K-STATE Kansas State University Research and Extension

FORAGE FACTS

Publication Series

TALL FESCUE

INTRODUCTION

Tall fescue is a cool-season perennial grass species adapted to the climate and soils of the eastern one-third of Kansas. Tall fescue can persist under limited fertility conditions and, when compared with smooth brome, better tolerates wet soils, grazing abuse, claypan soils and summer drought.

Fescue can be used not only for forage but also for waterways, pond dams, farm lanes and lawns. Fescue will grow when average temperatures are as low as 34˚F but does better with temperatures above 45˚F. Summer growth is retarded by high temperatures and low moisture, with little growth occurring above 85˚F.

Animals readily graze fescue during April, May, and June and again in the fall. With consideration for both the grass and animals, grazing should be avoided during late June, July and August. Tall fescue grazed during the summer results in low animal performance and possible damage to the grass. It should be "rested" during summer months to allow the plants to increase vigor.

Tall fescue is the best adapted cool-season grass in Kansas for winter use. Thus, fescue can provide most of the spring, fall, and winter feed for a beef-cow herd. Tall fescue should be used in conjunction with warm-season forage crops such as native grasses, bermudagrass, or summer annuals to provide summer forage.

TALL FESCUE TOXICITY

The terms fescue fungus, endophyte, fungal endophyte, and fescue endophyte have been used to denote the toxicity associated with tall fescue. "Endo" (within) plus "phyte" (plant) means a plant that lives within another plant. The fungus lives its entire life cycle within the fescue plant.

Two characteristics of the endophyte are significant: the organism does not affect either the growth or appearance of the grass and requires microscopic examination to detect, and it is seed transmitted only. The alkaloid, ergovaline, is thought to produce the animal symptoms observed in livestock feeding on infected tall fescue. Fungus-free plants remain fungus free, and infected pastures come from infected seed. The only way a fungus-free pasture becomes infected is when fungus-infected seed is brought into the pasture and the plants establish from that seed.

Over 500 pastures in Kansas have been tested for the endophyte, and approximately 95 percent were found to have infection. The average infection rate was 64 percent, with a range from 0 to 100 percent. Only about 20 pastures have been found free of endophyte. The specific instructions on sampling pastures and testing seed for endophyte can be found in K-State Research and Extension publication AF-139, *Sampling and Testing Procedures for Fungal Endophyte of Tall Fescue.*

ANIMAL RESPONSE TO TALL FESCUE TOXICITY

Cattle that consume infected fescue plants react to toxins that are produced either by the fungus or by the plant in reaction to the fungus. These toxic compounds are also present in stored hay or seed and can affect the animals that eat it. Data from several states, including Kansas, suggest that for each 10 percent increase in endophyte level, there is a reduction of approximately 0.10 pound in average daily gain (ADG) of

growing beef animals. This can be much lower when tall fescue is only grazed March through May and September through November. Grazing infected pastures during July and August is especially deleterious to animal performance.

A steer grazing study at Auburn University showed an 82 percent increase in average daily gain (ADG), and a 42 percent increase in gain per acre with endophyte-free fescue compared with endophyte-infected fescue. Research in Kentucky showed a 34 percent reduction in pregnancy in spring-calving cows grazing high-endophyte fescue pastures compared with grazing low-endophyte pastures.

Given a choice, grazing animals will spend much more time grazing endophyte-free pastures, with greater forage intake, thus requiring a lower stocking rate. Fungus-free pastures are much more subject to damage by overgrazing. Fungus-free pastures require lower stocking rates but produce higher average daily gain and more beef per acre on grazing yearling cattle compared with pastures infected with the endophyte.

ESTABLISHMENT AND MAINTENANCE

Several new certified varieties free of the endophyte fungus are suitable for Kansas. Pastures planted to fungus-free seed will have a 20 to 30 percent lower carrying capacity because the grazing animal eats more endophyte-free grass. Tall fescue will grow on almost any soil but produces best on fertile, moist soils. The ability of fescue to withstand low fertility and wet soil, as well as submersion for a few days, is excellent. It will produce on soils with a pH of 5.2 to 8.0, but optimum growth occurs in the 5.8 to 7.0 pH range.

Fescue establishes best in a well-limed and fertilized seedbed that has been tilled 4 to 6 inches deep, leveled, and firmed before seeding. When planting in a well-prepared seedbed, 15 pounds per acre of clean, high germinating seed is adequate. When seed germination is not known or the seedbed is less than desirable, a rate of 20 to 25 pounds per acre may be required for a satisfactory stand. For best results, the seed should be covered with ¼ to ¾ inch of soil.

Seeding fescue with winter wheat is often desirable because the cover crop can protect the soil from erosion and furnish additional grazing or grain production income in the seeding year. If wheat is grazed, avoid grazing during wet weather when new grass seedlings could be injured by trampling.

A soil test should be taken well ahead of planting to determine lime and fertilizer needs. Local agricultural Extension agents can provide fertilizer recommendations based on soil test results. Once established, fescue production will depend on the amount and time of fertilizer application. Adequate combinations of phosphate, potassium, and nitrogen can make the difference between good and poor yields. Research shows that 100 pounds of actual nitrogen produced only 1.6 tons of dry matter per acre; however, when adequate phosphate and potassium were applied with the nitrogen, yields increased to 3.7 tons. Phosphorus and potassium need only be applied once per year. For improved plant health, improved stand and good yields, a fall (September) application is recommended.

If fescue is grazed in the spring and fall, nitrogen should be applied in the winter and late summer because research indicates that spring-applied nitrogen does not carry over for fall growth; likewise, fall applications of nitrogen do not increase spring performance. Apply two-thirds nitrogen in spring and one-third nitrogen in fall.

HAY PRODUCTION

The key to quality fescue hay production is adequate fertilization and early cutting. Fescue crude protein drops 0.5 percent per day from the boot stage to the mature seed stage, therefore, fescue hay should be cut no later than mid-May in southeast Kansas. Cutting the forage for hay when it starts to show a few heads also results in lower levels of the endophyte in the hay. Nitrogen rates should be approximately 100 pounds of actual nitrogen. Phosphate and potassium should be applied according to soil test.

UTILIZATION BY CATTLE

High endophyte fescue pastures should be grazed only in the spring and fall to reduce the endophyte effect. Grazing when the grass has a high percentage of leaves can result in less toxicity occurrence compared with grazing mature grass. If pastures are to be grazed in the summer, legumes may be planted in high-endophyte fungus pastures to dilute the amount of fescue consumed. Legume interseeding has improved average daily gain of stocker cattle and conception rates in spring-calving cows.

A good mineral program is needed on high-endophyte fungus pastures because there appears to be some absorption problems with phosphorus even though the level in the plant is high. Grass tetany may occur in early spring when tall fescue starts growing. To prevent it, a mineral mixture containing 8 percent magnesium or 12 to 15 percent magnesium oxide is needed during March and April. Magnesium oxide is not palatable, so adding 10 percent soybean meal or dried molasses may be required to ensure proper intake by grazing cattle.

Brahman and Brahman-cross cattle may be more tolerant of the endophyte fungus and heat stress than other breeds of cattle grazing high-endophyte fungus pastures.

Performance of the grazing fescue pasture can be improved by energy supplementation. Dry matter intake is lower on high-endophyte fungus pasture compared with fungus-free pasture, which would make energy even more limited. Supplementation with 4 to 5 pounds of grain may be necessary to dilute the intake of the endophyte and to help compensate for the energy lost through lower dry matter intake.

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