


early season plant growth and corn yield, even when initial soil P and K tests were high. About two-thirds of the increase could be attributed to N. The starter response was greatest and most consistent in 1995, when late planting and adverse growing season conditions were experienced.

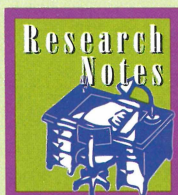
2. Seed-placed fertilizers increased early growth and yield, but increases were not as great as for banded starter fertilizer. Liquid starter fertilizers with low salt indices did not slow emergence. Seed placed fertilizers should not be used in sandy soils, but can be used in heavier soils at rates less than 10-15 lb/A of N+K₂O. Urea or urea-containing formulations should not be placed near the seed.
3. Dribbling fertilizers on the soil surface near the seed furrow resulted in

higher average yields than no starter controls, but yield increases were not statistically significant and were not as high or as consistent as the 2x2 banded or seed-placed fertilizers.

4. Yield ranking of the starter treatments tested, averaged over all locations was: 2x2 banded>seed-placed liquid>surface dribble>no starter. 

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Phosphate Fertilizer Management for Soybeans in Two Tillage Systems

Management of phosphorus (P) fertilizer for soybean production on calcareous soils that have low or very low soil P test levels has not been fully researched. The possibility of applying P prior to the soybean crop instead of the corn crop may offer potential for added profit. A study at the University of Minnesota West-Central Experiment Station, begun in the fall of 1994, is evaluating the impact of major factors (tillage system, row spacing, P placement, P rate, frequency of P application) on the yield of both soybeans and corn in rotation. Soil test P levels prior to the study were 2.3 parts per million (ppm) Bray P-1 and 4.3 ppm Olsen. Soil pH was 7.8.

Higher yields were recorded with the fall chisel tillage system and the use

TABLE 1. Relevant soil test values for the experiment site.

pH	7.8
Phosphorus (Bray), ppm	2.3
Phosphorus (Olsen), ppm	4.3
Potassium, ppm.	166.0

of narrow (7-inch) rows. For both tillage systems, broadcast rather than fall banded P produced the higher yield. Regardless of P placement, row spacing and tillage system, yields increased as rate of applied P increased. Residual effect of the biennial application will be measured with corn. 

Source: Dr. George Rehm, Extension Soil Scientist, Department of Soil, Water, and Climate, University of Minnesota, St. Paul, MN.