Fall and Winter Management of Toxic Tall Fescue

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Language describing tall fescue (TF) can be confusing. “Endophyte-free” means the plant does not contain a fungus – an endophyte – which is responsible for TF toxicosis problems following grazing. TF toxicosis is generally responsible for fescue foot, loss of tail switch, rough hair coat and reduced animal performance.

In contrast, TF infected with a “novel” endophyte does not produce toxins that cause fescue toxicosis, but retains the qualities desired for a productive crop. Examples of novel-endophyte-infected TF varieties include Jesup MaxQ™, BarOptima PLUS E34™ and Texoma MaxQ II™.

Lastly, wild-type, endophyte-infected TF contains a toxic endophyte which is responsible for TF toxicosis. The most common toxic TF is Kentucky 31 (Ky 31+), though other varieties can also be toxic. Of the 35 million acres of TF in the U.S., the majority are toxic. If you have TF and you know that it is not a novel or endophyte-free variety, chances are good that you are dealing with toxic TF and may experience fescue toxicosis problems.

The Noble Foundation recently undertook a study that may shed some light on management strategies for dealing with toxic TF during fall and winter. Ergovaline is an alkaloid produced by toxic endophytes and has been implicated in TF toxicosis. Our study measured amounts of ergovaline contained in toxic Ky 31+ through fall and winter. We also measured the impact of various applied nitrogen fertilizer rates on ergovaline levels in toxic Ky 31+.

Our study started in September with application of four nitrogen rates of 0, 60, 120 and 180 lbs/ac. Harvest began in November and continued monthly to May. Tillers were collected at each harvest from each nitrogen treatment and submitted for ergovaline analysis. The results from the first year of the three-year study are seen in Figure 1. The remaining years are still being analyzed, but first year results follow a pattern seen by other researchers (Kallenbach, et al., 2003). Ergovaline levels are given in parts per billion (ppb). The dashed red line is an ergovaline threshold level of 150 ppb. It has been suggested that beyond this level of ergovaline, TF toxicosis problems can occur during winter (Stamm, et al., 1994).

With application of nitrogen, ergovaline levels are above the 150 ppb threshold in November, but drop to around 150 ppb by January. A possible management strategy to avoid high levels of ergovaline would be to apply nitrogen in late summer to push production and delay grazing to January, allowing ergovaline levels to drop. Forages such as stockpiled bermudagrass or native grasses could be used prior to turning grazing cattle out on TF. This strategy may help reduce potential TF toxicosis problems during winter.

Figure 1. Monthly Ky 31+ ergovaline concentrations

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Looking again at Figure 1, ergovaline levels rise with the onset of spring growth in April. If cattle can be moved to forages other than TF at this point, toxicosis potential may be reduced. If you have excess spring growth of TF, consider putting it up as hay. Ergovaline levels have been shown to drop during the hay curing process.

If grazing cattle on TF can't be avoided during times when ergovaline levels may be high, there are other ways to deal with fescue toxicosis. One is to replace toxic-endophyte-infected TF with a novel endophyte TF. Another method is to dilute the toxic effect. There are three ways to do that: first, add a legume to the TF stand so that cattle have something to consume other than TF; second, feed a concentrate while cattle are on TF; and, third, feed hay other than TF.
