

EFFECT OF STRIP-TILLAGE, FERTILIZER PLACEMENT, CROP ROW SPACING, AND IN-FURROW FUNGICIDE ON SOYBEAN SEED YIELD

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Cold, wet, compacted soils can have negative implications on soybean production. Alleviation of these issues is of importance for earlier planting and improved seed yield. Strip-tillage adoption in corn has increased as a sustainable means to improve soil conditions and improve yield; however, the response of soybean to strip-tillage has been less consistent. This study aims to determine the yield response and best management practices for strip-tilled soybean production. Strip-tillage can be loosely defined as any tillage that only loosens the soil and removes or incorporates residue in a narrow (10- to 20-cm) band set to a 5- to 20-cm depth ahead of planting. Planting follows the strip-tilling and the seed furrow is formed in the middle of these strips while the area between the crop rows remains undisturbed. The most popular strip-tillage implements incorporate four individual procedures into a single pass: 1) residue removal, 2) residue sizing, 3) narrow tillage with a knife or coulter, and 4) twin opposing coulters to form an elevated berm. This can be performed in spring or fall and combined with deep banded fertilizer in each row. Experiments were conducted in Wisconsin using both field scale and small plot equipment. In soybean, combinations of strip-tillage, no-tillage, deep banded, and surface applied fertilizer, and 15- and 30-inch row spacing were compared. Physical plant and soil measurements were taken throughout the growing season. Results from the first 2 years of the study conclude that in small plot experiments, 15-inch row spacing significantly out-yielded 30-inch row spacing by 23%. In addition, strip-tillage significantly out-yielded no-tillage in 30-inch row spacing by 17%. Results from this study will provide best management decisions for strip-tilled soybean in Wisconsin and applicable to the upper Midwest. The potential for soybean seed yield improvement and environmental stewardship make strip-tillage an appealing option for soybean production.

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