Corn Harvesting And Drying

URBANA, ILL.

Mike Roegge, University of Illinois Extension, Adams/Brown Unit, reports that this years' corn harvest is going to place quite a demand on grain drying systems, both on farm and at the elevator. It's been years since we've seen the kind of harvest we're likely to be facing this year. I'll be the first to admit that I know very little when it comes to improving/increasing the efficiencies of grain drying systems. But I'll try and summarize some of what I've read.

There are a number of factors that affect grain drying, including: grain moisture, air flow, temperature (outside, grain and heated air), humidity, type of drying system, etc. But some factors are going to be the same, regardless of the drying system you have. One of those would be air movement. Generally speaking, the more air you can move, the better conditions you would have for drying. There are certain minimum air flows required based upon grain moistures and temperatures. The lower the heat, the higher you'd like the air flow to be. The higher the heat, the quicker and more efficiently you'll lower the grain moisture levels.

Following are some grain drying tips taken from Dr. Ken Hellevang, NDSU. The entire paper is located at: http://www.extension.org/pages/Postharvest_Tips_for_Later-maturing_Corn

High temperature grain drying- Using the maximum drying temperature that will not damage the corn increases the dryer capacity and can reduce energy consumption. The amount of energy required to remove a pound of moisture is about 20 percent less at a temperature of 200 degrees versus 150 degrees. However, remember too high of temperatures can lead to increased cracking and lower test weights. Also with higher moisture corn, lengthened drying times with high temps can lead to corn browning and discounts.

In Storage Cooling– using in storage cooling rather than in dryer cooling will boost your capacity. It requires airflow rates of about .20 cfm/bu or 12 cfm/bu-hr of fill rate. Cooling should start immediately when corn is placed in the bin. About 1 percentage point is removed during corn cooling.

Dryeration– will increase dryer capacity by 50 percent or more, and reduce energy by 25 percent and remove about 2-2.5 point of moisture (.25 points for each 10 degrees corn is cooled). Place the hot corn from the dryer into a bin, let sit for 4-6 hours without airflow, then turn on the fan to cool it. You must then move to a different bin. There will be a tremendous amount of condensation, so you must move the corn to a different bin.

Estimating costs for high temperature drying- use the following formula: cost/bu. point= 0.022 x propane cost/gallon. For example, the drying cost is 2.9 cents/ bu. point if the cost of LP is $1.30 (0.022 x $1.30) It will cost about $34 for LP to remove 10 points of moisture from 120 bu of corn using $1.30 propane. The estimated quantity of propane needed to dry is 0.022 gallon per bushel per point of moisture removed. For example, 26 gallons of propane is needed to dry 120 bushels of corn from 25 percent to 15 percent (0.022 x 120 bushel x 10 points).

Test weight will also increase as corn moisture decreases. Normally, test weight increases about 0.25 pound for each point of moisture removed during high temperature grain drying. However, mechanical damage during harvest and gentleness during the drying process can affect test weight. In ND last year, due to mechanical damage involving 25-30% moisture corn and high drying temperatures, there was sometimes no test weight increase. There will be little to no test weight increase on immature (frost damaged) corn.

Remember also to account for shrink when drying grain. To dry corn to 15.5 percent moisture, the shrink factor is 1.1834. The shrink drying corn 5 points would be 5 x 1.1834= 5.92 percent. Δ