

Tall Fescue for Forage Production

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Over 35 million acres of tall fescue (*Festuca arundinacea* Schreb.) are grown in the United States, with about 1 million acres in Indiana (Figure 1). Although primarily grown in the southern third of the state, almost every county has some fescue production. Tall fescue is used mainly as a forage for livestock, but is also used as turf and for erosion control.

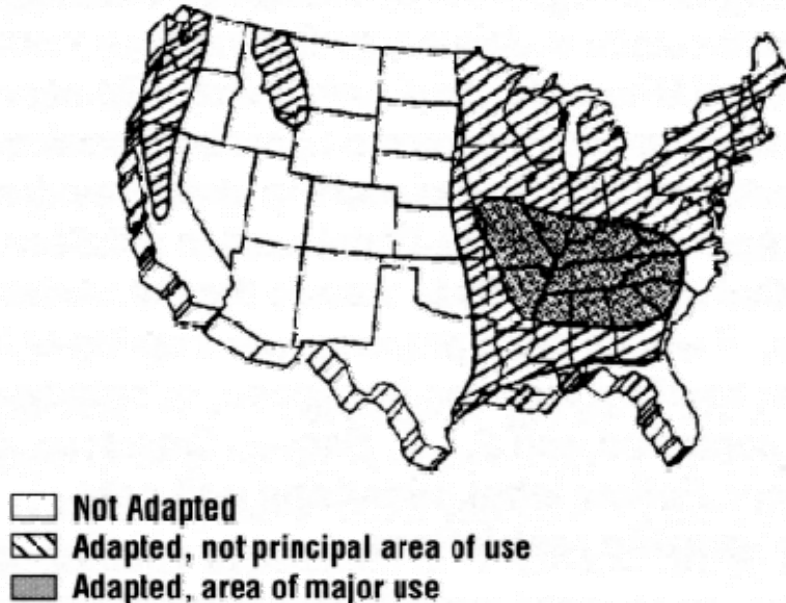


Figure 1. Adaptation and use of tall fescue (from ASA Monograph No. 20, *Tall Fescue*)

Tall fescue was introduced into North America from Europe in the late 1800's. In 1943 the University of Kentucky released the variety, *Kentucky 31* and fescue establishment rapidly spread throughout the eastern United States. Although tall fescue is often referred to simply as "fescue," there are several other types of fescue which can be found in the U.S., including meadow fescue, red fescue, chewings fescue, and rough stalk fescue. Varieties are available with greatly improved palatability and animal performance.

Plant Description and Uses

Strictly speaking, tall fescue is a bunch-type grass, but will spread slowly to form a dense sod. Tall fescue is a deep-rooted, cool-season, perennial grass which works well for gully-healing and erosion control.

Tall fescue prefers the cool temperatures of spring and fall, and grows poorly in mid-summer, which gives rise to the term "summer slump." It tolerates excessive moisture and drought as well as acidic (pH 5.4 - 6.2), low fertility soils. It does best on heavier soils, and is able to survive on fragipans.

Fescue begins spring growth when average daily temperatures remain above 40 F for several days. It is not completely dormant at lower temperatures; thus, there may be fescue growth in Indiana from early March to December.

Tall fescue is generally considered too low in quality to be used extensively by dairy farmers. It is more appropriate for beef and sheep operations, and is a good species to use in areas that receive heavy livestock traffic.

Tall Fescue Toxicity

Livestock grazing fescue may exhibit symptoms such as nervousness, rough hair coat, elevated body temperature, reduced weight gain, and low conception rates. Researchers have recently determined that these fescue toxicosis symptoms are caused by the endophytic fungus *Acremonium coenophialum*.

An endophytic fungus is one that lives within a plant's intercellular spaces. Therefore, it is not possible to determine if fescue is infected without the aid of a microscope and stain techniques. The Southern Indiana Purdue Agricultural Center does test (on a fee basis) for the presence of the endophytic fungus. Fescue seed becomes infected with the fungus, so the problem is readily transmitted to new seedlings. The fungus does not move quickly from an infected area to a bordering non-infected area, so producers are able to use low-endophyte seed.

The easiest way to reduce the fescue toxicosis problem is to renovate existing stands with legumes or new seedings of low-endophyte tall fescue or other adapted forages. Use seed that is certified to contain less than 5 percent of the endophytic fungus. In order for the newly established stand to actually be low endophyte, the planting site must not have grown fescue before, or infected fescue must have been completely eliminated from the site by crop rotation and/or herbicides.

