

Strategies to Mitigate Tall Fescue Toxicosis

Conservation Innovation Grant Project Fact Sheet



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Alkaloid Levels - Season Plant Part and Fertility

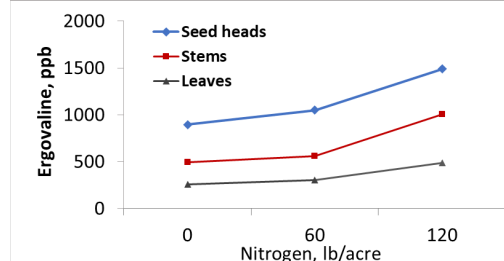
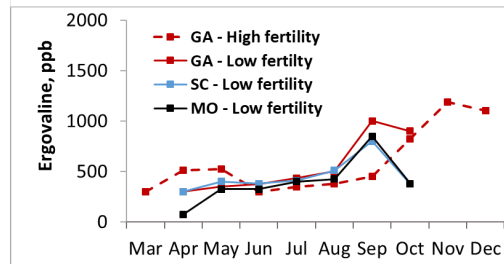
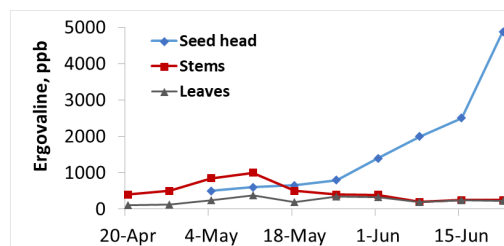
The fungus that makes fescue alkaloids relies on the host plant for nutrients. Alkaloid levels vary by season, plant part and management (Figure 1).

- Alkaloid concentrations are greatest during spring and fall, when environmental conditions support plant growth.
- Seedhead suppression (by grazing, mowing or chemical treatment) is an important strategy for reducing alkaloid intake.
- In vegetative tissues, alkaloids are highest in stems. Avoid close grazing, especially after spring.
- Apply nitrogen (N) sparingly to pasture. Fertilizers that support rapid growth increase alkaloid levels. Also, response to N in healthy pastures with legumes may not be economical.

Diversify Forage Species and Pastures and Manage Accordingly

Adding diversity to pastures (e.g., by overseeding fescue with legumes) or adding other species (e.g., native warm-season grasses

Figure 1. Alkaloid by plant part and season (top and middle; from Rottinghaus et al., 1991) and N input (bottom; adapted from Belesky et al., 1988, and Rogers et al., 2011.)



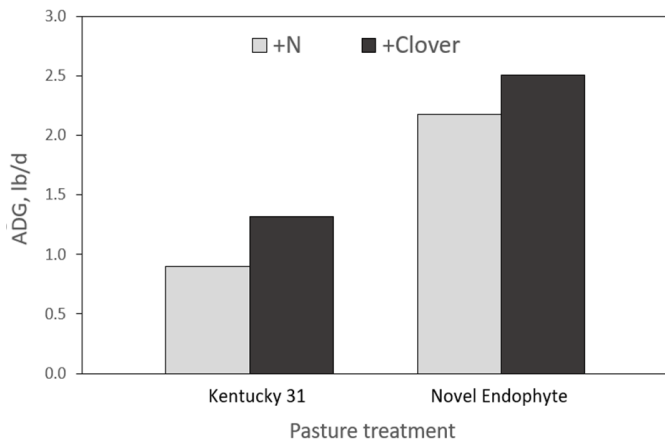
FESCUE TOXICOSIS

Traditional fescue varieties (especially KY31) contain a fungus (or “endophyte”) that helps the plants survive. However, the fungus also produces toxic alkaloids that stress livestock. Alkaloids constrict blood vessels, reducing blood flow to skin and extremities. Toxicosis symptoms and behaviors include:

- Long, rough, faded hair coats
- Heat stress (panting)
- Limping (and hoof loss in severe cases)
- Missing ear tips and tail switches (from frostbite)
- Reduced milk production
- Lower reproductive success
- Lower weaning weights
- Cooling in streams and surface waters
- Reduced water quality

and summer annuals) to the farm can improve nutrition and reduce alkaloid intake, increasing animal performance.

