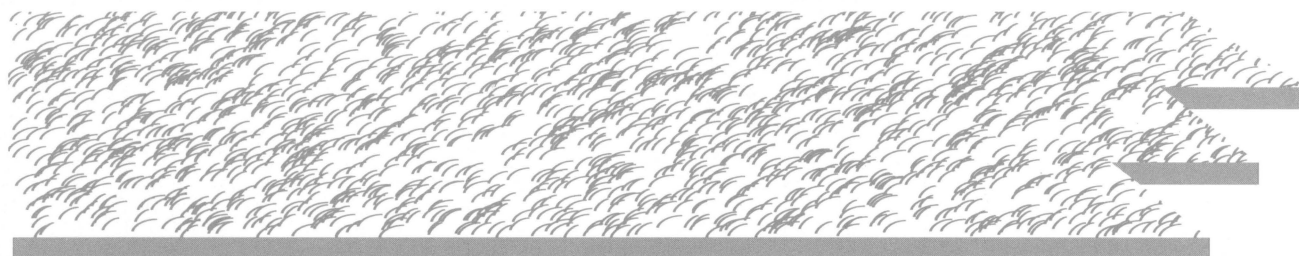


OCES Ohio Cooperative Extension Service
The Ohio State University

Lawn Establishment





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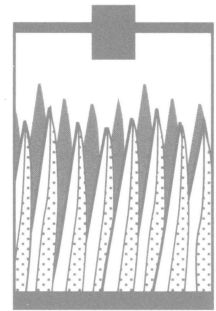
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Revised—3/91—2.5M—84296

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Issued in furtherance of Cooperative Extension work, Acts May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Bobby D. Moser, Director of the Ohio Cooperative Extension Service, The Ohio State University.

Lawn Establishment



A good lawn can be established by closely following the basic rules for seeding or sodding. Careful attention to detail will help insure success of the new turfgrass. The following steps are essential in developing a new lawn:

1. Control perennial weeds such as quackgrass, tall fescue and bentgrass.
2. Remove existing sod. Modify the soil if necessary.
3. Rough grade the lawn area. Allow the soil to settle and regrade, if necessary.
4. Have soil tested. Apply corrective quantities of fertilizer and lime, if needed.
5. Rototill or otherwise till the soil 3 to 6 inches deep.
6. Remove stones, wood and other debris from the top 3 to 6 inches of the soil.
7. Allow soil to settle, or firm with a heavy roller.
8. Apply starter fertilizer and rake it in while removing stones, trash, and other foreign material. Fill in any small depressions that are present.
9. Seed or sod—if sod, ignore items 10 and 11.
10. Rake lightly—let some seed remain on surface.
11. Mulch.
12. Roll lightly.
13. Irrigate. Surface must be kept moist until seedlings establish.

Soils

Subsoil taken from the basement of a new house—often containing plaster, cement, lumber, and other debris—is a poor soil for a lawn. Every house-building contract should specify that all topsoil be piled separately for the final grading and for debris to be removed—not buried on the site.

For most homeowners, the problem will be one of using the soil they have. Soils are generally poor because they lack acceptable structure and are deficient in many necessary plant nutrients. The lack

of nutrients can be overcome by applying fertilizer. Poor physical composition of the soil is a much more serious matter. Soils of the average graded lawn contain a high proportion of clay. These soils dry into hard crusts, are sticky and impervious when wet, slow to absorb water when dry, and furnish little water to plants. High temperature and drought stresses affect plants growing on these clay subsoils more quickly than lawns grown on good topsoil.

Turfgrasses can be grown on clay, even subsoil clay. However, these lawns will require more skill and work to achieve the high levels of vigor and quality of lawns grown on soils of good physical composition.

Even on good soils, a lawn requires some work. A perfect lawn will appear only after proper planning and use of good cultural practices.

Soil Modification

If the existing soil is not satisfactory, what can be done about it?

Buy Topsoil? This is expensive, and much so-called topsoil is little better than the soil already present. If topsoil is purchased, insist on a loam or



Till the soil 3 to 6 inches deep.

Lawn Establishment

sandy loam soil, or don't buy it. It doesn't need to be black. **Also, insist on getting soil with no quackgrass or Johnsongrass rhizomes.** These perennial grass weeds cannot be killed in the lawn without killing all the lawn grass.

How much topsoil is needed? The more the better—from 3 to 4 inches up to 6 to 8 inches.

