TAKING CARE OF NEW CROPS

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High-Value Crops Require Farmers to Handle with Care

With the increase of specialty grain – high oil, food grade – production, farmers have turned more attention than ever to their grain handling operations. Chris Wuethrich is a case in point.

As specialty grain manager of W&W Farms, Francesville, IN, Wuethrich understands that delivering a quality crop to market often boils down to post-harvest management abilities. W&W Farms has been in the specialty grain business since the early '80s and contracts with other producers, as well. It is the largest supplier of high-amylose (starch) corn to Cerestar USA Inc., Hammond, IN, a wet miller that makes starch that goes into both food ingredients and industrial products.

"The premium for our grain is quite a bit higher because of the reduced yields. I would say in some instances, two times higher than regular corn," says Wuethrich.

Special specialty. High-amylose corn is a niche product within the specialty grain business. Some say it is one of the most difficult specialty crops to produce because it acts differently than any other crop from planting through harvest.

To receive higher premiums for his crop, Wuethrich begins planning in the winter for the year's production. "The post-harvest stage is probably the most important time in the production cycle for grain quality because that's when we have the most control over it through our handling and drying practices," says Wuethrich. "One of our main objectives is the overall quality of the grain."

Dirk Maier, extension agricultural engineer at Purdue University, has been working on research in the specialty grain handling and drying area for years. He says, "In 30 minutes you can ruin an entire year's crop if you overheat it in the dryer."

"Anytime you can minimize breakdowns, it's definitely an advantage. A series of breakdowns can slow down our harvesting, and it's a concern because not only can you not get the crop out of the field fast enough, it's also never good for customer relations. In addition, a breakdown can be very serious because wet grain deteriorates very quickly." – Chris Wuethrich

Maier recommends that a farmer interested in specialty grain production should think beyond planting and harvest to the post-harvest stage because it takes a lot more care and management than conventional programs, and grain handling systems must be flexible to the needs of the crop.

To be successful at producing with high amylose corn

"We have to have a larger dryer than normally needed so the heat can be kept down because our contract specifies the corn temperature doesn't go over 140 degrees," says Wuethrich. "Still, we have to be able to move large quantities through the dryer."

High-amylose corn can be harvested as high as 30% moisture content to limit field loss, but the goal is to deliver a consistent, evenly dried 15% moisture content corn to the mill. W & W Farms, in conjunction with Cerestar, has done on-farm research in this area and developed a successful method to move large quantities of corn through the system. *Continued on next page.*

High volume.

“We run an average of 600,000 bushels of specialty corn a year through three dryers; 400,000 of that gets run through a Mathews 1195 six-stage dryer,” says Wuethrich. “Because we can’t take the corn above a certain temperature level, the stage dryer allows us to uniformly dry the corn in an efficient manner.”

“Our research has discovered when corn enters a six-stage dryer set at 200 degrees and then drops 20 degrees per stage for the next three consecutive stages before going through the two cooling stages, the average kernel temperature never goes above 140 degrees. With this method, the stage dryer reduces the stress on the grain compared to dryers that use high heat and rapid cooling."

Maier advises, “It’s important to remember that the air temperature in the dryer is not the same as the kernel temperature. The kernel temperature has to be kept below 140 degrees in corn used for wet milling and below 110 degrees in corn used for dry milling.”

Another option for farmers is to transfer corn from the dryer at 17 to 18% moisture, steep it in a bin for 8 to 12 hrs., then cool it down with air, which will bring the moisture to a safe storage level of 15%. This process, called dryeration or in-bin cooling, improves corn quality, saves fuel and increases dryer capacity. Overheating corn can cause the starch to gelatinize or cause the germ to release the oil and mix with the starch. This makes the milling process difficult because millers can’t separate the starch and protein fractions. When the corn goes through its normal grading process for moisture and foreign matter, there is no way to determine if it has been overheated until it reaches the stage when the color turns caramel. This is why overheating corn is a very serious problem and, in some instances, can even cause a wet miller to shut down.

Diane Hanekamp, manager of commodities operations for Cerestar, says, “We developed a proprietary test out of necessity to check for overheating, and though it’s time consuming, it can tell us the degree to which the starch has started to gelatinize. In 1992, we had problems nationwide with corn coming in that had been overheated because the crops wouldn’t dry and the temperatures got turned up on the dryers. It shut down our mills in the middle of the season and was a very expensive lesson.”

For exactly these reasons, Wuethrich says, “We keep somebody on the dryer all the time to monitor the moisture and temperature of the grain. Also, because of the many different types of corn we produce, we often have to empty out and refill the dryer with a different corn. The stage dryer speeds this process because we can temporarily run heat on the two cooling stages.”

“This year, in particular, we grew seven different types of corn. Part of our contract with the other farmers says we have to synchronize harvest so we have the same kind of corn coming in at the same time. This helps us keep it coming out of the field so we can handle the flow and not let it sit around too long.”

Wuethrich says the farm’s six-stage dryer has an excellent service record and is vital to the operation. “Anytime you can minimize breakdowns, it’s definitely an advantage. A series of breakdowns can slow down our harvesting, and it’s a concern because not only can you not get the crop out of the field fast enough, it’s also never good for customer relations. In addition, a breakdown can be very serious because wet grain deteriorates very quickly.”

Wuethrich’s attention to detail is what makes W&W Farms such a valuable supplier to Cerestar. ”We’re lucky to have them,” says Hanekamp. ”W&W Farms knows what it takes to handle the bizarre hybrids they are asked to raise.” ■