

Bluegrass-Fescue-Ryegrass Lawn - Maintenance

Management Highlights

- Target pH: 6.0
- Apply lime in the fall (August 15 - November 1).
- Apply a total of 3 lbs N/1000 square feet in two fall applications. Apply 1 lb N in a soluble source between August 15 and September 15. Apply 2 additional lbs N/1000 square feet either in a source containing 35% or more of the total as water-insoluble N or in a source specified as slow-release between October 1 and November 1.
- Never apply more than 1 lb N/1000 square feet as a soluble source.
- Spring fertilization of bluegrass-fescue-ryegrass mixes is not required.

Introduction

Bluegrass-fescue-ryegrass mixes are commonly used for lawns in Delaware. These species are cool season grasses which grow best in the spring and fall but grow very slowly or go dormant in our hot summer months. As a result, primary fertilization of these lawns is recommended only in the fall months (August 15 - November 1). When a late fall application is not possible, spring greenup may be attained with a light application of nitrogen (1/2-1 lb N/1000 square feet) between March 1 and April 15. Fertilization at other times of the year may result in injury of the turf due to fertilizer burn or other stress and/or a loss of nutrients by leaching or runoff at a time when the plants are not actively growing.

Soil pH and Liming

The target pH for bluegrass-fescue-ryegrass turf grass mixes on Delaware soils is **6.0**. The lime recommendation for a particular site is calculated from the soil pH and buffer pH measurements using the steps outlined in *Calculating the Lime Requirement -- Chapter 4, Section 4.4*. Avoid overliming in order to encourage good plant growth and prevent deficiency of micronutrients such as iron.

In most cases, the lime requirement can be met by either calcitic or dolomitic limestone. *Dolomitic limestone* is recommended if:

- soil test Mg is less than 50 FIVs, or
- soil test Mg is between 50 and 100 FIVs *and less than soil test Ca*.

Calcitic limestone is recommended if:

- soil test Mg is greater than 100 FIVs, or
- soil test Mg is between 50 and 100 FIVs *and greater than soil test Ca*.

Lawn and Garden Plants

Lime is best applied in the fall between August 15 and November 1. Do not spread more than 50 lbs lime/1000 square feet at a time. If more than 50 lbs/1000 square feet has been recommended, make two or more treatments of 40-50 lbs each several months apart until the full rate has been applied.

Nutrient Recommendations

Nutrient recommendations for lawns can be grouped into two broad classes: *corrective applications*, designed to correct any problems in the soil and establish an optimum level of fertility, and *maintenance programs*, which are suitable for use once any problems have been addressed. *Corrective applications* are based on the nutrient requirements of the turf grass and the soil test values for P and K. To determine the nutrient recommendation for a specific site, select the **P-K Index Value** from Table 1 using the soil test P and soil test K values shown on the Soil Test Report Form. Next, using that index value, select the appropriate nutrient recommendation from Table 2, below.

Fertilizer recommendations for turfgrass vary with the N availability of the source(s) used. Nitrogen availability is primarily dependent upon the chemical composition of the source and can range from immediately available to slowly available in which N is released over a period of weeks, months or even years. Nitrogen sources described as *water-soluble* produce a rapid response since the applied N is available immediately. These materials are usually less expensive than other sources but have several drawbacks: shorter residual response, increased chance of plant injury due to fertilizer burn and greater potential for loss due to leaching. Application rates, methods and timing for *water-soluble N (WSN) materials* must be carefully monitored to prevent plant injury and ensure that N is available to the plant when needed. Common sources of WSN include ammonium nitrate, ammonium sulfate, and urea. Fertilizer recommendations for materials high in WSN usually specify two applications of 1 lb N/1000 square feet applied several weeks apart. To avoid foliar injury, application rates should never exceed 1 ¼ lbs N/1000 square feet per treatment.