Add Sand or Calcined Clay? A small amount of sand may do more harm than good. Enough coarse sand to make up 50 to 80 percent of the resulting mixture will improve the physical condition of a clay soil, if uniformly mixed with it. However, a soil consisting of 50 percent to 80 percent sand means the addition of 4 inches (50%) of sand to 4 inches of soil or up to 6.4 inches (80%) of sand to 1.6 inches of soil for an 8-inch total depth. This is time-consuming and can be expensive.

Calcined clay, the name given to clay granules fired at a high temperature, can be used the same as sand. Calcined clay is more expensive than most homeowners are willing to pay.

Add Organic Matter? This is one remedy for fine-textured soils high in clay content. The difficulty lies in doing it. Manure is out of the question, except on the farm where lawn soils are usually best. Compost can be used and is gaining acceptance as composting facilities are producing large quantities of high grade compost at reasonable prices.

In starting a new lawn, peat may be added to fine-textured (clay) basement soil. This will greatly improve its physical composition if you use enough peat. Use fibrous peat rather than muck, which contains a large amount of clay. Mix the peat with the upper 3 or 4 inches of soil, or with less soil if you use only a small amount of peat. Apply at least a 1-inch layer of peat or compost and till it into the soil. One inch of peat applied to 4 inches of soil will provide the 20 percent recommended modification.

Improve drainage? Good surface drainage on the lawn is essential to prevent water from collecting. Free standing water will injure grass. A slight grade and correction of any depressions will facilitate good surface drainage.

Plenty of organic matter and large amounts of sand or calcined clay will improve the subsurface drainage (that is, the speed with which water moves through the soil).

Tile drainage is desirable, but its effect is slow if the tile is covered with basement soils. Tiling is not essential for home lawns if good surface drainage is provided.

Site Preparation

Many lawns are poor because the site was not prepared properly before establishment. Undesirable perennial grasses such as quackgrass, tall fescue, bentgrass, timothy, and orchardgrass should be controlled before grading the lawn. Roundup (glyphosate) applied to growing grass will eliminate undesirable perennial grasses. Glyphosate is a nonselective, systemic herbicide that will kill all grasses that the chemical contacts. Two applications spaced at 4 to 8 weeks may be necessary for deep rooted perennials. Glyphosate moves or translocates downward in grasses to kill underground plant parts like quackgrass rhizomes. Follow the directions on the label for application rates. A waiting period of 7 days after glyphosate application is necessary before tilling or sod disturbance.

As an alternate method, fallowing or tilling the soil for one growing season will help to control undesirable grasses and other weeds. The soil should be cultivated as regrowth occurs. This procedure is not practical for most homeowners.

Grade the lawn so that good surface drainage is provided. Avoid steep slopes when possible. They result in many establishment and maintenance problems.

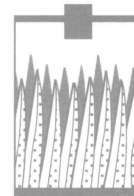
The desired result in final site preparation is a firm soil without depressions or rough areas. Rough areas are extremely difficult to correct after the lawn is established.

Fertilizer and Lime

All new lawns should have fertilizer applied before seeding. Some also will need lime. Poor lawn establishment or complete failure often occurs because soil fertility is low and is not corrected. Many Ohio lawns are established on subsoils. These subsoils are usually low in available phosphorus and must receive corrective application of high phosphorus-containing fertilizer to assure satisfactory establishment of grasses.

The best way to determine fertilizer and lime needs for a particular lawn is to have samples of the soil tested. Your county Cooperative Extension Service office can furnish information on how to take samples of soil and where to send them for testing.

Follow the soil test recommendations you receive from the soil testing laboratory. Apply fertilizer (and lime, if needed) to bring the soil fertility/nutrient



level up to a desirable range. This fertilizer, if needed, is called a corrective application. Corrective fertilizer and lime should be tilled into the top 3 to 6 inches of the soil. **Do not apply lime without a soil test.** Too much lime is more detrimental than a lime deficiency.

Follow the corrective application if soil test information is not available. Apply starter fertilizer to the soil surface at the time of seeding. The starter fertilizer application should consist of 1.0 to 1.5 pounds of actual nitrogen and 1.5 to 3.0 pounds of phosphorus per 1,000 square feet. These nutrients should be applied using a 1-1-1 to 1-2-1 ratio fertilizer (e.g., 10 to 20 pounds of a 10-10-10 or 10-20-10). The starter

fertilizer is applied just prior to or after seeding and raked in lightly with the seed. **Do not till the starter fertilizer into the soil.** A starter fertilizer hastens seedling development and lawn establishment.

