

# Nutrient Management Plan

Prepared For:

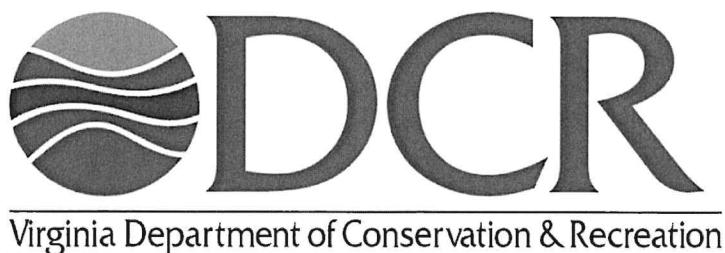
Vinton War Memorial  
814 E. Washington Avenue  
Vinton VA 24179

Prepared By:

Brent Wills  
2108 Hutchens Road  
Montvale VA 24122  
540.947.0337

Certification Code: #770  
Total Acreage: 3.47

The purpose of this Nutrient Management Plan is to ensure minimum movement of nitrogen and phosphorus from the specified area of application to surface and groundwaters where they can potentially have a detrimental effect on water quality as well as ensuring that plants have optimum soil nutrient availability for good productivity and quality. By following this soil test based plan you are helping to protect local waters and the Chesapeake Bay.



## Vinton War Memorial

### Landowner Information

Company Name	<i>Vinton War Memorial</i>
Customer Name	<i>Town of Vinton, Virginia</i>
Mailing Address	<i>311 South Pollard Street</i>
City State Zip	<i>Vinton VA 24179</i>
Phone	<i>540.343.1508</i>
Email	<i>RPETERS@vintonva.gov</i>

### Planners Information

Planner Name	<i>Brent Wills</i>
Mailing Address	<i>2108 Hutchens Road</i>
City State Zip	<i>Montvale VA 24122</i>
Phone	<i>540.947.0337</i>
Fax	
Email	<i>soils@bramblehollowfarm.com</i>
Certification Code	<i>770</i>

### Location Information

Physical Address	<i>814 E. Washington Avenue</i>
City State Zip	<i>Vinton VA 24179</i>
Coordinates	<i>37° 16' 50"</i>
Please Use NAD 83 Deg Min Sec	<i>-79° 53' 20"</i>
VAHUU6 Watershed Code	<i>RU13</i>
County	<i>Roanoke</i>

### Square Footage

Total	<i>3.47 acres (151,153 sf)</i>
Area 1	<i>Cool season turf: 76,230 sf (lawn)</i>
Area 2	<i>Cool season turf: 74,923 sf (entrance, islands, slope)</i>
Area 3	
Area 4	
Area 5	
Plan Start Date	<i>7/1/2019</i>
Plan End Date	<i>6/30/2024</i>

Planner Signature	<i>Brent M. Wills</i>
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# Narrative

The Vinton War Memorial is one of the region's crown jewels for meetings, social and outdoor events. The War Memorial offers corporate, association, civic, government and social groups a state of the art space to host a wide variety of special events. Situated on a beautiful 11.5 acre park and located in the heart of Virginia's Blue Ridge, the Vinton War Memorial is only an 8-10 minute drive from downtown Roanoke.

The Vinton War Memorial was originally conceived as the centerpiece of an 11-acre park that could be enjoyed by the community while honoring those who made the ultimate sacrifice in service to our country during World War II. The park was finished in 1946 and the two-story brick building known as The Vinton War Memorial was dedicated and opened to the public on August 20, 1948. Initially, the Vinton War Memorial included the town's library, small meeting rooms, and the Dogwood Ballroom. After an extensive renovation in 2007, the Vinton War Memorial continues to be recognized as a premier event space in Virginia's Blue Ridge.

The total area of turf grass at the site is 3.47 acres, predominantly cool season turf grass varieties like tall fescue, orchardgrass and perennial ryegrass. The main lawn in front of the building measures 1.75 acres, or 76,230 square feet. The entrance area, larger islands in the parking lot and the northern slope measure 1.72 acres, or 74,923 square feet. All areas receive very little in the way of fertilization and are mowed at a normal frequency during the growing season.

