A smaller approach to 'big data'

By Jacob Maurer

BIG data is one of the most buzzed-about concepts in our industry. Rarely do we read a newsletter, attend a conference, or make it through our Twitter feed without encountering the topic of big data.

It seems there's no shortage of the amount of data and the type of data that can be collected. But with big data comes bigger responsibility for agronomists, service providers, and other trusted advisors to show value from it.

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Growers are being inundated with data and, for many, it's too overwhelming for its own good. After all, the benefits that data can provide will go unused if growers aren't sure what to do with it – or worse, even how to start looking at it.

The most important thing to keep in mind when beginning to farm for data is that big data is nothing more than a collection of small datasets – and, the process is nothing new.

Background on big data

Believe it or not, the approach to using big data in crop production today more closely compares to horse-drawn plows and hand seeding than it does to the great era of mechanised agriculture. The very decision-making process we got away from in the interest of covering more acres via motorised farm machinery has actually come back around as we enter the digital age, and it is our job to get it back on track.

Consider all the decisions that go into planting a field today. Using a variety of new technologies, we can manipulate the weight displacement and down pressure of the planter, the planting depth, the spacing, and the fertiliser being applied (both in its rates and in its placement) to give each seed the ideal situation to maximise its potential. Not only that, we can even vary the method by which the seed makes its initial contact with the soil, via a host of motorised delivery components.

In addition to all of these mechanical manipulations, there is still the decision of which hybrid or variety gets planted in the first place – and we can vary that as well. Our ancestors followed the exact same methodology as they perfectly placed their seeds in the furrow, one at a time.

Converting this process to the digital age takes nothing more than simply logging what was done and evaluating what took place – but this is also where the big data problems begin for growers.

Why big becomes too big

If you made a single spreadsheet entry, recording everything taking place with a planter every time a seed went into the ground, think of how big that would become – how each small observation exponentially grows into a large, invaluable dataset.

Taking it a step further, think about just the seed variety variable alone. If there are two different varieties intended to plant within a single field, the dataset on an 80 acre soybean field, planted at a rate of 140,000 seeds per acre, would feature 11.2 million rows of data. A simple 'Variety A, Variety B" variable alone may seem pretty elementary when it comes to statistics, but it sure adds up in a hurry, especially when the other variables are added.

Of course, in the real-world, we do not have time to make 11 million decisions for each of our growers, and most of them have more than just 80 acres to focus on. Likewise, one perfect selection of a given variety planted at the same depth at a uniform down pressure may give the average grower a positive return on their investment across the farm, or field, in the majority of situations.

In both of these cases, it's easy to see why the adoption of big data on the farm can become both daunting and seemingly lacking in value.

Data usage missteps

So how has the experience with big data gone so wrong? In many cases, it is because the grower is being encouraged to convert an entire farming operation over at once, leading to a poor experience. Nobody warns them about the intense amount of background effort that is required to ensure that every layer of data is synched up to perfectly harmonise the operation.

For the big data collective as a whole, the false advertisement that a large dataset is the only way to go and that all users will find its value collectively has led many to the feeling of leaving a buffet with a full belly, but less than satisfied. Rather than breaking things down into smaller, bite-sized pieces that are easily digested, we've learned to over-indulge in data, quickly leading us to become bloated with un-actionable results.

This is related to another problem: the fact that we have been trained to believe that every morsel of data has value, and to not collect it is a sin. This is simply not true. Not every record in that yield monitor will lead you to the promise of 400-bushel corn, and certainly not if it is only preserved in printed form.

So where do we go from here?

Making big data actionable by taking it small

The very way we lost our growers' attention when encouraging them to adopt a big data mindset is how we can bring them back. Rather than thinking about big data as only being a part of some collective pool or aggregate that growers may become lost in, use the information gleaned from one field, or even one zone alone, to inspire and challenge them to re-engage them in the process of collecting and using their farm data.

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Prior to encouraging a grower to scale up the data collection process to cover an entire operation, I encourage you to start them out in small doses, and scale up from there. Take it one parcel or zone at a time, where success and failure can be more easily measured and tracked, and where a failure or error does not put the entire operation at risk. Also, try breaking field operations into separate, smaller job files to reduce your risk in losing an entire dataset.

Big data has the potential to change the entire horizon of agriculture in the future, but don't become so wrapped up in the "big" picture that you forget to bring your growers along for the ride. Remember, the concept of what we are trying to accomplish is nothing new, just the mechanisation and digitisation are.

It is important to be transparent to your growers throughout the process, and to help them see the value in collecting good datasets, no matter how small they may seem. Small datasets can have great results and even greater returns when we go big.

Drawn from the story by Jacob Maurer in *PrecisionAg* – August 7, 2018
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