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Corn Silage as an Alternative Feed During Drought

Drought issues can lead producers involved in dryland production to look for alternative feed materials for livestock. Farmers may consider using field crops as an alternative feed supply and gain some value from a possible low yielding crop. Producers only involved in field crop production, may be able to recuperate some of the loss due to poor yield by selling standing crops to livestock producers. For information about pricing corn silage refer to MU Guide 4591.

Potential grain yield and silage moisture content are important factors to consider, as both will affect the amount of silage (dry matter) that is produced and its quality. To estimate grain yield, multiply the number of ears in 17.5 feet of row by the average number of rows around the ear and the average number of kernels per row and then divide this value by 90. Kernels may start aborting in a process called tip back during drought, and it should be noted to not count aborted kernels. These aborted kernels will not produce viable grain, regardless of when the drought ends and the soil moisture level increases.

At harvest, corn silage should be approximately 60-70 percent moisture and kernel milk line will be roughly at 50%. Optimal corn silage harvest occurs at ½ milk line to black layer. Moisture level in the corn crop is important to determine because this impacts both the ensiling process and tons of dry matter that is being sold. Drought damaged corn will often have a higher moisture content than it appears, so a moisture test is recommended. Moisture can be estimated using the microwave method described in MU Guide G3151: Using a Microwave Oven to Determine Moisture in Forages.

When silage is harvested outside the recommended moisture range, feed quality will be reduced. When harvested too wet nutrients will be lost and palatability reduced due to seepage and butyric acid formation.

Dry silage will not pack well, making it difficult to remove the air which impacts the fermentation process, resulting in losses due to mold. (It is best to chop dryer corn as fine as possible ideally in the 3/8 to 1/2 an inch range.) Moisture can be added using the rule of thumb that 4 gallons of water per ton of silage will raise the moisture content by 1%. This addition of water should be made during the time filling the pit. When it is added after pit fill, water will not permeate effectively through the silage mass, and will likely seep down the silo wall.

Attention should be paid to stalk nitrates during a drought. High nitrate levels are found in corn where high levels of nitrogen fertilizer were applied. High nitrate levels are also observed for a few days after rainfall. Cloudy weather, high plant populations and deficient soil phosphorus and potassium can also cause increase nitrate concentration in the plant. Generally, the highest concentrations of nitrate will be found in the bottom eight to twelve inches of the stalk.

A qualitative field nitrate test can be useful in determining cutting height, but a quantitative nitrate test is needed for ration adjustment. Producers should feed small amounts of green chop the first few days until the quantitative sample results are received. Once producers increase the ration of green chop, feed only what can be eaten by the cows in a couple hours to avoid any nitrates in the green chop being converted to nitrite before being consumed.

Nitrite is the ultimate reason cows feeding on high nitrate feed stuffs lose their lives. Ensiling is a preferred method as opposed to green chopping because nitrate content can be reduced by 20 to 50 percent in the ensiling process. Making balage out of drought damaged corn is an option, with best results utilizing a baler with a cutter knife system in place and the bales wrapped in 6 mils of plastic. Thinner wrapped corn balage, even when chopped, is subject to plastic puncture due to the corn stalks. The 4-mil thickness used for grass ensiling is not enough. Give the ensiling process at least thirty days, while 21 days is technically enough, the maximum reduction in nitrates will happen 30 days after ensiling started. Have a quantitative nitrate test performed after the ensiling process occurs before feeding it to animals. It is also worthwhile to run a feed quality analysis at this time.

Other things to consider include crop insurance rules, pesticide applications and feed quality issues like aflatoxins. If the field is covered by crop insurance, it is critical to check with the agent prior to any chopping/harvesting being done. It is also important to know the restrictions associated with all pesticides that were used on the corn crop prior to cutting for silage or green chopping and to follow those requirements stated in the label. Alfatoxins can be an issue in drought years and can lead to reduced prices growers receive at the elevator.

Source: *Nick Wesslak, agronomy specialist*

Extended Drought Can Put Fish Ponds at Risk

Resources threatened by this year's drought include ponds that depend on surface runoff for water. Fish are at risk from high water temperatures, oxygen depletion, increased disease potential and other problems as water levels drop in ponds through lack of runoff and evaporation, said Bob Pierce, MU state fisheries and wildlife specialist.