All lawn establishment steps to this point are identical for both a seeded and sodded lawn. The remaining procedures will vary for seeding or sodding.

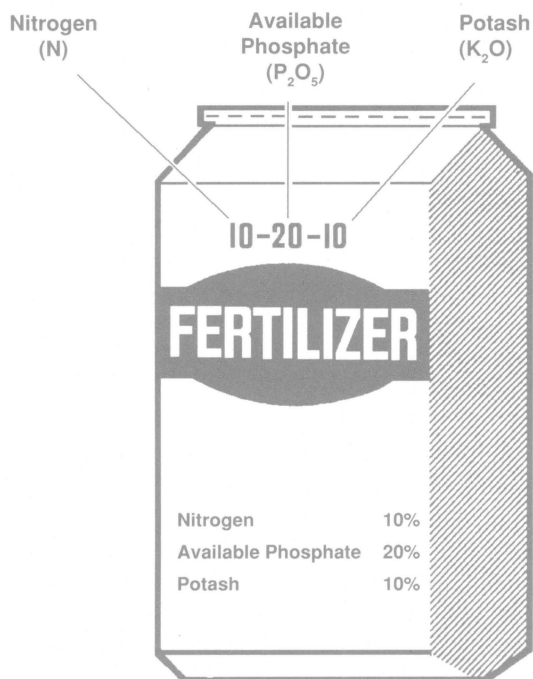
Seed or Sod?

High-quality lawns can be established from either seeding or sodding the prepared site. If seeding is the preferred method, be certain the seed used is free of weed seeds and of high quality and germination. By law, all seed sold in Ohio must be accurately labeled specifying contents of the package, percent germination of the specie(s) and data on which the testing was performed. Emphasis should be placed on obtaining the most desired species and the highest germination rates. Ohio law allows Kentucky bluegrass seed to contain some seed of annual bluegrass (*Poa annua*) and bentgrass, both of which can be serious weeds. It is possible to obtain seed free of those unwanted grasses if the buyer is persistent and willing to pay a premium price.

Sodding is an immediate resolution to lawn establishment. However, the aesthetics of a sodded lawn may be good or poor depending on the quality of the sod and the skill with which it is installed. Sod has an advantage on steep terraces and areas subject to unusual abuse such as between the walk and the street. Another advantage of sodding is that it may be successfully done anytime the ground is not frozen, if properly watered.

Potential home buyers should consider the existing sod or turf around a home before they buy. If grass has failed because of shade, poor soil, or turfgrass pests, sod will not correct this situation. It also will fail unless the cause for failure is corrected. Sod does not eliminate the need for good soil, adequate fertilizer, proper management, and pest control.

Only good quality sod from reputable dealers should be purchased for the home lawn. Information on the grass species and cultivar composition of the sod should be determined prior to purchase to ensure its acceptability. The sod should be of uniform density and free from broadleaf weeds, crabgrass, quackgrass, bentgrass and other lawn weeds.



Apply fertilizer.

Lawn Establishment

Table 1. Selected Lawn Grasses

Grass Blend or Mixture	% by Weight	Potential Quality of Lawn	Sun or Shade	Amount of Care & Cost of Upkeep	Seeding Rate (lbs/1000sq ft)
Improved Kentucky Bluegrass Blends ¹	100%	Excellent	Sun	Average to Above Average	1-2
Improved Kentucky Bluegrass-Improved Perennial Ryegrass	80% 20%	Good to Excellent	Sun	Average to Above Average	2-3
Improved Kentucky Bluegrass-Fine Fescue ²	30-50% 50-70%	Good to Excellent	Shade	Average	2-4
Common Kentucky Bluegrass-Fine Fescue ³	50-70% 30-50%	Fair	Sun or Shade	Below Average	2-4
Improved Kentucky Bluegrass-Improved Tall Fescue	10-20% 80-90%	Fair to Good	Sun or Shade	Average to Below Average	6-8
Improved Tall Fescue ⁴	100%	Fair to Good	Sun or Shade	Average to Below Average	6-8
Bentgrass ⁵	100%	Excellent	Sun	High	0.5-1

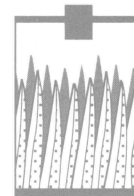
¹ A blend is a combination of 2 or more cultivars/varieties.

² Where improved grasses are used in mixtures (a combination of 2 species like bluegrass and fine fescue), it is recommended that at least 2 varieties of each species be used. Use shade-tolerant bluegrass varieties if available.