For a biannual fertilizer program, yearly nitrogen applications are recommended at  $<\#1.5/1,000\text{sf}$ , cannot exceed  $\#3.5/1,000\text{sf}$  and must contain at least a 15% slow release form of nitrogen.

*Fertilizer note: This Nutrient Management Plan will be administered by the Town of Vinton but implemented by a third-party contractor. Fertilizer types could vary depending on who is awarded the contract. Therefore the plan is written so as to be flexible regarding types of materials with a clear maximum application.*

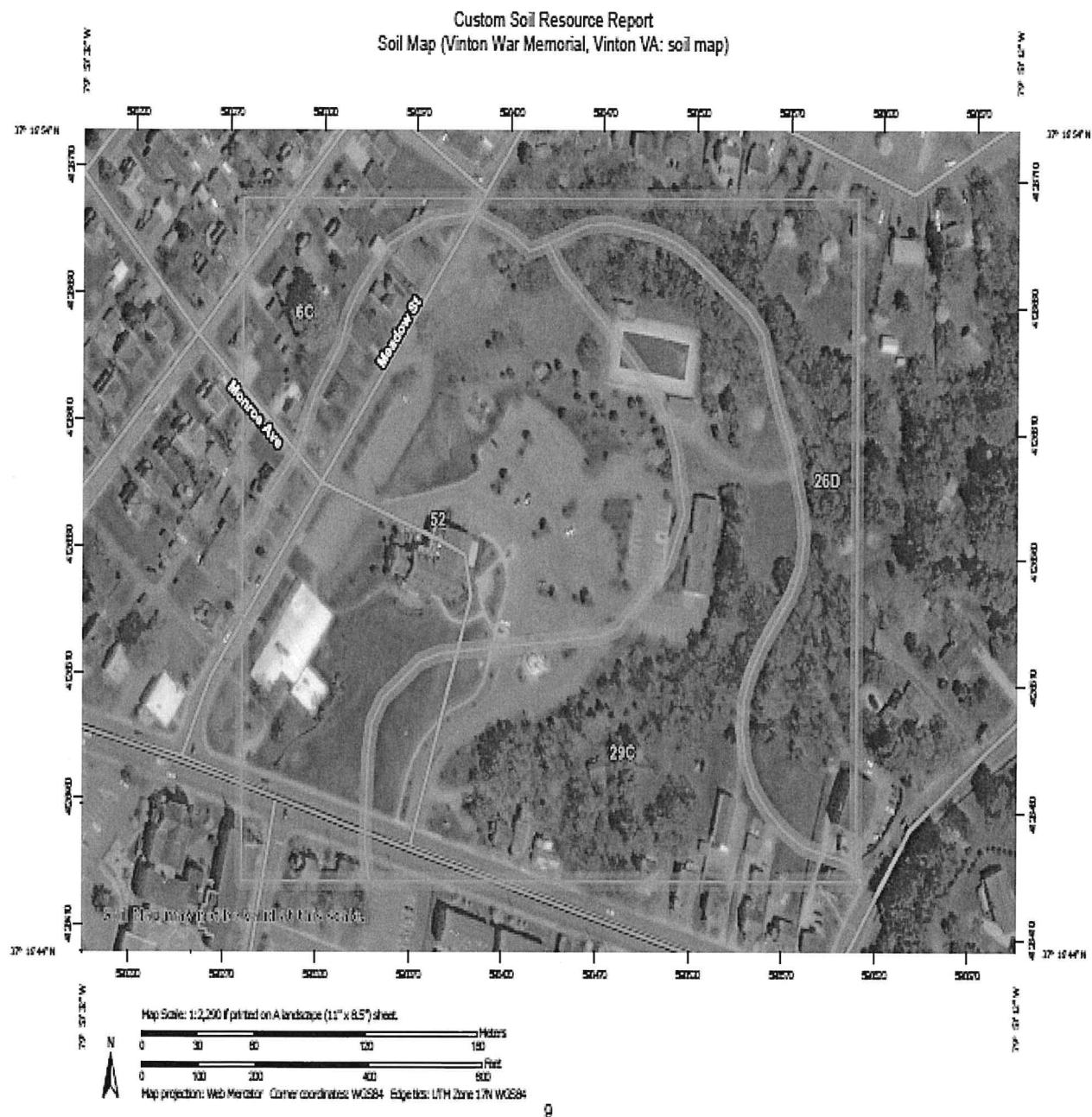
Follow the management practices listed below to ensure protection of water quality and correct implementation of this nutrient management plan:

1. Soil samples should be taken and analyzed at least once every three years for pH, phosphorus, potassium, calcium, and magnesium in order to maximize the efficient utilization of fertilizers.
2. Spreader calibration is extremely critical to ensure proper application rates.
3. A protective cover of appropriate vegetation should be established and maintained on all disturbed areas.
4. The nutrient management plan is required to be revised at least once every three to five years to make adjustments for needed renovations, re-establishment of turf, and updated soil test information.
5. If clippings are collected, they should be disposed of properly. 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. Composting or spreading uniformly across areas where plants are actively growing is recommended.
6. Iron 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.
7. Do not apply fertilizers to impervious surfaces (sidewalks, streets, etc.). Remove any granular material that lands on these surfaces.
8. These conditions do not override any local or county ordinances that may be more restrictive.

# Maps



# Maps







## Soil Test Summary

Customer Name:

## Testing Lab:

Sample Date:

Blattner Name

Hamlet Native

Certification Number

Town of Vinton, Virginia  
Brookside Laboratories Inc

Brent Will  
July 2020

Bielik Wins

11

Managed Area ID	AREA (sq ft)	Soil pH	Lab Test P (ppm)	Mehlich P (ppm)	V (H/M/L)	Lab Test K (lb/A)	Mehlich K (ppm)	V (H/M/L)	Species
lawn	76330	6.3	15	3.51	1	3.10	1.22	1.11	mixed grass

awii	70,250	0.2	13	3.01	L	340	122	H	mixed cool season turf
2	74,923	6.5	24	8	M-	552	199	VH	
	average	20	6	L+	446	160	VH		

All data is derived and reported using Mehlich III. To convert to H/M/L VT use Table 2-1, Table 2-2, and Table 2.3 in S&C pages 39-42.

# Soil Test Reports

attached

# Reference Materials and Notes

## Reference materials:

Virginia Nutrient Management Standards and Criteria: revised July 2014

Virginia Phosphorus Index Technical Guide, Version 2.0, 2005

Virginia Department of Conservation & Recreation (VADCR) Nutrient Management Turf & Landscape Plan Writing School, 2014

Soil Test Recommendations for Virginia, Virginia Cooperative Extension, 2014

Brookside Laboratories Inc. Consultant Manual, revised 2012

Agronomy Handbook, Virginia Cooperative Extension, 2000

## Notes:

For purposes of Nutrient Management planning, soil test results for specific areas have been used to make average recommendations for the management areas in general.

Do not apply phosphorus to areas testing above 55 ppm Mehlich I P.

Fertilizer materials listed in this plan may be substituted with materials with similar analysis based on market, price and availability.

In maintained and fertilized areas of the campus associated with water features, utilize application equipment with the highest degree of reliability to insure current buffers are maintained and water quality is protected.

Nitrogen inputs are well below maximum allowable application rates. Nitrogen inputs are adjusted based on multiple sets of testing data. At no time will staff exceed the recommended nitrogen rates for any management area listed in the Standards and Criteria.

No nutrient applications shall be made to frozen or snow-covered ground.

It is recommended that soil tests be performed at least once every 3 years.

If any questions or concerns arise during the implementation of this plan or site conditions change due to renovations or changes in treatment areas, contact the plan writer. Begin the NMP renewal process 6 months prior to expiration of current plan.