An MU Extension publication, developed in collaboration with Lincoln University, explains how to monitor your pond and respond to problems. The guide, "Managing Fish Ponds During an Extended Drought" (G9401), is available online and as a PDF download at www.extension.missouri.edu/p/G9401.

During an extended drought, watershed ponds can lose a lot of water to evaporation and seepage, reducing both the oxygen supply and the amount of living space for fish populations. Long stretches of hot temperatures make the problem worse. Warmer water can't hold as much oxygen as cool water. A combination of drought and extreme heat can leave ponds with dangerously low levels of dissolved oxygen.

The MU Extension guide, written by Pierce and Charles Hicks, an aquaculture specialist at Lincoln University, describes warning signs of oxygen depletion and discusses how to put more oxygen into a pond with aerators, pumps or, in an emergency, an outboard motor.

"The simplest solution is to use an electric aerator that provides about 3/4 horsepower of aeration per acre of pond area," Hicks said.

Falling water levels also leave a pond's fish with less and less living space. Crowding makes fish more vulnerable to stress and disease. Nutrients and waste products become more concentrated as the pond shrinks, further increasing the risk of oxygen depletion, disease outbreaks and other problems, said Hicks.

Landowners can reduce the chance of fish kills by keeping livestock out of the pond and avoiding the overuse of fertilizer in the watershed. Wise watershed management and proper design and construction of the pond can lessen the impact of drought, said Pierce.

Detailed information on pond management is available from the Missouri Department of Conservation at https://mdc.mo.gov/sites/default/files/2020-05/MOPondHandbook.pdf

Source: *Bob Pierce, state fisheries and wildlife specialist*

Have a Beetle Problem?

Gardeners in Missouri deal with beetles, including cucumber beetles, potato beetles, bean leaf beetles, blister beetles or Japanese beetles. In late summer, blister beetles and Japanese beetles often cause the most issues for gardeners.

Blister beetles are members of a family of plant-feeding insects (Meloidae) that contain cantharidin, a toxic defensive chemical that protects them from predators. Accidentally crushing a beetle against the skin can result in a painful blister, the source of the insect's common name. Animals may be poisoned by eating crushed beetles in cured hay. The severity of the reaction, ranging from temporary poisoning, to reduced digestive ability, to death, depends upon the amount of cantharidin ingested and the size and health of the animal.

Adult blister beetles are often visit flowers for food and mating opportunities. Several species of blister beetles prefer flowers in the sunflower family, which abound in prairies, old field, pastures, and along roadsides. But at least one specie, for example, focuses on flowers of apple, plum and other rose family trees. Others spend more time on the ground laying eggs in the soil. Adults visit flowers to eat nectar, pollen, and sometimes entire flowers. Some species eat leaves. Different species of blister beetles prefer different plant families; most prevalent are plants in the sunflower, bean and potato families.

The larvae of most blister beetles are parasitic on ground-nesting, solitary bees, eating the pollen, nectar and honey stored for the bees's young, plus the eggs and young themselves. The larvae of some groups eat the egg clusters of grasshoppers. Blister beetle numbers increase dramatically following a dry summer with high grasshopper numbers.

Four species of blister beetles are relatively common in the Midwest. They include the ash gray, striped, margined, and black. They have narrow, elongated, cylindrical bodies, and are ½ - ¾ inch long. There are no known predators or parasites that effectively control blister beetles. If you choose to spray for them, the following are recommended: Permethrin (Bonide Eight and Hi-Yield Lawn, Garden and Farm Insect Control) and Cyfluthrin (BioAdvanced Vegetable and Garden Insect Spray). Always follow label directions.

Japanese beetles are 3/8 inch (8-11 mm) long and ¼ inch (5-7 mm) wide, brilliant metallic green insects with copper-brown wings whose hard body makes them unpalatable to many predators, including birds. The larvae, called grubs, are grayish white with a dark brown head. They are C-shaped when disturbed. They are found in the soil where they feed on the tender roots of vegetables, lawn grasses, and other plants. Japanese beetles overwinter as a partially grown grub in the soil below the frost line. The grubs resume feeding on grass roots in the spring, and then pupate near the soil surface. Adults emerge between May and July, depending on their geographic location.

