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***Forage Focus: Drought-Damaged Corn Silage Considerations***

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Drought-damaged corn silage may be worth 75 to 95 percent the feeding value of normal corn silage. Allow the corn to stay in the field as long as possible, since if rains come they may bring more stalk and leaf growth, and more tonnage at harvest time. Don't get in a hurry to harvest corn even if several leaves are drying up on the stalk. Firing of the lower leaves is not critical to the survival of the plant. Plant survival is not in jeopardy until firing of the 6th or 7th leaf occurs. If you decide to harvest in the near future, the dry matter content of the silage should be in the range of 28 to 36 percent.

Corn chopped too wet ferments very poorly and feed intake is reduced greatly when it is fed. Corn chopped too dry ferments poorly, has low starch digestibility and spoils quickly during feed out. Corn should be chopped when its dry matter is between about 30 and 40% (equal to 60 to 70% moisture). Ideally the dry matter should be between 32% (for bunkers) and 38% (for upright silos). Do NOT chop corn for silage when its dry matter is less than 28%. Before a farmer starts to chop, they should go to the field and cut a few (3 or 4) stalks at the same height as the farmer plans on setting the chopper. Cut the stalks into small pieces (about 1 inch) using a cleaver or heavy knife, mix the sample and then analyze the sample for dry matter using a Koster tester or microwave (see OSU Agronomy Fact Sheet AGF-004-90). If the corn has the correct dry matter, they can chop. If it is too wet, delay chopping.

A "quick and dirty" method of estimating time to harvest is to squeeze a stalk in your hand for 30 seconds. If moisture drips from the stalk after squeezing, it is too wet for optimum ensiling. The crop needs to remain in the field a little longer or should be layed down in the field for 12 to 24 hours. If the stalk remains compacted after squeezing, the moisture level is acceptable for direct cutting. If the stalk bounds back after squeezing, the crop may be drier than it should be and water will need to be added while putting the corn in a silo or pile. The moisture level may drop rapidly as the plant begins to die.

If the corn becomes too dry, add four gallons of water per ton of silage for each 1 percent desired increase in the amount of moisture content. It is best to add this water at the time the silage is being put in the pile silo. Water added after all the forage has been harvested tends to seep down the sides of the pile or the inside walls of the silo.

Drought-stricken corn put up as silage will generally have more protein and less energy than normal corn silage. Corn stressed all summer, with short stalks and no ears has about 70 percent the energy value of normal corn silage. Corn not so severely stressed (about ten bushels per acre) will have approximately 80 percent the energy of normal corn silage.

There have been some questions about bagging silage this year by producers who do not normally make silage. Bagged silage will have a useful life of about two years before quality declines. Bags can remain open if about one foot per day of silage is used. With an 8 foot diameter bag, one foot equates to about 1 ton of corn silage. Tears and rips in the plastic need to be repaired when they occur.

The crude protein content of drought silage will likely be higher (11 percent) than that found in normal corn silage (8 percent) on a dry basis. In normal corn silage much of the protein is found in the grain. In drought-damaged corn more of the protein is found in the plant. This protein is more soluble in the rumen than protein found in corn grain. Therefore, the feeding of supplements containing large quantities of urea (NPN) may not work as well for animal performance than when a plant protein is fed. Urea based supplements may still need to be considered if natural protein sources remain high priced. Do not add urea to drought-damaged corn silage at silo filling time.

Feeding the silage after it has fermented can be a concern. Because it contains no grain, drought silage has a lower energy content than normal silage. Supplemental feed such as grain may be needed to provide cattle with the energy they need to perform as well as they would on normal corn silage. Weed seeds or screenings can also be added at time of ensiling. The ensiling process will kill many weed seeds, but not all, and will reduce moisture levels in wet silage. Ensiling and feeding losses of drought-stressed corn are generally higher than for normal corn silage but bunk life should be of less concern during cooler weather.

Studies feeding drought stressed corn silage are somewhat limited. In one study cattle fed drought-damaged corn silage gained 19% slower and required 27% more dry matter per pound of gain than those fed normal corn silage. This drought corn silage was harvest after 60 days without rain and it contained about 10 bushels of grain per acre.

When corn is stunted, as in a drought, the nitrate content of the plants becomes a major concern. The highest concentration of nitrate is found in the first 12 inches of stalk above ground. This portion may contain 10 times more nitrate than the upper plant parts. Cutting the plant at a higher level will reduce nitrate problems, but of course will reduce tonnage.

Nitrate problems can be reduced by harvesting the crop as silage. Fermentation can cause forage to lose 40 to 50 percent of its nitrate content. Also, waiting four to five days to harvest after a rain will reduce the amount of nitrates in the plant. And adding 20 pounds of limestone per ton of chopped corn has helped to reduce nitrates. There are however varying opinions on whether limestone should be added. For one thing, limestone prolongs the ensiling process. If you think you have a nitrate problem, have the forage tested for nitrate three weeks after the ensiling process, or prior to feeding.

Animals only adapt gradually to nitrates, so start them slowly on feeds high in nitrates (at least 10 days). Never feed hungry animals a diet consisting solely of forage high in nitrates. High nitrate forages can be diluted at feeding time with grain or chopped forages. Also, do not feed high-nitrate forages separately from the other ration components. Feeding small amounts of high-nitrate forage frequently - rather than large amounts less often lowers its toxic effect. One way to do this is to self feed a complete ration. Finally, feeding iodized salt and elevated vitamin A levels (30,000 I.U./1000 pounds body weight/day) will reduce some of the problems associated with feeding high-nitrate feedstuffs.

Be aware that toxic silo gases - nitrogen dioxide or nitrogen tetraoxide are produced at ensiling time when silage is harvested and put into an upright silo. These gases should be less a problem

to producers who use silo bags, as long as no one enters the bags. There are a few simple rules to follow when working with silos and silage. Run the blower 15 to 20 minutes before going into a partially filled silo, and keep the blower running while anyone is in the silo. Stay out of the silo for about three weeks after the silo has been filled. It takes about three weeks for any forage to become silage anyway. If you experience the slightest throat irritation or coughing, get into fresh air quickly and contact a doctor.

Baling a corn crop is another way to salvage it, the method is not without problems. For one thing, it is extremely important that the crop be cut and allowed to completely dry before baling it, but the corn stalk may take a long time to dry and this can increase the chance of encountering a nitrate problem. Also, harvesting corn for baling may be hard on regular haying equipment.