



CATTLE SENSE

Information that makes sense helping you make cents

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/// On Watch for Toxins

It has been, to say the least, an unusual growing season across much of the country. Widespread weather extremes have significantly impacted plant populations and growth, with major implications for anyone whose business relies on forage resources. Every year provides some potential for feed toxicity issues, but the current risk level is exceptionally high. Producers need to be aware of potential dangers in forage crops, in other plants that hungry cattle may consume, in grains, and even in drinking water.

Plants Stress, Too

When weather conditions are tough on plants, they adapt in a variety of ways. The result can be production or accumulation of compounds that can be harmful to animals that consume them.

Nitrate. Plants take up nitrate from the soil, and use photosynthesis to drive the conversion of nitrate into plant proteins. If photosynthesis is seriously slowed or stopped -- by drought, frost, lack of sun, mineral deficiencies, or leaf loss (hail, grasshoppers)-- the nitrate simply accumulates in the portion of the plant closest to the roots. When consumed by cattle, the nitrate (NO_3) is converted to nitrite (NO_2), and then ammonia, which is used by the rumen microbes. But when very high levels of nitrate are present, nitrite is produced faster than it can be taken on to the next step, and the excess moves into the bloodstream. Here it combines with hemoglobin, forming a compound that is now unable to transport oxygen. If enough of the hemoglobin is tied up in this way, the animal basically asphyxiates. At lower levels, abortions are seen, due to a lack of oxygen for the fetus.

Prussic Acid. Prussic acid poisoning is caused by cyanide production in several types of plants under certain growing conditions. It is most common in grain sorghums, Johnsongrass, and sudangrass that exhibit regrowth after a drought-ending rain or stunting frost.

Unwelcome Extras

Conditions in many areas have been ideal for infection of forage plants with undesirable microorganisms. These fungi may produce a variety of toxic substances that remain present in feed.

Ergot. Cool, damp spring weather followed by heat can set the stage for infection by a fungus called *Claviceps purpurea*. Ergot bodies, which contain multiple toxic alkaloids, appear as dark brown to black growths on seedheads of grasses and grains. Over 200 species of grasses are known to be susceptible, including wheat, barley, oats, brome grass, fescue, and wheatgrass. In cattle, a common effect of ergot poisoning is a constriction of the small blood vessels to their extremities, damaging ears, tails, and feet. Other initial signs of ergotism are less specific: increased susceptibility to heat, reduced feed intake, rough hair, weight loss, and decreased milk production. Cattle may also show excitability and tremors, especially when animals are forced to move.

Mycotoxins. Toxic metabolites produced by molds are termed mycotoxins. Droughts accompanied by high temperatures during grain fill provide ideal conditions for fungal invasion and mycotoxin production in corn. If these poisonous substances are present in grain used for ethanol

production, they will be concentrated in the resulting by-products. Research indicates that DDGS (distillers grains with solubles) will typically run 3 times higher in mycotoxins than originally found in the grain. It is closer to 4-times more concentrated in CCDS, or “syrup.”

Better Than Nothing... Or Not?

When conditions are too hot and dry, or too cool and wet, to promote vigorous growth of the primary species in pastures and hay fields, other plants will try to fill that niche. When cattle are faced with a shortage of preferred forages (or of any forage at all), they will eat whatever is available. Also, if detrimental plants are baled into hay, animals may not be able to sort against them. Problems occur when animals are forced to consume plants that naturally contain harmful compounds.

Poisonous Weeds. The following is only a partial list of weeds that are known to be toxic to cattle: Arrowgrass, cocklebur, hemlocks, houndstongue, jimsonweed, loco weed, lupine, milkweed, nightshades, perilla mint, pigweed, snakeroot, and wild parsnip (water hemlock).

Problem Trees. Multiple tree species have been involved in cattle poisoning, including:

- ✓ Maples – dried and wilted leaves;
- ✓ Oaks – acorns and buds;
- ✓ Pines – needles;
- ✓ Cherry – wilted leaves, bark;
- ✓ Peach, plum and other stone fruits – wilted leaves;
- ✓ Choke cherries.

Deadly Decisions

I have been involved in situations where cattle were lost because of some direct action (or inaction) on the owners’ part, and many other similar cases have been documented.

Alternative feeds. Producers utilizing feedstuffs that they are not familiar with may not be aware of specific management needs. A case in point would be sweet potatoes; while offering substantial nutrition, they can develop a highly toxic mold.

Landscaping plants. These can become an issue when they are either planted within reach of cattle leaning across a fence, or if clippings or branches (i.e., following a storm) are dumped in a pasture. The list of potentially dangerous garden plants is long; species frequently involved in toxicosis include Japanese yews, rhododendrons, delphinium, oleander, larkspur, foxglove, and canna lilies.

Trash. In particular, any source of lead can lead to animal losses. These can include old batteries, grease, putty, lead-based paints and painted surfaces, roofing materials, some plumbing supplies, lead shot, and used oil filters.

Water Concerns

Water can be another source of toxicity concerns, potentially containing excess levels of some minerals, nitrates, contaminants, or harmful microorganisms. Flooding brings a high risk of contamination from outside sources. During drought, salts and other minerals can become more concentrated as water volume is reduced. Under the right conditions (warm weather, high levels of nitrogen and phosphorus, stagnant water), certain cyanobacteria can proliferate and “bloom” in ponds utilized for livestock. These are commonly called ‘blue-green algae,’ and they produce neurotoxins that are deadly to animals.

It somehow seems appropriate to wrap up with a weather-related adage: when it rains, it pours. Besides dealing with limited and expensive feed resources, producers will need to be tuned in to a range of potential problems that this year’s feeds may contain.