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Alternatives for Drought-damaged Corn—Grain Crop or Forage

Stephen K. Barnhart

Iowa State University, sbarnhar@iastate.edu

Roger W. Elmore

Iowa State University, relmore@iastate.edu

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Abstract

As people reflect on the reasons for the irregular development and poor grain production in Iowa this year, the next important questions relate to evaluation of crops in individual fields and planning when and how to harvest them to the greatest economic advantage. This evaluation involves reviewing normal crop growth and development, assessing the condition of the crops in individual fields relative to normal, and to think through several harvest scenarios such as: Will this field have a harvestable grain crop? Are there concerns about the crops? What use or management alternatives do I have?

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Alternatives for Drought-damaged Corn – Grain Crop or Forage

By Stephen Barnhart and Roger Elmore, Department of Agronomy

As people reflect on the reasons for the irregular development and poor grain production in Iowa this year, the next important questions relate to evaluation of crops in individual fields and planning when and how to harvest them to the greatest economic advantage. This evaluation involves reviewing normal crop growth and development, assessing the condition of the crops in individual fields relative to normal, and to think through several harvest scenarios such as: Will this field have a harvestable grain crop? Are there concerns about the crops? What use or management alternatives do I have?

Most of the Iowa corn crop is intended for harvest as dry grain. If it has sufficient grain content and quality, corn will be more valuable as harvested grain. If the field or parts of the field fall short of economic grain potential, some producers can harvest this low-yield corn for silage or use it in grazing programs.

Predicting grain yield mid-season is difficult. It involves assessing what you have in the field and comparing that with normal crop growth and development. With normal corn development, the number of pollinated kernels should be visible at about 10 to 12 days after silking (blister stage). This represents potential grain set. If weather conditions have adversely affected pollination, it will be evident at blister stage. For the remainder of the summer, weather conditions influence how many of these pollinated kernels develop and the stage of their development. Harvest decisions can then be based on knowledge of seed development gained by monitoring.

If the crop does not appear to be developing well, and you are making early forage harvest decisions, the following guidelines have been adapted from the University of Wisconsin Extension for estimating silage yield of moisture-stressed corn.

Grain yield method for estimating silage yield

For moisture-stressed corn, about 1 ton of silage per acre can be obtained for each 5 bushels of grain per acre. For example, if you expect a grain yield of 50 bushels per acre, you will get about 10 tons/acre of 70 percent moisture silage (3 tons/acre dry matter yield). For corn yielding more than 100 bushels per acre, about 1 ton of silage per acre can be expected for each 6 to 7 bushels of grain per acre. For example, for corn yielding 125 bushels of grain per acre, corn silage yields will be 18 to 20 tons per acre at 70 percent moisture (5 to 6 tons per acre dry matter yield).

Plant height method for estimating silage yield

If little or no grain is expected, a rough estimate of yield can be made assuming that 1 ton of 70 percent moisture silage can be obtained for each

foot of plant height (excluding the tassel). For example, corn at 3 to 4 foot will produce about 3 to 4 tons per acre of silage at 70 percent moisture (about 1 ton per acre of dry matter).

In addition to yield, other factors also should be considered. Stage of development or condition of growth also has an influence on the feed value of the harvested crop. Compared to normal corn, corn that would yield about 20 to 40 bu/A would have about the same pound for pound feed value. Very poorly pollinated stalks with 0 to 20 bu/A yield potential would have about 80 to 90 percent the feeding value of normal corn. Short, barren stalks would have only about 70 to 80 percent the feed value of normal corn.

In what form will the corn be harvested and used? The three most practical options for using drought-damaged corn are green chopping, ensiling and storing as dry stover. Each system has some advantages and disadvantages. Producers should consider the fungicides, herbicides or insecticides used in their corn production. Each of these products has a legal preharvest interval. Early harvest or grazing may violate these intervals. Growers should carefully check the label for any restrictions that may affect harvest or harvest timing.

Green chopping corn provides an immediate source of feed for dry lot or supplement on pasture. A disadvantage may be a potentially high level of nitrates in the drought-damaged, fresh forage. Producers are encouraged to have fresh chopped corn tested for nitrates at a nearby commercial feed testing laboratory if there is any concern about high levels.

Chopping corn for silage provides a less immediate feed source, but a form that can be stored and fed over a longer period of time. One of the main management challenges of harvesting drought-damaged corn for silage is cutting the plant at the proper moisture content for the type of silo structure in which the forage will be stored. Corn should be stored at 65 to 70 percent moisture in a bunker or trench silo and at 60 to 65 percent moisture in upright silos. In plants with at least some grain, the dry down rate of the grain will provide a rough guide for predicting whole plant moisture.

Plants with no grain but with some live green leaf tissue still evident will have surprisingly high moisture content (75 to 80 percent), too high for direct cut ensiling. In some cases even when all the visible leaves have turned brown, the whole plant moisture is still above 70 percent moisture. Plants that have actually died will lose moisture very quickly and could drop below 50 percent moisture in a short time, too low for best nutrient conservation as silage.

An accurate moisture test from a representative field sample is an important piece of information needed to manage a corn crop for silage. It is difficult to estimate the whole-plant moisture content in the field. The best method may be to chop a representative area of the field with the silage chopper to be used and send the representative sample of chopped forage to a test lab for moisture determination. Moisture determinations can be made at a nearby feed testing laboratory or with a home check using an accurate scale and a microwave oven or heat lamp to dry the sample. Use caution when drying forage in a microwave oven or under a lamp at home. As the plant material dries it becomes more combustible. Special precautions should also be taken to avoid permanent damage to microwave ovens.

If nitrate concentrations are a concern in the chopped crop, ensiling can diminish the nitrate concentration by 30 to 50 percent. Good management would be to have the silage tested by a commercial feed testing laboratory, after ensiling, to estimate nitrate concentration and nutritive value for livestock.

Harvesting drought-injured corn as silage will not be a good option for everyone. Making good silage from a normal corn crop requires some degree of skill and attention to detail. If you do not already have the harvest machinery, a silage storage structure in good condition, experience in making corn silage, and a well-defined plan for silage use, then making silage from drought-damaged corn may be a high risk venture.

Too often producers who are looking for a 'cheap way' to salvage a crop as silage choose to store silage in a wide, low pile on the ground, possibly even bounded on each side by a row of large round hay bales. These piles may seem to be low cost initially, but spoilage and waste is often high and as a result the 'cost' per ton of usable, good quality silage is higher than expected.

Stacking or baling as dry corn stover - Drought-damaged corn has dried quickly in many areas. Corn that has dried below 55 to 60 percent moisture is not a good material for ensiling. Rather, it should be considered for possible stacking or baling as dry corn stover. Timeliness is not quite as critical when harvesting stover. It should be dried to 20 percent moisture or less to avoid spoilage in storage and should be harvested before excessive leaf loss occurs. High nitrates can be a concern with stover. If you're concerned, have a nitrate test done on a representative sample. A few other suggestions are to store stover at a dry location near the site of feeding, and provide limited access to stover during feeding to stretch feed supplies and minimize feeding waste while allowing livestock to adapt to potentially high nitrate-concentration forage.

Stephen Barnhart is an extension forage agronomist. He can be reached at 515-294-7835 or e-mail sbarnhar@iastate.edu. Roger Elmore is an extension corn agronomist. He can be reached at 515-294-6655 or relmore@iastate.edu.

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