

While there have been improvements in the systems that move grain on and off the farm, keeping up with the rapid rise in yields is a mighty—and expensive—challenge.

BY DAN MILLER

John Gnadke remembers loading 75-bushel corn into cribs. “We wondered back then what 100 bushels of corn would look like,” he says, with some irony. The farm that produced those 75 bushels per acre in 1957 soon passed 100 bushels, and has more recently produced 225 bushels.

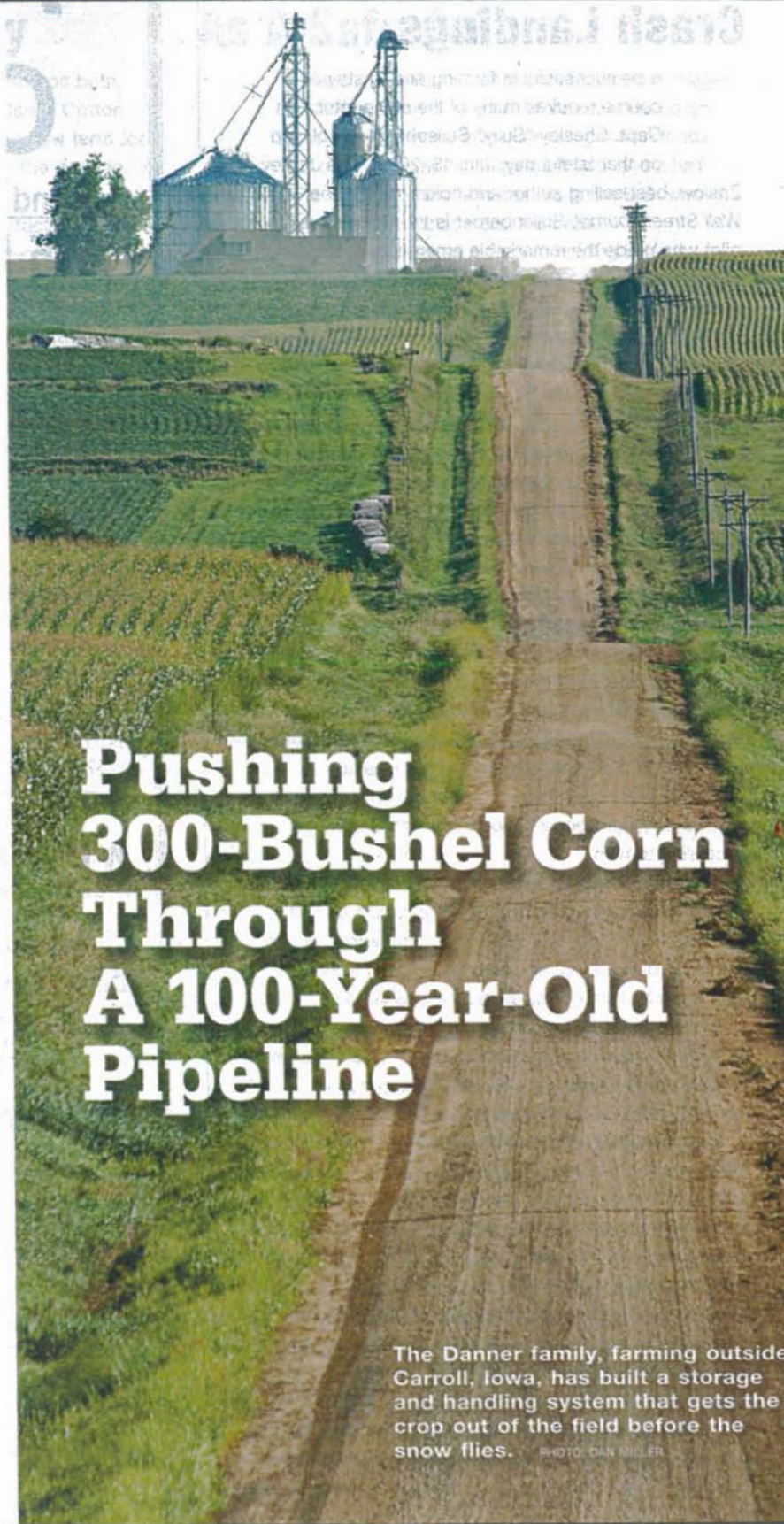
The day when that field in Minnesota—and many thousands more like it—produces 300 bushels of corn to the acre seems almost inevitable.

Wonder, as Gnadke did all those decades past, what that will look like, especially if the grain-handling system adds capacity and efficiency?

Gnadke has built a business on ever-rising grain production. By way of his Advanced Grain Systems in Ankeny, Iowa, he advises growers on their plans to modernize and expand their grain-handling systems. He is a horse whisperer of sorts in the grain industry, having shared with thousands of growers his decades-long experience in drying grain.

In anticipation of 300-bushel corn, Gnadke will tell you that now is none too soon to begin making plans for that harvest.

