

Grain Conditioning Tips

BEST AND EASIEST WAYS TO MAINTAIN THE CONDITION OF GRAIN THAT WENT INTO THE BIN

The quality of grain is never better than the day it goes into the tank. However, proper use of today's technology can go a long way toward making sure that quality doesn't get worse. Grain Journal surveyed suppliers of grain conditioning equipment for their best tips on utilizing conditioning technology.

Sanitation, Sanitation, Sanitation

"Assuming you have a well-balanced system, the key is sanitation, sanitation, sanitation. Make sure you keep the system clean of any particulate matter. That includes exhausts, pipes, tunnels, and any perforated metal screens. You don't want any restriction to the flow of air.

"Also, you need to get rid of all that "200-mph duct tape." Fix the equipment that needs to be fixed."

Scott Chant, president, Safe-Grain/Maxi-Tronic, Inc. Loveland, OH

Keep the Fans Running

"One mistake many people make is forgetting that you don't need to run the fans all night, then shut them off during

the day, especially in rainy and foggy weather. Aeration is such a slow process that once you start cooling the grain, you don't want to shut it off. It takes 120 hours or roughly five days to run a cooling front through the bin. We're talking about ambient temperatures, so if you have highs around 80 and lows around 40, you're looking at an ambient air temperature of 60 degrees. Once you stop a cooling front from moving through the bin, you end up with cool grain on the bottom and warm grain on the top, and that's when you get hot spots and crusting on the surface.

"With positive aeration systems, you absolutely need to have power exhausters on the roof. Otherwise, you get condensation dripping down from the roof, and pretty soon you have a rain forest in there. Free vents by themselves don't work to prevent this. If you're putting in 1,000 cfm in the bottom of the tank, you need to be pulling 1,500 cfm out of the top. You can do this with very small fans, because on the top in a positive system, they aren't working

against static pressure."

Kevin Miles, president, Rolfes@Boone, Boone, IA

Control Heating, Cooling Rate

"Most of this is just using common sense. For example, you want to control the rate of heating up and cooling down the grain in your storage bin, to avoid shocking it. When you're moving grain, try to avoid damaging it; variable feed drives can minimize the damage to the grain when you're emptying it onto a conveyor or running it through mechanical equipment.

"Always be aware of the amount of moisture you're pulling out through cooldown and equilibrium. Don't just leave your aeration fans running."

Brent Bloemendaal, engineering manager-grain conditioning, Brock Grain Systems, Frankfort, IN

Monitor Consistently

"Watch the trends. We like to see at least weekly temperature monitoring. Monitor consistently, and believe what you see. We had one new manager one time who called us several times saying there must be something wrong with his system, and we kept telling him to turn on his aeration. After the grain caught fire, he believed us."

Darwin Winkowitsch, president, Tri-States Grain Conditioning Inc., Spirit Lake, IA

The Benefit of Coring

"My biggest tip is to keep an even flow of air through the bin. Guys already know this, but make sure you get that grain cored. Otherwise, air will avoid that top middle section of the bin, where the fines tend to collect, and you begin to get spoilage in that area. Coring lets you get the air into that area.

"Also, use your temperature cables and all other sources of information that you have to tell you the right times to run your aeration fans. Cool, dry times work best. You need to keep an eye ►

on the progress of the cooling front through the bin.”

Todd Morey, sales manager, AIRLANCO,
Falls City, NE

More is Better

“Oversize rather than undersize your air flow capacity. For the insurance that will give you, that’s a pretty cheap investment.”

Kevin Rapp, marketing manager,
Advanced Drainage Systems, Hilliard, OH

Remove Outside Debris

“In preparing bins for fall storage, you are looking at three main areas: Physical integrity, sanitation, and most of all safety are important.

“Keep your facility maintained by mowing and keeping it free from debris and grain spills. Weeds and spills promote rodent infestation, and a clean, debris-free facility is a safer place in which to work.

“As a general grain storage guide, I refer customers to the SLAM storage strategy, <https://www.extension.purdue.edu/extmedia/ID/ID-207.html>.”