## 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<sup>2</sup> of total nitrogen for cool season grasses or 1.0 pounds per 1,000 ft<sup>2</sup> 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<sup>2</sup> total for cool season grasses and 2.0 pounds per 1,000 ft<sup>2</sup> for warm season grasses for the establishment period. Applications of WSN cannot exceed more than 0.7 pounds per 1,000 ft<sup>2</sup> within a 30 day period.

<b>Phosphorus and Potassium</b>	<b><u>Soil Test Level</u></b>	<b><u>Nutrient Needs (lbs /1000 ft<sup>2</sup>) *</u></b>	
		<b><u>P<sub>2</sub>O<sub>5</sub></u></b>	<b><u>K<sub>2</sub>O</u></b>
	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.

### Per Application Rates

Do not apply more than 0.7 pounds of water soluble nitrogen per 1,000 ft<sup>2</sup> within a 30 day period. For cool season grasses, do not apply more than 0.9 pounds of total nitrogen per 1,000 ft<sup>2</sup> within a 30 day period. For warm season grasses, do not apply more than 1.0 pounds of total nitrogen per 1,000 ft<sup>2</sup> within a 30 day period. Lower per application rates of water soluble nitrogen sources or use of slowly available nitrogen sources should be utilized 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<sup>2</sup> of nitrogen may be applied annually to cool season grass species or up to 4 pounds per 1,000 ft<sup>2</sup> 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 slow or controlled release fertilizer sources, or enhanced efficiency fertilizer sources, no more than 0.9 pounds of nitrogen per 1,000 ft<sup>2</sup> 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<sup>2</sup> may be applied to warm season grasses within a 30 day period. Provided the fertilizer label guarantees 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<sup>2</sup> in a 30 day period, no more than 2.5 pounds of nitrogen per 1,000 ft<sup>2</sup> 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<sub>2</sub>O<sub>5</sub>) : Soil Test Level      Nutrient Needs (lbs /1000 ft<sup>2</sup>) \*      if test using the following guidelines:

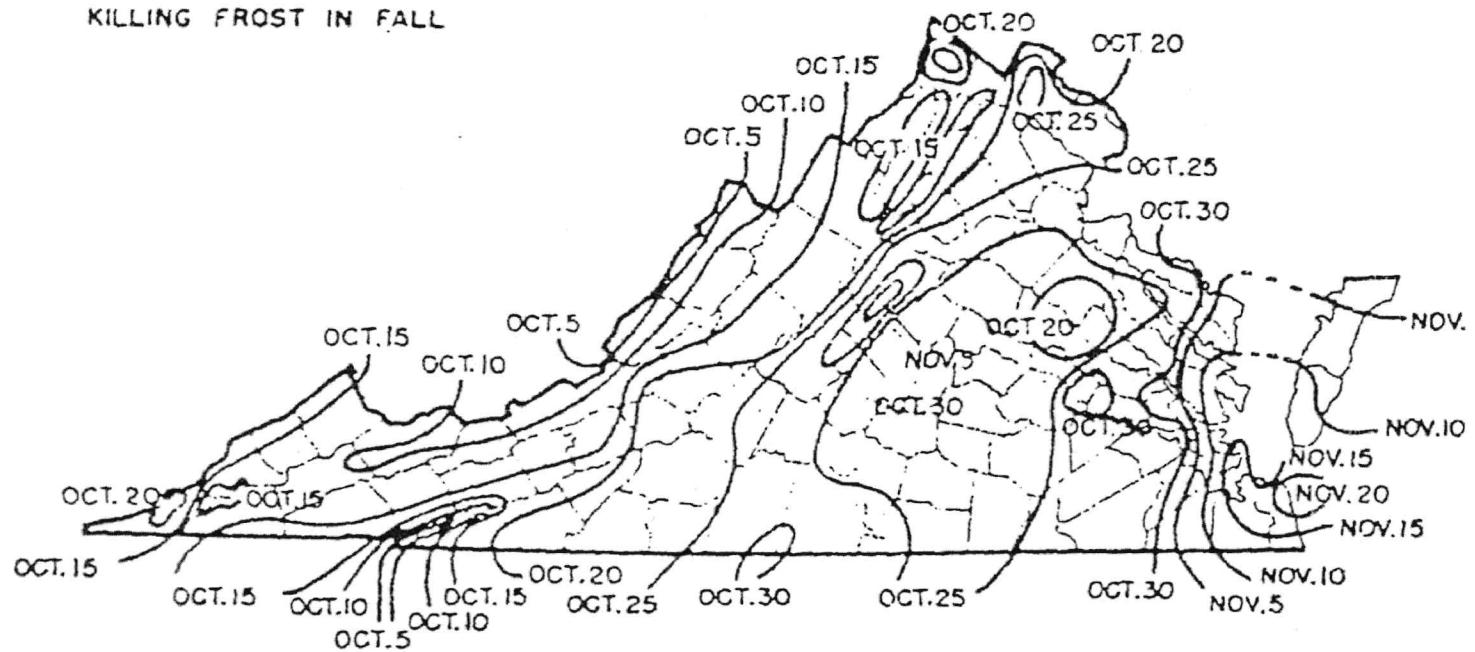
	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
L	2-3	2-3
M	1-2	1-2
H	0.5-1	0.5-1
VH	0	0

