

Prussic Acid and Nitrates of Concern to Cattle Producers

AGRI-VIEWS

by Chuck Otte, Geary County Extension Agent

As fall crops get harvested, many cattle producers look to those crop residues in the sorghum and corn fields as a cheap source of feed to get cow herds through the next couple of months. There's good nutrition in those fields, the cows are at a low nutritional plane at this time, so other than a little time and money making sure fences are in good shape, the crop residue makes for some pretty cheap keeping for those cattle herds. Unfortunately, there is also a bit of a risk that has to be managed so we don't wind up inadvertently killing some cattle!

Sorghums, including grain and forage sorghum, shattercane or johnsongrass contain a product called prussic acid. Prussic acid is also known as hydrocyanic acid or hydrogen cyanide. If the concentrations of this compound are high enough, which they often are in short, smaller or drought stressed plants, the cow's body quickly absorbs the cyanide into the bloodstream which prevents the hemoglobin from transferring oxygen to the body. Death can occur in a matter of minutes from the time of consumption. While a veterinarian does have compounds to save animals from prussic acid poisoning, there is a very narrow window of opportunity because the cyanide works so fast.

The good news is that the prussic acid is quite volatile. Anything that ruptures plant cells will release the prussic acid and in a few days the risk is gone. A good hard freeze, 25 degrees or colder, which ruptures the plant cells, is very effective at doing this. It'll also kill the sorghum plant so it won't be sending up any new shoots that will once again be high in prussic acid. Where there are sorghum plants, either volunteer or in a sorghum field, I'm encouraging keeping cattle out of them until a week after a 25 degree or colder freeze.

Corn and sorghum can both also contain nitrates. Plants take up a lot of nitrogen which is fairly quickly converted into non-toxic compounds in the plants. But sometimes, such as drought stress, heat stress, even cold and cloudy weather stress, plants can wind up with essentially free nitrates. If these nitrate levels are high enough and cattle consume the forage, they can exhibit nitrate poisoning. Unlike prussic acid poisoning, where the hemoglobin can't take up oxygen molecules, with nitrate poisoning, the hemoglobin can't get rid of the oxygen. Nitrate poisoning takes much longer than prussic acid poisoning and if noticed by the producer, a vet can usually get out in time to save the animals.

Unlike prussic acid which dissipates after the plant is dead, nitrates don't go away. If the plant was high in nitrates when it died, it's going to stay high in nitrates. Fortunately, cattle can, and do, develop tolerance to high levels of nitrates. But this takes several days. Plant samples tested this fall from area fields have shown low nitrate levels in some fields and high nitrate levels in others. It's always best to assume that there is some risk in any field and proceed appropriately.

Make sure that cattle in residue fields have easy access to lots of high quality water. Feed the cattle well before you first turn them out in the field. Turning a herd of hungry cows into a residue field causes them to really fill up on feeds that may cause a problem. If you turn them out with a full stomach, they'll be grazing much more slowly and have time to adjust. Finally, keep a close eye on them for the first week. The first day, check them every couple of hours. If you see any acting abnormally, call the vet! These feeds are valuable for late fall nutrition, but manage them appropriately!