Gary Woodruff, senior product specialist,
GSI Group LLC, Assumption, IL

Automate Aeration

“It’s becoming more popular to use monitoring systems to automate the aeration process. While it’s important to know what’s happening inside the bin, it’s equally important to know what to do about it to prevent the grain from getting out of condition.

“Once you know what’s happening inside the bin, aeration automation lets you make fewer mistakes. At some elevators, employees may turn

the fans on Friday when they leave, and they end up running all weekend. This can introduce temperature and/or humidity fronts, which can make the grain condition worse than it was before. Automated systems really can help manage your conditioning and prevent costly errors.”

Justin Albright, vice president,
NAB Automation Inc., Cape Girardeau, MO

Hire, Install the Best

“As with nearly any system, the best advice we can offer is to hire a reputable company that uses known hardware and experience-backed installers. There is simply no substitute for using the best equipment, properly installed, maintained, and serviced.”

Josh Coder, president,
Control Stuff Inc, Cologne, MN

Pay Attention to Monitoring

“You just need to take the time to monitor the condition of the grain through temperature cables or with whatever equipment you have on hand. There are a number of different ways to monitor grain quality. Experienced grain managers just pay attention to what’s going on.”

Keith Locklin, sales engineer,
North American Equipment Co. Inc.,
Nortonville, KS

Management Saves Electricity

“Utilize your temperature detection system, and pay attention to what it tells you. Don’t run your fans for any longer than you need. People used to turn their fans on for three months and then turn them off. With the cost of electricity today,

you need to be a better manager than that.”

Mike Strader, president,
Decatur Aeration, Decatur, IL

Avoid Freezing the Crop

“A lot of mistakes are made in grain conditioning. The number one mistake to avoid – don’t freeze the crop. Too many commercial people want to freeze the grain, because they lack the drying capacity to get it into storage, before it develops problems. The biggest problem with freezing grain is that it loses its ability to flow, because it’s turned into a huge block of ice. Where it is possible, you can take the temperature down to 35 degrees, which is as far as you need to go. But then, you still need to get the grain out and dry it down, as soon as possible.

“A case in point is that you see a lot of accidents from bridging, when you try freezing grain. You also get wall hang-ups, where employees are sent into the bin to knock the grain off the walls and end up getting buried.

“If you can get the grain cooled down to just above freezing, then it will last a very long time. Then, going into spring, you can raise the temperature using ambient air, but then, you still need to get the grain that is too wet dried as quickly as possible.”

Steve Waechter, product coordinator,
Sukup Mfg. Co., Sheffield, IA

Maintain Target Moisture, Temps

“We’ve been pushing the use of our grain spreader, which among other things, can make the aeration system more efficient. Managers need to monitor outside air temperature and humidity and use that information to make decisions on whether or not to run the aeration fans. You need to maintain your target moisture and manage temperatures to eliminate spoilage.”

Eli Troyer, president, AgriDry LLC,
Edon, OH

Take a Proactive Approach

“Managers need to take a more proactive approach to grain conditioning. By the time your monitoring system tells you there’s a problem, it’s too late. Having a good, well-integrated automation system can do the heavy lifting for you in that area.”

David Crompton, president and CEO,
OPI Integris, Calgary, AB
Ed Zdrojewski, editor

Grain Conditioning Trends

HOW EQUIPMENT END USERS ARE CHANGING THEIR APPROACH OVER TIME

The basic tools of grain conditioning – drying, monitoring, aeration – haven't changed in decades. However, the details of that technology and how end users utilize it, do change over time. Grain Journal interviewed suppliers of grain conditioning equipment for their insight about what's happening out in the field.

Willing to Spend More

“With the price of commodities up as high as they have gotten, people are willing to spend more money on grain conditioning systems that are bigger, better, with higher capacity, and higher performance levels. The cost of a system no longer scares people compared with the investment they have in stored grain at today's prices.

“Just a few years ago, a system that can deliver 1/7 cfm per bushel on wheat was unheard of. The technology wasn't there. We can do it now, with centrifugal fans rated at 125 or 150 hp. I never sold an aeration fan over 50 hp until a few years ago, but the big fans are becoming routine now.

