PotashCorp

SPECIAL EDITION

AGRIVIEWS

Spring 2009

STARTER FERTILIZERS:
AN OPTION FOR CORN GROWERS IN TOUGH TIMES?

Payback potential mounts as traditional practice yields to a more strategic approach.

KIM POLIZOTTO, Ph.D.
Senior Agronomist, PotashCorp/PCS Sales

A farmer's lot in life seems to be always fighting the odds; from swings in the economy to unpredictable weather, farmers historically are "fighting the odds." For example, as today's price per bushel is not as high as a year ago, some farmers wonder whether it's best to aim for higher yields or to stay the course and hope for the best.

One by one, from early spring through harvest, myriad factors impact agribusiness, constantly threatening to batter the bottom line — giving farmers pause at each turn.

Growers should take a look at the options that can, with reasonable certainty, increase yields and boost ROI efficiently.

Use of starter fertilizers remains a solid, sensible option. Even growers who already use starters can increase yields further with a few simple changes to their usual routine.

In a past survey by PotashCorp — in which we interviewed dozens of growers, ag retailers, equipment dealers and manufacturers, plus university and industry specialists — all respondent groups had a clear message: Starter fertilizers can deliver significant ROI in ways that also go beyond year-to-year bottom-line returns.

Starter fertilizers help growers beat a short growing season and cold soils, or a late, wet spring. Fast, early growth offers an extra edge in drier conditions, too, by quickly shading the row and preserving moisture.

continued inside

Inside this Special Edition of *Agriviews*, a review of how starter fertilizers can help increase yields.

Starters increase corn plants' ability to handle stress, improving the odds of high pollination during the reproductive stage and helping ensure fuller, bigger kernels and maximum tip fill by dry-down time and harvest.

Can starters offer potential fall cost savings, too?

When grain moisture's in the mid- to high-20s, studies show that "starter" corn is one percent to two percent drier — which can save a bundle in drying time and costs. And if, as some growers told us, moisture "went from 26 percent to 19 percent in a week" . . . did starters speed the process? Probably yes.

In short, starters have consistently boosted returns across multiple years, soil types, tillage systems and planting dates throughout the Midwest and elsewhere, including when soils tested high in P and K levels.

BEYOND CORN:
STARTERS ON OTHER CROPS

In soybeans, cotton and sorghum as well as corn in Florida and other states, starter fertilizers have increased yields across a wide range of growing conditions and cultural practices.

Clearer insights emerge from starter's track record

The use of starter fertilizers in corn, of course, is not new. In a 10-state area from Ohio to Nebraska, Minnesota to Missouri, the percentage of corn acreage planted with starters each year has hung close to 50 percent dropping a bit from 48 percent in 1988 to 46 percent in 1996, the latest year for which USDA-ERS figures are available.

It's also no secret that cold soils and shorter growing seasons have been prime factors influencing starters use — and driving the relatively high acreage percentages in states such as Wisconsin (92%) and Michigan (89%).

Up to 42 more bushels per acre

Starter fertilizers have consistently boosted yields in comparative studies in Iowa, Indiana, Wisconsin and elsewhere with different hybrids, under a variety of conditions and in no-till to conventional tillage operations.

In Wisconsin, in over three tests at 100 on-farm sites, increases up to 42 bushels/acre (bu/A) were noted, while yield boosts averaging several bu/A statewide were recorded. The probability of a profitable starter program also increased significantly with later planting dates, linked with the relative maturity of hybrids.

In a four-year Minnesota study, starter fertilizer produced the same beneficial responses (8 bu/A average) for corn after corn, and corn after soybean, plantings under a variety of tillage systems: no-till, zone till, strip till, and conventional tillage (Vetch and Randall, 2002*), according to a 2008 crop management article by the International Plant Nutrition Institute (IPNI). The need for starter fertilizer for corn, regardless of rotation, may arise from the rapid influx of nutrients by corn roots early in the season and the positive effect of N and P on root proliferation.

In Illinois, where starters have enjoyed less popularity than in surrounding states, results from tests sponsored by the University of Illinois have growers taking renewed notice. They've shown yield increases on almost all no-till farm sites (up to 17.7 bu/A).

And, while it can still be said that the worse the spring (cold, wet, late planting), the more you need a starter program; nowadays, deciding to go with a starter — and getting the most out of it — brings additional considerations into play.

Every balance sheet has two sides. And when margins get tighter, the first instinct is to look for ways to cut costs.

But, where? Equipment or labor? Fuel? Seed and fertilizer? Herbicides? Pesticides? Although you may find some application efficiencies or other ways to trim, all are necessary expenses for producing your crop.

And fertilizer, specifically starter fertilizer, could directly help both sides of your balance sheet, by increasing yield and resulting income, while also reducing some other production costs.

Dual payback: turning a "minus" into a big-time "plus"

In past years, results documented in Wisconsin provided eye-opening insights. Across all years, tillage systems and planting dates, corn yields with starter fertilizers averaged 158.0 bu/A vs 148.1 without — an increase of 9.9 bu/A. The news gets better.

Counting kernels: *Starters are key to record-breaking yields. The maximum number of kernels-per-ear harvested is determined by corn's five-leaf growth stage and is directly impacted by the percentage of phosphorus in plant tissue at that time. A starter fertilizer can ensure adequate amounts for fuller ears on stalk after stalk, acre after acre.*

Grain moisture at harvest in the higher yielding "starter corn" was 23.5 percent — a full percentage point lower than the non-starter corn at 24.5 percent. Result: drying cost savings as well.

