

Planning for Drought-Stressed Silage

Much of the Western and Southern United States were already in extreme drought conditions before summer officially started. Now it is time for producers to plan for harvesting and feeding their drought-stressed corn silage.

“When drought occurs, I worry most about nitrate accumulation in the plant and potential heating and spoilage issues at feedout,” says Renato J. Schmidt, Ph.D., Forage Products Specialist, Lallemand Animal Nutrition North America. “We can still produce good silage from drought-stressed corn, maintaining the quality of the crop coming out of the fields, as long as the crop is harvested correctly, ensiled well and carefully stored.”

Minimizing potential impact from nitrates during harvest

Even subclinical nitrate toxicity can result in decreased intakes, weight gains, production and conception rates. Nitrate toxicosis can also cause embryonic death and, occasionally, abortions.

Nitrates accumulate in the bottom third of the plant; therefore, producers could cut drought-stressed forage crops higher as management tool. Assess the degree of drought stress in the field. Sorghum and sudangrass hybrids, corn, pearl millet and cereal grains have high potential for nitrate accumulation. Then, harvest based on whole plant dry matter (DM) recommended ranges for the type of forage crop to be ensiled.

Treating drought-stressed silage crops with a research-proven inoculant

Drought-stressed corn tends to have low levels of lactic acid bacteria (LAB), which are essential to drive the initial fermentation process. These crops also tend to have higher levels of yeasts and molds and so are more prone to aerobic stability issues. Proven inoculants can help address both challenges.

MAGNIVA® Silver or MAGNIVA Titanium can provide a fast, efficient fermentation, making up for the low natural LAB levels and maximizing nutrient recovery.

MAGNIVA Titanium adds *Lactobacillus buchneri* NCIMB 40788 to the proven combination of *Pediococcus pentosaceus* 12455 with enzymes and to help achieve a fast front-end fermentation and maintain aerobic stability throughout storage and feedout. In fact, *L. buchneri* 40788 applied at 400,000 CFU per gram of silage or 600,000 CFU per gram of high-moisture corn (HMC), has been uniquely reviewed by the FDA and allowed to claim improved aerobic stability.

The effect of ensiling on nitrates

“The ensiling process itself can reduce nitrates by about 40 percent,” Dr. Schmidt advises. “However, it’s important to give ensiling time to work. Let forage ensile for at least three to four weeks. Then, introduce it gradually into the ration.”

Testing nitrate levels prior to feeding helps avoid toxicity. Silage can be incorporated at varying amounts depending on the results, but levels of 1.5% or greater should not be fed.

Producers should also be cautious when unloading silage made from corn with high nitrate levels. Nitrogen oxide gasses, which can be generated from nitrates during the first few days of ensiling, are lethal to animals and humans. Nitrogen oxide gases tend to accumulate in low areas and range from colorless to orange-brown.

Dr. Schmidt says these gasses are typically only a concern during the first few days of ensiling and tend to accumulate in low areas as they are heavier than air. To dissipate the gasses, run the blower for 15 to 20 minutes before entering an upright silo and use caution around vents in silo bags and when opening up a pile or bunker for feeding.

“Dangerous gases can be produced during ensiling — even in crops that weren’t stressed at all,” Dr. Schmidt cautions. “It’s best to just stay clear of silos and piles for two to three weeks after filling. Always ventilate and wear an approved breathing apparatus. Safety should always come first!”



Photo courtesy of Whitney Cranshaw

This tomato hornworm continues feeding on a plant after consuming two leaves (see arrows). Hornworm caterpillars blend in with the foliage, so they often go undetected until damage is severe.

Caterpillars horn in on tomato plants

By Univ. of Missouri Extension
Contributed

COLUMBIA, Mo. — Several types of caterpillars damage tomato plants in Missouri, but the tomato hornworm and the tobacco hornworm usually get the most attention because of the prominent horn on the last segment of their bodies.

These insects are big, green, and hungry, says University of Missouri Extension horticulturist Michele Warmund. Measuring up to 4 inches, these munching marvels devour tomato plant leaves and strip them bare if unchecked. Hornworms chew holes in green tomato fruit as well, especially during dry weather. They also chomp on eggplant, pepper, potato and some weeds, such as horsenettle, jimsonweed and nightshade.

Usually, two generations of hornworms develop each summer. The adult moths emerge in mid-to-late spring. Moths of both species are mottled gray-brown with wingspans of 4-5-inches. After mating, females lay their small eggs—which often go unseen—on leaves of tomato and other host plants, says Warmund.

After hatching, tomato hornworms undergo five larval or instar stages in three to four weeks. All five instars feed on plants. The first small instar is whitish-yellow with five pairs of prolegs used to grip onto plant stems and leaves. When fully grown, caterpillars are usually green, but dark brown types can also develop.

Full-grown tomato hornworm caterpillars have V-shaped markings on their sides and a black posterior horn. In contrast, late-instar tobacco hornworm caterpillars have seven diagonal stripes on their body and their horn is usually

red. Full-grown caterpillars of the second generation, which develop in mid-to-late summer, drop off plants to pupate. Pupae overwinter about 5-6 inches below the soil surface.

To limit hornworm damage, scout often for signs of feeding, says Warmund. Hornworm caterpillars blend in with the foliage, so they often go undetected until damage is severe. Feeding damage generally begins on the upper leaves of tomato plants. The caterpillars often leave dark greenish-black droppings on the foliage. Under rapid-drying conditions, spray plants with water to disturb the caterpillars, which makes them easier to spot.

Hand-pick hornworms from plants and drown them in soapy water. However, first check to see if small predatory wasps have parasitized the hornworms. Wasp larvae feed on the internal organs and fluids of hornworms. Fully developed wasp larvae form cocoons that look like grains of white rice attached to the hornworm. After killing the hornworm, wasps move to other hornworms to parasitize them. Leave parasitized hornworms on the plant to increase the number of these beneficial wasps, which are harmless to humans.

On very young caterpillars, use low-risk pesticides with active ingredients such as *Bacillus thuringiensis* (Bt) or spinosad. You can also use insecticidal soap to control small caterpillars, but the spray must contact the hornworm to be effective. Carbaryl (sold under the trade name Sevin) and other broad-spectrum insecticides are also available to control hornworms. To reduce future infestations, till the soil to depth of 6 inches in the fall after harvest to destroy burrowing caterpillars and pupae.



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