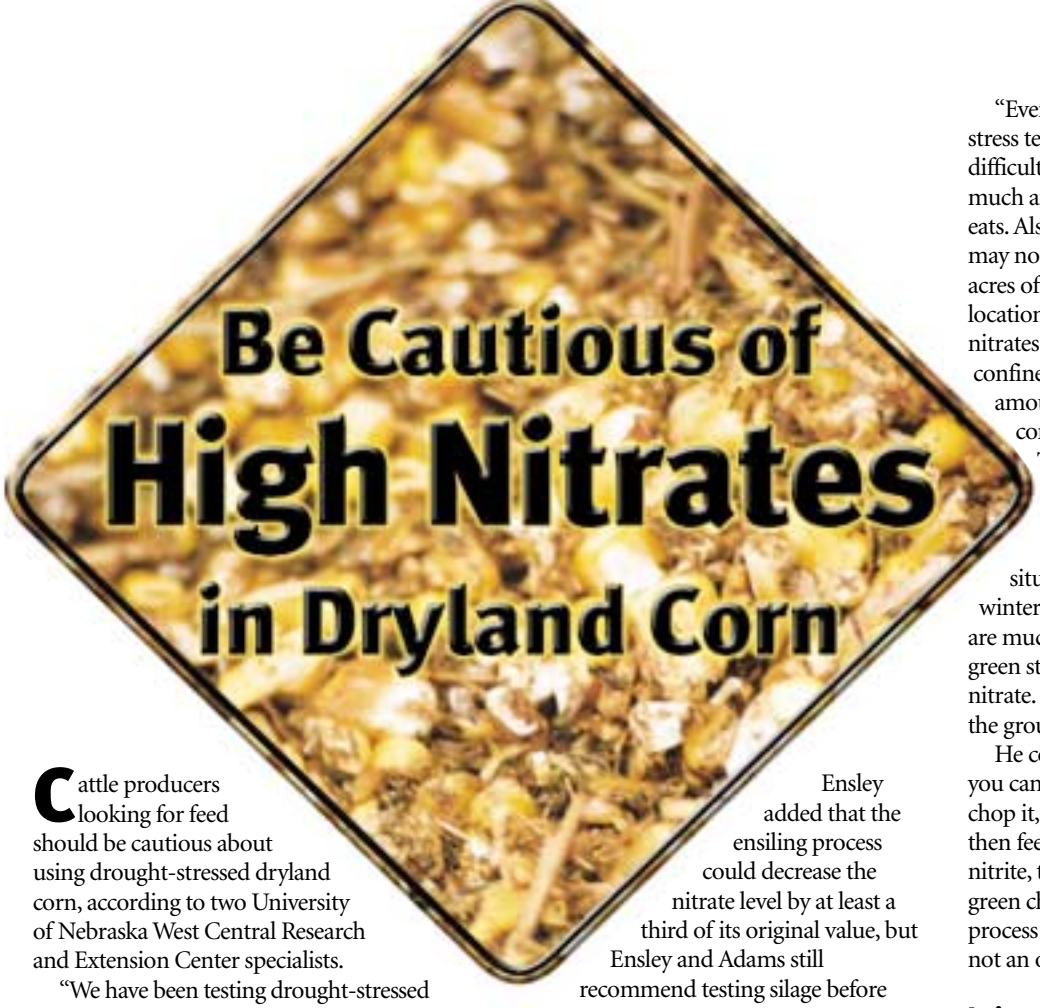

Cattle producers looking for feed should be cautious about using drought-stressed dryland corn, according to two University of Nebraska West Central Research and Extension Center specialists.

"We have been testing drought-stressed ecofallow corn for nitrate concentration. We analyze the bottom 10 inches of the stalk versus the remainder of the plant. Nitrate is concentrated in the bottom third of the plant, where it can contain two to three times the amount [required] to kill a mature cow," said Steve Ensley, veterinary pathologist and toxicologist at West Central. "The rest of the plant contains nitrate, but not at a toxic amount. We need to implement a strategy that eliminates the bottom 10 inches of the stalk and use the remainder of the plant."