Whether increasing yield or reducing cost, however, the benefits of starter fertilizer don't happen by accident. Understanding how, when, where and why they work can help you increase the probability as well as the amount of payback in your own operation, across the board.

For example, starters can help add bushels in several ways. Beginning with the seed you choose.

When employing new, genetically improved, high yielding varieties and hybrids, it is very important not to overlook the importance of high soil fertility. To get the maximum potential from new corn hybrids, it is important to get them off to a good start, and starter fertilizer programs will help.

These new hybrids and varieties tend to have larger root systems due to resistance to certain insects and herbicides. They often tend to shrug off drought and other environmental stresses better than older hybrids/varieties and have less year-to-year yield variation.

Good soil fertility is necessary to take full advantage of the improved genetics available to farmers today and balanced NPK fertility efficiently uses all soil nutrients to grow high yields.

Improving your payback odds, from Day One

Although spur-of-the-moment decisions to use starter fertilizers may work, a bit of sit-down planning can help you make the most of data at hand and improve your chances for success.

For example: up-to-date soil samples help point the way toward ideal NPK starter blends, as well as a cost-effective total crop nutrients program.

While results with starters are likely to be greater when soil-test P and K are low, studies have shown that they also can pay when P and K test levels are considered high.

Once you determine the right combination for your soil and hybrid choices, your fertilizer supplier can provide a custom-blended solution.

All of which helps a strategic starter program do exactly what you want: deliver the nutrients each hybrid needs.

Starter application: effective, efficient and environmentally friendly

The most common, recommended and all-at-once labor-efficient starter application method — 2x2 banding at planting — places the fertilizer 2 inches alongside and 2 inches below the seed. A good alternative to 2x2 banding is "pop up." This close-to-the-seed application method positions the starter for fast, maximum impact when seeds germinate. Be sure to work with your dealer on proper application rates of "pop up" fertilizer as the chances for seedling injury are higher when applied directly on the seed. With today's bigger planters, "pop up" applications seem to be the trend among growers and are better than not using starter at all.

BRAINS OVER BRAWN:

STRATEGIZE WAYS A FASTER START PAYS FOR YOU, EARLY-SEASON PLANTING OR LATE.

There's still time to do it. And, regardless of weather, there is probably never been a better spring for it. A few simple steps, "a little here and a little there" could add up to a lot — on field after field, from pre-plant through harvest.

1. Select fuller season hybrids wherever you can, for early — as well as late — season planting.
2. Include starters as part of a well-planned fertilizer program, along with early broadcast application of overall foundation nutrients.
3. Keep up with soil test samples to ensure an ideal custom-blended NPK starter.
4. Band starter 2x2 or use "pop up" for most effective and efficient fertilizer usage.
5. Be alert for an earlier harvest and related activities, depending on your specific program and other factors during the year.

Of course, you can't control prices or the weather. And there are no guarantees . . . except for one: nothing ventured, nothing gained.

continued on back page

Other starter benefits

- **Zero-to-five:** Stimulated early growth means a quicker two- to three-week trip from emergence to the five-leaf stage for corn. Even more importantly, your corn gets enough vital phosphorus for fuller ears with more kernels on every plant. "Vital" phosphorus? You bet. Because now, at the five-leaf stage, your corn must have at least 0.5 percent of phosphorus in the plant tissue in order to deliver its bred-in hybrid best. If it doesn't, your ears will likely initiate fewer kernels. It's that simple.

- **Weather or not:** What's more, the worse the weather gets, the more your starter functions as a stress management tool . . . boosting plants' ability to shrug off inclemency and grow to maturity with less yield loss.

- **Reproductive stage:** Starter fertilizers help shorten the trip to silking, too, so that your crop arrives when temperatures and humidity are more likely to be "summertime cool" and moist-perfect for pollination. Hotter, drier weather later on reduces "stick," leading to more aborted pollination attempts — and fewer kernels. In short: here, too, the right starter fertilizer helps your hybrid give birth to every kernel bred-in.

- **Grain fill period:** Starters also help corn make the most of warm days and cool nights so that kernels grow bigger and fuller. Every kernel. Every ear and stalk. Every row.

- **Tip fill:** Stalks can grow truly full ears, with fewer nubs and heftier kernels all the way to the top end. Ensuring delivery of the plant nutrients that help make this happen begins with starters, too.

If you wind up with 14 more kernels per ear, what's the difference? Well, how many ears and stalks per acre in your fields? How many acres: 100? 500? 1000? It's simple math. Better yet, it's addition . . . to yield, to income.

That's how little things like these with starter fertilizers help you stack the odds for a greater payback on your side.

Think "harvest savings" before you plant maybe big-time savings.

The early jump that starter fertilizers give each hybrid not only crams more maturity days into the calendar — but chances are, your hybrids could also go into harvest a bit drier than if they'd taken the longer, non-starter route. (Note Wisconsin studies mentioned earlier.)

What difference would a single percentage-point less moisture make in your operation?

***Sources:** Vetch, J.A. and G.W. Randall. 2002. Corn production as affected by tillage system and starter fertilizer. Agron. J. 94:532-540.

PotashCorp
Helping Nature Provide

AGRIVIEWS is published by PotashCorp. Should you have any questions, please contact customer service at: (800) 524-0132.