Cover Cropping and Tillage Systems in Soybean Production

Trial Objective

- In northern geographies, it is more difficult to get a cover crop established with the shorter growing season. Selecting an early maturing soybean product may allow time for better cover crop establishment, but could this practice negatively impact the yield potential of the farming operation?
- Eliminating a tillage pass through the field is another cropping system decision, but is there a yield penalty associated with no tillage?
- The objective of this study was to evaluate different cropping systems that integrate no-till, conventional tillage, cover crops, and product maturity selection.

Research Site Details

Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield (bu/acre)	Seeding Rate (seeds/acre)
Storm Lake, IA	Silty clay loam	Corn	Conventional & no tillage	5/24/18	9/17/18	70	140K

- Four cropping systems were evaluated:
  - System 1 – Early soybean maturity (1.1 MG), early cover crop establishment, and no tillage.
  - System 2 – Normal soybean maturity (2.4 MG), late cover crop establishment, and no tillage.
  - System 3 – Early soybean maturity (1.1 MG), no cover crop, and no tillage.
  - System 4 – Normal soybean maturity (2.4 MG), no cover crop, and conventional tillage.
- Plots were 20-ft wide and 340-ft long strip trials with five replications.
- Soybeans were planted into the cereal rye cover crop in the cover crop systems.
- Cereal rye was terminated with an early post-emergence herbicide program.
- All treatments were treated with the same late post-emergence herbicide program.

Understanding the Results

Figure 1. Field picture showing the established cereal rye cover crop used for the trial. Dense vegetation on the right is the early established cover crop and the sparse vegetation on the left is the late established cover crop. Picture was taken just before soybean planting.

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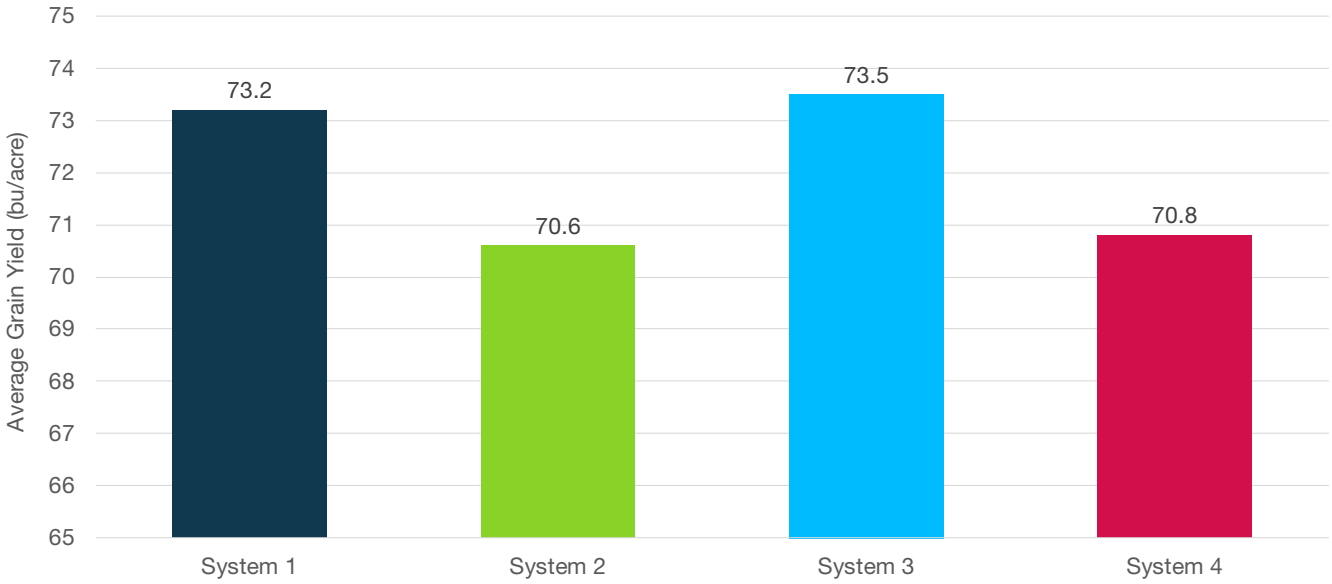

Figure 2. Average yields of four soybean cropping systems. Systems 1 and 2 are the cover crop trials with the early MG product (System 1) and normal MG product (System 2). System 3 is the early MG product in no-till, and System 4 is the normal MG product in conventional tillage.

- Figure 1 indicates that the time of cover crop establishment made a tremendous difference in cover crop biomass at the time of soybean planting.
- With the two cover crop systems, the early MG soybean product with early cover crop establishment (System 1) out-yielded the normal MG product and late cover crop establishment (System 2) (Figure 2).
- In this study, no tillage with an early MG soybean product (System 3) out-yielded conventional tillage with a normal MG soybean product (System 4).
- In all trials, each soybean product performed similarly across the systems; however, the early MG product (Systems 1 and 3) out-performed the normal MG product (Systems 2 and 4).

What Does This Mean for Your Farm?

- Choosing the proper genetics is the most vital component of any cropping system. In this trial, the early MG soybean product provided over a 2.5 bu/acre advantage over the normal MG product in the cover crop systems (Systems 1 and 2). Thus, if chosen properly, early maturing soybeans could be a better fit in the cover crop system with little to no yield penalty.
- In this trial, no-till did not show any yield drag when compared to conventional tillage, thus saving money with less trips across the field. In some situations, no-till may provide a yield advantage in some years.

Legal Statements