Can I Feed Cows with Drought-Affected Crops?

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Severe drought has left many farmers with limited amounts of forage for grazing. Using drought-affected crops is common; however, be aware of potential toxins and conditions increasing toxicity. Grazing management practices can reduce these risks. The most common toxicities include nitrate, hydrocyanic acid (HCN) or prussic acid, and sulfur (S). Other considerations include sweet clover poisoning and high oilseed inclusion.

Nitrate toxicity. This is the most common toxicity in cattle fed drought-affected forages. Nitrates accumulate in small-grain forages, millets, sorghum, sudangrass, and corn during drought. However, they can also accumulate with prolonged cool and moist conditions. Nitrates are not typically a problem on rangeland and pastures, but common in drought-affected cereals, especially if high rates of N fertilizer were applied. Plants take nitrate up from the soil, which quickly convert to protein. When plants encounter stressful growing conditions, photosynthesis is inhibited and protein synthesis is halted, increasing nitrate accumulation potential. Newly-seeded cover crops for fall grazing (i.e., brassicas, oat, pea) can also accumulate nitrate even if not drought affected. The best way to reduce this risk is to test forage before feeding. Strategies to reduce nitrate toxicity:

- Avoid grazing early in the morning when nitrate levels are highest.
- When cutting, raise the bar as nitrate levels are highest in the bottom third of the stem.
- Provide cattle with high fiber, dry forage before feeding high nitrate feed to reduce the amount of nitrate ingested.
- Consider delaying harvest – as plants mature, nitrate content decreases.

Prussic acid. Forage sorghum, sudangrass, and hybrids contain a sugar, dhurrin, linked to an HCN molecule, released if damage occurs (undamaged, they do not contain high HCN levels). Concentration depends on species, variety, maturity, and plant damage. Concentrations decrease as plants mature. Plant damage from hail, insects, frost, or harvest breaks cells and releases the toxin. To reduce HCN toxicity potential, delay grazing until forage is 18-24". Do not graze following hail or a light frost. However, grazing a week to 10 days after a killing frost is safe because the HCN dissipates quickly after the plant dies.

Sulfur toxicity. Most S forms are non-toxic, but hydrogen sulfide is highly toxic. Water and diets high in S can increase hydrogen sulfide, resulting in toxicity. High S contents can be found in water and in some feeds (i.e., corn distiller's grain). To manage this, limit high S feedstuffs and water to <0.3% of the diet dry matter (DM). Test water; sulfate content <1,000 ppm is generally safe.

Sweet Clover Poisoning. During drought, ditches will be cut and baled. Many ditches in the Dakotas are heavy with sweet clover, mostly in full bloom the end of June. Sweet clover contains high amounts of coumarin. Although dry sweet clover hay is safe, when hayed and baled at high moisture (>20%) it will likely mold, causing coumarin to convert into dicoumarol, a potent toxin preventing normal blood clotting. Avoid feeding overwintered bales containing sweet clover, as they likely contain high dicoumarol levels.

Oilseed Inclusion. Feeding oilseeds with mature seeds, such as flax, sunflower, soybean, and canola must be limited to <12% of the diet (DM). Excessive fat content in the diet of ruminants affects normal rumen function reducing normal digestion.