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Avoiding Prussic Acid Poisoning While Grazing

Writing this article on Halloween, there is no doubt to be some scary ghosts and goblins going door to door tonight looking for treats. While this is a fun tradition for many families, what truly can be scary at this time of year is Prussic Acid Poisoning in grazing livestock. Having experienced frosty mornings and the pending hard freezes, this is a question that has been a popular one in the office. Two University of Nebraska Specialist composed a good article on this topic, discussing the quick testing method, so credit goes to Mary Drewnoski and Daren Redfearn for the base of this article this week.

Annual forages like sorghum, sorghum x -sudangrass, and sudangrass can accumulate nitrates, which should be evaluated before grazing. However, another potential risk is prussic acid poisoning (hydrogen cyanide), which can be lethal if ingested. Forage sorghum and grain sorghum (milo) pose the greatest risk, with sorghum x -sudangrass having a reduced risk, but still a concern. Other plants in the sorghum family like Johnsongrass can pose a problem and not be thought about. Volunteer corn is another common question but is considered low risk and nitrates are often more a concern.

Prussic acid poisoning can occur in certain scenarios, such as new growth or following a frost. If these plants are fertilized with high rates of nitrogen fertilizers, the risk of prussic acid increases further. Shoots shorter than 15 to 18 inches are especially dangerous, particularly for the sorghums. To minimize risk, wait until sorghum and sorghum x sudangrass plants are at least 24 inches tall and sudangrass is at least 18 inches tall before grazing. If you have regrowth in late summer that does not meet these plant height thresholds, you can either wait seven days after a killing frost before grazing or test the plants to assess prussic acid levels.

Frost poses a significant risk because prussic acid forms in plants when cell membranes are damaged by freezing. This allows chemicals within the plant cells to combine and produce cyanide. After seven days, any cyanide generally dissipates into the air. However, each freeze that does not completely terminate plant growth results in an additional seven-day countdown. A killing frost is typically considered to be around 24°F. However, dense stands may require a longer, sustained cold period to achieve a full termination of growth.

To mitigate this risk, one strategy is to pull livestock off pastures when frost is forecast and then wait seven days after a killing frost before grazing. However, the period between the first frost and a killing frost can sometimes be prolonged, with frost-free intervals where grazing might seem feasible. During these windows, testing the forage for cyanide can provide valuable information, helping producers determine if it is possible to safely graze before the final killing frost occurs.

Producers looking to assess risk in situations where plant growth is borderline or to confirm safety after a killing frost can perform a simple in-field test for prussic acid. This test screens for the presence of cyanide but does not provide exact concentration. It can, however, give an indication of potential risk. Meadowlark District has purchased some “ready to use” field kits from Ward Labs to offer a testing to our patrons for results in 20 minutes or so.

K-State has a good publication on this topic titled “Prussic Acid Poisoning” MF3040 that serves as an excellent resource on this topic. Bottomline: Prussic Acid Poisoning can be a quick and deadly issue in sorghum species, particularly around times of stress like rapid plant growth, drought or most timely now – frost and killing freezes. Delaying grazing 7-10 days after a killing frost is recommended practice, but testing is available. Additionally, don’t forget that nitrates can be a companion issue that will not dissipate after a killing frost. “Nitrate Toxicity” MF3029 is the resource on this topic