

Fescue Fears

By Les Sellnow

Tall fescue grass appeared to be almost a wonder forage when it came into this country from Europe in the 1940's. Farmers and ranchers around the country planted acre after acre in fescue. Today, its lush greenery covers some 35 million acres. Some of the heaviest plantings are east of the Mississippi, but there are fields of fescue in about every state, including the Rocky Mountain region.

There are several reasons to recommend fescue. It's easy to establish, has a high forage yield, can withstand heavy foot traffic from cattle and horses, and can tolerate a wide variety of climatic conditions.

But some time after its introduction, problems began to surface. A number of horse breeders noticed they were having foaling problems with mares grazing on fescue grass or being fed fescue hay. Some foals were born so weak they couldn't stand and nurse.

In a number of cases, the gestation period lasted an additional month and the foal that emerged was exceptionally large, causing birthing problems for the mare. That wasn't all. Many of the mares didn't have milk for their foals. Others aborted. Still others had overly thick placentas and many retained the placenta after birth.

Cattle producers reported that some steers on fescue pastures or being fed fescue hay appeared to be unthrifty, and milk production on lactating dairy and beef cows was reduced.

Scientists attacked the problem with a variety of research projects. In the 1970s Dr. Charles Bacon, a U.S. Department of Agriculture plant pathologist at the Richard Russell Research Center in Athens, Ga., discovered a fungal endophyte that lived in the seed of fescue grass. Its scientific name is *Acremonium coenophialum*. This fungus appeared to be the source of the problems. The fact that it lives within the seed, and not the leaves of the grass, made it extremely difficult to locate.

THE STUDY

Now it was time for research to prove or disprove whether the endophyte fungus really caused the problems being laid at its doorstep. The most definitive study took place at Auburn University in Alabama. The study, launched in the fall of 1986, was funded in part by the American Quarter Horse Association.

The researchers established four pastures of 11 acres each. Two of the pastures were free of endophyte-infected fescue, while the other two had more than 80 percent endophyte infection. The lots were ready in the spring of 1987 for the next step in the study.

Involved in that phase were 22 mares - 6 Thoroughbreds, 8 Quarter Horses, 7 Arabians, and 1 Morgan. The mares were bred on synchronized estrous cycles from June through August of 1987. After pregnancy had been confirmed by palpation, the mares were randomly placed on either infected or

non-infected fescue pasture on Oct. 1, 1987. The mares remained on the assigned pastures, and when grass ran out, the ones on infected pasture were fed infected hay and those on the non-infected pastures were fed non-infected hay.

THE RESULTS

The results of this bit of research were dramatic. Of the 11 mares who had grazed infected fescue pasture and had been fed infected fescue hay, 10 had major foaling problems. In four of the ten mares, the problems were so severe they had to be put down. The infected fescue also severely affected foal survival. Of the 11 foals whose dams were exposed to the fungus, only 1 survived the natal period. Three died soon after birth; one died during delivery; another survived for several hours, but was put down when he didn't respond to routine nursing care; and another lived for 7 days but later suffered from an infection and died. The rest of the foals were stillborn.

In 10 of the 11 mares on infected fescue, there was on evidence of udder development or lactation prior to or after giving birth.

In the group of mares on non-infected fescue, all had normal birthing processes, all produced normal quantities of milk, and all foals survived.

Dr. J.P. Brendenuehl, D.V.M., formerly of Auburn University and now doing research at Tuskegee University in Alabama, later produced research results that demonstrated that infected fescue also had a negative effect on mare fertility and early embryo survival.

He found that mares grazing endophyte-infected fescue pastures have a significant delay in returning to normal cycling during the spring transition.

"The number and size of follicles," he reported, "was significantly lower and smaller in January, February, March, and April in mares grazing infected pastures. The time to first ovulation was likewise significantly delayed, not occurring until May 28, compared to April 15 in mares grazing non-infected fescue. The delay of approximately 43 days represents a loss of over two breeding cycles from the breeding season. Particularly in older or problem mares, this delay could result in a lost year of productivity...Continuous grazing of endophyte-infected fescue during breeding resulted in a 45 percent pregnancy rate at 14 days, compared to 75 percent in mares grazing endophyte-free grass."

At the end of 60 days, Brendenuehl reported, the pregnancy rates evened out.

His research also turned up another disturbing finding. Early embryonic death was observed in 30 percent of the mares grazing endophyte-infected fescue, compared to approximately 10 percent of mares grazing endophyte-free pasture.

