

Strategic Placement

Farm Journal Test Plots examine starter attachments that bridge the nutrient gap and get corn off to a strong start **BY MARGY FISCHER**

For two decades, the Farm Journal Test Plots have studied nearly every aspect of starter fertilizer: attachments, placement and rates. This ever popular topic continues to generate more questions than any other topic from farmers.

“The key to fertilizer is to know the three R’s,” says Farm Journal Field Agronomist Ken Ferrie. “Right time, right place, right rate.”

Ferrie, along with Farm Journal Associate Field Agronomist Missy Bauer, organized more than a dozen plots to look at attachments, rates and blends for starter. This article discusses the test plot results relating to attachments. (Watch future issues for continued coverage.)

Dialing in on attachments involves two of the R’s: right timing and placement.

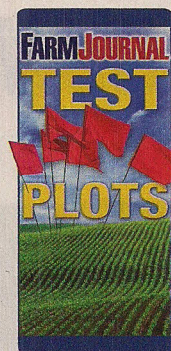
There are a wide variety of starter attachments available to apply in the furrow, above the seed, below the seed and to the side of the seed. Each placement is a source of nutrients for the two types of roots that starter fertilizer targets: the seed root and the crown root.

The first roots to emerge are the seed roots. Once they emerge from the seed, they grow downward in the soil to establish the plant.

“While seed roots only pick up small amounts of nutrients, for a tiny plant those nutrients are important in the early days,” Ferrie explains.

When starter is placed so the seed roots can pick it up, you see a quick visual response at the two-leaf stage.

When fertilizer is placed farther away or above the seed roots, the crown roots come into contact with it. The response from that can be seen in five-leaf corn.



“Placing starter in the furrow gives quicker response early in the season, and that usually translates to a 3 bu. to 5 bu. increase,” Ferrie says. “Placing a higher rate of fertilizer away from the seed root avoids the risk of starter burn and tends to get a higher response overall of 7 bu. to 10 bu., but it is a somewhat delayed visual response compared with in-furrow.”

In considering the options for applying starter fertilizer, there are positives and limitations to only applying either in the furrow or outside the furrow. ▶

PHOTOS: DARRELL SMITH

Schaffert Generation 1

Yetter 2959

Huckstep Shoe

Keeton Seed Firmer

Schaffert Generation 2

Yetter In-Between

Using a single planter outfitted with quick-attach plumbing, the Test Plots crew was able to do replicated strips with six starter attachments to look at starter placement relative to the seed and how adding pop-up can increase yield.

Applying starter in the furrow always carries some risk of starter burn regardless of the rate or salt load. But going the in-furrow starter route also adds less weight to the planter and makes it easy to run in the field.

Some farmers, due to soil fertility and phosphorus needs or crop rotation and nitrogen needs, go outside the furrow to be able to apply a higher rate.

To learn more about starter placement, Ferrie led his crew to run six

starter attachments on an eight-row Kinze planter. Starter was placed in the furrow, outside the furrow and a combination of the two. The Precision Planting 20/20 SeedSense monitor was used to observe and adjust planter down pressure and the smoothness of the ride. Every pass was harvested with a calibrated yield monitor and a grain cart with scales.

The planter tractor used the Trimble VRS network, which provided accu-

racy correction so that each treatment could be replicated across the field. The planter was set up with quick-attach plumbing, and at the end of each treatment the crew installed the next round of attachments.

Attachment assessment. Across the plots, the following attachments were used to achieve the desired starter placements: Huckstep shoe, 3/4" beside by 1/2" below the seed; Schaffert Generation 1 fertilizer disk, 2" to the side; Schaffert Generation 2 fertilizer disk, 2" to the side; Yetter 2959 injection coulters, 2" beside by 1" below the seed; Yetter 2968 row-unit mount-in-between fertilizer opener, 2" beside and slightly below the seed; and the Keeton Seed Firmer in-furrow.

"The Huckstep shoe is mounted between the depth wheels and allows placement in a sweet spot where we're off the seed to reduce the risk of burn but close enough to catch the seed root," Ferrie says. He adds that the shoe takes more down pressure and has trouble in rocky or high-muck soils.

