

# Needed: A Research-driven Understanding of Every Aspect of Producing Grain

*A long-winded, kitchen sink approach to enhance grain yields and profits.*

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The Fluid Journal • Official Journal of the Fluid Fertilizer Foundation • Fall 2011 • Vol. 19, No. 4, Issue # 74

**Summary:** *We have entered an age of amazing precision in agriculture. Not only does size matter, but with size comes performance and improved accuracy. We need to accept the reality of this fundamental shift in agriculture and respond with research driven by understanding every aspect of producing grain. Inputs are much more involved than just seed and pesticides. Knowledgeable genetic selection is just as crucial as knowing your costs. Another challenge is selecting the right equipment. And the list goes on. What about seeds and pesticides? Herbicides? Foliar fungicides and insecticides? And don't forget the soil. Finally, what about y-o-u-r skills? Are you an innovator, adopter, or follower? Bottom line: a skilled operator knows how to produce profitable grain.*

Far too often in life we have a natural tendency to focus on one item as the answer to a problem. However, reality teaches us that multiple factors usually contribute to the solution. In modern agriculture we face a similar dilemma. We may promote product A or product B as the yield enhancing miracle cure. Sometimes that is indeed true, but more often it is only part of the cure and modern agriculture demonstrates that reality.

Twenty-four row planters, Class 9 combines, and 600 horsepower tractors all point to the future or reinvention of grain farming. Three-hundred-bushel

## **“Know your costs of Everything!!”**

corn needs to be the norm not the exception. We have entered an age of amazing precision in agriculture. Not only does size matter, but with size come performance and improved accuracy. We need to accept the reality of this fundamental shift in agriculture and respond with research driven by understanding every aspect of production grain. Factors of genetics, information, profitability, equipment, inputs/outputs and the soil, as well as honing our skills all must be a part of this reinvention.

### **Genetics**

Genetics is the fundamental foundation of yield. Marketers often fixate that it is the GMO trait that produces yield. Actually, it is the agronomic and DNA traits that determine a potential yield. The GMO traits assist in protecting the yield potential. Additionally, seed selection based on yield, test weight, and grain dry-down are important, but we must also look at percent germination, seed

size, relative maturity, root size, stalk strength, stay-green, disease package, early season vigor, and population density. These additional factors must be identified to unlock the hidden yield potential in every hybrid/variety. Building upon our genetic selection includes our need to access information.

### **Accessing**

Our sources of information may originate from:

- Seed and/or pesticide suppliers
- Custom applicators
- Farm service agencies
- University extensions
- Friends and neighbors
- And don't overlook the internet!

Such accurate and timely information will assist producers in their pursuit of higher yields. And while we often use yield as the sole source of success in what we do, we would be remiss if we did not also factor in profitability.

### **Profitability**

Cost of inputs versus expected outputs, cost per acre, cost per bushel, profit per bushel, and profit per acre all must be calculated to help producers to market their products. Knowing your costs signifies knowing the cost of everything:

- Land costs:
  - Rents
  - Leases
  - Mortgages
  - Needed improvements
- Costs of:
  - added fertilizers
  - pesticides
  - seed and seed additives
  - fuel



- equipment
- maintenance
- labor

All must be known to maintain profitability. Throughout the growing season any additional applications must be calculated as to what impact it would have on yield and profitability.

### **Equipment**

We know equipment is easy to access. Simply put: choose a color, find a dealer, pay the money, and you get the equipment. It is the challenge of choosing the correct type of equipment, how to use that equipment, and how to properly drive and maintain that equipment that creates more anxiety. The range of our equipment needs includes:

- Tractors
- Planters
- Tillage pieces

- Sprayers
- Applicators
- Combines

**Tractors.** Regarding tractors, it is important to relate tractor power to wheel slip, to soil compaction, to fuel economy and so forth.

**Planters.** We have made great improvements in our planters, much with respect to their increased size and improvement in efficiency. Planters do, however, require maintenance and attention to detail to maintain optimum performance.

Losses in potential grain yield can be significant due to skips, doubles, and poor stands. Follow strict guidelines regarding wear tolerances on coulters, seed openers, tubes, seed meter brushes, as well as proper tire inflation.

Other yield factor enhancements involve slower planter speeds (4 to 4.5 mph), and proper seeding depths (2 to 2.5 inches). Remember, stand uniformity is the key to producing high yielding corn. Maintain your equipment to assure success in this area. Everything we do to a crop later in the season reflects on starting right!

**Combines.** And what about the combine? Sadly, the combine often gets forgotten as a machine that can be made more efficient. Many are able to drive a combine. However, few understand combines well enough to operate without higher than necessary grain losses. A productive combine requires adjustments

throughout the harvest season.

### Inputs

Inputs are much more involved than just seed and pesticides. Inputs include seeding rates, row spacing, fertilizers, as well as adding herbicide and insecticide traits to them.

**Fertilizers** include not just the formulation, but also the type and timing. Considerations of fertilizer loss due to volatilization and denitrification as well as through surface runoff may encourage producers to apply their fertilizer in different forms and at different timings to more effectively match crop needs. Matching crop yields to fertilizer needs plus application timing may also encourage the use of starters, in-season sidedress application, as well as adding micronutrients to soil, or via foliar sprays.

**Herbicides.** What about them? We know that glyphosate is the standard, but with the threat of weed species shifts and/or potential resistance issues we may need to revisit the need to use a variety of modes of action to maintain weed-free fields. Likewise, it is important to understand the activity of any herbicide class, plus any additives in the mix, to understand how the crop will respond. Hidden yield losses are always possible.

**Fungicides/insecticides.** Use of foliar fungicides and/or insecticides is a hot topic. Are they necessary? Do we spray in the absence of visual symptoms and spray for plant health? Accurate answers

include the use of crop scouting and understanding the impact of your crop.

### Closing tips

Do not forget the soil. All crops require 16 essential nutrients--however, at different levels. Yet, even in a soil with

**“Are we innovators, adopters, or followers?”**

good fertility levels a soil with low or high pH may not provide a proper level of available nutrients.

Finally, our skills reflect on our ability to pull it all together. Are we innovators, adopters, or followers? The category we find ourselves in can determine our levels of success. A skilled operator knows how to produce profitable grain!

### Knowledge counts

So, it may be a gross exaggeration to say farming is simple when we know better. Modern grain production is an expensive business that requires high-tech inputs in the hands of knowledgeable people. If all that was required would be to grow 100-bushel corn, most could do that with their eyes closed. In the future, the level of expectation may be to produce 300- to 400-bushel corn. To produce corn at that level will involve close scrutiny of every aspect of a producer's operation, not just those on the surface.

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