“Another added cost to a grain conditioning system is exhaust fans, but they supply a huge bang for the buck. When roof exhausters are used as intended, they will eliminate 100% of condensation from a storage tank.”

Scott Chant, president, Safe-Grain/Maxi-Tronic, Inc. Loveland, OH

Higher CFM Wanted

“More people want a higher level of air delivery. For a long time, the standard on corn was 1/10 cfm per bushel for maintenance air. Now, they want a higher cfm, so they can store grain at a higher moisture content and dry it entirely with natural air or at least spend a shorter amount of time in the dryer.”

Kevin Miles, president, Rolfes@Boone, Boone, IA

Combination Drying

“I'm seeing a lot more emphasis on combination drying. For example, you get a certain percentage of moisture removal while the crop is still in the field, you get more in a conventional grain dryer, you get more through the equilibrium moisture of the air after cooldown. Combination drying utilizes all of these phases to reach a target moisture level, along with a low cfm per bushel in the bin. Look at when you want to market your grain, say in May, and then look at an equilibrium moisture chart to figure out how to get to your target moisture level at that time.”

Brent Bloemendaal, engineering manager-grain conditioning, Brock Grain Systems, Frankfort, IN

Returning Moisture to Soybeans

“More people are leaning toward reconditioning soybeans by way of putting moisture back into the beans. If you harvest the beans too dry at harvest, they have a tendency to break. We're seeing controllers being installed on small- to mid-sized bins to blow in humid air and try to reconstitute some test weight.

“There is a stronger trend toward temperature monitoring, especially at the farm level. Farms are putting up larger bins partly because farmers are seeing the need for it. A younger generation of farmers is coming in, and they are more open to the technology. And you have a higher value on the crop today.

“Ethanol plants have discovered that they can get more ethanol out of a bushel of grain that has not been exposed to temperatures above 105 degrees. Some of them have begun paying a premium to farmers and elevators that can provide a history of the grain in storage, so we're seeing more interest in systems that can record that.

“We're getting more business in South African and in Central and South America. Some of the handlers in those parts of the world want systems that can provide volume charts calibrated off of the grain temperature records due to the problem of theft.

“Finally, there is an interest in wider means of communication to read current storage temperatures on your cell phone or computer. People are wanting to be able to check on their grain, while they're vacationing in Florida.”

Darwin Winkowitsch, president, Tri-States Grain Conditioning Inc., Spirit Lake, IA

More Air for Bigger Bins

“The biggest trend we're seeing is the demand for more air in bigger bins. There is an interest in higher horsepower fans and more cfm per bushel. Where I used to see 1/10 cfm per bushel as standard on corn, now it's 1/7 or 1/8.”

Todd Morey, sales manager, AIRLANCO, Falls City, NE

Elevators Losing Out

“Farmers are building more on-farm storage. Then, there is an increasing amount of grain going directly to ethanol plants. None of this by itself is related to grain conditioning, but it does indicate that more grain is going anywhere but grain elevators.”

Kevin Rapp, marketing manager, Advanced Drainage Systems, Hilliard, OH

Harvest Moisture

“Most of the United States south of I-80 had a little late start but caught up, probably close to normal harvest dates and moisture, possibly a little early and drier. Weather through the growing season can change this considerably. ►

"North of I-80 had one of the latest starts, and almost all of the planting was done over the last possible couple of weeks. A short growing season is expected due to the ice on the Great Lakes and the snow cover, which kept soil temperatures low later into the spring. A wet, late harvest is expected. Weather could change that, but not by a great deal.

"There is a direct relationship between harvest moisture and how much field loss can be expected. At 15% moisture, the minimum field loss compared to 21-27% moisture at harvest is 10%. This number can be much higher, if wind or drenching rains are experienced. Also, downed corn from wind means less yield. That can be catastrophic, with 50% or more in losses.

Early harvest avoids some test weight losses when moisture is below 30% or at maturity. Invisible or phantom losses mean fewer pounds to sell. This can be as much as 5%, but since no one can dry all of their grain at 30%, at best, half of this can be regained through early harvest.

This will be a good year to remember that the final moisture determines how long grain can be stored safely, in order to time the markets. 15% moisture is good until June 1. 14% is good through the next fall harvest. 13% is good for over a year depending on the initial quality of the grain and the quality of the storage management.