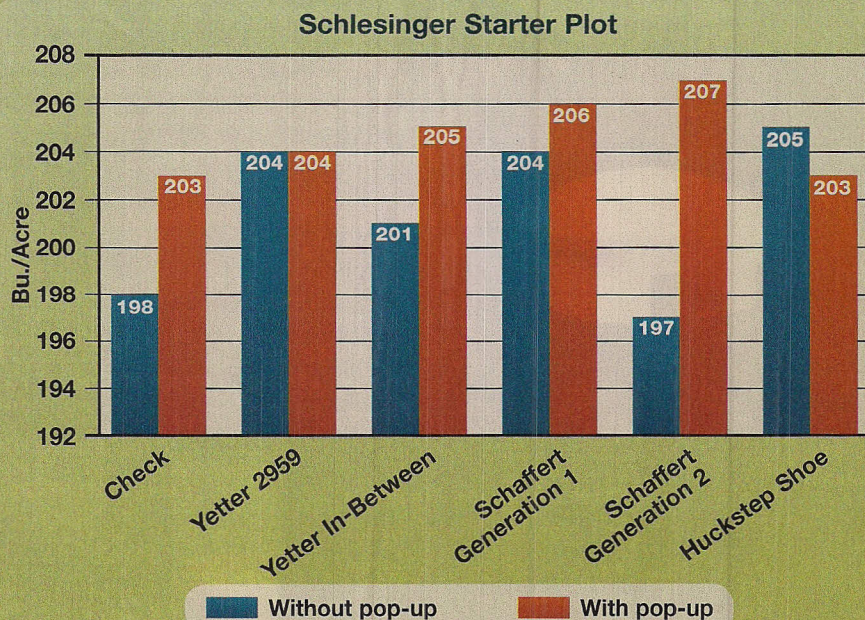
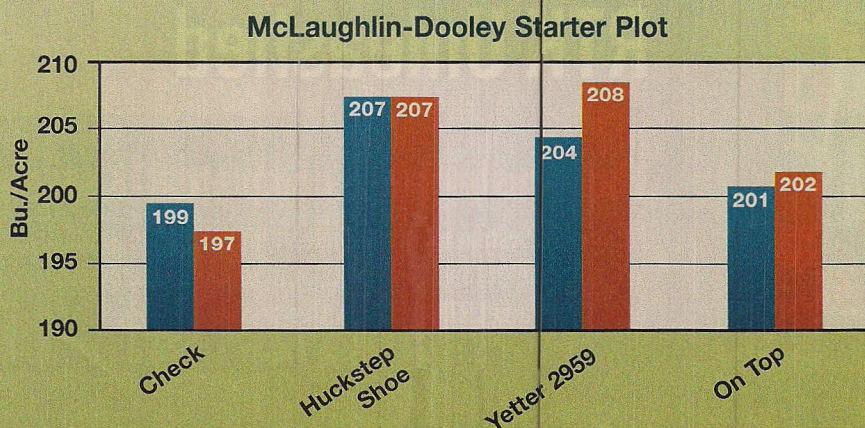
"Both Schaffert attachments don't add as much down pressure requirement or residue flow concern because they are mounted with the closing wheels," Ferrie says. "These attachments use a trailing hose to drip fertilizer into a slot created by a straight, narrow blade 2" beside the seed. The fertilizer, while still banded, is distributed from the surface to the bottom of the slot.

"They could be a good fit for someone looking to run higher rates of nitrogen on the planter," he adds. "And since these attachments stagger the closing wheels, we improved our ability to close the furrow."

The Generation 1 fertilizer disk is designed for medium to firm soil conditions. The Generation 2 places the walking beam in the center of the tail section and has depth adjustment.

"The Yetter 2959 injection coulters places the starter below the

2011 Starter Placement Plots



These charts display the average yield results across two entire corn-on-corn fields in central Illinois. The farther the starter was placed outside the furrow, the more likely that adding pop-up starter in-furrow would increase yield. Both plots ran 7-22-5 with zinc outside the furrow and 10-34-0 with zinc in the furrow.



PHOTOS: DARRELL SMITH

As in all Farm Journal Test Plots, the fields are harvested using a calibrated yield monitor. In addition, a grain cart weighs each bushel.

seed closer to the seed roots than the Schaffert attachments but not as close as the shoe," Ferrie says. This attachment needs to be run with depth wheel scrapers, he notes, because the coulter will bring up moisture that can stick to the depth wheel and cause issues.