“The genetics are already there,” he says. Some of his clients have seen their yield monitors tickle 300 bushels. Gnadke has seen 88-day corn planted into North Dakota soils



Pushing 300-Bushel Corn Through A 100-Year-Old Pipeline

The Danner family, farming outside Carroll, Iowa, has built a storage and handling system that gets the crop out of the field before the snow flies. PHOTO: DAN MILLER

yield 200 bushels on ground that would have produced half that much just 30 years ago. It is a genetics-fueled bounty that today's retiring farmers never dreamed would be possible.

On farms unprepared for it, it is a bounty that may drag a grower into an unproductive trap. It is a time and a place where so much grain must be harvested that the process grinds to a halt for lack of handling capability and storage capacity—especially when logistical glitches pop up.

It was a glitch that arose in 2009 for many corn growers, recalls Bill Schroeder, of Reynolds, Ind. In that memorably wet harvest, he says, “nobody that I know of had a dryer big enough [to efficiently handle that year's high-moisture corn]. We quit early then. Instead of 14-hour days, we worked 10 hours. But some harvested only two or three hours a day.”

That is expensive downtime. Or, as Gnadke would alternately say, “Uptime has value.” An idled combine may cost \$500 or more per hour in lost productivity, not to mention the lost opportunity to efficiently move grain to storage or make harvest-time sales.

Gnadke argues that a well-planned storage and handling facility ought to be built with an eye toward harvests 20 years into the future. It is a generational investment where your child today will be your adult business partner then.

That investment needs to consider not only increased yields, but your plans for expanding your production acres. It's more efficient, Gnadke contends, to build yield over time with a sufficiently large storage facility in place (or at least provided for in terms of space and utilities) than to continually modify your grain facility to meet the demands of rising

yields and increased production.

“It's important to think big,” says Bill Wilcke, a University of Minnesota ag engineer. “Yields keep going up, and your crop mix may change. And, you never know when you are going to add more land.”

In the hours and days of harvest, the math is fairly straightforward.

A thousand-acre corn farm producing 200 bushels to the acre harvests 200,000 bushels. If that same farm produces 300 bushels, it brings in 300,000 bushels.

Add into the equation this one fact of harvest. There are a finite number of days to harvest, especially if you intend to complete fall fieldwork before the ground freezes. Outside



PHOTO: JIM PATRICO

Fargo, N.D., for example, the corn-harvesting season averages 14 days. Farms along the Iowa and Minnesota border have 21 days. By the time you get to Des Moines in central Iowa, it's 28 days. Southern Illinois allows 42 days for harvest.

“If you need to be done by the first of November, any day past that day is borrowed time,” Gnadke says.

Matt Danner, who farms with ▶

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The number of semis moving grain out of the field will grow as grain yields grow. That traffic will further stress an already stressed transportation system.



his father, Rich, and brother Chris near Carroll, Iowa, operates a pretty impressive grain facility—much of it they built themselves.

“We built it to get out of the field on time, before the snow,” Matt says. As their acreage grew, they added storage on a site designed for the addition of more capacity as needed.

On it, the Danners now have 43,000 bushels of wet storage, a 3,000-bushel-per-hour tower dryer and nearly 300,000 bushels of storage. As Matt well knows, the clock is no ally in the heat of harvest.

In a 21-day, 300,000-bushel harvest, your daily combining quota is 15,000 bushels, compared to 10,000 bushels per day with a 200,000-bushel harvest.

That means an additional 120 semi truckloads, suitable wet and dry grain storage, a capable dryer, dumps, grain legs, monitors and all the other pieces of an efficient grain-handling system.

It is not difficult to ring up an investment of a million dollars for a facility to handle 300-bushel crops on a 1,000-acre farm.

Brian Miles and his father, Dale, began a significant storage expansion effort in 2004. They added more in 2005, in 2006 and again in 2007 to their farm at Marshall, Mo.

Brian Miles envisions a facility to

handle “more grain than we can now imagine.”

Built in a centrally located site near their old facility, the Mileses have added 219,000 bushels of bin space. Their longer-term plan calls for a parallel row of bins and one or two central dumps between them. This year the Mileses are looking to buy a neighbor’s dryer that will improve their handling capacity.

It’s an intermediate step that gives added handling capacity without the investment now in a new dryer, Brian says. “Over the past two or three years we have not been able to run at full harvest capacity.”

Gnadke and others offer a blueprint for building an efficient and profitable grain-handling system. If there is a ruling philosophy in a world where country elevators are sometimes swamped with deliveries, it is this: Prepare yourself for that on-farm opportunity. Capacity has value. Quality has even more value.

► Purchase of a new dryer is a 15- to 20-year investment. If your current system requires 25 days to dry the harvest, consider a system that can handle that crop in 12

days. The idea is to buy capacity for the future, Gnadke says.

“The question you need to ask is, ‘Does a 2,000-bushel-per-hour dryer or a 7,000-bushel dryer keep my combines running?’” he says. “It’s less expensive to keep a larger dryer longer with the capacity to build your yield over 20 years.”

► You may be able to create “harvesting days” by building enough wet storage to keep your dryer running for 24 hours, even if the harvest is stalled by weather.

