

Fescue, one of the major forages in many parts of the country, has contributed significantly to the cow-calf industry. However, problems arising from fescue grazing are of growing concern to cattlemen. Here, Dr. Ron Morrow, professor of animal science at the University of Missouri, outlines some of the fescue problems and what can be done to reduce them.

by Dr. Ron Morrow

FESCUE ■ Friend or Foe?

The predominant cultivated grass in the United States, particularly in areas of high numbers of beef cows, is tall fescue. Utilization of fescue has contributed significantly to the expansion of beef cow numbers in states such as Missouri, Arkansas, Kentucky, Tennessee and other states in the "fescue belt." Tall fescue is a cool season grass that is easily established, tolerant to overgrazing and to hot, dry weather and adapted to a wide range of soil types. The grass is highly productive and can be grazed the year round. It is well-suited to use in the fall and winter because of its good growth in September and October and because accumulated fescue increases in quality when the temperature drops below 35 degrees. Approximately 40 million acres of tall fescue are grown in the upper south, mid-west and eastern sections of the country.

Problems exist

In spite of these attributes, tall fescue has its problems. For several years producers have been aware of fescue foot, primarily

observed during the winter when grazing stockpiled growth. The first case was observed in Missouri in 1952. It still can have a high incidence in some herds. Horse enthusiasts have been aware since the early '70s of problems in mares when grazing fescue pastures. These problems range from loss of foals at birth to agalactia (no milk) in the mares.

Also in the early '70s research with beef cattle at the University of Missouri Forage Systems Research Center indicated problems of poor reproduction and low animal gain on fescue pastures when grazed the year-round. Problems were greater on pastures with higher levels of nitrogen fertilization and became worse over the four years of the research. The problem was also greater on spring-calving cows and not nearly as noticeable on fall-calving cows. Follow-up research showed improved reproduction when cows were fed small amounts of grain during late winter and early spring.

Summer slump

In the late '70s researchers in Georgia observed a high occurrence of fungal endophyte (*Epichloe typhina*-recently reclassified *Acremonium coenophialum*) in pastures where cattle showed symptoms of fescue toxicosis (summer slump). The summer

slump syndrome has been used to describe cattle during the summer months grazing fescue pastures and showing a general unthrifty appearance and low performance. In recent years animals have shown more than the sub-clinical signs of fescue toxicity. Clinical signs are easily recognized by a beef producer and are seen after animals have been on fescue pastures for several weeks, depending on the temperature and humidity. These symptoms are as follows:

■ **Rough hair coat**—Cattle can be seen in mid-summer that have not shed off. This can vary considerably and is influenced to some degree by breed. In addition, the hair coat may vary in color from normal. For example, a black animal might have a reddish tinge to the hair and a red animal a dark tinge. This would be most noticeable on the extremities of the body.

■ **Fast respiration rate**—On hot, humid days the breathing rate of an animal is increased considerably. This can be seen even after the cooler part of the day is reached.

■ **Lying in mud or standing in water**—Cattle have been observed to stand in creeks, ponds or ditches with water in them beginning in early morning and into late evening. This alone would decrease performance just by cutting down on grazing time. If water to stand in is not available, animals tend to gather around waterers or in shade and a mudhole is formed, primarily through urination of the cattle. Cattle having symptoms of summer slump then will usually have mud caked on various parts of the body.

■ **Excessive salivation**—Cattle grazing infected pastures will show varying degrees of salivation. During the hot part of the day they will be standing with a droopy appearance and strings of saliva hanging from their mouths.

■ **Elevated body temperature**—Most reports indicate cattle will have a temperature of 1 to 2 degrees higher than normal. Several of the symptoms shown are from efforts to dissipate heat from the body. In extreme cases capillary destruction has occurred in the extremities of the body and blood circulation in those areas is impaired. In the summer of 1980 this contributed to the deaths of animals with severe fescue toxicosis.

Those symptoms are variable, depending on how long cattle have been on fescue pastures infected with the fungus. Cattle that graze these pastures (and fed hay from these pastures) year-round show increased clinical symptoms, indicating the effects are accumulative.