A LITTLE GOOD NEWS

About the only good news that surfaces from the research involving pregnant mares grazing infected fescue is that nearly all of the damage is done in the final 30 days of pregnancy. Thus, if the mares are removed from the infected pasture during the final 30 days of pregnancy, there should be few, if any, harmful effects.

For some breeders, however, this may not be practical because of space problems.

For them, there's other good news from the scientific community. Dr. Dee Cross of Clemson University in South Carolina has developed a medication called domperidone that has been able to eliminate the harmful effects of infected fescue, even though the mare continues ingesting it. It must be administered for the last 10 to 15 days prior to foaling.

Before we can understand how the drug works, we must first understand just what happens in the mare's body during those final days of pregnancy if she eats infected fescue grass or hay.

The researchers explain it this way: The body of a pregnant mare produces a biochemical known as dopamine. It occurs naturally throughout the body and affects the functions of glands, organs, muscles, and nerves.

Within the endophyte fungus are substances that, in a sense, imprison the dopamine receptors in the mare's system so they can't function normally. The result is decreased production of both prolactin and progesterone. Prolactin is the hormone that stimulates milk production. Progesterone is the key hormone involved in maintaining a normal pregnancy.

When the substances in the fungus effectively reduce the normal supplies of these two hormones, the mare fails to produce milk and things go awry within her reproductive system. The result can be no milk for the foal and a whole host of birthing problems, such as those discovered in the research at Auburn.

Simply put, the drug developed by Cross—domperidone—doesn't allow the substances within the fungus to imprison dopamine, and the mare's body produces the appropriate amount of both prolactin and progesterone.

Cross said it's extremely rare for the medication to fail if administered as prescribed. In several hundred mares on infected fescue pasture and treated with domperidone, he said, virtually all have had normal deliveries and the foals have been normal.

If the mare is to be left on infected pasture right up to foaling, Cross recommends that treatments begin 15 days prior to the expected foaling date. If the mare is removed from infected pasture, treatment could begin 10 days prior to the expected foaling date. Of course, if the mare doesn't foal on the expected foaling date, domperidone administration should be continued until she does foal.

Each treatment consists of between 4 and 6 cc of domperidone—administered as one would a paste dewormer—depending on the mare's weight. The cost, which can vary somewhat, is about \$7 per treatment. The drug must be obtained through a veterinarian.

WHERE FESCUE GROWS

A matter of concern that arises when discussing infected fescue is just where it might be found geographically. There is no definitive answer, other than that it's widespread in this country. Although infected fescue is generally considered to be a problem in the east-central and southern United States, as well as the Pacific Northwest and California, Cross thinks that it's present in many other states as well. Including the Midwest and Rocky Mountain states.

Cross says he recently traveled across South Dakota, and was surprised at the amount of fescue he observed in pastures throughout the state. Montana, he says, had also become aware of problems with infected fescue.

Unfortunately, he says, lack of awareness in some of these areas has lulled horsemen into a feeling of complacency. Quite simply, they haven't identified fescue-infected or non-infected—that might exist in their pastures.

The only way to determine whether fescue is infected is with a laboratory test. Auburn University offers testing for a \$25 fee (\$15 for Alabama residents). It's available to anyone, no matter where they are located. Send samples to: Auburn University, Fescue Diagnostic Lab, 209 Life Sciences Building Auburn University, AL 36849. Individuals who want to find out which testing lab is closest to them should contact their agricultural extension agent.

One of the basic solutions for the infected fescue problem has been provided by science through development of an endophyte-free seed. It isn't, however, an easy solution. The infected seed is tougher than its non-infected counterpart. In other words, it's difficult to eradicate the infected fescue and replace it with the non-infected variety, though it can be done with effort and good management.

Adding to the eradication problems of infected fescue is the fact that destructive insects seem to feed more voraciously on the non-infected variety than on the infected. Once the non-infected seed is planted, the goal, obviously, is to prevent the later establishment of volunteer infected plants. Fescue experts recommend that any replanted field not be allowed to produce seed during the establishment year. Seedhead formation should be prevented by heavy grazing, clipping, or chemical application.

One of the keys to establishing a growth of non-infected fescue, researchers say, is to pick the right variety of non-infected seed for a given region. University trials in various geographic areas are a good source of information on appropriate variety.

Fescue remains an excellent forage for all animals, providing it isn't infected with the damaging fungus.

However, horsemen, no matter what their geographical location, who are having mysterious foaling problems, would do well to identify the grass their mares are grazing and the hay they're being fed. If it's fescue, it should immediately be checked for presence of the harmful endophyte.