The theory is on days where harvesting is stopped, your dryer can continue to work through a prior day’s harvest. It’s a capacity that also can handle the surge when the combines are running again. Gnadke suggests at least enough wet corn holding capacity for up to 12 hours of overnight drying.

► As you might expect, a grain-handling site is best located near



Matt Danner

PHOTOS: JIM PATRICO

all-weather roads. Roads restricting traffic in the spring remove marketing windows. There is another consideration beyond roads.

Given wireless services for communicating with your storage facilities, it makes sense to consider your primary markets as well as your major production centers when setting out plans for a new facility.

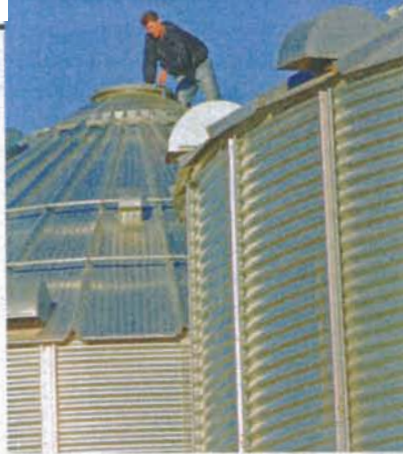
Those considerations would include access to local elevators, processor markets, rail and



river transportation and your own logistical capabilities.

- ▶ A semi truck unable to negotiate a bin site is a bottleneck all by itself. The granary should include at least 40 feet of access—and more is better—onto and off from a highway to account for the length of a semi.
- ▶ Semi trucks require a turning radius of 55 feet. Gnadke suggests you plan for double lanes, 36 feet wide, for safe transit around the site.

Brian Miles



- ▶ On a new site, include space for future wet holding bins and perhaps more than one dryer. These are future, high-value spaces that can be created today with little real investment.
- ▶ Grain-handling facilities chew up a lot of electricity. You'll want to consider having enough power to run 1,000 hp worth of motors. Three-phase power is an efficient way to manage the utility budget. ●

Beyond THE FARM

If grain producers have challenges absorbing the crops they produce, how is the grain-handling system beyond the farm handling increasingly large harvests?

"I'm pleasantly surprised," says Mike Steenhoek, executive director of the Soy Transportation Council in Ankeny, Iowa. "It was a compressed harvest, and overall the infrastructure held up well."



Country elevators with access to tracks struggle with high rail charges. PHOTOS: JIM PATRICO

Railroads are proving to be effective in moving the soybean harvest away from the farm—although at a price sometimes considered excessive by many. "With their investments, the railroads have done a good job," Steenhoek says.

If there is a source of tension in the transportation community, you might find it down at your county roads department. It was in the 1990s when the states and local governments inherited responsibility for 97% of the nation's roads. Traffic on those roads has in recent years increased by more than a third, while new road miles grew by less than 3%.

Traffic is moving over rural roads and bridges stressed by age and lack of repair. 80,000-pound, grain-loaded semis traverse roads—some of them laid out 100 years ago. It is traffic that is expected to increase sharply over the next 20 years.

But it's not just the semi loads. A loaded 750-bushel grain wagon weighs 50,000 pounds. A liquid manure tank with

10,000 gallons of hog waste weighs in at 140,000 pounds, including the tractor.

Nationally, a quarter of the nation's bridges are deficient. In states bordering the Mississippi River and along its tributaries, a third of the bridges are deficient. That includes major producing states such as Iowa, the Dakotas, Nebraska, Kansas, Arkansas, Mississippi and Kentucky.

Worrisome too are the conditions of the nation's lock and dam system. There are just less than 300 locks in the U.S.—many of them built between the 1930s and 1950s. Of special concern are the big locks on the upper Mississippi and Illinois rivers. Repairs and upgrades run into the billions of dollars.

On the horizon is the very real expectation of even bigger harvests. "But we don't have the logistics to accommodate it," says Steenhoek. "We have to find ways of getting more throughput through our existing system."

For example, the Soy Transport Coalition has looked for ways to put more beans into a single semi load. One method would be to add a sixth axle to the vehicle. The additional axle spreads out the weight of the load and gives the tractor-trailer additional capacity.

A six-axle semi can carry another 138 bushels of beans per load. While that increases the weight of the truck to 97,000 pounds, Steenhoek says the stopping distance is the same. The impact on the road could actually be reduced, compared to the typical five-axle, 80,000-pound truck loaded with grain. The impact on bridges, especially older bridges, is less certain. Total axles mean less to the weight-bearing capacity of a bridge than does total weight.

It's an idea that has been talked about in Congress as recently as this past summer. But no action has been taken.

Steenhoek says transportation innovation is vital to the marketing opportunities envisioned by agriculture. He argues there must be a significant investment in the transportation assets critical to agriculture. Without it, the movement of grain will be akin to "attaching a garden hose to a fire hydrant. It's great that yields are increasing," he says, "but that investment will not come to full fruition if we don't have a transportation system that can absorb the surge we are hoping for."