

What About Starter Placement in High Phosphorus Soils

Maryland researcher takes a look at alternative methods of placing starters in soils testing excessively high (above 205lbs/A of P_2O_5).

Summary: *In most situations, corn grain yields are higher where starters are placed in the row when compared to broadcasting. Dribbling starters, over the row behind one of the closing wheels, seems to be as efficient as 2 x 2 placement. In wheat, it appears yields decrease if more than 20 lbs/A of nitrogen (N) is applied in-row. Excepting this 20-lb rate, it appears all surface-applied starter rates performed better than the in-row treatments.*

In Maryland on some soils testing excessively high in phosphorus (P_2O_5) and considered environmentally sensitive using the P index system, little or no phosphorus fertilizer will be allowed. Thus a new project not reported here is being proposed to answer what effect using

starters with no P will have on yield. Also, as corn planters get bigger the equipment for the traditional 2 x 2 starter placement is adding cost and in some situations excessive weight. For these reasons and others we are in search of alternative methods of placing solution starters over the row but directly behind the planter closing wheels. In this article we will review studies on corn and wheat.

Corn

Our objective here was to evaluate the influence of starter placement using a recommended phosphorus level on high P soils at two nitrogen rates.

Fertilizer rates. Starter N rates were 8.5 and 25 lbs/A, each combined with 20 lbs/A of P_2O_5 , 5 lbs/A of potassium (K_2O), 1 lb/A of sulfur (S), .6 lb/A zinc (Zn), and .13 lb/A of boron (B). N rate

was starter N plus additional sidedressed N when corn was at 5th leaf stage to give a total of 80 lbs/A. Helena HM9840 was also added to some in-row treatments.

Placement. Starter placement methods were broadcast, 2 x 2, in-row, and dribble over the row behind one of the closing wheels.

Planting. A John Deere 6-row conservation tillage unit planter was used, which had been modified to apply fluid starters five different ways.

A typical comparison in our studies is shown in Figure 1. In most cases corn grain yields were higher when a corn starter was placed near the row, compared to broadcasting. Overall, dribbling the starter over the row behind one of the closing wheels seemed to be as efficient as the traditional 2 x 2 placement.

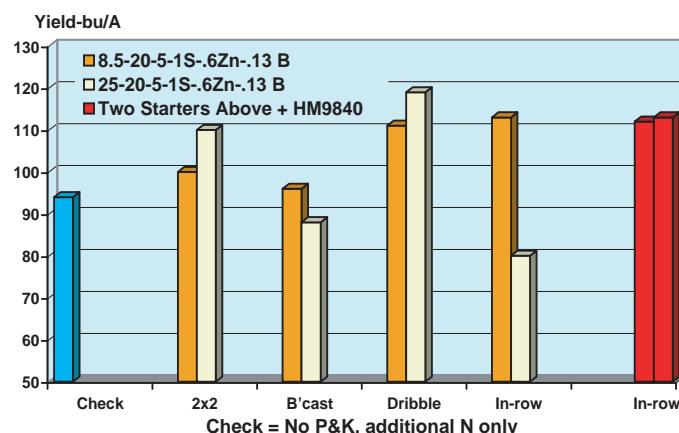


Figure 1. Effect of varying starter N rates and placement methods on corn yields, University of Maryland, 2001.

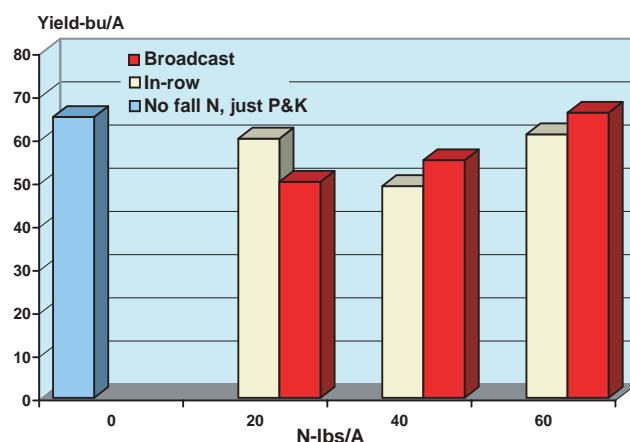


Figure 2. Effect of varying starter N rates and placement methods on wheat yields, University of Maryland, 2001.

Wheat

Objective of this study was to measure the difference between alternative placement methods using a liquid starter, as well as evaluate the difference between starter N rates.

Fertilizer source. Liquid sources used were 11-37-0 and 30 percent UAN.

Fertilizer rates. Fall applied starter N rates were 20, 40, and 60 lbs/A. The 11-37-0 starter was used at a constant rate of 8.4 gal/A to supply the fall P. Additional N was added to the 11-37-0 to give varying starter N rates. The experimental site received a uniform application of 140 lbs/A of K₂O, which was disked into the soil before planting. All plots received 60 lbs/A of N at spring greenup. This was a blend of 30 percent UAN and 8-0-0-9 to give 21 and 24 lbs/A of ammonium nitrogen and sulphate sulfur, respectively.

Placement. Broadcast and in-row applications were compared. Broadcast treatments were applied using a custom-made CO₂ charged bicycle sprayer.

After application the soil was disked twice before planting. The in-row applications were made as the individual plots were being planted. Spring greenup liquid solution was streamed on in 10-inch spacings.

Planting. A custom-made 17-row by 4-inch planter, equipped with a 5-gallon tank and application tubes running to each row opener, was used for the in-row treatments.

As can be seen in Figure 2, when more than 20 lbs/A of N was applied in-row, yields appear to decrease. The surface-applied starter rates all performed better than the in-row treatments, except at the 20-lb/A rate. If additional spring nitrogen had been applied, quite

possibly the 20-lb/A starter N treatment would have been as good or better than the broadcast treatments.

Pros/cons

Broadcasting. An advantage of broadcasting starter is N along with P and K can be applied in one application, thus saving time and labor, along with equipment charges. A disadvantage is it appears 20 lbs/A of starter N is not sufficient. Between 30 to 40 lbs/A may be required.

In-row application. One advantage is the grower may get by with less starter N. A disadvantage would be a slowing of the planting process. The producer would have to handle a fertilizer solution as well as small grain seed.

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