\* 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<sub>2</sub>O<sub>5</sub> soil test level of L- would be 3 pounds per 1,000 ft<sup>2</sup>.)

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.

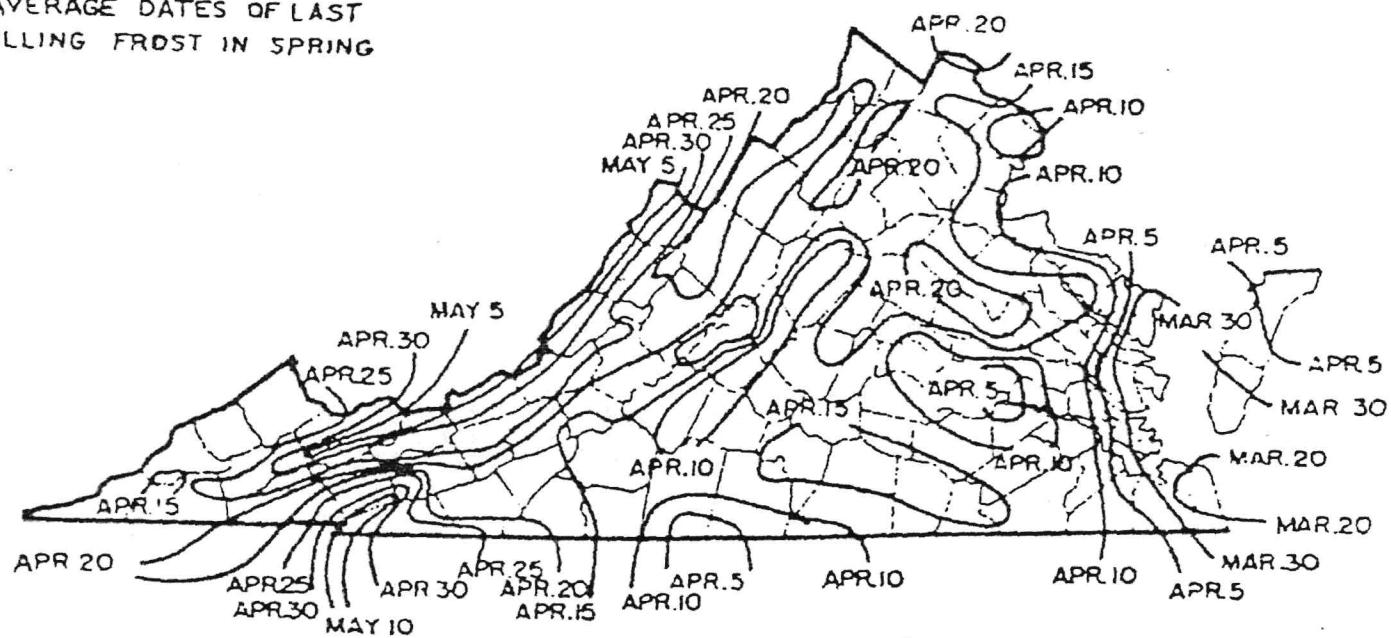
## VIRGINIA

AVERAGE DATES OF FIRST  
KILLING FROST IN FALL



## VIRGINIA

AVERAGE DATES OF LAST  
KILLING FROST IN SPRING



## Standards and Criteria

### Section 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” and “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 turfgrass; 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 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 ft<sup>2</sup> 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<sup>2</sup> rate. Do not apply nitrogen or phosphorus fertilizers when the ground is frozen.

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).

## 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 <sup>a</sup>		
When to Apply <sup>b</sup>	Pounds per 1,000 ft <sup>2</sup> Nitrogen	First Fall Killing Frost Date <sup>b</sup>
April 15 - May 15	0.5 - 0.7 <sup>(c)</sup>	Before Oct. 20
June	0.7	
July	0.5 - 0.7 <sup>(d)</sup>	
August	0.5 - 0.7 <sup>(d)</sup>	
Sept 1 - Sept 15	0.5 - 0.7 <sup>(c)</sup>	After Oct. 20
If overseeded with perennial ryegrass		
Oct - Nov	0.5 <sup>(e)</sup>	
Feb-Mar	0.5 <sup>(e)</sup>	

Bermudagrass - Naturally Occurring or Modified Sand based Fields <sup>a</sup>		
When to Apply <sup>b</sup>	Lbs/1,000 ft <sup>2</sup> Nitrogen <sup>c</sup>	First Fall Killing Frost Date <sup>b</sup>
April 15 - May 15	0.5 - 0.7 <sup>(c)</sup>	Before Oct. 20
June	0.7 <sup>(c)</sup>	
July	0.7 <sup>(c)</sup>	
August	0.7 <sup>(c)</sup>	
Sept 1 - Sept 15	0.7 <sup>(c)</sup>	After Oct. 20
If overseeded with perennial ryegrass		
Oct - Nov	0.5 <sup>(e)</sup>	
Feb - Mar	0.5 <sup>(e)</sup>	

The following notes apply to both of the Bermudagrass tables above:

- In the Piedmont and the Ridge and Valley areas of Virginia, the existing native soil will normally be