Varieties

Many low-endophyte tall fescue varieties are adapted to Indiana. Included are *Fawn*, *Kenhy*, *Johnstone*, *Martin*, *Phyter* and *Stargazer*. *Kenhy* and *Johnstone* were developed by the Kentucky Agricultural Experiment Station and USDA-ARS. *Phyter* and *Stargazer* were developed by FFR Cooperative and are marketed through the Countrymark

Cooperative, Inc. system. *Martin* is marketed by CISCO and George W. Hill of Indiana, Inc., Indianapolis. *Fawn* was developed by the Oregon Agricultural Experiment Station.

The most commonly grown varieties in Indiana are *Kentucky 31* and *Alta*. Neither of these is a low-endophyte source of tall fescue. There is no easy method to remove the endophytic fungus from an established stand.

Establishment

Soil should be tested for pH, phosphorus, and potassium 6 months prior to seeding. If lime is needed, it is better to apply it 6 months before seeding. Fertilizer can be worked into the soil just before seeding. A firm seedbed is essential. If your footprint in the soil exceeds a one-inch depth, the soil should be cultipacked before and after seeding, or a cultipacker seeder utilized. A drill with a seeding mechanism designed for forage grasses is preferred to a broadcast seeder. No-till seedings are becoming more common. Weed control with *Gramoxone Extra* or *Roundup* may be needed prior to seeding if a no-till drill is utilized.

For pure stands, the seeding rate of fescue is 15 lb. of pure live seed (PLS) per acre. For higher quality pasture, use a mixture of 6 lb. PLS of red clover, 1/4 lb. PLS of ladino clover, and 8 lb. PLS of fescue per acre. Planting depth should be 1/4 inch. (See [AY-253, Forage Selection and Seeding Guide for Indiana](#) for other seeding mixture recommendations.)

Time of Seeding

Late-Summer Seeding. A late-summer seeding should be done early enough to allow at least 60 days of growth before soil temperature drops to 50 F. If seedings are made in August in northern Indiana, or before mid-September in southern Indiana, plants should be sufficiently hardy to tolerate winter temperatures. Do not graze summer seedings until the following spring. A March application of 50 lb. or more of nitrogen will encourage early spring growth.

Wheat or rye may be seeded (1 bu./a.) with tall fescue in late summer to prevent erosion while the fescue becomes established. This companion crop can become excessively competitive the following year, and must be spring-grazed or harvested as hay or silage to reduce competition. New stands of fescue planted in late summer may be damaged by heavy pasturing in early spring, however, and livestock should not graze a new stand during wet weather.

Spring Seeding. Tall fescue can be broadcast into wheat stands in January or February, or interseeded when soil conditions permit. Spring oats can be used as a companion crop when fescue is sown in the spring. Spring seeding should be done before April 15. Later seedings result in smaller plants that are less likely to survive the hot, summer months. If weeds are a problem with a spring or late-summer seeding, they can be clipped, or

broadleaf weeds controlled with 2,4-D, Banvel, Crossbow, Ally, or Stinger. Follow label directions and note harvest-grazing restrictions.

Fertilization

Nitrogen. Tall fescue can survive without a fertilization program, but high productivity requires fertilizer inputs (Figure 2). Split applications are suggested when the fertilization rate exceeds 100 lb./acre. Nitrogen increases yield, and thus, carrying capacity of each acre. Protein content will also be improved. Nitrogen should **not** be applied to endophyte-infected stands, as it enhances fescue toxicosis.

