

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 percent 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 percent) 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 percent) higher than continuous no-till corn and 4 bu/acre (3 percent) higher than no-till corn fol-

lowing 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 percent) 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 percent) higher than continuous no-till soybean; and 3.4 bu/acre (8 percent) 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 percent and 15 to 24 percent 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. Δ

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