

Harvesting Corn for Silage under Drought Conditions

Chad Lee, Grain Crops Extension, University of Kentucky

August 2, 2007

The following are some brief bullet points on harvesting drought-stressed corn for silage. For more information, contact your county extension office.

Why harvest drought-stressed corn for silage

Drought-stressed corn that is unlikely to resume growth should be ensiled. Overall tonnage yield will be reduced, but drought-stressed corn with an ear could still net 85 to 100% of the normal net energy content. Crude protein values could be slightly higher. The ensiled corn should not be fed until at least three weeks after the silo has been filled.

As with any silage sample, a feed value analysis should be conducted. Collect a couple handfuls of each load of forage. Keep the samples in a cool, dry area until they can be sent off for analysis.

Drought-stressed corn forage should also be tested for nitrate levels. Corn will accumulate nitrates, especially in the lower stalks and leaves, under dry conditions.

Caution about nitrates

At high enough concentrations, nitrates are poisonous to cattle. Ensiling reduce nitrate levels by 30 to 50%.

Nitrate (NO ₃) in dry matter	Feeding Instructions
0.0-0.44%	Safe to Feed
0.44 – 0.88%	Limit to 50% of total dry ration for pregnant animals.
0.88 – 1.50%	Limit to 25% of total dry ration. Avoid feeding pregnant animals.
Over 1.50%	Toxic. Do not feed.

The University of Kentucky Livestock Disease Diagnostic Center has testing kits available free of charge to county extension offices for testing corn for nitrates. These kits will provide a ballpark estimate for the level of nitrates in the corn. If the kit indicates a high level of nitrates, then a sample should be sent off for further analysis prior to feeding.

When to harvest drought-stressed corn for silage

Dry matter should be near 35%, slightly more dry matter concentration for bunkers, trenches and stacks. Under ideal conditions, the milk line would be about ½ to ¾ down the kernel. In drought condition, kernels will be small, but the milk line will move down the kernel quickly. Silage should be chopped into lengths of approximately 3/8 to 1/2 inch.

Determining Crop Moisture (Microwave Method)

This method provides a fairly accurate estimate of crop moisture but requires scales, a microwave, and people who do not mind the smell of burnt corn in the microwave.

- Collect a representative sample of fresh plants.
- Chop the plants in 1 to 2 inch pieces.
- Weigh a sample (about 3 to 4 oz or 100 g). This will be referred to as the fresh weight.
- Spread the sample uniformly and thinly over a microwave safe dish and place in microwave oven.
- Heat for 1 to 2 minutes and weigh. Heat for 30 seconds and reweigh. Repeat until two weight recordings are similar. If the sample chars, use the previous weight. This is referred to as the dry weight.
- Calculate the percent moisture. Percent moisture = [(fresh weight – dry weight)/fresh weight] x 100.

Determining Crop Moisture (Grab Test Method)

This method provides a ballpark estimate of crop moisture.

- Squeeze a handful of green chop as tightly as possible for 90 seconds to make a forage ball.
- If the forage ball holds shape and there is considerable free juice, moisture is above 80%
- If the forage ball holds shape but has very little free juice, the moisture is about 70 to 75%
- If the forage ball falls apart slowly and has no free juice, the moisture is about 70 to 60%, which is ideal for most ensilage situations.
- If the forage ball falls apart rapidly, the moisture is below 60%, making ensilage more difficult.

Harvesting corn for silage increases the risk of lethal gases.

The greatest danger for lethal gases occurs between 12 to 72 hours after filling. Run the blower. Stay out of the silo for at least one week after filling. Keep doors closed between silos and barns. Any experience of the slightest throat irritation or coughing requires immediate medical attention.

More Information

For more information see University of Kentucky Extension Bulletin ID-86 “Using Drought-Stressed Corn: Harvesting, Storage, Feeding, Pricing and Marketing”.