2008 Crop Year in Review

Tom Dorn
UNL Extension Educator

This article is a look back over the 2008 crop season in Lancaster County and the obstacles many producers had to overcome. It also looks ahead to the challenges and opportunities in the new crop year.

Looking Back

The wet spring in 2008 delayed planting and other field operations in April, May and June. A considerable percentage of the corn and soybean acres were planted well after the optimum plating date for highest yield potential.

Lincoln had the eighth wettest June on record with 8.59 inches of precipitation, over five inches above normal for the month even though Lincoln was essentially missed by the June 6 storms that spawned a tornado and produced widespread flooding along the Lancaster–Saunders County border and flooding and wind damage south of Saltillo Road to the Gage County line. Not only did this make the fields, which had not been planted yet, too wet to work for another 10–14 days, but some high-priced nitrogen leached below the root zone in well-drained fields or was lost to denitrification in areas where the soil remained saturated for long periods.

Fungal diseases were prevalent in wheat again this year, mainly as a result of the extended periods of free water on the leaf and head surfaces from the frequent rains. These conditions were ideal for fungal growth. Some producers were docked at the elevator when detectable levels of mold toxins were found in the grain. Wheat yields were respectable, but nothing close to a record.

The rainfall spigot shut-off in late June and we only had three rain events where we received over a half-inch through July and August in Lincoln.

Thankfully, the soil moisture stored in the root zone in May and June was sufficient to carry corn through the critical tasseling, pollination and early dent stages before undergoing significant moisture stress. Most corn ears filled fairly well, but there was tipping back (barren ear tips) in many fields. The cooler-than-normal August delayed corn maturity which will likely result in more corn being harvested at higher moisture content than usual. I expect more corn will require drying to reach safe storage moisture for long-term storage (see the article on the Farm Views page of the October NEBLINE, "How to Reduce Energy Cost for Grain Drying," online at http://lancaster.unl.edu/nebline).

Soybeans drew on the stored soil moisture and grew well through flowering, pod development and early pod fill. The cool temperatures in August were ideal for soybean aphid reproduction and survival. Far more acres were sprayed to control soybean aphids than we have ever done in Lancaster County. Soil moisture began to run out around the last week of August, which hastened soybean maturity and reduced bean size. This was especially evident in lighter soils and areas with soil compaction or salinity problems.

Looking Ahead

As this is being written the third week in September, winter wheat planting is about to start. We have had several small rains this month so there should be adequate moisture for germination and early growth. Grasshoppers are abundant and are very hard to kill this time of year. Grasshopper feeding on wheat seedlings is a concern. By the time this NEBLINE is printed, we should have had some killing frosts. Hopefully frost has reduced grasshopper populations to sub-economic threshold levels. It never hurts to scout field margins to assess this for yourself.

One growing concern for producers when looking forward to next year is the ever higher cost for purchased inputs for crop and livestock production. To aid producers as they make plans for next season and as they put together their cash flow and borrowing needs, UNL Extension Cropping Systems Specialist Robert Klein has put together several estimated 2009 crop budgets. These are all based on scenarios typical of the type of crops and cropping practices one would find across the state. These budgets can be found on the Crop Watch Newsletter Web site. The budgets were split up between two consecutive issues of the newsletter. Go to http://cropwatch.unl.edu, click on Archives, then click on 2008 Archives and open the newsletters dated Sept. 12 and Sept. 22.

A hint of the type of information found in these crop budgets is an irrigated corn budget. The assumption was a 220 bushel per acre yield goal with a 205 bushel actual yield. The actual budget is very detailed. The following are the highlights:

Total cost for field operations	$172.62
Total cost for materials and services	$388.96
Total listed costs for field operations and materials and services	$561.58
Cost per bushel for field operations and materials and services	$2.74

Note: This analysis did not include cash rent on leased land or interest on the land loan or property taxes on owned land. These costs should be included when calculating a true break-even cost per bushel.

Photos by Tom Dorn, UNL Extension in Lancaster County

This was a field just South of Roca Road on Hwy. 77 flooded by heavy rains in June.

This corn was laying over after heavy rains in June caused rushing water to wash over the corn.

Surviving High Input Costs in Crop Production Web Site

UNL extension specialists and extension educators are in the process of creating a Web site titled, "Surviving High Input Costs in Crop Production." This Web site will be populated with short single-topic papers describing ways to reduce input costs in crop production without suffering economic yield loss.

