

Managing Fescue for Horses

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Introduction

Tall fescue is one of the most abundant cool-season grasses in the Southeastern United States, including Arkansas. Presently, there are an estimated 35 million acres dedicated to fescue production in the United States. Tall fescue (*Festuca arundinacea*) is a perennial grass used to provide nutrition for livestock and turf for heavy traffic areas and for erosion control. Fescue, as it is commonly referred to, became popular with the release of the variety “Kentucky 31” in 1943.

Fescue has several characteristics which make it an excellent forage for a horse grazing management system. Fescue is a hardy grass that is easily established, tolerates close grazing, stands up to heavy horse traffic, survives drought condition and is resistant to weeds, insects and diseases. In addition, it is a good yielding grass that tolerates a wide range of management systems.

Unfortunately, fescue is not without its shortcomings. Cattle grazing fescue often develop a chronic, unthrifty condition, especially apparent during the summer months. In addition, some cattle occasionally develop lameness and lose portions of their feet and tails during fall and winter. Some mares grazing fescue have reproductive problems during the last trimester of pregnancy.

In the mid-1970s, USDA scientists discovered an endophytic fungus that infects the fescue plant. The

endophyte was associated with poor gains in beef cattle, and replicated research at Auburn University subsequently confirmed the initial findings. “Endo” (within) plus “phyte” (plant) means a plant that lives within another plant. In this case, the host is the fescue plant and the endophyte is a fungus (originally identified as *Epichloe typhina*, later renamed *Acremonium coenophialum*). New technology allowed scientists to study the DNA composition of the endophyte. As a result of the new studies, the name has changed once again to *Neotyphodium coenophialum*.

Two characteristics of the endophyte have great practical importance. First, the organism does not affect either the growth or the appearance of the grass, and it requires a laboratory analysis to detect its presence. Second, it is seed transmitted and apparently not transmitted in any other way. Ergot alkaloids, produced by *Neotyphodium coenophialum* infected fescue, have been implicated as the source of adverse physiological effects in cattle and horses. Although endophyte-related problems may be observed in all classes of horses, the most pronounced problems are seen in pregnant mares.

Pregnant Mares

Pregnant mares grazing endophyte-infected fescue may be subject to several problems. Abortions may occur during late pregnancy, or stillborn foals may result at the expected time of parturition. Mares

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may carry their foals for 30 to 40 days longer than normal, resulting in a difficult birth due to the increased size of the foal. Foal deaths may increase due to difficult birth associated with increased foal size. Thickened placentas and/or retained placentas are common for mares grazing endophyte-infected fescue. This may cause excessive hemorrhaging, resulting in mare death. Uterine infections may increase, thus causing a delay in rebreeding. If these are not problems enough, mares on fescue may have reduced milk production or no milk at all. Colostrum production may be decreased or nonexistent.

The mechanism that causes the reproductive problems in mares is not exactly known; however, it is known that the ergot alkaloids produced by *N. coenophialum* act as dopamine, a neuroactive chemical. Excess dopamine suppresses the production of the reproductive hormone prolactin. Prolactin is essential to the final stages of pregnancy and birth. Another factor contributing to prolonged gestation is suppression of the hormone progesterone. Progesterone levels should increase about two weeks before parturition, but mares exposed to endophyte-infected fescue have reduced progesterone levels.

Growing Horses

A grazing study conducted at Auburn University used yearling geldings and fillies to determine if grazing endophyte-infected tall fescue had an adverse effect on the growth and development of young horses. Yearlings were compared grazing either high (> 75%) or low (< 25%) endophyte-infected fescue. Average daily gain, change in wither height and rectal temperature were measured. Average daily gain was lower for yearling horses grazing the highly infected fescue, but no significant differences were measured for change in wither height or rectal temperature. This research indicates that growing horses grazing fescue with high endophyte levels may suffer decreases in weight gain. Long bone growth is not adversely affected, however. The higher weight gains of horses on pastures having low infection levels further suggests that diets composed solely of high quality tall fescue forage can provide acceptable weight gains for yearling horses.

