Tall Fescue

Tall fescue (*Festuca arundinacea* Schreb.) is a deep-rooted, long-lived, sod-forming grass that spreads by short underground stems called rhizomes. In Pennsylvania it has been used primarily for conservation purposes but is well suited as hay, silage, or pasture. It is well adapted to the soil and weather conditions of Pennsylvania (Table 1). It is especially well adapted to acid, wet soils of shale origin and produces more forage than other cool-season grasses on soils with a pH of less than 5.5.

Tall fescue is drought resistant and maintains itself under rather limited fertility conditions. It is also ideal for waterways, ditch and pond banks, and farm lots and lanes. It is the best grass for areas of heavy livestock and machinery traffic.

In the past, animals readily grazed tall fescue during April, May, and early June, and again in the fall, but they showed reluctance to graze it during July and August. Some of this reduced summer palatability, which resulted in poor animal performance, is associated with the presence of a fungus in the plant (endophytic). The fungus grows between the plant cells and overwinters in the base of the plant. The fungus produces alkaloids that are toxic to animals. These alkaloids are thought to cause the poor conception rates, low birth weights, and low daily gains of animals grazing fungus-infected tall fescue. Endophyte-free varieties are now available and are recommended for new seedings.

Tall fescue is the best adapted cool-season grass to stockpile (accumulate growth) for use in fall and winter (Table 2). In addition, compared with other cool-season grasses, tall fescue is generally of higher quality in fall because of greater leaf retention. Thus, tall fescue can supply much of the spring, fall, and winter feed for a beef cow herd.

Table 2. Yield of grasses during the summer and when stockpiled for fall consumption.

Species	Early summer	Mid-summer	Fall
		tons/acre	
Tall fescue	1.79	0.72	1.25
Reed canarygrass	2.13	1.18	1.12
Orchardgrass	1.82	0.92	0.90
Smooth bromegrass	2.28	0.65	0.62

Note: All grasses received 240 pounds N per acre.
Source: Wedin et al.,10th International Grassland Congress.

ADAPTED VARIETIES

Numerous varieties are adapted for use in Pennsylvania, but the endophyte-free varieties are higher in quality than varieties infected with the endophyte fungus. Endophyte-

Table 1. Characteristics of perennial cool-season grasses in Pennsylvania.

Grass	Seedling vigor[a]	Tolerance to soil limitations			Persistence	Tolerance to frequent harvest	Relative maturity[c]
		Droughty	Wet	Low pH[b]			
Kentucky bluegrass	M	L	M	M	H	H	Early
Orchardgrass	H	M	M	M	M	H	Early–medium
Perennial ryegrass	H	L	M	M	L	H	Early–medium
Reed canarygrass	L	H	H	H	H	H	Medium–late
Smooth bromegrass	H	H	M	M	H	L	Medium–late
Tall fescue	H	M	M	H	M	H	Medium–late
Timothy	M	L	L	M	H	L	Late

a. L = low, M = moderate, H = high.
b. pH below 6.0.
c. Maturity characteristic refers to relative time of seed head appearance in the spring. This will depend not only on the species but also on the variety.

infected varieties are well suited for planting on reclaimed strip mines and for other conservation uses where soil conditions are unusually adverse for plant growth.

Because of differences in growth habit, palatability, and time of year best used, other grasses should not be included with tall fescue at seeding time. However, legumes can be included in the seeding mixture with tall fescue, although the stand may eventually be used as a pure tall fescue stand for winter stockpiling. The legumes will persist for several years, improve forage quality, and serve as a source of nitrogen for the tall fescue. *Regardless of the seeding mixture, it is recommended that endophyte-free seed be used if the tall fescue is to serve as animal feed.*

ESTABLISHMENT

Tall fescue and accompanying legumes can be seeded in spring or late summer. Spring seedings should be made as early as possible to avoid hot, dry weather when the seedlings are small. Late-summer seedings usually have less weed competition and more favorable moisture conditions than spring seedings. Late-summer seedings should be made before August 15 in northern Pennsylvania and September 1 in southern Pennsylvania.

For seeding tall fescue alone, 12 pounds of seed per acre is adequate. Tall fescue in legume mixtures should be seeded at 8 to 10 pounds per acre (Table 3).

For best results, band seed tall fescue ¼ inch deep. Press wheels used in conjunction with band seeding add additional stand insurance. If the seedbed is dry and not firm, cultipack before seeding to make a firm seedbed.

Table 3. Seeding rates for tall fescue and a single legume in mixture.