Nitrogen sources described as *slow-release or water-insoluble* release N over a much longer time period (e.g., several weeks or months). These materials are less likely to injure the plants, have a longer residual response and are less likely to be lost through leaching. Two drawbacks of *water-insoluble N (WIN) materials* are their higher cost relative to WSN materials and their slow response time. Common sources of WIN in turfgrass fertilizers include ureaformaldehyde products (UF), isobutylidene diurea (IBDU), sulfur-coated urea (SCU) and natural organic materials. Given their slow-release, materials high in WIN can often be applied in a single application per growing season. Application rates per individual treatment can be higher than those allowed for WSN sources since the risk of plant injury is low. The total recommended N rate for the season, however, (e.g., 2-3 lbs N/1000 square feet/season), remains the same.

Since most mixed fertilizers available in the retail market contain more than one source of N, the N availability of a particular fertilizer is dependent upon both the type and relative quantities of the N sources included in the material. *When 35% or more of the N present in a fertilizer comes from WIN materials, the fertilizer is considered a slow-release or insoluble fertilizer. These materials are also referred to as turf-type fertilizers. When less than 35% of the N in the fertilizer is supplied by WIN materials, the fertilizer is considered quickly available or water soluble.* The percentage of WIN in a fertilizer material can be calculated using the equation:

$$WIN(\%) = \frac{\sum \text{ of WIN Sources}}{\text{Fertilizer N Content}} \times 100$$

A fertilizer with a total N content of 10% that contains 4% WIN materials would be classified as a *water-insoluble or turf-type fertilizer* since 40% of the N is supplied by WIN materials (e.g., $[\{4\% / 10\% \} \times 100] = 40\%$).

Table 1. P-K Index value as a function of soil test P and soil test K.

Soil Test K (FIVs)	Soil Test P (FIV)s			
	1 - 25	26 - 50	51 - 100	101 - 150
1 - 25	1	2	3	4
26 - 50	5	6	7	8
51 - 100	9	10	11	12
101 - 150	13	14	15	16

Table 2. Corrective nutrient recommendations for bluegrass-fescue-ryegrass lawns as a function of the P-K index value.

PK Index Value	Nutrient Recommendation
1	Between August 15 and September 15, apply 15 lbs 5-10-10 or equivalent water-soluble fertilizer per 1000 square feet. Repeat application between October 1 and November. Re-soil sample 1 month later to see if P and K are adequate.

Lawn and Garden Plants

PK Index Value	Nutrient Recommendation
2,3,4	<p>Between August 15 and September 15, apply 12 lbs 12-4-8 (or equivalent fertilizer as described in ST Note 9) containing at least 35% total nitrogen as WIN <i>and</i> 5 lbs muriate of potash (0-0-60) per 1000 square feet. If an appropriate slow-release fertilizer is not available, apply 10 lbs 10-10-10 or equivalent water-soluble fertilizer <i>and</i> 5 lbs muriate of potash (0-0-60) per 1000 square feet.</p> <p>In October, switch to one of the lawn maintenance programs outlined below.</p>
5, 9,13	<p>Between August 15 and September 15, apply 20 lbs 8-18-10 (or equivalent fertilizer as described in ST Note 9) containing at least 35% total nitrogen as WIN per 1000 square feet. If an appropriate slow-release fertilizer is not available, apply 20 lbs 5-10-10 or equivalent water-soluble fertilizer <i>and</i> 5 lbs triple superphosphate (0-46-0) per 1000 square feet.</p> <p>In October, switch to one of the lawn maintenance programs outlined below.</p>
6, 10,14	<p>Between August 15 and September 15, apply 15 lbs 10-6-4 (or equivalent fertilizer as described in ST Note 9) containing at least 35% total nitrogen as WIN per 1000 square feet. If an appropriate slow-release fertilizer is not available, apply 10 lbs 5-10-10 or equivalent water-soluble fertilizer per 1000 square feet.</p> <p>In October, switch to one of the lawn maintenance programs outlined below.</p>
7, 8	<p>Between August 15 and September 15, apply 12 lbs 12-4-8 (or equivalent fertilizer as described in ST Note 9) containing at least 35% total nitrogen as WIN per 1000 square feet. If an appropriate slow-release fertilizer is not available, apply 10 lbs 10-10-10 or equivalent water-soluble fertilizer per 1000 square feet.</p> <p>In October, switch to one of the lawn maintenance programs outlined below.</p>
11, 12, 15	<p>Between August 15 and September 15, apply 5 lbs 26-4-6 (or equivalent fertilizer as described in ST Note 9) containing at least 35% total nitrogen as WIN per 1000 square feet. If an appropriate slow-release fertilizer is not available, apply 10 lbs 10-6-4 or equivalent water-soluble fertilizer per 1000 square feet.</p> <p>In October, switch to one of the lawn maintenance programs outlined below.</p>