³ Used for low maintenance lawns.

⁴ Use only improved tall fescue cultivars/varieties. Do not use "Kentucky 31" tall fescue.

⁵ Not recommended for home lawns because of high maintenance level.



Rake in fertilizer as stones and trash are removed



Apply straw mulch.

Seeding

Time: The best time to seed a lawn in northern Ohio is between August 15 and September 15. In central and southern Ohio, the entire month of September is acceptable. Lawns seeded later in the fall may fail because the seedling turf has insufficient growth to survive the winter.

If seeding cannot be done by October 15 in northern Ohio or before October 30 in southern Ohio, postpone the job until spring. The earlier in the spring a seeding can be made (preferably March) the better the chances for success. Winter seedings (dormant seeding) made after November 15 in northern Ohio and after December 1 in southern Ohio will not germinate until the following spring.

Unfortunately, all lawns cannot be seeded during the recommended late summer/early fall period. Besides the summer survival risks associated with spring and winter seedings, these seedings also will be susceptible to heavy infestations of summer annual weeds including crabgrass, foxtail, barnyardgrass, pigweed and many others. Infestations of these summer annual weeds are greatly reduced in successful early fall seedings, since a good density develops before the weed seeds germinate the following spring.

Rate: Most people sow much more seed than is needed. The lower rate suggested in Table 1 is adequate if the seeds are distributed evenly. The higher rate will provide a more dense turf during the establishment period but does not substitute for other recommended practices in establishing the lawn. Normally, 15 to 20 seeds/square inch is adequate.

Procedure: Sow seed evenly with a spreader. Plan to go over the area to be seeded twice, prefer-

ably in a different direction each time. With a low seeding rate, it is easier to get good distribution if something is added to the seed to make more bulk. Several materials such as sand or corn meal may be used. Starter fertilizer should be applied just prior to or after seeding.

The soil should be raked lightly to cover the seed with 0.1 to 0.3 inches of soil. If some seed can still be seen after raking, they have not been covered too deeply.

Apply a mulch after seeding to ensure optimum moisture conditions and reduce erosion. Straw applied in a thin layer is a very satisfactory mulch. Straw spread uniformly at 50 to 80 pounds (1-2 bales) over 1,000 square feet of seeded area is about the proper rate. When the job is finished there should be half soil and half straw when looking directly down on it. Most people apply straw too heavily than too lightly. If straw is applied at a rate higher than that recommended, one-half of the straw mulch should be removed when the grass is 1.0 to 2.0 inches tall. Piles of mulch caused by wind should be respread or removed to prevent smothering the young seedlings.

On terrace slopes where erosion may be a problem, stake down burlap, cheesecloth, special netting, or other very thin cloth through which the grass can sprout. After establishment you do not need to remove this cloth.

A light lawn roller should be used to roll the mulch after it is applied, providing the soil is not too wet. The lawn should be irrigated and the surface kept moist. This usually means sprinkling the new seeding lightly at least twice a day, sometimes more often, depending on how hot the weather is and how often it rains. After the seedlings emerge and begin to

Lawn Establishment

establish, the interval between waterings can be lengthened provided adequate moisture is available for seedling growth.

Sodding

Time: Site preparation should be as thorough for sodding as previously described for seeding. Sod may be transplanted to a home lawn any time during the growing season when the soil can be prepared and adequate water provided. The soil should be moist when sod is transplanted to aid in rooting.

Procedure: Several sodding techniques should be followed to obtain a properly sodded lawn. The lengths of sod should be staggered in a brick-like arrangement, with the ends in contact but not overlapping. The sod should not be stretched since cracks may develop between pieces as it shrinks during drying. The finished lawn should be rolled to ensure contact with the soil for better rooting. On slopes the sod may need to be pegged to prevent slippage. A sodded lawn should be irrigated to a depth of 6 inches immediately after transplanting. Subsequent irrigations on a daily, to every few days, basis will be required for 2 to 3 weeks to maintain adequate soil moisture during the initial rooting period.

Post-Establishment Care

A newly seeded or sodded lawn should be mowed when the grass reaches a height of 3 inches. Mow to a height of 2 inches and return or remove the clippings depending on the quantity. An application of 0.5 to 1.0 pound nitrogen per 1,000 square feet 3 to 5 weeks after seeding will improve establishment. The



Transplant by placing sod pieces in a brick-like pattern.

lawn should be irrigated immediately following the nitrogen application.