Options for dryland corn

Ensley and Don Adams, range beef nutritionist at West Central, recommend baling or ensiling drought-stressed corn.

"The advantage of silage or hay is that you can blend it with other feeds. However, it is critical producers also test the additional feeds they plan to blend [with it] for nitrates," Adams said. "If you are going to hay or ensile, I would put the head up 10 inches off the ground, so the highest concentration of nitrates is left in the field. However, if producers come back and feed hay on that ground later, the nitrates may still be there."

Ensley added that the ensiling process could decrease the nitrate level by at least a third of its original value, but Ensley and Adams still recommend testing silage before and during feeding.

"The one concern with ensiling right now is the plants are still 80% water, and it's going to be difficult to pack to ensile. We have had questions about drying the corn plants, including adding straw as the corn is brought into the pit. The corn could possibly wilt before it's ensiled. If it wilts, the nitrates could be converted to nitrites, which is what's toxic to the animal. We would expect the nitrates to be reduced through the ensiling process, but they are still going to be there," said Adams.

Nitrate vs. nitrite

Rumen microorganisms reduce nitrate to nitrite. Nitrite affects the blood hemoglobin, making blood unable to carry oxygen.

"When animals run out of oxygen, they suffocate," Ensley said.

Both Institute of Agriculture and Natural Resources (IANR) specialists agree that baling is a viable option for drought-stressed corn, but the corn must be dry before baling.

Producers have mentioned grazing drought-stressed dryland corn, but Adams and Ensley advise against it.

Fig. 1: Methods of reporting feed nitrate concentration (dry basis)

Reporting Method	Potentially toxic amounts %	ppm
Nitrate nitrogen (NO_3N)	› 0.22	2,260
Nitrate (NO_3)	› 1.0	10,000
Potassium nitrate (KNO_3)	› 1.6	16,300

"Everything we have seen with drought stress tends to be high in nitrates. Grazing is difficult because you cannot control how much and what part of the plant the animal eats. Also, nitrate analysis of a few plants may not represent 1.5 million plants on 100 acres of dryland corn. There are likely locations in a field that could be higher in nitrates than others," Adams said. "In a confinement situation, we can feed a set amount. In a grazing situation, you can't control how much the animal eats. They can consume quite a bit in a short amount of time."

Adams and Ensley said green corn plants do not help in a grazing situation. "Summer grazing is not like winter grazing of mature stalks. The cows are much more likely to `consume the whole green stalk, which contains the majority of nitrate. The stalk is palatable all the way to the ground," Ensley said.

He continued, "One of the worst things you can do with ecofallow corn is to green chop it, let it sit in the wagon, heat up and then feed it. Heating will convert nitrate to nitrite, the toxic compound. When you green chop and heat it, the conversion process is increased manyfold. Green chop is not an option."

Irrigated corn

Adams and Ensley have received calls about grazing irrigated corn, an option that is less likely to contain high nitrates.

"Usually irrigated corn doesn't tend to be high in nitrates. However, it must be managed with fencing, allowing cattle to access only a day's forage at a time. Grazing irrigated corn is going to require electric fencing and moving cattle daily to make it work. Certainly the feed from this would be very high in value," Adams said.

"People should be cautious about the corners of the pivot where corn has been drought-stressed. Those corners may need to be fenced off," he added.

Ensley warns that providing high-quality feed is essential, especially in the long run.

"If we go into the spring with nutritional deficiencies where animals don't have vitamins and minerals they need, the chance for sickness during calving is increased," Ensley said. "This drought isn't going to be over even if it starts to rain tomorrow."

Fig. 1 indicates three different reporting methods and the toxic levels used in testing nitrates.

AJ

Editor's Note: *This article was supplied by the West Central Research and Extension Center, North Platte, Neb.*