PK Index Value	Nutrient Recommendation
16	Between August 15 and September 15, apply 4 lbs of urea-form or 5 lbs 27-3-3 (or equivalent fertilizer as described in ST Note 9) per 1000 square feet. Fertilizer should contain at least 35% total nitrogen as water-insoluble nitrogen and little, if any, phosphorus and potassium. In October, switch to one of the lawn maintenance programs outlined below.

Lawn Maintenance Programs

Lawn maintenance programs are designed to meet the annual nutrient needs of the turf grass while maintaining an optimum level of soil fertility. Unless problems develop, *maintenance programs* can be followed for 2-3 years before a new soil test is required. Three *maintenance programs* for bluegrass-fescue-ryegrass lawns are outlined below. *Program 1*, summarized in Table 3, is based on the use of soluble fertilizers. *Program 2*, summarized in Table 4, is based on the use of water-insoluble or slow-release fertilizers. *Program 3*, summarized in Table 5, uses both types of fertilizers. Each program contains separate guidelines for use when clippings will be removed and when clippings will be left on the lawn. When clippings are left on, fertilizers should contain little or no P and K since these nutrients will be returned to the soil in the organic material. Additional information about these programs can be found in Soil Test Note 9 or Extension Bulletin #155, *Successful Lawn Management* (Barton, 1992).

Table 3. Maintenance program 1 for bluegrass-fescue-ryegrass lawns using water-soluble nitrogen fertilizers.

Date to Apply	Amount to Apply (lbs/1000 square feet)	
	Clippings Removed	Clippings Left On
Aug. 15 - Sept. 15	10 lbs 10-6-4 (containing less than 35% WIN)	2 lbs ammonium nitrate (34-0-0) or 1½ lbs urea (46-0-0)
Oct. 1 - Nov. 1	10 lbs 10-6-4 (containing less than 35% WIN)	2 lbs ammonium nitrate (34-0-0) or 1½ lbs urea (46-0-0)
March 1- April 15	5 lbs 10-6-4 (containing less than 35% WIN)	1 lbs ammonium nitrate (34-0-0) or ½ lbs urea (46-0-0)

Lawn and Garden Plants

Table 4. Maintenance program 2 for bluegrass-fescue-ryegrass lawns using water-insoluble or slow-release nitrogen fertilizers.

Date to Apply	Amount to Apply (lbs/1000 square feet)	
	Clippings Removed	Clippings Left On
Aug. 15 - Sept. 15	20-25 lbs 10-6-4 (containing at least 35% WIN)	5½-7 lbs 26-4-6, 27-3-3 or equivalent (containing at least 35% WIN)
Oct. 1 - Nov. 1	10-15 lbs 10-6-4 (containing at least 35% WIN)	2½-3½ lbs 26-4-6, 27-3-3 or equivalent (containing at least 35% WIN)

Table 5. Maintenance program 3 for bluegrass-fescue-ryegrass lawns using both water-soluble and water-insoluble or slow-release nitrogen fertilizers.

Date to Apply	Amount to Apply (lbs/1000 square feet)	
	Clippings Removed	Clippings Left On
Aug. 15 - Sept. 15	10 lbs 10-6-4 (containing less than 35% WIN)	2 lbs ammonium nitrate (34-0-0) or 1½ lbs urea (46-0-0)
Oct. 1 - Nov. 1	20 lbs 10-6-4 (containing at least 35% WIN)	5 ½-7 lbs 26-4-6, 27-3-3 or equivalent (containing at least 35% WIN)

Additional Information

See Soil Test Notes 1 and 9 (Appendix APP-7) and Extension Bulletin #155: *Successful Lawn Management* for additional information about nutrient management of bluegrass-fescue- ryegrass lawns.