Herbicides are not recommended for weed control on a newly seeded lawn until after it has been mowed at least 3 times. Even then, herbicides must be used at **minimum rates** and with **caution**. Follow label directions carefully.

Further post-establishment cultural practices can be obtained in Extension Bulletin 271, *Your Lawn*. Pest control recommendations can be found in Extension Bulletin L-187, *Control of Turfgrass Pests*.

Turfgrass Species

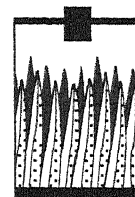
Many lawn problems result from seeding grasses incapable of producing a high-quality turf. Since a lawn is seeded with the expectation that it will be permanent, it is important to select a grass adapted to the area, capable of delivering the desired perfor-



Roll a newly sodded lawn to insure contact with the soil for better rooting.



Inadequate irrigation of a newly sodded lawn will result in severely wilted or dead grass.



mance and suited to the intended level of management. The least expensive seed selections are likely to give the poorest results, but expensive seed will not necessarily guarantee good results

In Ohio somewhat few species of grass are useful for home lawn turf. The recommended species include Kentucky bluegrass, perennial ryegrass, tall fescue and fine fescue. Table 1 summarizes information pertaining to the recommended uses of these grasses, their potential quality, relative management costs and seeding rates.

Kentucky bluegrass: Kentucky bluegrass is the primary turfgrass in Ohio. With proper management, it forms a fine textured, high-quality, long lasting turf. It has an aggressive sod-forming nature that allows rapid recovery from injury. It is winter-hardy and can withstand severe drought; however, it often becomes dormant during periods of hot or dry weather.

Kentucky bluegrass requires moist, well-drained, fertile soil. It will not tolerate extremely acid or alkaline soils and generally does not tolerate shade. Germination and establishment rate are slow, and weeds may become a problem if seeded in spring or summer. Kentucky bluegrass can be established from seed or as sod with equal success.

For a high-quality, weed-free turf, Kentucky bluegrass requires a medium to high level of management with regular applications of fertilizer. Although not needed for survival, irrigation is required during hot, dry periods if turf quality is to be maintained. All varieties respond well to a mowing height of 2 to 2 1/2 inches.

Ryegrass: Both perennial and annual (or Italian) ryegrasses are used for turf purposes. Ryegrass seed labeled "common" or "domestic" is usually a mixture of annual and perennial types. The ryegrasses have the most rapid germination and seedling establishment of all the turfgrass species. For this reason they are used primarily where rapid establishment is desired.

Annual ryegrass usually persists for only one season, making it useful only as a temporary cover. These selections lack acceptable color, are difficult to mow and do not make a high-quality turf. Similar shortcomings are also exhibited by the older varieties of perennial ryegrass. These older perennial types usually persist for only a few years because of poor winter hardiness. The use of annual ryegrass or older varieties of perennial ryegrass are not recommended

for Ohio lawns. Newer varieties of perennial ryegrass developed specifically for turf have higher density, improved mowing quality, greater cold tolerance, better disease resistance, darker green color and finer leaf texture than the older perennial ryegrass selections. These improved varieties exhibit quick germination, and rapid establishment making them ideal selections for use as a quick cover and in heavily trafficked areas.

All perennial ryegrasses require well-drained soils of medium to high fertility. The maintenance, fertility and pH requirements are similar to the improved bluegrasses. The optimal mowing height is 2 to 2 1/2 inches. Well-sharpened mower blades are necessary to achieve a high-quality cut. Supplemental irrigation is required to maintain high quality during drought conditions.

Tall Fescue: Tall fescue continues to be a preferred species selection for usage on many Ohio turfgrass sites, particularly in the southern part of the state. Although the traditional "Kentucky-31" and the new, improved "turf type" cultivars are all technically tall fescues, dramatic differences in quality and appearance exist. Tall fescues in general tolerate soils of low fertility, persist well under low maintenance, and possess good insect and disease tolerance under Ohio conditions. This species possesses rapid establishment, excellent wear tolerance and due to its deep rooted nature, is heat and drought tolerant and will remain green through most Ohio summers without supplemental irrigation. Juvenile tall fescue seedlings are not cold tolerant and will be prone to winterkill. However, well-established seedlings and mature lawns will endure most Ohio winters.

The old "Kentucky-31" cultivar is a coarse, bunch type selection and should not be confused with the fine fescues. "Kentucky-31" tall fescue is desirable only in areas where its coarseness and a bunch growth habit are not objectionable. This cultivar should not be used on lawns where high quality is important.