## 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 <sup>a</sup>	
	Normal	Intensive
When to Apply <sup>b</sup>	Pounds per 1,000 ft <sup>2</sup> Nitrogen	
After August 15	-----	0.5
September	0.7	0.7 <sup>(c)</sup>
October	0.7 <sup>(c)</sup>	0.7 <sup>(c)</sup>
November	0.5	0.7 <sup>(c)</sup>
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<sup>2</sup> 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 N application rate.

\* WSN = water soluble nitrogen; WIN = water insoluble nitrogen

- (a) Intensive managed areas must be irrigated.
- (b) The beginning and ending dates for application of nitrogen shall be determined 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 to 0.9 pounds per 1,000 ft<sup>2</sup> of total nitrogen can be applied using a material containing slowly available forms of nitrogen, with a minimum of 30 days between applications.
- (d) Make this application only if turf use warrants additional N for sustaining desirable growth and /or color.

- (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<sup>2</sup> of total nitrogen may be applied for cool season grasses or 1.0 pounds per 1,000 ft<sup>2</sup> 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<sup>2</sup> of total nitrogen may be applied for cool season grasses or 1.0 pound per 1,000 ft<sup>2</sup> 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<sup>2</sup> of total nitrogen for cool season grasses or 1.0 pounds per 1,000 ft<sup>2</sup> 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<sup>2</sup> 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<sub>2</sub>O<sub>5</sub>) and potassium (K<sub>2</sub>O) fertilizers as indicated by a soil test using the following guidelines:

<u>Soil Test Level</u>	<u>Nutrient Needs (lbs /1000 ft<sup>2</sup>)*</u>	
	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
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<sub>2</sub>O<sub>5</sub> per 1,000 ft<sup>2</sup> 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.