A similar study was conducted at the University of Georgia. In the Georgia study, the yearling ration consisted of a 60:40 concentrate to forage diet that contained either infected or non-infected tall fescue hay. Results indicated no differences in the average daily gain or wither height of the horses on fescue diet compared to the control group that was provided another feed source. It is possible that the grain supplementation adequately diluted the effects of the endophyte-infected hay to safe levels.

Mature Geldings and Mares

It has been observed by many horse owners that mature horses grazing endophyte-infected tall fescue show signs of laminitis or sore feet similar to what has been observed in cattle. Horses normally affected have been exposed to continuous grazing of endophyte-infected fescue and with little or no forced exercise. This condition is more prevalent when the fescue plant is seeding. Since the fescue seed has a more concentrated level of endophyte, horses are probably ingesting a higher concentration of endophyte alkaloids. Little is known about the actual physiological effects the endophyte may have on this condition other than the ergot alkaloids have the ability to cause vasoconstriction in the extremities of horses. The reduced blood flow may predispose affected animals to chronic foot and leg disorders.

Other problems may also exist for this class of horses. Prolonged exposure to endophyte-infected hay and forage may have a detrimental effect on mature, inactive geldings' ability to properly digest the infected feed, resulting in a weight loss. A study at Auburn University reveals that continuous grazing of infected fescue may cause an increase in the interval between reproductive cycles, a decrease in conception rates and an increase in early embryonic deaths.

Management Options

Horse owners with established fescue need to assess their situations carefully. The first step in managing fescue toxicity is to know for certain that the pasture is indeed infected and at what level. There are several options on diagnostic tests. For specific sampling procedures, cost and shipping requirements, contact your local county Cooperative Extension office. One sample is needed for each pasture, and the analysis of each sample costs approximately \$20.

Once the level of endophyte infection is known, a producer can select the best option(s) to deal with the problem. There are six options for the horse owner. Options 1 and 2 are specific to the pregnant mare in late gestation, while the other four are designed for other classes of horses to reduce the effects of the endophyte.

1. **Remove pregnant mares from endophyte-infected tall fescue fields 45 to 90 days before foaling.** Removal may be to a drylot area with nutrient requirements met with hay and grain or to a pasture consisting of forage species other than endophyte-infected tall fescue. This option is the most conservative way of avoiding toxicity problems.

2. **Drug therapy.** An experimental drug, Domperidone, has been used at Clemson University to reverse the effects of fescue toxicosis. The drug stimulates normal prolactin and progesterone production, therefore eliminating the problems of agalactia and dystocia. Veterinarians may request the drug from Dr. Dee L. Cross at Clemson University. The cost is about \$75 per mare. Domperidone should be administered daily for the 30 days prior to foaling.

3. **Manage to minimize effect.** Grazing and/or clipping management that keeps fescue plants young and vegetative will result in better animal performance. Remember that the fungus is seedborne but is also found in other plant parts.

4. **Avoid the endophyte.** Use of other forage species for grazing and hay avoids the endophyte.

5. **Dilute the endophyte.** The endophyte or its products (alkaloids) can be diluted through the use of other feeds in the diet. Growing legumes with infected fescue is a good option. You not only get the desired dilution effect but receive an added benefit of improved pasture production and quality.

6. **Kill infected stands and replant.** Due to cost, this may not be an option. However, endophyte-free seed varieties are readily available. The old infected stand and all shattered seed (that may give rise to infected volunteer plants) must be eliminated and the endophyte-free variety planted. Contact your county agent for recommended procedures for eradication.

Summary

Tall fescue is a popular grass in Arkansas because it is capable of withstanding environmental extremes such as drought, flooding, heavy traffic and varying soil types. It is also capable of surviving a variety of management systems, both good and bad. When managed properly, fescue is capable of producing large volumes of high-quality forage for livestock. Some precautions must be considered if the livestock are horses, particularly mares in the last trimester of pregnancy.

There are no easy solutions to the fescue problem for horse owners. Research continues on the effects of fescue toxicity on horses. Hopefully, it will provide more answers. In the interim, evaluate your individual operation and choose the management options that will be most beneficial.

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