

On-Farm Corn and Soybean Planter Demonstration Trials

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Introduction

Corn and soybean planting is one of the most critical operations of the season. Operating the planter with the proper soil conditions for proper placement of the seed to obtain the correct seed-soil contact is important to optimize yields and reduce problems later in the season with plant and root growth. Timely planting also is important for optimum yields. The objective of these trials was to investigate the effect of various planter operations on corn and soybean yield.

Materials and Methods

In 2019, six trials investigated the effects of various aspects of planter operations on corn and soybean yield (Table 1). Some of the trials were conducted on-farm by farmer cooperators, and some were conducted on research farms. Strips were arranged in a randomized complete block design with at least three replications per treatment. Strip length and width varied from field-to-field depending on field and equipment size. All plots were machine harvested for grain yield.

In Trial 1, soybean planted at 280,000 seeds/acre in 15-in. rows was compared with soybean planted at 140,000 seeds/acre in

30-in. rows (Table 2). In Trial 2, corn planted at 6 mph was compared with corn planted at 7.7 mph. In Trial 3, corn planted with down pressures of 100, 225, and 350 psi were compared with each other. In Trial 4, soybean planted April 24 was compared with soybean planted June 1. In Trial 5, soybean planted at 3, 4, and 5 mph was investigated. In Trial 6, corn planted at 3, 4, and 5 mph was investigated.

Results and Discussion

In Trial 1, there was no difference in yield between the soybean planted at 280,000 seeds/acre in 15-in. rows and the soybean planted at 140,000 seeds/acre in 30-in. rows (Table 2). In Trials 2 and 6, planter speed had no effect on corn yield up to a speed of 7.7 mph. In Trial 3, corn planted with down pressures from 100 to 350 psi had no effect on corn yield. In Trial 4, soybean planted April 24 yielded 6 bushels/acre more than soybean planted June 1. This agrees with most studies, which have shown that soybean planted in late April to early May yield more than soybean planted in late May or early June. In Trials 5 and 6, planting speeds from 3 to 5 mph did not affect corn or soybean yield.

NOTE: The results presented are from replicated demonstration trials. Statistics are used to detect differences at a location and should not be interpreted beyond the single location.

Table 1. Variety, row spacing, planting date, planting population, previous crop, and tillage practices in the 2019 planter trials on corn and soybean.

Exp. no.	Trial	County	Variety	Row spacing (in.)	Planting date	Planting population (seeds/ac)	Previous crop	Tillage
190806	1	Bremer	Channel 2416R2X	15 & 30	6/1/19	280,000 & 140,000	Corn	No-till
190104	2	Lyon	Pioneer PO157AMX	22	5/15/19	38,000	Corn	Conventional
190116	3	Sioux	Pioneer PO306AM	30	6/5/19	34,000	Oats	Disk
190118	4	Sioux	Pioneer P25A27X	30	4/24/19 & 6/1/19	140,000	Corn	No-till
190305	5	Monona	LG C1870R2	30	5/16/19	140,000	Corn	No-till
190309	6	Monona	LG 59C66	30	5/15/19	32,000	Soybean	No-till

Table 2. Yields for on-farm corn and soybean planter trials in 2019.

Exp. no.	Trial	Treatment	Yield (bu/ac) ^a	P-value (yield) ^b
190806	1	Planted in 15-in. rows at 280,000 seeds/ac	51 a	0.35
		Planted in 30-in. rows at 140,000 seeds/ac	55 a	
190104	2	Planted at 6 mph	187 a	0.56
		Planted at 7.7 mph	190 a	
190116	3	Planted with 100 psi of down pressure	196 a	0.96
		Planted with 225 psi of down pressure	197 a	
		Planted with 350 psi of down pressure	197 a	
190118	4	Planted 4/24/19	73 a	0.03
		Planted 6/1/19	67 b	
190305	5	Planted at 3 mph	58 a	0.38
		Planted at 4 mph	56 a	
		Planted at 5 mph	56 a	
190309	6	Planted at 3 mph	213 a	0.57
		Planted at 4 mph	203 a	
		Planted at 5 mph	211 a	

^aValues denoted with the same letter within a trial are not statistically different at the significance level of 0.05.

^bP-value = the calculated probability that the difference in yields can be attributed to the treatments and not other factors. For example, if a trial has a P-value of 0.10, then we are 90 percent confident the yield differences are in response to treatments. For P = 0.05, we would be 95 percent confident.