



October 5, 2012

YIELD CONTEST CORN IS A PERSONAL RECORD

I had the opportunity last week to be a third party referee in a National Corn Growers Contest entry field near Dorchester on a pivot irrigated, corn-on-corn field. The field was selected to be a contest entry field at the beginning of the year and essentially the grower chose to do his normal production practices. Everything went well, excellent soil quality and fertility, the stand was excellent with planted population of 32,500 plants per acre and harvest population estimate of 32,000 plants per acre. No severe storm damage. The irrigation system worked well except for the two inside spans with not enough water applied. Total irrigation was estimated to be 9 acre inches of water.

One harvest pass through a good area of the field and an additional 400 feet or 1.27 acres yielded 276.44 bushels per acre. The yield was certified by me and Paul Hay. Yields over 250 bushels per acre require two, third party referees. What an incredible accomplishment in terms of a contest entry and as a farmer. It's proof of the incredible production capacity of the current farmer. The previous personal high for me was around 260 bushels per acre in a Jefferson County field not too far from the Bower sign along Highway 15 a couple years ago.

This year with all the heat units, lower disease levels, this helped lead to higher plant health. If spider mites were not an issue and if irrigation kept up with the demand, we have some really good irrigated corn this year in the area. We had plenty of heat units and sunshine for photosynthesis. I was concerned that 25 out of 31 days in July where we had 90 degrees F and above and eight of those days in the 100's would be a negative factor. The key was the low dew points and low humidity which led to temperatures that were not too high at night. Corn does not sleep at night but rather respiration occurs so night temperatures in the 80's can be detrimental to yield. This year our night time temperatures would go back into the 70's generally speaking.

During the day sugars and starches are produced from photosynthesis. The process that runs during the night is called dark respiration. Respiration means to "burn." Oxygen is used by the plant to burn the stored carbohydrates within the plant to perform two critical functions. The first function of dark respiration is for cell growth. Corn plants continue to grow during the darkness with the aid of the stored carbohydrates. The second function is for cell maintenance and cooling. Cells continually need repaired and energy is required to fix the cells and maintain a strong healthy plant. Dark respiration uses the carbohydrates that were produced by photosynthesis to produce the energy the plant needs to carry out the two functions of dark respiration.

When nighttime temperatures are below 70° F, the entire system runs smoothly and highly efficient. As temperatures increase, more energy is required by the plant to stay alive and remain cool. Dark respiration begins to rapidly accelerate as the nightly temperatures begin to climb above the mid 70's. As dark respiration speeds up a large amount of energy is consumed by the corn plant.

With this in mind the yield equation for the corn plant is simple. The corn plant needs to be able to both maximize photosynthesis during the day and minimize dark respiration in order to maximize yield. While the main focus of grain production is often solely on the daylight hours, but the nighttime hours are just as critical to the success of the corn plant. Dark respiration is an important function of the corn plant. The balancing act between efficiently using and burning carbohydrates is done while the moon hangs over our heads.



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