## Standards and Criteria

### 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 <sup>2</sup>	Total Annual N Rate pounds per 1,000 ft <sup>2</sup> <sup>a</sup>
Greens		0.7 <sup>(b)</sup>	3-6
Tees		0.7 <sup>(b)</sup>	2-5
Fairways	Cool Season	0.7 <sup>(c)</sup>	2-3
	Warm Season	0.7 <sup>(c)</sup>	3-4
Fairways - Intensive Management	Cool Season	0.5 <sup>(d)</sup>	3-4
	Warm Season	0.5 <sup>(d)</sup>	3.5-4.5
Overseeding Warm Season Fairways		0.5	1.25
Roughs		0.7 <sup>(e)</sup>	1-3

#### Fairways-Overseeding Warm Season Fairways

- \* For warm season grasses, up to 0.7 pounds of nitrogen per 1,000 ft<sup>2</sup> 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<sup>2</sup> 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<sup>2</sup> within a 30 day period.
- \* Soluble nitrogen rates of 0.25 pounds per 1,000 ft<sup>2</sup> 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

## **Other Turf Management Considerations for Golf Courses, Athletic fields, and Home Lawns**

### **Lime Recommendations**

Lime should be recommended based on a soil test to maintain soil pH within an agronomic 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 disposed of properly. They may be composted 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.

## 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<sup>2</sup> 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<sup>2</sup> for cool season grasses or 1.0 pounds of nitrogen per 1,000 ft<sup>2</sup> 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.

<u>Soil Test Level</u>	<u>Nutrient Needs (lbs /1000 ft<sup>2</sup>) *</u>	
Phosphorus and Potassium	<u>P<sub>2</sub>O<sub>5</sub></u>	<u>K<sub>2</sub>O</u>
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.

## **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<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O 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<sup>2</sup> 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 1,000 ft<sup>2</sup>.
- \* Four weeks after planting - 0.25 pounds of WSN per 1,000 ft<sup>2</sup> 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<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O 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<sup>2</sup> 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 1,000 ft<sup>2</sup>.
- \* Four weeks after planting - 0.25 pounds per 1,000 ft<sup>2</sup> 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<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O 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<sup>2</sup> 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<sup>2</sup> every week for the next 4 weeks.

#### **Naturally Occurring or Modified Sand Based Soils**

- \* Plant Date - August - September (preferred)
- \* Apply P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O as needed based on soil test recommendations, incorporate into the top 2 inches if possible.
- \* At Planting - up to 0.9 lbs pounds of nitrogen per 1,000 ft<sup>2</sup> using a using a material containing slowly available forms of nitrogen may be applied.
- \* Apply up to 0.25 pounds of nitrogen per 1,000 ft<sup>2</sup> per week after germination is complete, for the next 8 weeks. If using a material containing slowly available forms of nitrogen, up to 0.5 pounds of nitrogen per 1,000 ft<sup>2</sup> every two weeks may be applied after germination is complete for the next 8 weeks.

## Standards and Criteria

### Nitrogen Management on Athletic Fields -warm season grasses (continued)

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 managed as predominantly sand-based systems to minimize nutrient leaching.

- (b) 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.
- (c) WSN must be applied as two applications not to exceed 0.35 pounds per 1,000 ft<sup>2</sup> 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 ft<sup>2</sup> 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<sup>2</sup> 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 1,000 ft<sup>2</sup> 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<sup>2</sup> of nitrogen each, with a minimum of 15 days between applications. Additional WSN application of 0.5 pounds per 1,000 ft<sup>2</sup> 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<sup>2</sup> 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<sub>2</sub>O<sub>5</sub>) and potassium (K<sub>2</sub>O) fertilizers as indicated by a soil test using the following guidelines:

<u>Soil Test Level</u>	<u>Nutrient Needs (lbs /1000 ft<sup>2</sup>)*</u>	
	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
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<sub>2</sub>O<sub>5</sub> per 1,000 ft<sup>2</sup> 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.

## Fertilizer Application Records