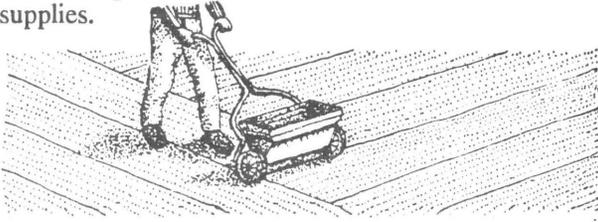


Choosing Application Equipment

It is important to apply all fertilizers uniformly. This will eliminate streaks of different shades of green turf in the lawn caused by uneven application. Proper application of nitrogen fertilizers by hand is difficult, even for a trained professional.

Drop-type or rotary fertilizer spreaders are most effective. Drop-type spreaders are more difficult to maneuver around trees and shrubs. Rotary spreaders usually give better distribution where sharp turns are encountered because they tend to cover a broader swath and fan the fertilizer out at the edges of the swath.

By applying half the material in one direction and the other half in a perpendicular direction, streaking can be minimized. Avoid application of any fertilizer to nonturfed areas (driveways, roads, or bare soil) since it is then prone to run off which could affect water supplies.



Use the following chart to determine the correct amount of fertilizer when applying nitrogen required per 1000 square feet.

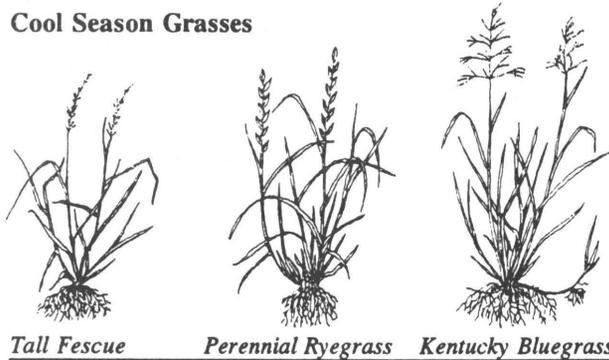
Fertilizer analysis	lbs of nitrogen desired per 1000 sq. ft.			
	1/2	1	1.5*	2.0*
	lbs fertilizer per 1000 sq. ft			
6-2-0	8.3	16.6	25.0	33.0
10-10-10	5.0	10.0	15.0	20.0
12-4-8	4.1	8.3	12.5	17.0
16-8-8	3.1	6.2	9.4	12.0
20-0-16	2.5	5.0	7.5	10.0
23-3-7	2.1	4.3	6.5	8.6
28-0-12	1.8	3.6	5.3	7.2
31-0-0	1.6	3.2	4.8	6.4
33.5-0-0	1.5	3.0	4.5	6.0
38-0-0	1.3	2.6	3.9	5.2
46-0-0	1.1	2.2	3.2	4.4

* These amounts are only recommended for predominantly slowly available nitrogen sources.

For more information on selection, planting, cultural practices, and environmental quality, contact your local Virginia Cooperative Extension Office. If you want to learn more about horticulture through training and volunteer work, ask your Extension agent about becoming an Extension Master Gardener. For monthly gardening information, subscribe to *The Virginia Gardener Newsletter* by sending your name and address and a check for \$5.00 made out to "Treasurer, Va Tech" to the Virginia Gardener, Department of Horticulture, Virginia Tech, Blacksburg, VA 24061-0349. Horticultural information is also available on the Internet by connecting with Virginia Cooperative Extension's server at <http://www.ext.vt.edu>

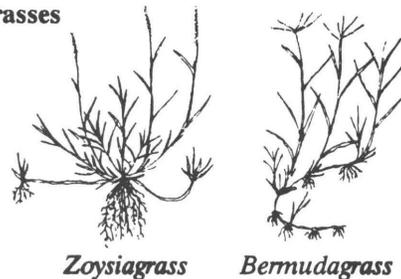
The original development of this series was funded by ESUSDA Smith Lever 3(d) National Water Quality Initiative Funds and the Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation.