Species	lbs/A
Tall fescue	8–10
With any one of these legumes	
Alfalfa	8–10
Birdsfoot trefoil	6–8
Red clover	6–8
White clover	2–4
Crownvetch (conservation plantings)	8–10

HARVEST MANAGEMENT

Tall fescue can be part of a forage program but should not be all of it. Legumes with tall fescue improve animal performance and increase forage production during the summer. Legumes are difficult to maintain in a tall fescue sod, but certain management practices will help keep legumes in the stand. Two such practices are maintaining pH above 6.0 and making annual applications of potash.

Tall fescue grown with either red or white clover should not be allowed to smother the legume in the spring. This can be avoided by grazing early and close to the soil surface. Red clover is a short-lived perennial and must be managed to produce seed if red clover is desired in the stand after 2 to 3 years.

Tall fescue withstands closer grazing and more abuse than most cool-season grasses, but it can be overgrazed to the point that vigor and production are reduced. Don't graze closer than 3 or 4 inches, and allow at least 30 days for tall fescue to recover.

An improvement in animal performance has been reported for the new endophyte-free varieties relative to endophyte-infected varieties of tall fescue. Increased average daily gains of 0.5 pound per animal per day have been reported for 7- to 12-month-old angus steers that have grazed endophyte-free compared to endophyte-infected tall fescue. In a two-year study at Penn State comparing endophyte-free tall fescue varieties, animal performance was similar for all varieties (Table 4).

Other tests comparing orchardgrass and endophyte-free tall fescue for animal performance had similar results. While orchardgrass is generally of higher quality during spring and summer, tall fescue quality is higher in the fall, especially after frost.

Table 4. Average daily gains of ewes and lambs grazing endophyte-free tall fescue varieties.

Variety	Ewe	Lamb	
		Spring	Summer
	lbs/animal/day		
Festorina	0.18	0.43	0.32
Johnstone	0.29	0.42	0.33
Roa	0.15	0.43	0.33

Source: L. C. Vecellio, 1992, master's thesis, Department of Dairy and Animal Science.

If fescue is to be used during the summer, maintain a legume in the stand to improve animal performance. Otherwise, allow the late-summer growth to accumulate for use in fall or winter stockpiling. Tall fescue that is used exclusively for stockpiling is usually maintained in a pure stand.

FERTILITY

Prior to seeding, determine lime and fertilizer needs by soil test. Although tall fescue can achieve adequate yields on low-pH soils, maximum productivity is achieved when the pH is between 6.0 and 7.0. In the absence of a soil test for tall fescue seeded alone, plow down 0-45-135 pounds per acre and apply 20-20-20 pounds per acre at planting (banded if possible) when seeding without a legume. While small amounts of nitrogen and potash are beneficial at seeding, too high a concentration of these elements can interfere with germination. Do not apply nitrogen at seeding if tall fescue is seeded with a legume.

Under pasture conditions it is difficult to evaluate the amounts of nutrients removed by grazing animals. Grazing animals trample or leave some of the total growth available to them. This is returned directly to the soil. Manure is not deposited evenly across the field; most studies show that about 12 to 15 percent of a pasture area is covered with ma-

nure by grazing animals each year. If an estimated 3 tons of forage is produced from a pasture field, an annual application of fertilizer at 0-20-60 pounds per acre should maintain production.

If pure tall fescue stands are used, high yields can be expected if fertilizer is applied during the winter or very early spring. This is especially true for the nitrogen portion of the fertilizer. Tall fescue to be used for hay should receive 100 to 150 pounds N during the winter period. The same amount should be applied if tall fescue is to be used for early grazing. If much fall pasture is desired, reapply fertilizer in July.

When legumes make up 30 percent or more of a tall fescue or any grass stand, do not use nitrogen fertilizer. When these stands are topdressed with fertilizer containing nitrogen, the growth looks dark green and appears more lush, but research shows that production is not increased. In addition, applying nitrogen fertilizer to mixed stands will cause the grass to dominate the mixture.

Tall fescue-legume mixtures should be topdressed annually with phosphorus and potassium. A fescue-legume mixture removes about 15 pounds phosphate and 45 pounds potash from the soil for each ton of hay produced. Phosphorus and potassium can be applied anytime during the year with satisfactory results.

SUMMARY

Tall fescue is a deep-rooted, sod-forming grass best adapted to cool-season production. It is extremely well suited for use as a stockpile forage because it retains its quality and improves in palatability in the fall. It is well adapted to low-pH soils like those found in strip mine reclamation. It is more tolerant of animal and machinery traffic and mismanagement than are other cool-season grasses. Endophyte-free varieties improve animal acceptance of and performance on tall fescue. Tall fescue can be part of a forage program, but it should not be the only species in the program.

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