*Gary Woodruff, senior product specialist,
GSI Group LLC, Assumption, IL*

Smaller Operators Now Monitor

"There is a continuing emphasis on actually monitoring what is going on inside the bin, especially at the farm and small commercial level. The big terminals and large elevators have known for years about the benefit of monitoring systems, and now it's working its way down to the smaller operator."

*Justin Albright, vice president,
NAB Automation Inc., Cape Girardeau, MO*

Industrial-Grade Systems

"We are seeing increased demand for industrial quality systems for on-farm storage. With the increases in both size and quantity of on-farm storage systems, we are seeing an increase in demand for systems that were once

only quoted, purchased, and used by large-scale operations.

"We are seeing increased demand for our wireless systems. With the cost of wireless technologies coming down, it is increasingly more cost-effective to go wireless, as opposed to a conduit and hardwired system.

"We are seeing increased demand for mobile connectivity to our systems. With the cost of mobile connectivity coming down and the use going up, we are providing more and more remote connection options for smartphones and tablets."

*Josh Coder, president, Control Stuff Inc,
Cologne, MN*

Gradual Improvement

"When the price of grain was way up, there was a trend among most people to try to take care of the grain a little better. Whether or not they succeeded is an open question. Some people are becoming more educated about grain conditioning, and they're making good and better decisions. But there still are a lot of poor or misinformed decisions being made, too. The information is out there, and overall, I'd say the grain industry is getting better."

*Keith Locklin, sales engineer,
North American Equipment Co. Inc.,
Nortonville, KS*

Higher Horsepower for More CFMs

"The tendency today is to put larger aeration systems on bigger tanks. While you need more horsepower to push air through that size of a grain mass, people want higher cfm, in order to hold higher moisture corn. You can hold 15% or 16% corn at 1/8 to 1/10 cfm per bushel. Corn at 18% requires 1/7 cfm. Ten years ago, 40-hp fans, occasionally 50-hp, were standard. Today, you're seeing mostly 60-hp, and I've quoted a few 75-hp fans. It takes 75-hp fans to achieve 1/6 cfm per bushel."

*Mike Strader, president,
Decatur Aeration, Decatur, IL*

In-Bin Drying With Natural Air

The trends are going in two different directions. In one, a lot more guys want to harvest grain at 18-20% moisture and then just dry it in the grain bin. They want to use natural air or low temperature drying. We've invented a

controller that keeps the air within 10 degrees above ambient, which is ideal for this type of application, which is mainly used on-farm.

"On the other hand, we're seeing bigger and bigger facilities utilizing some of our larger storage bins and our commercial tower dryers. The trend is bigger, bigger, bigger. We market a couple of different dryer models intended for people wanting to expand their capacity, as well as huge bucket elevators and storage tanks."

*Steve Waechter, product coordinator,
Sukup Mfg. Co., Sheffield, IA*

Maintain Moisture, Avoid Shrink

"Managers are trying to maintain market moisture and, at the same time, avoid losing money to shrink. Bins are bigger, so problems with fines and air-flow become exponentially larger. Some markets now require segregation of grain such as food-grade varieties such as the ones used for corn chips."

*Eli Troyer, president, AgriDry LLC,
Edon, OH*

Get Data Anywhere

"I'm seeing a greater level of awareness related to the management techniques required to manage the grain conditioning process. There's a greater uptake on when to respond to the data from monitoring control systems, which can range from nothing to some form of temperature monitoring to completely automated controls. There's a trend toward mobility, by which I mean having remote access to data from your storage via cell phone, i-pad, etc. Finally, at the larger commercial facilities, there's a trend toward integration at the system level, for example, tying the stored grain monitoring systems with systems that monitor electrical efficiency.

*David Crompton, president and CEO,
OPI Integrus, Calgary, AB*

More Demand for Control

"With all of the improvements in technology, at all levels from the farm to the elevator to the processor/end user, we're seeing more demand for control over cost and grain quality. End users include feed mills and ethanol plants, among others."

*Brad Baker, sales representative,
Springfield Plastics Inc., Auburn, IL*