Cool Season Grasses



Tall Fescue *Perennial Ryegrass* *Kentucky Bluegrass*

Warm Season Grasses



Zoysiagrass *Bermudagrass*

Revised 2000

Publication 426-720

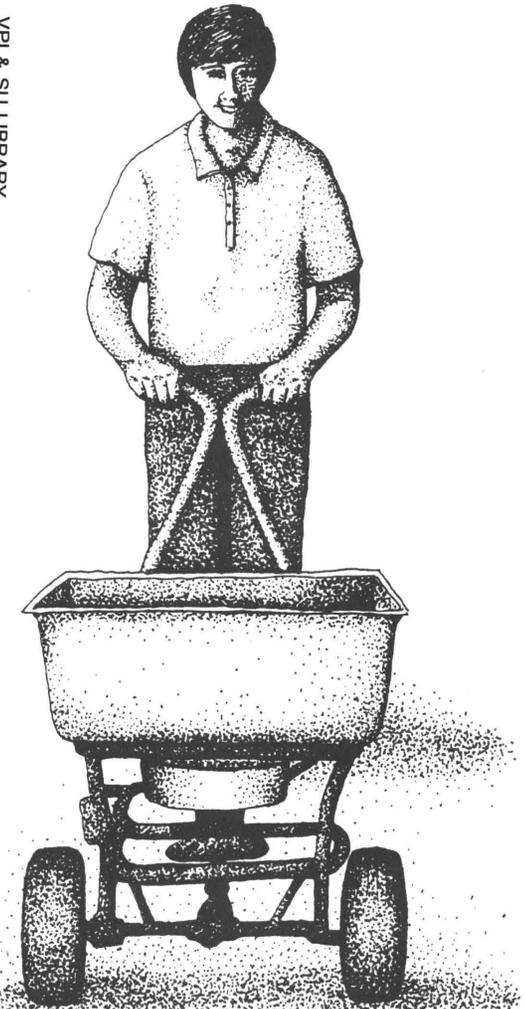
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Fertilizing Lawns

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Fertilizing Lawns

Fertilizers are used to improve or maintain turfgrass quality. A well-planned and environmentally sound turfgrass fertilization program will take into account native soil fertility, nutrient source characteristics, desired turfgrass quality or performance, nutrient application rate, application frequency, season of application, and application method.

The value of a fertilizer depends upon the total amount of nutrients and the source of nitrogen in the fertilizer.

Testing the Soil

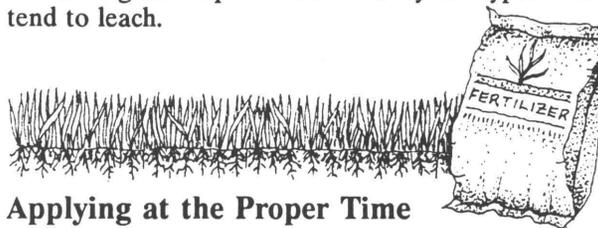
Before beginning a lawn fertilization program, a soil test should be done to determine the fertility of your lawn soil. The results will indicate the amounts of nutrients your soil can provide to the turfgrass. The test will also indicate the acidity (pH) of your soil and whether lime is needed. Your local Extension agent can provide information on how to sample the soil and submit it for analysis.

Selecting a Fertilizer

Based on the soil test recommendations, choose a fertilizer with the appropriate amounts of nitrogen, phosphate, and potash for your lawn. If a soil test indicates high levels of phosphorus and potassium availability, then a fertilizer supplying only nitrogen is necessary. Fertilizer analysis is described using three numbers (i.e., 12-4-8 or 46-0-0) indicating, respectively, the percent by weight of nitrogen (N), phosphate (P_2O_5), and potash (K_2O). For example, a 12-4-8 fertilizer would contain 12% nitrogen, 4% phosphate, and 8% potash by weight.