- Adding clovers benefits nutrition and intake and may partly offset the effects of fescue alkaloids but doesn't eliminate fescue toxicity (Figure 2).



- Figure 2. Adding white clover to fescue pastures increases animal gains, but this improvement is about the same on toxic and non-toxic pastures (from Beck et al., 2012).
- Strategically overseed fields where endophyte or alkaloid levels are highest on the farm.
- Provide regular (monthly) exposure to toxic fescue. Sudden exposure to toxic fescue after prolonged (>40 day) withdrawal can be detrimental to livestock.

Stockpile, Stockpile, Stockpile

Stockpiled fescue is a profitable way to feed cattle. Compared with hay, it is far cheaper and it provides better nutrition. It also has low alkaloids because they decline from late fall into winter with hard freeze events (Figure 3).

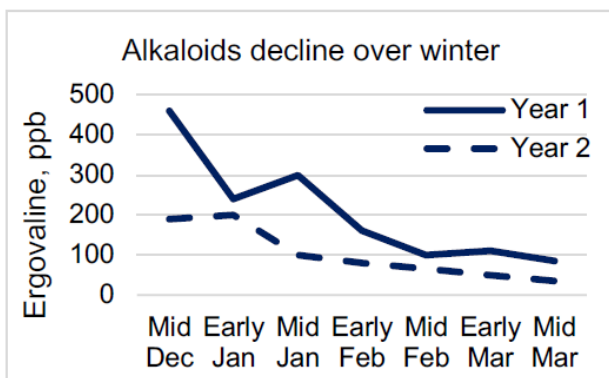


Figure 3. Fescue alkaloids decline over winter (adapted from Kallenbach et al., 2003).

Make Hay – Not Baleage

For conserved forage, it will be best to make hay rather than baleage (Figure 4). Fescue alkaloids

degrade during the hay curing process but ensiling fescue preserves alkaloids.

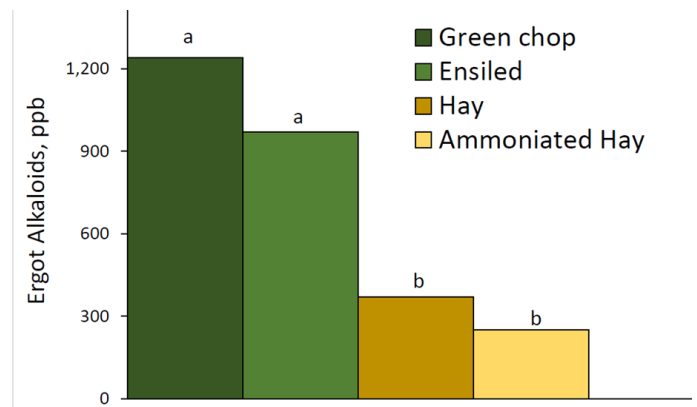


Figure 4. Alkaloids in ensiled fescue can be nearly as high as in fresh forage. More degradation occurs during hay curing (from Roberts et al., 2002).

- Making hay, particularly on the most toxic pastures, is the best conservation strategy.
- Make hay in the boot stage, before alkaloids go up into seed heads. This also makes better hay in terms of nutritional quality.

Animal Management

Several strategies can improve animal performance. Fall calving can increase reproductive success. Select animals with slick coats or lower obvious symptoms of heat stress. Put cows on non-toxic pastures during calving and breeding to reduce exposure to toxins during these critical periods.

SUMMARY POINTS

- Conditions that support fescue growth support higher alkaloid concentrations
- Graze fescue in a vegetative stage; prevent seedhead development but don't overgraze
- Incorporate legumes into fescue and alternative pasture species to the whole farm
- Fertilize sparingly with nitrogen
- Use fields dominated by toxic fescue for stockpiling and hay making
- Harvest fescue in the boot stage and conserve as hay
- Convert from spring to fall calving to improve reproductive performance
- Manage the herd by selecting tolerant cattle and reducing exposure to alkaloids

