

Meadowlark District Extension News
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Starter Fertilizer for Corn

How much yield benefit is there to that starter fertilizer you are using? Is it economic – or mainly visual? Every system is different, and that means that in some cases it may be both – in others, neither. What factors make it so?

Soil fertility levels make a difference - the lower the fertility level, the greater the chance of an economic response to starter, even in some low yield environments. Higher soil test levels may elicit a response, but the degree of response may be less frequent or of less magnitude. Cool/wet soils also increase response chances. In cases where high nutrient levels are needed to build soil test levels, application levels can be split between preplant broadcast and starter applications. Limit starter applications to the first 20-30 pounds of P/K per acre. Note: Phosphorous source does not tend to make a difference. More information can be found in the accompanying KSU eUpdate article located at the link below.

Tillage system can make a difference. While there is seldom an economic response in conventional till systems, you'll often get a response to an N containing starter in no-till systems. This is especially so when preplant N is applied as deep-banded anhydrous ammonia or UAN, or where most of the N is sidedressed in-season. No-till soils are typically colder and wetter at corn planting time than soils that have been tilled, and N mineralization from organic matter tends to be slower at the start of the season in no-till environments. This response tends to wane if more than 50 pounds of N was broadcast prior to or shortly after planting. As would be expected, reduced till systems generally fall somewhere in between conventional and no-till systems, with a lot of the response effect subject to soil test levels.

Placement also makes a difference. Apply with the seed and you need to limit the N/K/Boron you use, making sure to have some soil separation between the starter fertilizer and the seed. If applying starter fertilizer with the corn seed, you run an increased risk of seed injury when applying more than 6 to 8 pounds per acre of N and K combined in direct seed contact on a 30-inch row spacing (avoid urea or UAN in furrow). It is best to have some soil separation between the starter fertilizer and the seed. The safest placement methods for starter fertilizer are either a subsurface-band application two to three inches to the side and two to three inches below the seed, or a surface dribble-band application 2 to 3 inches to the side of the seed row at planting time (especially in conventional tillage or where row cleaners or trash movers are used in no-till). There's some excellent work from the North Central Kansas Irrigation Experiment Field near Scandia illustrating this. Let me know if you want to see the research report. In short, a comparison of in-furrow, 2x2, and surface band placement of different starter fertilizer rates showed excellent response from up to 30 pounds of N combined with 15 pounds of P in both the 2x2 and surface-band placements. In-furrow placement however, caused stand reductions from salt injury to germinating seedlings.

For more information and a brief summary of the study results, check out this KSU eUpdate link: https://webapp.agron.ksu.edu/agr_social/eu_article.throck?article_id=855.