By the time this newsletter is printed, this Web site will be linked to the Crop Watch Newsletter site (http://cropwatch.unl.edu) and will be linked to the UNL Extension in Lancaster County Acreage, Farm and Ranch page at http://lancaster.unl.edu/ag. Take a look and see how many of the practices suggested could be implemented on your farm. It may be possible to reduce input costs by $20 to $50 per acre or more without hurting yields.

Preserve Grain Quality with Aeration Management

Tom Dorn
UNL Extension Educator

Corn matured later than normal this year and as I write this article on Sept. 25, I anticipate many fields will be harvested at higher moisture content than usual. This means more grain than usual will need to be dried in the bin or high-capacity dryer to bring the corn down to a safe moisture content for storage. Shelled corn should be dried to 15.5% if the grain will be fed or delivered before December; 15% if held into the new year; and 14% if held into the summer months. The safe storage moisture content for soybeans is two percentage points lower than corn. To learn some techniques to reduce drying cost, see the article on the Farm Views page of the October NEBLINE "How to Reduce Energy Cost for Grain Drying," online at http://lancaster.unl.edu/nebline.

Don't forget, it is important to get the grain cool as well as dry in order to maintain grain quality. Insects become nearly dormant at temperatures below 50 degrees F and many are killed below freezing. Mold growth is nearly zero at temperatures below 40 degrees F as well.

After the grain has reached the target moisture content, run the aeration fan whenever the ambient air temperature is 10 degrees F cooler than the grain. The goal is to cool the grain to between 30 and 40 degrees F as soon as possible. The amount of time required for a cooling cycle to pass through a bin of grain depends on the airflow rate. The cooling time (hours) can be estimated by dividing 15 by the airflow rate, measured in cubic feet per minute per bushel (cfm/bu). For example: it will take about 15 hours to push a cooling front through a bin of corn with a typically sized drying fan capable of pushing one cfm/bu and about 75 hours is needed with an airflow rate of 0.2 cfm/bu (15/0.2 = 75). (This is about the airflow rate you would expect to achieve with a 0.5 hp 12-inch diameter 3450 rpm axial flow fan on a 30-foot diameter bin with a full mesh floor and 18-feet grain depth.) Check grain temperature at several locations in the bin to determine when the cooling cycle is complete. Grain temperature changes about 50 times faster than the moisture content, so the air's relative humidity is of little concern during grain cooling.

It is important to keep the grain temperature uniform throughout the bin. The temperature of the grain next to the bin wall will be influenced by the air temperature so tends to be colder than the grain in the middle of the bin in winter. Cold air sinks along the bin wall and warmer air rises in the middle of the bin where the grain is warmer. When the warm air gets to the cold grain surface at the top of the grain mass, moisture in the air can condense and cause a wet spot to form in the top middle of the bin. It is a good idea to run the aeration fan once a month in winter when air temperature is between 28 and 35 degrees F to keep the grain at a uniform temperature within the bin. Run the fan long enough to push a temperature front all the way through the grain mass before shutting down.

Always cover roof hatches when you are not aerating to keep snow from blowing into the bin, where it can melt and cause a wet spot. It is also a good idea to cover the fan opening to prevent the chimney effect from drawing cold air in through the fan and up through the grain. If you have discovered spoiled grain on the bottom of the bin when you unloaded in the spring, it was likely due to the chimney effect drawing small volumes of air through the fan opening into the cold grain which resulted in the humidity in the air condensing on the cold grain in the bottom of the bin.

Estimating Corn Drydown Time

Farmer Question: About how long should it take to dry 20% moisture corn to 15% using natural air during the last three weeks in October?

Answer: The High Plains Climate Center data for Lincoln, Nebraska shows the 24-hour mean temperature is 51 degrees F for the final three weeks in October. If we assume the mean humidity is 50% (dew point of 33 degrees F) and if we assume the airflow is 1.0 cubic feet per minute per bushel, (the minimum recommended airflow for 20% moisture corn), we can estimate the time to dry this grain.

Under these climatic conditions, the stated aeration fan and assuming no stirring system in the bin, it should take about 20 days to bring the moisture content at the top of this bin of corn to 15%.

If the bin is equipped with a stirring system, run the stirring system while filling the bin to relieve the pack factor, redistribute the fines (which tend to congregate in the middle of the bin) and to level the grain. Then shut off the stirring system and allow a drying front to form and move through the grain. Since the bottom of the bin will be over-dried by the time a drying front is pushed through the bin, run the stirring system again when the top of the drying front is two feet below the surface to equalize the moisture in the grain mass. Following this stirring system management could reduce drying time about three days.