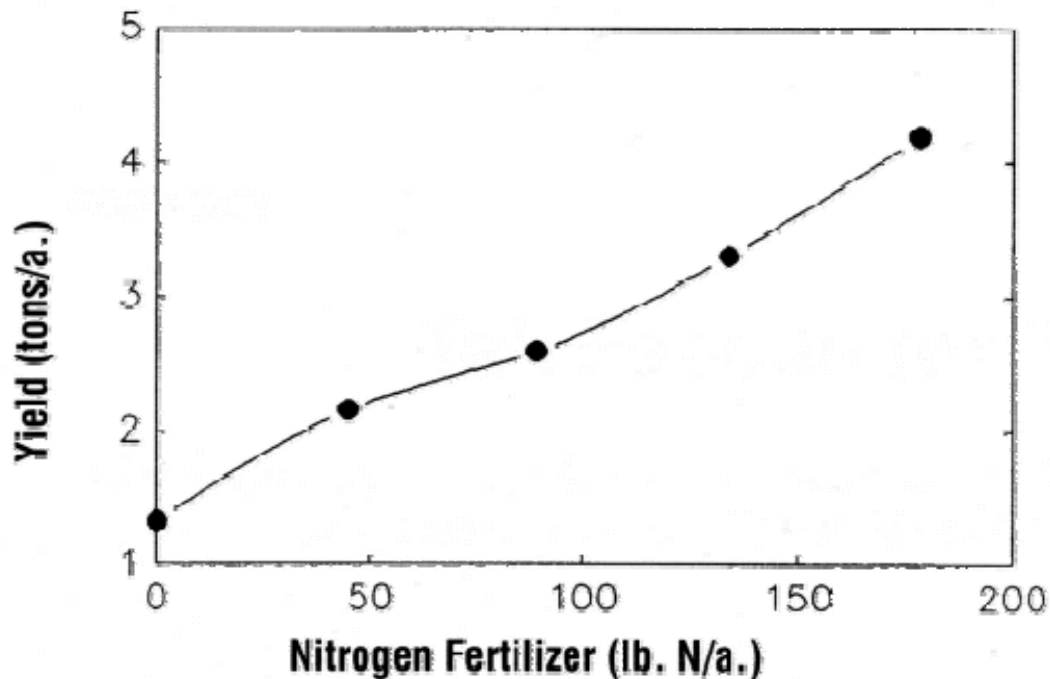


Figure 2. Dry matter yield of tall fescue at the Southern Indiana Purdue Agricultural Center as influenced by N fertilization (total of two harvests per year).

Heavy rates of manure or nitrogen fertilizer in a single application have resulted, on rare occasions, in a dangerous accumulation of nitrates in the forage. Heavy fertilization immediately following a rain that breaks a long dry period can result in nitrate accumulation. If high nitrates are suspected, dilute the fescue with other feed or limit daily intake to insure that animals are not adversely affected by nitrates.

Approximately two-thirds of fescue's annual production occurs during the spring and early summer. An early spring application of N, followed by another application immediately after the first cutting or grazing, will maximize yield. Be prepared to handle the high yields by harvesting the surplus as hay and/or silage. Forage quality declines rapidly after seedhead emergence.

Tall fescue, a "cool-season" grass, tends to go dormant during the hot summer months. Fertilization with N will not greatly affect yield during the summer. A late summer application of N will encourage late summer and fall growth. Do not apply heavy rates of N in the fall.

Phosphorus and Potassium. Old fescue fields that have not been fertilized, and fields where natural fertility is low may require up to 120 lb. of P₂O and 200 lb. of K₂O per acre for high yields. However, a soil test is the best method of determining fertility requirements.

Unlike nitrogen, P and K can be applied at any time of the year. Do not apply these materials on slopes of more than 4 percent when the ground is frozen.

Many soils in southern Indiana are extremely low in P, and it will likely be the first nutrient after N that restricts yields. Less P in the soil is available to plants when soils are dry. Thus, adding P fertilizer helps prevent this nutrient from becoming the factor that reduces yields during dry periods.

Yellowing Symptoms

The most likely cause of "yellowing" in tall fescue is nitrogen deficiency. Yellowing may also indicate the presence of certain diseases. Crown rust causes the field to become yellow or brown in appearance. Fusarium wilt turns the field light yellow and later straw-colored. Dollar spot, which is observed during wet seasons or in fields with low nitrogen, causes white spots in the field. Selection of resistant varieties and proper management will minimize disease problems.

Renovating Pure Stands

Pure stands of tall fescue can be improved by renovation with a legume. The following procedure is suggested for pasture renovation:

- 1. Graze the fescue very close in the fall.
- 2. Fertilize and lime according to soil test.
- 3. Disk the sod to kill at least 60 percent of the fescue.
- 4. Overseed in January, February, or early March with an adapted legume. (See AY-251 for legume species and seeding rates.)
- 5. Graze the field as soon as it will support the weight of the livestock in the spring.
- 6. Remove the cattle when young legume seedlings begin to be eaten.
- 7. Rest the pasture until grass and legumes have accumulated at least 4 weeks of growth.

This process may need to be repeated every 2 or 3 years, since red clover, a commonly used legume, does not usually persist for more than 2 or 3 years.

Harvest Management

Pasture. Tall fescue is a good winter pasture for overwintering livestock. Fall growth is more palatable and digestible than summer growth. Pastures used for late fall and winter should not be grazed during the summer.

Palatability can be improved by: a) establishing low-endophyte fescue; b) renovating with a legume; and c) keeping growth of endophyte-infected fescue short by grazing or clipping.

Hay. Excessive fescue produced in the spring is commonly cut for hay to be fed on pasture or in the drylot the following winter. Hay should be cut in the early head stage of growth to insure reasonable quality and yield. Cutting early and frequently improves quality of the hay and does not negatively affect the stand.

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