

PureGrade Liquid Plant Food

Efficient Phosphorus Use Requires Soil Testing

WASECA, Minnesota — Farmers who use strip-tillage should use a soil test to determine the most efficient way to apply phosphorus.

Conventional wisdom is that fertilizer phosphorus is most effective when band-applied six inches to seven inches deep during fall strip tillage. Now research results from the University of Minnesota southern Research and Outreach Center in Waseca suggest strip-till producers working on soils with low phosphorus levels — 10 parts per million or less in Minnesota on a Bray test — should use a dual application.

The dual application includes the traditional deep-band treatment in the fall as a starter, pop-up fertilizer in spring.



Gyles Randall - soil scientist at the University of Minnesota.

“Pop up is applied at the time of planting. You drop the seed and drop the fertilizer at the same time. The two are in intimate contact,” said Gyles Randall, a soil scientist with the university and the research’s primary investigator.

This conclusion is the result of two studies that took place in Waseca between 1997 and 2007 to determine how phosphorus placement effects corn and soybean production on high and low-testing soils. High-testing soils were classified as anything above 16 ppm on a Bray test.

The first study compared pop-up, deep-band and no phosphorus treatments. The second study compared single applications of pop-up, deep-band and broadcasting the fertilizer on the soil surface with a dual application of deep-band plus the pop-up treatment.

On high- and medium-testing soils, the studies found phosphorus placement didn’t make a difference in yields. In some years on the low-testing soils, corn yields didn’t grow in some years or only increased by two or three bushels per acre. However, in other years, corn yields on low-testing soils jumped 10 to 15 bushels per acre.



The Southern Research and Outreach Center in Waseca, Minnesota, used strip-tillage equipment as part of their research efforts led by Gyles Randall.

“Adding P as an in-furrow, seed-placed pop-up to the deep-band treatment produced an ideal solution, sometimes giving the greatest yield of any of the treatments,” Randall wrote afterward.

The researchers were surprised the deep-band treatment didn’t provide the best yields, but concluded corn roots apparently grow out and around the deep-band fertilizer. The plants’ early growth was no different than if it had no phosphorus applied.

When looking at the residual effects on soybeans, researchers found no response on high-testing soils. In some years on low-testing fields there was as much as a 15 bushels per acre increase with any kind of placement: deep-band, pop-up or broadcast on the soil surface.

by Heather Thorstensen, www.agrinews.com

Gyles Randall is a soil scientist with the University of Minnesota.