

Column Name – The Heartland Minute

By: Ben Sims

K-State Research and Extension Greenwood County

Agriculture Extension Agent

*“Tis the Season: Nitrate Toxicity & Prussic Acid Poisoning”*

With the severe drought in southeast Kansas this year, there are certain forage diseases farmers and ranchers need to keep in mind that could be deadly to our cattle. Two such diseases are nitrate toxicity and prussic acid poisoning. Deadly levels of nitrates and prussic acid can accumulate in forages such as corn, sorghum, canola, cereal grains, sudangrass, sorghum-sudangrass crosses, and other related species. It is important for producers to understand the signs and symptoms of these two deathly diseases and what can be done to prevent them.

**Prussic Acid Poisoning (PAP):** Prussic acid is also known as hydrocyanic acid or hydrogen cyanide. Animals ingesting plants that can produce excess cyanide is what causes prussic acid poisoning. Plants associated with this are sorghums, sudangrass, sorghum-sudangrass, and other related species such as Johnsongrass. Other varieties include indiangrass, flax, choke-cherry, black cherry, elderberry, and some varieties of white clover and birdsfoot trefoil. The plant containing the highest concentrations is typically grain sorghum. Toxic levels are highest in young plants, new regrowth, and following rapid regrowth after a period of stunted growth. Rapid regrowth is in plants following a rain in a drought stricken time or a frost or freeze. Appropriate management of these forages is essential. Plants grown in soils that are high in nitrogen and low in phosphorus and potassium tend to have higher cyanide concentration. Forages injured by herbicide application can also increase cyanide concentration. Grazing should be delayed until minimum plant heights are reached or until stressed plants have had time to recover. In addition, properly ensiling or conditioning and drying of hay can reduce prussic acid levels. Hungry or stressed animals should not be released to graze on susceptible plants. PAP has a rapid onset and will often kill animals in minutes. Symptoms include increased pulse rate and respiration, excessive salivation and foaming at the mouth, blue coloration of the lining of the mouth, difficult breathing, staggering, convulsions, and collapse. Blood from animals will be bright red. Effective treatment can be difficult as the disease kills so quickly, so it is important to manage susceptible plants effectively.

**Nitrate Toxicity:** The potential for high nitrates is also seen in stressed plants such as corn, sorghum, canola, cereal grains, and some grasses. Plants most prone to have higher levels are forage and grain sorghum, sudangrass, hybrid sorghum-sudan, and pearl millet. Nitrates will accumulate in the lower portion of these plants when stressed below typical yields based on the supplied nitrogen fertility level. Young plants have the highest concentrations which will decrease with maturity. Animals that are under physiological stress such as being sick, hungry, lactating or pregnant, are more susceptible to nitrate toxicity. Symptoms may occur within a few hours or several days. These symptoms, in higher concentration situations, include reduce appetite, weight loss, diarrhea, and runny eyes. Lower nitrate levels can cause abortion with no

other symptoms. In addition, animals affected will have dark brown blood. Forages that fall under the conditions to raise nitrate levels should be tested before being offered to livestock. Forages high in nitrates can be fed if proper precautions are taken.

For more information on prussic acid poisoning and nitrate toxicity, please contact the Greenwood County Extension office. We are ready and willing to accept your forage samples to send off for testing.

For more information regarding Agriculture and Natural Resources, 4-H Youth Development, or K-State Research and Extension call the office at 620-583-7455, email me, Ben Sims, at [benjam63@ksu.edu](mailto:benjam63@ksu.edu), or stop by the office which is located inside the courthouse. Be sure to follow K-State Research and Extension- Greenwood County on Facebook for the most up-to-date information on Extension education programs and the Greenwood County 4-H program.