VAC50-85

## Virginia Soil and Water Conservation Board

Statutory Authority: § 10.1-104.2 of the Code of Virginia

Effective Date: November 23, 2014

### 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<sub>2</sub>O<sub>5</sub>, and potassium as K<sub>2</sub>O on a per acre basis to supply crop or plant nutrient needs, and to achieve realistic expected crop yields.

"Banding" or "sideband" means the placement of fertilizer 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 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, Virginia Pollutant Discharge Elimination System (VPDES) Permit Regulations, and 9VAC25-32, Virginia Pollution Abatement (VPA) Permit Regulation, of the State Water Control Board.

"Broadcast" means the uniform application of a material over a field.

"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, 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:

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, or turfgrass.

"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<sub>2</sub>O<sub>5</sub>, and potassium as K<sub>2</sub>O 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 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 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:

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 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.

"Field identification number" means a number used by a farmer (or the United States Department of Agriculture Farm Service Agency) to distinguish or identify the location of a field on a farm.

"Grid soil sampling" means a process whereby farm fields or other areas are subdivided into smaller areas or squares for the purpose of obtaining more detailed soil analysis results.

"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" means 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.

"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.

"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 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.

"Micronutrient" means a nutrient necessary only in extremely small amounts for plant growth.

"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 Resource 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.

"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 waste, green manure, compost, or other plant or animal residues which contain plant nutrients.

"Organic residuals" means nutrients released over time from 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.

"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 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.

"Secondary nutrient" means calcium, magnesium, or sulfur.

"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 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.

"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 storage availability.

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

"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 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.

#### **4VAC50-85-30. Certificates of competence.**

A. This chapter applies to any individual seeking a certificate of competence as described in § 10.1-104.2 of the Code of Virginia.

B. Certificates of competence shall be issued by the department to certified nutrient management planners. The department may issue distinct classifications of certification based on areas of specialty, including agriculture and urban agronomic practices.

#### **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 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, or

- b. 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.

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

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

#### **4VAC50-85-70. Training.**

A. The department shall provide a training session on the mechanics of nutrient management plan development prior to scheduled examinations.

B. The department may provide a training course on concepts supporting and relating to nutrient management which may include: basic soil science; soil fertility; environmental management; fertilizer, manure, and biosolids management; and other relevant topics.

#### **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.

#### **4VAC50-85-90. Expiration of a certificate.**

A. A certificate shall be deemed expired the day after the expiration date on the certificate if any of the requirements of 4VAC50-85-80 are not met.

B. Following the expiration of a certificate, reinstatement may be accomplished only by reapplication and compliance with all requirements of 4VAC50-85-40 A including the examination requirements.

#### **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 of each year an annual activity report on a form supplied 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.

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 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 § 32.1-164.5 for sewage sludge, § 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 § 32.1-164.5 of the Code of Virginia for 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.

#### **4VAC50-85-120. Advisory committee.**

The department may establish a nutrient management training and certification advisory committee. Advisors shall serve for a term of two years. Members shall be from the agricultural community, academia, industry, the environmental community, and appropriate government units.

#### **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.

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;
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;
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 that would require the plan to be updated prior to the time specified in this subdivision 7;

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.

#### **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, 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 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 exceeding 65% phosphorus saturation levels as listed in Virginia Nutrient Management Standards and Criteria, revised July 2014, 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 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 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 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

(3) Verifiable past crop yields are utilized to determine expected crop yield. 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. Soil analysis results 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. 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 which 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.

g. For existing operations, the most recent organic nutrient source analysis results or an average of past nutrient analysis results for the specific operation 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, should 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, 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.

3. Soil pH influences nutrient availability and crop nutrient utilization and should 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, 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, 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;

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

c. Plans shall not recommend liquid manure or sludge 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 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. The planner shall recommend setbacks around wells, springs, surface waters, sinkholes, and rock outcrops where manure, biosolids, or industrial waste should not be applied. Such setbacks recommended shall be consistent with criteria contained in Virginia Nutrient Management Standards and Criteria, revised July 2014, 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 § 32.1-164.5 of the Code of Virginia for sewage sludge, § 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 permits 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, 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. 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.

2. The plan shall state a need for immediate modification if (i) animal numbers are to increase above the level specified in the plan, (ii) animal types including intended market weights are to be changed, (iii) additional imported manure, biosolids, or industrial waste that was not identified in the existing plan is to be applied to fields under the control of the operator, or (iv) available land area for the utilization of manure decreases below the level necessary to utilize manure in the plan. 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.

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. 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.

**DOCUMENTS INCORPORATED BY REFERENCE**  
**(4VAC50-85)**

Virginia Nutrient Management Standards and Criteria, revised July 2014, Department of Conservation and Recreation, Division of Soil and Water Conservation

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