

Data management beyond the spiral notebook

By Meryl Rygg McKenna

In farming, as in any business, people strive to make a profit. Few can afford to farm solely for its lifestyle, and agricultural production in the U.S. requires very high capital investments in land, facilities, machinery, and inputs like fertilizer. Making a profit seems more and more challenging.

Commodity prices that a generation ago changed by a penny or less per day now fluctuate easily 10-fold more than they did then. Markets have changed significantly even in the past five to 10 years.

“Margins have become very tight. We’re seeing a lot more volatility than we have historically, both on the input side, what it costs to grow the crop, and on the output side, in the pricing of our products,” said Markus Braaten, a Certified Crop Adviser for a Kalispell-based company offering agricultural consulting services.

Thin profit margins drive any business toward efficiency. In order for growers to know what is most efficient, we must have records where we can find them. Tough business decisions are usually best based on hard data.

But we can’t efficiently manage what we’ve never measured.

Numbers, numbers

What does it cost to produce a ton of alfalfa hay or a bushel of hard red winter wheat? How does our cost per bushel position our product in the market?

We’re in an environment that varies year to year as a function of weather, we have variability within each field, and so our yield is also variable. If we are to say with confidence that we know our cost per bushel or ton, we may need more data than we actually have.

We need to know what we have into a crop, but the cost per unit is often a bit unclear. We might know fertilizer and herbicide costs, but not consider labor costs or depreciation.

How would the cost per unit change if we get another inch of moisture, an inch less, or hail damage? Suppose I see stripe rust – shall I spray or not? Is this variety susceptible to this particular disease? How has this disease impacted past production? Can I afford to spray a fungicide? Can I afford *not* to spray a fungicide?

A good data system will show the best course of action, based on the history of that particular field or sub-field. Therefore we want our data system to store information and help us access it to make adjustments *in season*. The system can give us real-time cost-per-unit projection to help determine profit potential, and the profit potential helps us decide things such as whether to spray for rust.

From Braaten’s perspective, growers need to track at least these categories of information: cropping history; product history; soil test data; tissue test data; yield history; yield boundaries; coverage maps; scouting reports; herbicide, pesticide and other

crop protection products used; and quality attributes of the commodity, such as grain protein and test weights.

Braaten believes Montana is ripe for the adoption of precision agriculture that becomes possible with such hard data at hand.

“Traditionally we have large fields and a large degree of variability as a function of alkalinity, soluble salts and topography, and all of those factors drive or impact yield variability. As we shift from managing fields to zones within a field, we must have the data platform that accommodates the expanded data set,” he said. “There’s a lot more to it when we break a field into five management zones. Multiply that by the number of fields in an operation, and now we’re talking about digital prescription files that we’re going to input into a controller, for a variable rate of phosphorus or nitrogen into different zones of a field.”

“We now have a significantly higher degree of data intensity than ever before,” he added. “We have more factors to consider when we’re making decisions.”

Emotions affect our management, as well. Braaten said he often sees subjective decision-making in the marketing of commodities. A grower thinks, “The price is low; I’m not going to sell today.” Then the price dives even lower – “I should have sold yesterday!” The price goes higher; wanting to maximize sales, he waits another day, but by then the peak has passed.

Selling at the top of the market isn’t a realizable goal every time, but we want to move our commodities at a profit. How can we know whether a particular price is profitable?

When we do a good job of capturing data, we can do a better job of making decisions. The more information we have regarding yield per field, fertilizer used, the weed spectrum, and so on, the more objectively we can assess the effectiveness of prior decisions. Then we can base current decisions on something more substantial than the emotion of the day.

Overwhelmed by data?

Collecting, storing and using all that information can be daunting.

“The days of keeping our field notes in notebooks that fall out of our trucks are probably done,” Braaten said.

Data-management tools are available to help capture information associated with producing crops. The prospect of buying and learning to use any of these computer programs and platforms can be daunting, too.

The data “platform” is critical. That’s the computerized system where we capture the information so we can pull it up on our smart phone or tablet or desktop computer.

Many of the platforms are “cloud-based” – the information is stored off-site via the Internet, not in the grower’s individual computer. Benefits of this arrangement include automated backups and software updates. Even if our computer breaks down, the stored information still exists.

The platform we choose needs to be accessible enough to input while auto-steer is on, or for someone else to input data regularly – sometimes daily.

Programmers who build data platforms should understand what a grower needs to know in order to make decisions, and that growers have various levels of experience and comfort with technology. Too little bandwidth means an Internet or cloud-based platform is not accessible, no matter how good a tool it is.

On the other hand, “While the Internet can present challenges with cloud computing, that is rapidly changing with high-speed mobile data services and software programs that balance offline use with online syncing,” said Alan Telck, Certified Crop Adviser in Sheridan, Wyo., and board member for the Rocky Mountain CCAs.

There is a lot of chatter in the information technology industry about data ownership. In some cases, whoever owns the platform owns the data. In other cases, the grower maintains ownership.

“Producers do need to do their homework to use a trusted and reputable source that has a good privacy policy,” Telck added.

Taking advantage of outside expertise becomes more and more important, whether that is from a certified crop adviser, retail sales representative, precision ag specialist, University Extension agent, or University Extension specialist. When we need guidance, an outsider’s perspective can help us look at these management questions objectively, not from an emotional viewpoint.

Farming will always be something of a gamble, but using the data we’ve collected can help us make the best of the factors we *can* control.

For more information on certified crop advisers, or to find one near you, go to <http://www.certifiedcropadviser.org>.