



Long-Term Tillage and Crop Rotation Trial

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Objective

Evaluate the long-term effects of tillage systems and crop rotations on grain yields and soil health.

Materials and Methods

Crop Year—2021

| | |
|---------------------|--|
| Soil Type: Galva | Clarion, Nicollet, Webster |
| Previous Crop | varied by crop rotation |
| Hybrid | corn: Golden Harvest G03R40-5222; soybean: Golden Harvest GH2011E3 |
| Planting Date | corn: April 27, 2021 soybean: April 30, 2021 |
| Row Spacing | 30-in. |
| Seeding Rate | corn at 35,000 seeds/acre soybean at 150,000 seeds/acre |
| Tillage | Stalk chop of CP, DR and MP: October 18, 2020 fall ST, CP, DR and MP: November 3, 2020 Spring soil finisher (except NT and ST): April 23, 2021 |
| Fertilizer | 250 lb. MAP (11–52–0), 350 lb. potash (0–0–60), 50 lb. elemental sulfur/acre (0–0–0–90): fall 2020 |
| Nitrogen | NH ₃ at 184 lb. N/acre following soybean and 241 lb. N/acre following corn: April 22, 2021 |
| Harvest Date | corn: October 10, 2021 soybean: September 28, 2021 |
| Experimental Design | Randomized complete block design by corn brand |
| Replications | Randomized complete block design |
| Treatments | No-tillage (NT), strip-tillage (ST), chisel plow (CP), deep rip (DR), moldboard plow (MP) |

Results

Table 1. Yield, test weight, plant height, percent lodging, and germination of cereal rye varieties.

| Tillage System | Continuous Corn Rotation | Corn-Soybean Rotation | Corn-Corn-Soybean rotation |
|----------------|---------------------------|-----------------------|------------------------------|
| | corn yield (bushels/acre) | | soybean yield (bushels/acre) |
| No-tillage | - | - | 54.3 |
| Strip-tillage | - | - | 55.8 |
| Chisel plow | - | - | 56.5 |
| Deep rip | - | - | 55.9 |
| Moldboard plow | - | - | 57.3 |
| | | | P = 0.7327 |

Key Takeaways

- There were no reported corn yields due to wind-induced lodging, which prohibited corn harvest for grain yield.
- There was not statistical effect of tillage system on soybean yield.