Estimating yield of drought-stressed corn.

Jürg M. Blumenthal, State Sorghum Cropping Systems Specialist

Soil & Crop Sciences Department

Texas A&M University

College Station, TX 77843-2474

The lack of rain over the last two weeks and low soil moisture have resulted in medium to severe drought stress impacting corn in central Texas. Test weight is one of the factors that determines market grade. Drought stress during grain fill can cause light test weight grain, resulting in lower grain grade and a considerable price dock at the elevator. On the other hand, light test weight corn usually makes good animal feed, having 90 to 100 percent of the feed value of normal corn. Light test weight grain can be a bargain for the feeder provided the corn does not contain mycotoxins.

In the following a procedure is outlined to estimate the yield of a corn crop prior to harvest. Much of the following information is derived from work done by T. Dorn, B. Anderson, and R. Rasby at the University of Nebraska and from the National Corn Handbook published by Purdue University.

Yield of a corn crop in the field can be estimated by the following procedure:

1) To estimate potential yield in standing corn, measure a distance equal to 1/1000 acre. in one row and count the number of plants that will produce an ear. Repeat this in several areas of the field. The length measured will depend on row spacing (for 30 inch rows measure 17 ft 5 in, for 38 in rows measure 13 ft 9 in, and for 40 inch rows measure 13 ft 1 in, respectively). Multiplying the measured value by 1000 will result in the number of pants per acre that will produce an ear.

2) Take an ear at random from each of these areas and count the number of rows of kernels and the number of kernels per row on each ear. Average the number of rows per ear and the number of kernels per row.

3) Multiply the average number of rows by the average number of kernels per row to get the kernels per ear.

4) The kernels per ear multiplied by the ears per acre results in the kernels per acre.

5) There are about 90,000 kernels per bushel in normal corn. Drought-stressed corn may have 110,000 kernels per bushel. Dividing the kernels per acre by 110,000 results in the estimated yield of the droughtstressed corn.

For example: A dryland field of corn under moisture stress during pollination and kernel fill has 20,000 plants per acre with ears that pollinated but have “tipped back” to an average of only 22 kernels per row. There are an average of 14.1 rows of kernels per ear. The estimated grain yield (assuming enough moisture is received for photosynthesis to

occur and transport of starch into the grain) would be 56 bushels per acre (20,000 x 22 x 14.1 / 110,000 = 56 bu/ac).

Sources:

T.Dorn, B. Anderson, and R. Rasby. 2002. Drought-stressed Corn. NF547. University of Nebraska.
National Corn Handbook. Purdue University.