

The Fescue Endophyte Problem— What To Do About It Now And New Solutions In The Future

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Nearly all of the tall fescue pastures in Georgia, and elsewhere in the eastern USA, are infected with fungal endophyte (the fungus lives inside the grass and is not visible) which produces toxic alkaloids. These alkaloids often result in reduced cow pregnancy and low calf weaning weights. Growth rate of young horses is reduced while pregnant mares often fail to produce milk, abort the foal, and sometimes die. With such potential problems, one wonders why we grow so much tall fescue. The truth is that tall fescue is a splendid pasture and hay plant, growing over much of the year in cooler areas, competing well with other grasses, is highly productive when fertilized, and tolerant of drought and grazing. The desire for a dependable perennial cool season grass in the Coastal Plain area resulted in the development of a very hardy endophyte-infected variety, 'Georgia 5', which can be planted alone or in bermudagrass and bahiagrass sods to provide winter maintenance for beef cows.

Realistically, a beef cow-calf producer should work toward a goal of 95% pregnancy rate for the herd and 500 pound calf weaning weights. Comparing this with present production output, it should be possible to determine what changes can be made in the forage program to meet the new goals. In too many herds, pregnancy rates and weaning weights are much lower and fescue toxicosis may be a major cause.

Dealing with the fescue endophyte problem now

The answer to the endophyte problem is relatively simple for livestock producers with valuable animals or those especially sensitive such as horses, growing beef steers, purebred beef

breeding stock, and lactating dairy cattle—**DON'T USE ENDOPHYTE-INFECTED TALL FESCUE PASTURE OR HAY!** The potential for losses is too great to take chances with infected tall fescue. Infected tall fescue fields should be killed either by tillage and cropping or herbicide, then replanted to endophyte-free tall fescue, preferably the new Jesup variety developed by Dr. Joe Bouton at the University of Georgia. This variety is more tolerant of drought and close grazing than other endophyte-free varieties but not as tough as infected tall fescue. Seed of Jesup will be available in quantity for planting in autumn 1998.

Beef cow-calf producers are understandably reluctant to destroy existing pastures of infected tall fescue and spend the money to replant with an endophyte-free variety although it would generally improve animal productivity and pay for itself. If replanting is done, avoid close continuous grazing of endophyte-free tall fescue in summer. When this is done, stands and productivity will be excellent for many years as shown by our research at the Central Georgia Station near Eatonton. Some endophyte-free tall fescue pastures at the station are eight years old and in good condition.

What are the other options that a beef cow-calf producer has to reduce fescue toxicity problems?

(1) The cheapest and easiest thing is to do nothing and accept losses in animal production.

(2) Feed hay other than infected tall fescue in winter. Bermudagrass, orchardgrass, endophyte-free tall fescue, or sericea lespedeza are excellent hay choices.

(3) Don't overfertilize infected tall fescue pastures with broiler litter as high rates of nitrogen increases toxicity symptoms. Dumping 5 to 6 tons/acre of

litter on an infected pasture may be a way to get rid of unwanted waste but it can be costly in terms of animal toxicity problems.

(4) Dilution of toxic tall fescue pasture by planting a legume. No-till planting of red and white clovers during late autumn or winter in infected tall fescue sod is a cheap and helpful way to reduce the toxicity problem in northern and central Georgia. Puna chicory, a long-season productive perennial forb also appears promising for no-till planting in tall fescue to reduce toxicity. No-till planting of Marion annual lespedeza (naturally reseeding) in late winter can supply some high-quality grazing in summer to reduce toxicity.

In the Coastal Plain area where infected Georgia 5 tall fescue is grown with bahiagrass and bermudagrass, no-till planting of crimson clover will help reduce any toxicity problems. However, the presence of warm season grass residue will also help reduce toxicity.

(5) Dilution of toxic tall fescue pasture with other grasses. In the lower Piedmont area, most tall fescue pastures generally contain substantial amounts of bermudagrass which can offset much of the toxicity problem. Further north, bermudagrass will be less aggressive and may need some nitrogen fertilization in early summer to stimulate growth. In areas where orchardgrass survives well, planting this grass in infected tall fescue can dilute much of the problem. Annual ryegrass can also help alleviate the problem during spring.