The Yetter 2968 is mounted between the depth wheels and the closing wheels to place starter 2" beside and near seed depth.

"Like the 2959, there is a risk of bringing up moisture to stick to closing wheels, and there can be some issues with residue flow in chisel-plowed cornstalks," Ferrie says. "This attachment, using an orifice and pressure, does put a majority of the fertilizer at the bottom of the 2" trench."

The Keeton Seed Firmer runs in the furrow and places the lower rates for pop-up starter.

The two Illinois corn-on-corn fields were in vertical tillage programs. Soils ranged from light silt loam to heavy clay loam. Replications were done with each starter attachment with and without the pop-up in-furrow.

Distance matters. "In these trials, we found that the closer the attachment placed starter to the first seed roots, the less likely we were to have a positive response to adding a pop-up application," Ferrie says. "When the starter placement was far enough away from the seed root, the addition of pop-up starter was pretty dramatic, thanks to the quick response of a pop-up and the staying power of a higher

rate placed beside. Instead of 2 plus 2 equaling 4, it equaled 5 or 6."

Bauer compares the response to passing a baton in a relay. In her plots in southern Michigan, she looked at adding in-furrow pop-up in a 2" beside by 2" below application.

"In the eastern Corn Belt, we run a lot of high-nitrogen starters with phosphorus in a 2" beside by 2" below placement," she says. "The high nitrogen rates reduce the effect of immobilization in our cool environment but force us to stay further away from the seed to prevent starter burn. Having the phosphorus only in a 2" beside by 2" below placement delays the time that the roots come into contact with the phosphorus. In order to get more


phosphorus into the plant early, we paired an in-furrow placement with the 2" beside by 2" below placement."

Bauer reports that adding a pop-up application led to an average increase of 4 bu. to 5 bu. in recent years.

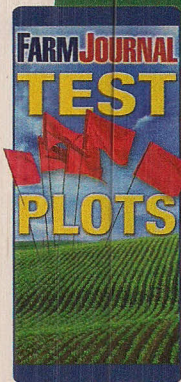
There are additional considerations to adding a pop-up application. Starter burn is a risk that must be weighed, especially in sandy soils or when planting seed with questionable quality.

"We recommend keeping the salt load low in the furrow. If we have seed with severe pericarp damage [or cracks], we leave the pop-up turned off for that hybrid. Since we are still running the 2" beside by 2" below placement, we still have starter available but at a safer position," Bauer says.

Using two starter placements can result in yield bumps by reaching two target roots. It also provides options in conditions where in-furrow applications carry too much risk.

"The bottom line: Pop-up by itself can mean 3 bu. to 5 bu. more, and starter to the side and below nets 7 bu. to 10 bu. more. Combining the two can get up to 15 bu. or more," Ferrie says. "If your current attachment is not positioning the fertilizer so it is available to the seed root, there could be a huge benefit to adding a pop-up." 

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Thank You to Our Test Plot Partners

Each Farm Journal Test Plot is a cooperative effort. Our thanks go to: Yetter Manufacturing, Pat Whalen, Susan Wherley and Scott Cale; Kinze Manufacturing, Susanne Veatch and Mike Feldman; AGCO, Mike Alvin and Reid Hamre; Farm Depot and Mark Laethem; Precision Planting and Gregg Sauder; Great Plains Manufacturing, Tom Evans, Doug Jennings and John Sites; Versatile and Adam Reid; McCormick USA, Doug Rehor and Kurt Schneick; Unverferth Manufacturing and Jerry Ecklund; Orthman Manufacturing, Adam Souder and John Bell; Jensen Electronics and Stephen Jensen; Trimble, Sid Siefkin and Brian Stark; OmniStar and John Pointon; The Andersons, Jan Finch and Jeff Balsley; Mike and Steve McLaughlin, Cole Dooley; Don Schlesinger; Bob Kuntz; Terry Finegan; Bob and Mary Kochendorfer; Crop-Tech Consulting, Brad Beutke, Isaac Ferrie, Jason Kienast and Justin Zeeb; B&M Crop Consulting, Vicki Williams and Gary Cooper.