Source: *Jennifer Schutter, horticulture specialist*

Equipment is Key to Drought Harvest

Equipment usable for harvesting drought damaged crops depends on end use of the commodity, moisture content of the crop and equipment available to use (owned, leased, or custom).

Plant moisture content may have already dropped below that suitable for the ensiling process (60 to 70 %). Forage material may still be collected in bales or stacks if plant material is dry enough for storage without excess spoilage.

Have the intended use or market for harvested feed in mind before pursuing forage harvest. Harvesting a silage or forage crop with no definite plans for feeding or local sale can be costly. Crop producers can often be caught a year after a drought with poor quality forage and no plans to use it.

Recognize that harvesting a drought damaged crop will be more stressful on the operator due to higher field variability. Do not be tempted into short cuts or using equipment in a manner for which it was never intended. Expect variable crop conditions within individual fields.

Grain harvest

If ear diameter is smaller than normal, stripper plates will need to be moved closer together to avoid excessive shelling on the snapping rolls. This will break off more stalks, increasing the load on the processing unit. Stripper plate spacing on newer combines may be adjustable from the operator's station and can ease adjustment if sizable areas of a field have different ear size. Beware of making numerous on-the-go adjustments or trying to evaluate shelling on the stalk rolls from the cab. At least one cornhead has spring-loaded stripper plates to adjust spacing on-the-go.

If ears are of non-uniform size and shape, adjustment of the threshing mechanism will be a compromise between adequate separation from the cob and acceptable grain breakage level. Concave clearance should be narrow enough to thresh grain from ears. Adjustment for small ears will break larger cobs and over load the cleaning shoe. Chaffer, sieve, and fan adjustment becomes more critical. Grain may be fragile and more susceptible to damage. Ideally, threshing should result in whole but battered cobs exiting the separator.

Soybean threshing needs to be just aggressive enough to remove beans from pods. Beans in drought-stressed fields may be smaller than usual. If beans are small, air flow may need to be reduced in the cleaning shoe and the openings in chaffer and sieve screens reduced to maintain air speed, yet allow beans to fall through. More pods will be close to the ground if plant population has been reduced, so it is

essential to keep the cutterbar low. The front drum of the feeder should be low enough so that the chain just clears the floor of the feeder house. If plants are shorter, smaller clearances may be needed between reel, cutterbar, auger, and feed conveyor chain to make sure stalks are feeding through the platform.

Expect to spend more time checking grain loss. Traveling fast enough to keep the combine loaded will improve grain quality, however a greater percentage of material other than grain moving through the combine may increase separation losses.

Forage harvest

A common mistake is to underestimate the moisture content of drought damaged crop. Check moisture content before baling or stacking. Operation of harvesting equipment will generally be similar to that used in a normal crop with a few exceptions. Check your owner's/operator's manual for useful tips (for example using hay harvest equipment to harvest cornstalks or soybean straw). Your dealer is another source of information.

Windrowers, rakes, balers, and stackers have all been used to harvest corn. Expect that operation of conventional hay harvest equipment in cornstalks may be more difficult or at least require adjustment and some experimentation. Cornstalks are larger and may be more difficult to package. The potential variability of stalk diameter and length will put a premium on proper adjustment. Some equipment may not work in some conditions. Expect more wear, especially on cutting components, than when harvesting hay.

A major objective is to get the stalks dry enough to store. Allow the crop to field dry for much of the moisture removal. Equipment should aggressively shred stalks to promote drying and present smaller pieces for easier packaging. Flail shredding may do this easier than conditioning. If using a conditioner, consider tightening the roll spacing and slowing travel speed for more aggressive action. Stalks that are damp can be hard to start and they tend to wrap in baler belts.

Article developed from materials developed by Mark Hanna and Graeme Quick, Ag Engineers, Iowa State University, Ames, IA