Causative agent

Most researchers now agree that the endophyte fungus is the causative agent of the summer slump in beef cattle grazing Kentucky 31 tall fescue. According to sampling surveys it is also anticipated that 80 to 90 percent of these pastures carry at least a 50 percent infection of the fungus. Recent research at the University of Missouri shows that the higher the percentage of plants infected, the lower the performance of cattle. It is not known how low a rate of infection is considered to be "safe" but decreased performance has been seen on pastures with 20 to 25 percent of the plants infected.

The fungus is apparently carried in the fescue seed. Evidence indicates storage of

the seed for a time to exceed one year will cut down the rate of infection when making new plantings. The infected fescue in a pasture should be destroyed either by cropping for a couple of years or by the use of chemicals. Several of the new varieties of fescue are relatively free of the fungus (Missouri 96, Kenhy, Forager, Johnstone).

Management can help

Very little is known as to what causes these symptoms so management designed to alleviate the stress is based more on conjecture and observation rather than hard research facts. Listed below are suggestions to consider:

■ **Avoid heavy nitrogen fertilization**—It is not known whether nitrogen compounds the problem through some direct effect or by encouraging more plant growth and therefore possibly making the plant more toxic. At any rate, cattle grazing fescue pastures fertilized with nitrogen tend to show more severe symptoms.

■ **Add a legume to fescue pastures**—Some research has shown fewer problems and improved performance by adding a legume. In other cases clinical symptoms were observed even with clover in a pasture. Use of a legume is good pasture management, irrespective of the fungal problem.

■ **Graze pastures short**—Good management of fescue pastures has always been to graze short (2 to 4 inches) and rotate pastures. Quality of the pasture is best at the height of 2 to 6 inches. Some people feel that because of the location of the fungus in the plant (see figure 1.) that keeping the fescue grazed short will decrease the problem with the fungus and also insure better quality forage.

■ **Do not graze infected pastures year round**—Since it appears effects are ac-

cumulative, putting cattle on noninfected pastures or other forages may help decrease the toxicity.

■ **Graze infected pastures at times of year when stress is less**—The clinical symptoms of summer slump are only observed during the hot, humid times of the year. Infected pastures can be used for grazing in early spring or summer, or for hay production. It is not known at this time the effects of feeding this hay have during the winter. If fed during the summer, hay from infected pastures will cause summer slump.

■ **Use other types of fescue or other forages**—Several new varieties of fescue, as mentioned earlier, are free of the fungus. These are improved varieties and give good performance. It should be stated, though, that Kentucky 31 fescue which is not infected with the fungus also gives good per-

formance. If new seedings are made with Kentucky 31, it would be desirable to check the seed for infection or store it for a safe time period prior to planting. Other forages should be considered by progressive producers but they should recognize these forages require more management than fescue.

■ **Do not let cattle graze seed heads**—Clipping pastures where growth has accumulated is a good management procedure. Producers have usually done this anyway to cut down on the incidence of pinkeye.

■ **Have a good mineral supplementation program**—The area of beef cattle nutrition most lacking is mineral supplementation. Very little is known about mineral requirements of cattle on forages. Several minerals are being mentioned in relation to the fungal problem, but no research is available. Some people feel the animal on infected pastures has decreased rumen activity. Therefore, any supplemental feeding program to help stimulate the rumen would be helpful. A mineral supplement with good consumption could be useful.

Solutions must be practical

Fescue can be a useful forage in beef cattle programs. The ultimate solution to the fungal problem in Kentucky 31 is to destroy the plants and start over. This is not a practical solution to most operators. Suggestions presented in this article are intended to help a producer live with the situation until he can gradually make changes.

Most states in the fescue belt now have testing services to determine if a pasture is infected and the rate of infection. Knowing this can help you manage the pastures more effectively. Your extension office should be able to assist you in this procedure. A sample can consist of seed or plants. If sampling plants, they should be relatively mature.

