Western Illinois University/ School of Agriculture

2019 Blind Cultivation & Soybean Variety Study

Dr. Joel Gruver and Andrew Clayton

Introduction:

Blind cultivation is an early season mechanical weed control strategy designed to accomplish 2 main goals: a) termination of very young weeds (primarily between germination and emergence) when seedlings are most sensitive to mechanical disturbance and b) creation of a loose soil surface environment that is unfavorable for germination until the next rain.

Blind cultivation generally disturbs the entire field surface and thus is not targeted (i.e., blind), in contrast with row-crop cultivation that primarily disturbs soil between crop rows.

The tools farmers use for blind cultivation vary with respect to intensity of soil disturbance and compatibility with surface residues. Rotary hoes are more compatible with surface residues but generally fracture the soil surface less completely while tine weeders and drag harrows are less compatible with surface residues but tend to be more aggressive tools.

Blind cultivation is typically performed multiple times between planting and first row cultivation, sometimes as soon as the same day as planting. Some organic farmers perform blind cultivation approximately every 3-4 days for 3-4 weeks as long as the soil is not excessively wet.

This study compared 2 methods of blind cultivation (rotary hoeing vs tine weeding) and 2 soybean varieties (34A7 and 35DC2) from Blue River Organic Seed. 34A7 is a tall leafy variety that has been a top performer at the WIU Organic Research Farm most years for over a decade whereas 35DC2 is a shorter relatively new variety. Both varieties are a mid-group 3 maturity.

4/23: Shallow tillage (~2") with a McFarlane Incite vertical tillage tool to size corn stalks

6/13: Shallow tillage with a 25’ Soil Finisher tool (field cultivator with disk harrow)

6/18: Shallow tillage with a 31’ field cultivator

6/30: Shallow tillage with a 31’ field cultivator to prepare for planting soybeans

7/1: Planting of soybeans with a JD 12-row air vac planter at ~1.75" deep (34A7 @ ~170,000/a & 35DC2 @ ~167,000/a)

7/8: Rotary hoeing of plots with IDs 1 and 1.1 using a 15’ M&W rotary hoe at ~10 mph, soybeans were ~ 1" tall.

7/9: Tine weeding of plots with IDs 2 and 2.2 using a 15’ Einbock Aerostar tine weeder at ~4.6 mph, soybeans were ~1" tall.

7/19: Rotary hoeing of plots with IDs 1 and 1.1 using a 15’ M&W rotary hoe at ~10 mph, soybeans were ~ 2-3" tall.

7/19: Tine weeding of plots with IDs 2 and 2.2 using a 15’ Einbock Aerostar tine weeder at ~ 5+ mph, soybeans were ~2-3" tall.

7/25: Row crop cultivation of a

Resultsand Discussion

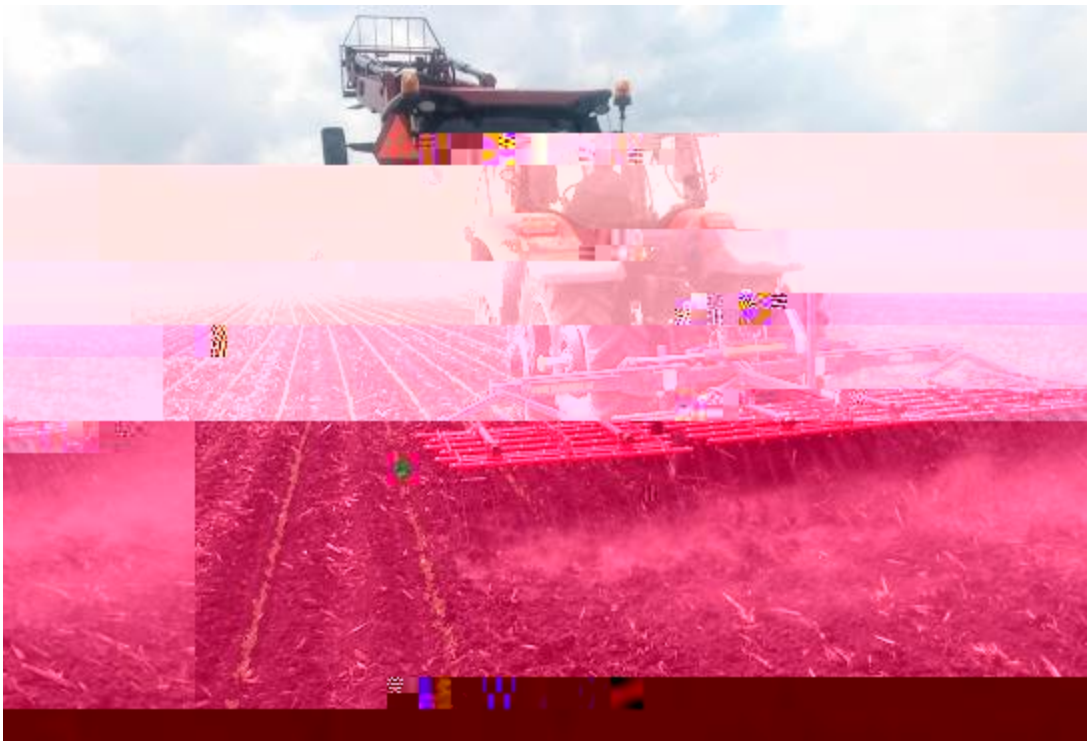
Grain yields, stand counts and weed counts are reported in table 1.

No statistically significant differences in whole plot grain yields were identified but the numerical differences shown in Table 1 suggest that rotary hoed plots tended to have higher yields than tine weeded plots and this effect is likely to have been more distinct with more replication

Negative effects of early tine weeding on soybean stand appear to vary with variety, with 34A7 less sensitive to tine weeding than 35DC2. In addition to measured effects on stand reported in Table 1, qualitative visual observations revealed 34A7 plots to have a more robust appearance and stand compared to 35DC2 plots.

Overall, grain yields for all treatments were good (averaging 48.8 bu/a) considering how late the soybeans were planted (7/1) and the excessive precipitation. The 2019 season was one of the wettest seasons in decades reducing opportunities for timely field operations and vigorous crop growth and increasing opportunities for weed germination.

It should be noted that treatment ID 1, rep 1 (34A7 with rotary hoeing) was accidentally tine weeded on 7/19. This error occurred during the second blind cultivation and thus



First tine weeding on 7/9

Second tine weeding on 7/19