

► Soybean And Corn Response In A Crop And Tillage Rotation

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Most often soybeans have shown a yield response in a rotation with corn. However, little information has been published in regard to corn yield response in a rotation with soybean. The objective of this study was to evaluate both corn and soybean yield responses in a rotation and alternating years with a one-pass tillage system. The study (2001-2011) was conducted on an upland Blackbelt Prairie clay soil (Catalpa silty clay loam) with a 2% slope. The 11-year (2001-2011) average yield was 140 bu/acre for no-till corn following no-till soybean in an every other year corn-soybean rotation. This was 21 bu/acre (18%) higher than continuous no-till corn. The yield was 144 bu/acre for no-till corn following no-till soybeans that had received a previous fall applied chisel-harrow (high clearance chisel equipped with colters in front of each staggered chisel shank on a three-bar toolbar with a chain harrow attached to the rear of the implement), one-pass tillage operation. This was 25 bu/acre (21%) higher than continuous no-till corn and 4 bu/acre (3%) higher than no-till corn following no-till soybeans.

The 11-year average yield for no-till soybeans following no-till corn in an every other year corn-soybean rotation was 43 bu/acre, 6 bu/acre (15%) higher than continuous no-till soybeans. The soybean yield average for the fall applied colter-chisel harrow (one-pass tillage) to the previous crop of no-till corn was 47 bu/acre, 9 bu/acre (24%) higher than continuous no-till soybean; and 3.4 bu/acre (8%) higher than no-till soybean in rotation with no-till corn. These results indicate corn and soybean in a rotation are complementary with each other with an 18 to 21% and 15 to 24% yield increase, respectively. In addition to the soybean-corn rotation yield benefits, through the use of herbicides that are of different family chemistries for each of these crops, the rotation also offers potential for good weed resistance management strategies. The one-pass chisel-harrow tillage operation applied in the fall to no-till corn in an every other year rotation, not only showed a positive yield impact on the following year stale seedbed soybean crop, but also the succeeding year's no-till corn crop.

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► Fall Versus Spring Fertilizer Applications In Soybeans

Presented by Donna S. Morgan

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Traditional methods of applying fertilizer to cropland primarily include fall applications of Phosphorus (P) and Potassium (K), which are usually broadcast, and then may be incorporated if conditions permit. Nutrients are then left on the soil surface, or slightly beneath, for 6-7 months prior to planting of the crop. Soybeans, for example, are categorized as legumes and therefore fix their own nitrogen, but do require adequate amounts of P and K, if soil tests results recommend it (this is based on soil type and texture, soil pH, previous crops, and other variables). A medium soil type (such as a silt loam or clay loam) would normally require the application of 200#/acre of 0-18-36. If these nutrients are applied this far in advance of planting, is it really beneficial to the crop and to the environment to do so? What happens to the nutrients during typical, heavy winter rainfall events? What if the soil has a high pH (such as those found in the Red River Alluvial soil class) and the Phosphorus becomes bound to the soil particles, thereby becoming unavailable to the plant when it needs it the most? Do you apply the nutrients anyway? Or is a spring application more beneficial? These are some of the questions that prompted a study at the Dean Lee Research Station to determine if fall and