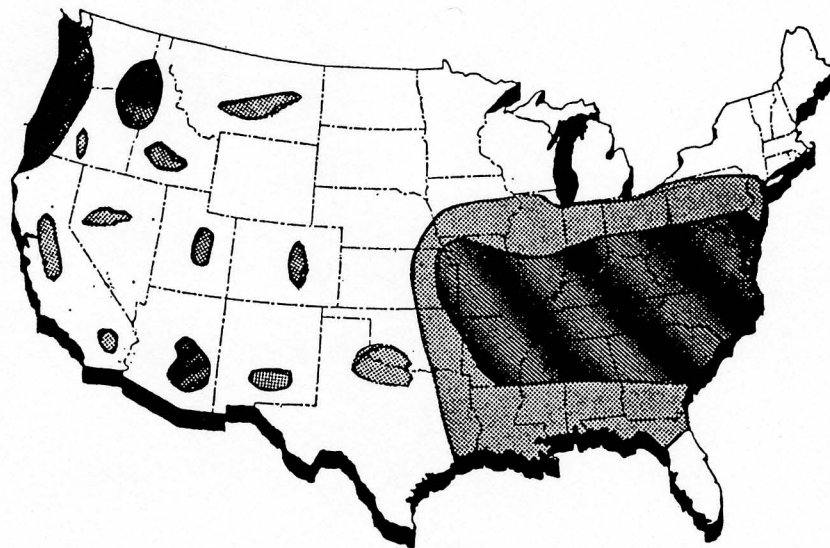


Figure 2. Tall Fescue Producing Areas of the United States

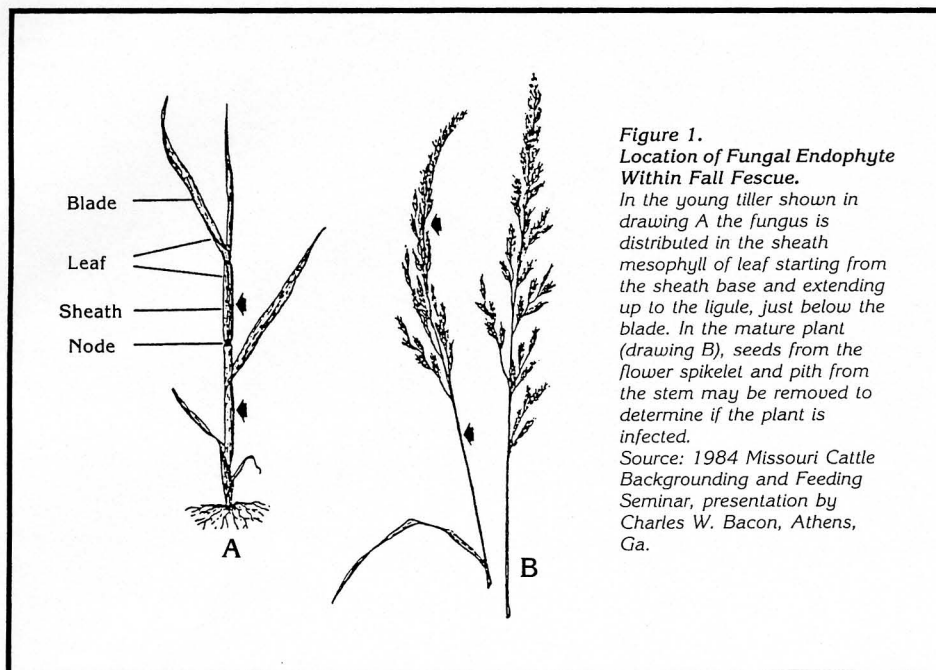


Figure 1. Location of Fungal Endophyte Within Tall Fescue.

In the young tiller shown in drawing A the fungus is distributed in the sheath mesophyll of leaf starting from the sheath base and extending up to the ligule, just below the blade. In the mature plant (drawing B), seeds from the lower spikelet and pith from the stem may be removed to determine if the plant is infected.

Source: 1984 Missouri Cattle Backgrounding and Feeding Seminar, presentation by Charles W. Bacon, Athens, Ga.