United States Department of Agriculture

NRCS Natural Resources Conservation Service

Grazing Technical Note 2

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Possible Forage Anti-Quality Factors

Forage Quality Issues

While most forages are suitable for grazing, some have negative side effects on animals. Negative issues are referred to as "anti-quality factors". These factors may be associated with certain species and may only be present at certain growth stages of the plant.

Alkaloids. Anti-quality factors associated with alkaloids are found in some perennial ryegrass, tall fescue and reed canarygrass.

Perennial ryegrass can cause "staggers" when it is the dominant species. Staggers is caused by indole diterpene alkaloid from ryegrasses infected with an endophyte fungus. It can affect all grazing livestock, but seems to be more of an issue with llamas and alpacas. To minimize staggers, use perennial ryegrass varieties with little or no endophyte infection.

Fescue alkaloids may decrease palatability and intake and can cause decreased milk production, poor growth, mild fever, and foot-rot problems. Low-endophyte and endophyte-friendly varieties are available and should be considered over endophyte-infected varieties to help improve animal performance and production. Dilution, especially with 30-40% legumes in the stand, can reduce the toxicity effects. Using fescue as stockpiled winter forage can also be a viable option to reduce the side effects. The ergo-valine, which is the alkaloid associated with tall fescue, is generally higher when the plant is under stress.

Many old **reed canarygrass** stands have high concentrations of indole alkaloids (above 0.2% by dry weight), and should not be prescribed for sheep grazing. All livestock should be conditioned to graze it by giving them access for short amounts of time or in small quantities and gradually increasing access.

Reed canarygrass should not be allowed to go to seed in order to eliminate the risk of spread. Evaluate any hay that might have mature **reed canarygrass** as a component and avoid feeding this hay within close proximity of any water bodies, wetlands, or floodplains to eliminate the chance of seed moving via watercourses.

Endophyte-infected **tall fescue** and high alkaloid **reed canarygrass** pastures should not be prescribed for grazing brood mares, especially the last 60 days before foaling. Test all tall fescue-dominated pastures for level of infection as warranted. Diversity of forages and addition of legumes will reduce severity.

Poisonous plants should be scouted for and removed if found at levels that would cause illness or death. Consult your local extension educator with assistance in identification and control. Poisonous plant problems increase as desirable plants become limited as in a drought or sometimes winter. The primary problem plants in Indiana include; **poison hemlock**, **white snakeroot**, **water hemlock**, **buttercups**, **jimsonweed**, **pokeberry**, all **nightshades** (such as Carolina horsenettle), and **cocklebur**.

Many common landscape plants are also very poisonous to livestock such as all **yews**. Trees can also cause problems

such as the wilted stage of **wild cherry** leaves.

Ruminants will avoid toxic or low quality plants when possible and have adapted to limited amounts of most toxins. Being able to selectively graze or browse is the herbivore's first line of defense against the negative effects of plants with toxic or anti-quality attributes.

Grass tetany is a serious problem and in most cases indicates an insufficiency of magnesium. Where grass tetany is a problem, pastures should be fertilized to produce forage with at least 0.2 percent magnesium, or ruminants should be fed a magnesium supplement.

Cyanogenic forages (**sorghum**, **sudangrass**, **sorghum-sudangrass**, volunteer **johnsongrass**, and **white clover**) should not be grazed when hydrogen cyanide content of the forage dry matter exceeds 200 ppm (drought or frosted or stressed plants). For sudangrass or sudangrass-sorghum hybrids, defer grazing until plants are 18 inches tall and not under stress.

Early in the growing season when crude protein and digestible organic matter are excessively high in all forages, the addition of fiber may be needed to better utilize and absorb nutrients and balance the rumen. This can be accomplished by leaving stockpiled forage over winter or providing hay.

If ruminants are grazing "bloat-causing legumes" (**alfalfa**, and **red and white clovers**) then do so only under one or more of the following conditions:

1. Pure Legume Stands or Grass Legume stands with > 40% bloating legumes.
    - Provide poloxalene free choice prior to first time on pasture each season and as needed – best mixed with mineral.
    - Feed dry hay prior to first time on pasture each season.
    - Allow livestock to graze only when water from dew, rain, or irrigation has evaporated from foliage and dry hay is available free choice.
2. Grass-Legume Stands – When the legume makes up no more than 40 percent of the available pasture forage, check animals frequently and when beginning to graze new paddocks

Alsike clover and **switchgrass** should not be used for horses because it can increase photosensitivity.

Healthy animals can better handle minor anti-quality factors. Sufficient access to diverse forages, water, and shade may help.

Shade should be considered on days where relative humidity levels exceed 75 percent and air temperatures exceed 85°F of ambient air temperature. Livestock may need access to natural or artificial shade during these periods where sufficient cooling is not occurring at night (generally when there is less than 10 degrees difference between night and daytime temperatures).

REFERENCES

Management-Intensive Grazing in Indiana, Purdue Publication AY-328
http://www.extension.purdue.edu/extmedia/AY/ay-328.pdf

Poisonous Plants for Livestock and Pets; Purdue Extension Publication WS-9
http://vet.vet.purdue.edu/toxic/cover1.htm

Anti-Quality Factors in Rangeland and Pastureland Forages, NRCS 7/01