Making Silage from Drought-damaged Corn
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Dry conditions around the state have many corn producers wondering about making silage from drought-damaged corn. Although silage made from drought-damaged corn is usually not as good as that made from unstressed corn, drought-damaged corn can make good livestock feed. As a rule, drought-damaged corn will have 85 to 95% of the feeding value of normal corn silage. Ideally, corn silage would be 60 to 70% moisture at harvest. If drought-damaged corn contains less than 60% moisture, producers could add some water at the silo. However, when drought slows plant growth and delays maturity, the moisture content is often higher than is suggested by the appearance of the crop. Taking the time to check the moisture content before harvesting could save a lot of trouble later. MU Guidesheet 3151 contains detailed information on how to measure the moisture content of silage by using a microwave oven.

Drought-damaged corn should be chopped to 3/8 to 1/2 inch in length. This length of chop should help in packing the silage to exclude as much oxygen as possible. Producers should also sharpen the knives on their equipment before making silage. Other tips include filling the silo quickly and packing the silage as tightly as possible. Remember, to make good silage, oxygen should be excluded at all points.

One concern with drought-damaged corn is high nitrate levels in the silage. High nitrate levels are frequently found where high levels of nitrogen fertilizer were applied and/or where drought-damaged corn is chopped a few days after a rain. Other factors that contribute to high nitrate levels in corn silage are cloudy weather, extremely high plant populations, and shortages of soil phosphorus and potassium. Ensiling drought-damaged corn is preferred to greenchop because during the fermentation process, the nitrate content will be reduced by 30 to 50%. If a producer suspects that the crop may have high nitrate levels, they should have it analyzed before harvest, if possible.

One word of caution: corn with high nitrate levels produces more silo gas (mainly nitrogen dioxide and nitrogen tetroxide) than normal corn silage. During the fermentation process, a portion of the nitrate in corn silage is converted to nitrogen dioxide and/or nitrogen tetroxide; the higher the nitrate levels in the plant, the more silo gas that is produced. The reddish-yellow fumes of silo gas often smell like chlorine bleach, and silo gas is toxic to humans. Remember that silo gas is heavier than air and thus tends to accumulate in low areas. Most often, this is a problem for producers with upright silos, as the silo gas tends to accumulate in feed rooms at the bottom of silo chutes. Silo gas can be a problem for other silage storage systems as well, and one should exercise caution around silos during the filling and fermentation process.
If producers have corn with high nitrate levels, there are a few things they can do. First, they might delay harvesting until the plant begins to "outgrow" the nitrate accumulation. Usually, drought-damaged corn will have normal levels of nitrates after 2 weeks of normal growth (once the drought ends!). Second, producers might increase the cutting height to 8 or 10 inches. Nitrate levels are usually highest in the lower part of the stem, so increasing the cutting height can help lower nitrate levels in silage. Finally, if they have high nitrate corn silage in the silo, they could dilute the silage with other feed grains or hay at feeding.

Several producers have asked about making "big round bale silage" or baleage from drought-stressed corn. For those not familiar with the practice, baleage is simply baling high moisture forage (55% is usually ideal) and then wrapping the bales with plastic film to exclude oxygen. In theory, this could be a way to store the crop if silage-making equipment were not available. However, many people who try this with corn are disappointed. Often, the corn stalks poke holes in the plastic film, and thus the silage spoils. In addition, it is difficult for many big round balers to tightly compact 60 to 70% moisture corn stalks and/or partially mature ears. For these reasons, I do not recommend baleage for drought-stressed corn.

Harvesting drought-damaged corn for silage can be a way to salvage an otherwise useless crop. Paying close attention to moisture content, length of cut, packing, and nitrate levels in drought-stressed corn cut for silage will help make the most of a bad situation.