The fertilizer ratio is based on the N, P_2O_5 , K_2O numbers; for example, if the fertilizer analysis is 16-4-8, the fertilizer ratio is 4-1-2; similarly, a 14-7-14 analysis would have a 2-1-2 ratio. Mature lawns generally require more nitrogen than phosphorus and potassium; therefore, ratios of 4-1-2 or 4-1-3 are commonly recommended. The nitrogen content in turf maintenance fertilizers is derived from either a quickly available or slowly available source. Quickly available sources are water soluble and can be readily utilized by the plant. They include ammonium nitrate,

urea, ammonium sulfate, and calcium nitrate. Slowly available sources contain water insoluble nitrogen (WIN) from urea formaldehyde (UF), UF based products (methylene ureas), sulfur coated urea, natural organics (bone meal, fish meal, dried blood, and animal manures), and activated sewage sludge. Slowly available nitrogen sources release nitrogen over extended periods of time and are applied less frequently and at somewhat higher rates than the quickly available nitrogen sources. It is less susceptible to leaching and is preferred on sandy soil types which tend to leach.



Applying at the Proper Time

Proper timing of nitrogen applications is different for warm-season and cool-season turfgrasses because of their different growth cycles. The following four charts show the recommendations for pounds of actual nitrogen per 1000 square feet of lawn area using both quick release and slow release nitrogen sources for both warm- and cool-season grasses. The charts can be used to determine the most effective times of application for different levels of turfgrass quality.

Programs for Cool-season Grasses. The best time to fertilize cool-season grasses, including Kentucky bluegrass, tall fescue, perennial ryegrass, and fine fescue (creeping red fescue, hard fescue, sheep fescue, and chewings fescue), in Virginia is from August 15 through November. Excessive spring application of nitrogen to cool-season grasses in Virginia leads to excessive leaf growth at the expense of stored food reserves and root growth, increasing injury to lawns from summer disease and drought.

PROGRAM 1. Nitrogen fertilization of cool-season grasses using quickly available nitrogen fertilizers (less than 50% slowly available nitrogen)

Acceptable Quality	Nitrogen Application by Month			
	Sept	Oct	Nov	May 15-June 15
	lbs N/1000 sq ft			
Low	0	1	0	0-½
Med	1	1	0	0-½
High	1	1	1	0-½

PROGRAM 2. Nitrogen fertilization of cool-season grasses using slowly available fertilizers (50% or more slowly available nitrogen or WIN)

Acceptable Quality	Nitrogen Application by Month		
	Aug 15 to Sept 15	Oct 1 to Nov 1	May 15 to June 15
	lbs N/1000 sq ft		
Low	1.5	0	0
Med	1.5	1.5	0
High	1.5 to 2	1.5	0 to 1.5

Fine fescue performs best at 1 to 2 pounds of nitrogen per 1000 square feet. Up to 1 pound of nitrogen in Program 1 and up to 1.5 pounds of nitrogen in Program 2 may be applied per 1000 square feet in the May 15 to June 15 period if nitrogen was not applied the previous fall, or to help a new lawn get better established.

Program for Warm-season Grasses. Warm-season grasses, including bermudagrass, zoysiagrass, and centipedegrass, perform best when fertilized between April 1 and August 15 in Virginia. Centipedegrass and mature zoysiagrass perform best at 1 to 2 pounds of nitrogen per 1000 square feet per year.

PROGRAM 3. Nitrogen fertilization of warm-season grasses using quickly available nitrogen fertilizers (less than 50% slowly available nitrogen)

Acceptable Quality	Nitrogen Application by Month			
	April	May	June	July/Aug
	lbs N/1000 sq ft			
Low	1	1	0	0
Med	1	1	1	0
High	1	1	1	1

PROGRAM 4. Nitrogen fertilization of warm-season grasses using predominantly slowly available nitrogen fertilizers (50% or more slowly available nitrogen or WIN)

Acceptable Quality	Nitrogen Application by Month	
	April/May	June/July
	lbs N/1000 sq ft	
Low	2.0	0
Med	1.5	1.5
High	2.0	2.0