(6) Provide small creep grazing pastures of a high-quality grass such as pearl millet or a legume such as Alfagraze or Amerigraze 702 alfalfa for calves adjacent to endophyte-infected tall fescue cow pastures. Calf weaning weights should be substantially improved.

(Continued on page 14)

New solutions for the future

Beef cattle **annual** losses from fescue toxicity are conservatively estimated at \$354 million in reduced calf numbers and \$255 million in reduced weaning weights in the USA. The importance of this problem has stimulated a great deal of research in the USA and also in New Zealand. Progress has been made with some potential solutions in sight.

(1) In the past, determining infection levels in the pasture by microscopic examination of plants were time-consuming and costly. A new rapid and reliable method with monoclonal antibodies for immunochemical detection has been developed at the University of Georgia and is commercially available. This method should only be used by diagnostic laboratories as specialized equipment is required. This should assist livestock producers in assessing the endophyte-infection status of their pastures.

(2) Development of endophyte-free tall fescues that are more drought and grazing-tolerant is progressing well. Jesup is a major improvement in getting a tougher endophyte-free variety but further progress is being made developing varieties that are productive and long-lived in pastures.

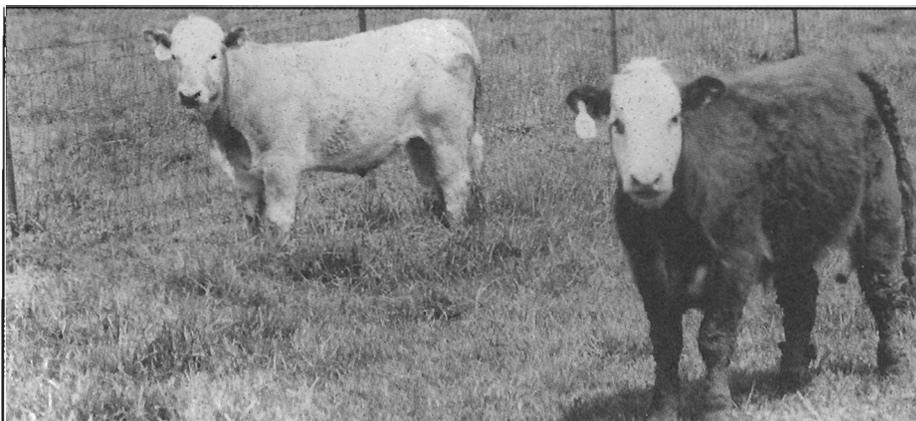
(3) It has been found that the fungal endophyte is beneficial to the tall fescue plant in bestowing greater tolerance to drought and pests while unfortunately producing alkaloids that are toxic to grazing animals. Two research

approaches are being used at the University of Georgia to reduce the toxicity of endophyte-infected tall fescue. One strategy is to breed endophyte-infected populations of tall fescue for low toxicity, an approach that has made significant progress. The second is to use fungal endophytes that do not produce the toxic alkaloids and insert these non-toxic endophytes into endophyte-free tall fescue. This results in an endophyte-infected tall fescue which is nontoxic to animals but should give the same benefits to the plant. The new infected nontoxic tall fescue variety should be as tolerant of drought and overgrazing as the old endophyte-infected Kentucky 31 tall fescue. This is currently being tested in the field under grazing. If it proves out, then these non-toxic endophytes can be inserted into any tall fescue variety. It opens up the possibility of eventually

having a non-toxic tall fescue variety that would survive well and be productive in any stressful environment, thus greatly extending the range of this valuable cool season perennial grass and reducing the amount of hay fed in winter.

Summary

Tall fescue is the best adapted cool season perennial grass we have in the southeastern USA. Unfortunately, the fescue toxicosis problem is a serious livestock problem and causes significant economic losses. However, there are pasture management strategies available today that can help reduce these losses. Current research programs are making excellent progress and all indications point to genuine solutions that will make this grass even more useful to livestock producers in the future.



Beef steers in late May on infected tall fescue pasture. Steers have typical fescue toxicosis symptoms of heavy unshed hair coat, thin condition, and muddy legs from standing in wet areas because of heat stress.



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SCRIPTURE OF THE MONTH

I am the Lord, and there is none else, there is no God beside me: I girded thee, though thou hast not known me:

ISAIAH 45:5

**RICK TORRANCE
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