New, improved, "turf-type" tall fescue cultivars have many improved quality characteristics over the "Kentucky-31." These turf type cultivars are less coarse, grow more upright, tiller more readily and exhibit a darker green color than the old "Kentucky-31." Their major attribute is a lower maintenance requirement than Kentucky bluegrass. These improved types are being used on many lawn sites and are replacing "Kentucky-31" on playgrounds, parks and low maintenance athletic fields.

Lawn Establishment

Fine Fescue: Red, hard and chewings fescue are fine leaved turfgrasses that maintain well under conditions of shade, low soil moisture, low fertility and low pH. The fine fescues require well-drained, slightly dry soils with minimum levels of management. Overfertilizing, overwatering or establishing on poorly drained soils will result in a decline in quality.

With correct management, the fine fescues can make an attractive turf of fair to good quality. In Ohio, fine fescue is seldom seeded alone and seldom is it intended to constitute the primary species where conditions favor establishment and maintenance of other cool season grass selections. Fine fescue is used primarily in mixtures (with bluegrass) on low maintenance and shade lawns.

Bentgrass: The bentgrasses form an extremely fine textured, dense, uniform, high-quality turf when managed correctly. However, good cultural practices are so expensive and time consuming that few homeowners are prepared to grow a bentgrass lawn. The primary use of bentgrass in Ohio is on golf courses. Bentgrass, when found in a home lawn, is usually considered a weed.

Bentgrass is not compatible with bluegrass and should never be included in a lawn seed mixture.

Zoysiagrass: Zoysiagrass is a vigorous sod-forming grass that has received much publicity in recent years. It is very drought and heat tolerant and is resistant to weed invasion. Its winter hardiness is marginal, making it better adapted to southern than to northern Ohio. After the first fall frost zoysiagrass turns straw color and doesn't turn green again until May. Because of a slow rate of establishment and because of the lack of winter color, zoysiagrass has not become popular and should not be used for home lawns in Ohio.

Cultivar recommendations for each turfgrass species reviewed can be found in Extension Fact Sheet 4027—*Lawn Grass Cultivar Selection*.

Turfgrass Mixtures

Bluegrass-Ryegrass Mixtures: The rapid seedling establishment of ryegrass makes bluegrass-ryegrass mixtures desirable where (1) quick cover is needed for aesthetic reasons, (2) quick cover is needed for erosion control, (3) seeding is in the summer when bluegrass is difficult to establish alone, or

(4) when seeding during dry periods where irrigation is not available. The addition of ryegrass is not required in bluegrass seedings made in late summer or fall during favorable seeding conditions except for erosion control. Due to the improved hardiness of the new ryegrass cultivars, ryegrass should not be included in a bluegrass mixture where a solid bluegrass lawn is desired. Ryegrass should never constitute more than 50 percent of the mixture by weight.

Bluegrass-Tall Fescue Mixtures: A bluegrass-tall fescue mixture may be used on high traffic areas or areas receiving minimum maintenance. Tall fescue must be the predominate species and constitute at least 80 percent of the mixture. The seeding rate should be at least 6 pounds per 1,000 square feet. Seedings utilizing this mixture should be maintained with rather low nitrogen fertilizer rates. If turf areas containing this mixture are subjected to high levels of management (i.e., frequent irrigation, high fertilization rates), after a period of time the bluegrass will dominate the stand, leaving scattered, unsightly bunches of tall fescue.

Bluegrass-tall fescue mixtures are commonly used on playgrounds, park areas, athletic fields, waterways and roadsides. When overseeding into predominantly tall fescue turf areas, seed using only tall fescue. Tall fescue should never be seeded either alone or in a mixture where coarseness is objectionable.

Bluegrass-Fine Fescue Mixtures: A bluegrass-fine fescue mixture is desirable for shady areas, areas having low fertility, areas prone to frequent moisture stresses or areas receiving low levels of maintenance. One of the two species will usually dominate the stand, depending upon local conditions. This mixture also provides insurance against total loss to insects and disease, since the same pest usually will not attack both grasses with equal severity.

Some uniformity and quality may be sacrificed by using a bluegrass-fine fescue mixture. Because of the adaptability of fine fescue to shade conditions, this mixture is recommended for shade conditions.

Mixtures Containing Redtop: Redtop grass seed is frequently found in lawn mixtures. Redtop becomes established rapidly and provides quick cover. However, it remains in the mixture for several years and detracts seriously from turf quality. It is not recommended as a turfgrass in Ohio.

