Frost Injury in Sorghum Species

Posted on September 21, 2024 by Christine O'Reilly, OMAFRA Forage & Grazing Specialist

Caution! Members of the sorghum family – sorghum, sudangrass, and hybrid sorghum-sudangrass – contain dhurrin, a glucoside that breaks down to release hydrocyanic acid, also known as prussic acid (hydrogen cyanide, HCN). A sudden disruption of growth such as frost, drought or cutting, causes prussic acid to be released inside the plant at a more rapid rate. High prussic acid levels may be lethal to ruminants; death often occurs within 20 minutes of ingesting sorghum forage with elevated prussic acid concentrations.

Early fall, **between the first frost and the first killing frost, is the riskiest time of year for prussic acid** production in sorghum species. These warm-season grasses are very frost-sensitive. It is impossible to know by looking at them how much prussic acid is present in the plants. Below are some frequently asked questions related to managing sorghum species and frost.

Is it okay to harvest sorghum after a frost?

Wait 3-5 days after a killing frost to ensile sorghum or make baleage. Prussic acid levels will decrease with fermentation. Silage should be completely fermented before feeding (6–8 weeks).

I cut my sorghum, then we got a frost while it was in the swath. Will the sorghum still produce prussic acid?

Cut grasses don't know they have been cut. Cellular processes, like respiration and photosynthesis, continue so long as the leaves have enough water and oxygen to keep going. While information on this specific situation is scarce, the safest option is to respect the same wait times as if the crop was hit by frost just before cutting. This will give the prussic acid time to dissipate.

There is frost in the forecast, and my cattle/sheep are grazing sorghum. Should I move them off the sorghum?

Yes. Prussic acid levels are highest just after the frost occurs. Since this is usually in the wee hours of the morning, it is generally much easier to avoid an issue by removing livestock from the sorghum before the forecasted frost.

Sometimes frost comes as a surprise. Immediately after a frost, remove the livestock from the pasture until it has dried out (usually 6–7 days). If new shoots develop, harvest the field as silage rather than pasture.

Prussic acid concentration is always higher in leaves than in stems. Because livestock preferentially graze leaves, they are more likely to be poisoned by prussic acid in a pasture situation. Lightly grazing a field will not reduce risk.

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About Christine O'Reilly, OMAFRA Forage & Grazing Specialist

Areas of Focus: - Production and storage strategies to improve the productivity and profitability of forages - Benefits of forages and grazing within cropping systems - Forage production and grazing systems in northern Ontario

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