On-farm Corn Planter Trials

RFR-A1302

Closing wheel configurations

Methods

Trials were conducted that examined closing wheel type and wheel down pressure on subsequent corn grain yield. Treatments consisted of conventional press wheels, finger press wheels, and half conventional and half finger press wheels, each with both heavy (high)- and light (low)-down pressure. Because of the study design, we can look for yield differences between closing wheel type, amount of pressure, and closing wheel type × wheel pressure interactions. These trials were identical in design, but Trial 1 was no-till and Trial 2 was conventional tillage (Table 1).

Results

There were no statistically significant differences in corn grain yield with any of the wheel types or wheel down pressures in either of the two trials, although there was a nearly significant trend (P=0.13) for a greater yield with the conventional press wheels compared with the finger press wheels in Trial 2 (Table 2). Stand counts (not shown) taken in the spring indicated a lower stand count with the finger wheel treatment in Trial 1.

Table 1. Hybrid, row spacing, planting date, planting population, previous crop, and tillage practices from two closing wheel and wheel pressure trials in corn.

Exp. No.	Trial	County	Hybrid	Row spacing (in.)	Planting date	Planting population (seeds/A)	Previous crop	Tillage practices
130516	1	Boone	Fontanelle 6A100	30	5/24/13	35,700	Soybean	No-till
130517	2	Boone	Fontanelle 6A100	30	5/24/13	35,700	Soybean	Conventional

Table 2. Yield from two closing wheel and wheel pressure trials in corn.

Exp. No.	Trial	Wheel	Yield (bu/A)*	P-value	Down pressure	Yield (bu/A)*	P-value	Wheel × pressure	Yield (bu/A)*	P-value
130516	1	Conventional	200.7 a	0.61	High	201.9 a	0.43	Conv × Hi	209.2 a	0.66
								Conv × Lo	200.4 a	
		Finger press	195.0 a		Low	198.8 a		Finger × Hi	195.5 a	
								Finger × Lo	192.2 a	
		Half & Half	206.0 a					Half × Hi	201.0 a	
								Half × Lo	203.8 a	
130517	2	Conventional	208.4 a	0.13	High	199.0 a	0.93	Conv × Hi	205.8 a	0.48
								Conv × Lo	210.9 a	
		Finger Press	191.5 a		Low	198.4 a		Finger × Hi	196.3 a	
								Finger × Lo	186.8 a	
		Half & Half	196.1 a					Half × Hi	194.9 a	
								Half × Lo	197.3 a	

*Values denoted with the same letter within a trial are not statistically different at the significance level 0.05.

Planter attachments and planting depth

Methods

One corn planter trial was conducted in Sioux County in 2013 that compared the use of an "E-Set" precision planting vacuum disk with the standard John Deere vacuum disk. Ten trials were conducted in O'Brien County comparing factory-installed spring pressure with hydraulic down pressure on a Kinze 3600 planter using V-Set vacuum disks. Another corn planter study (Trial 12) looked at the effect of planting depth on corn stands and corn grain yield. Corn was planted at a 1-in., 2-in., and 3-in. depth in this trial. See Table 3 for details on these 12 studies.

Results

No difference was detected in grain yield between corn planted with the E-Set vacuum disk and the standard John Deere vacuum disk in Trial 1 (Table 4). No significant yield difference was detected with corn planted using hydraulic down pressure vs. spring down pressure in nine of the 10 trials, but there was a significant yield advantage of over three bushels/acre to the hydraulic down pressure in one trial. However, when all 10 trials and 48 reps were analyzed together, there was no difference in corn grain yield with the two treatments (P=0.48). The average yield for the hydraulic down pressure for the 10 trials was 193.8 bushels/acre. The average yield with the spring down pressure was 193.3 bushels/acre.

There was no difference in corn grain yield among the three planting depths in Trial 12, although there was a nearly significant increase in yield with the 2-in. planting depth compared with the 3-in. depth (P=0.11). Corn yield for the 2-in. planting depth also was about 13 bushels/acre greater than the yield for the 1-in. planting depth, although not statistically significant at P=0.05. There also was no difference in plant stands with the three planting depths. Corn stands in the spring were 28,750 plants/acre for both the 1-in. and 2-in. planting depths and 25,250 for the 3-in. planting depth. Even though the yield differences were not significant at P=0.05 in this trial, the greatest yield was obtained with the 2-in. planting depth, which agrees with the recommendation of planting corn 1.5 to 2 in. deep.

Table 3. Hybrid, row spacing, planting date, planting population, previous crop, and tillage practices from planter attachment and planting depth trials in corn.

Exp. No.	Trial	County	Hybrid	Row spacing (in.)	Planting date	Planting population (seeds/A)	Previous crop	Tillage practices
130133	1	Sioux	Golden Harvest 8239-3111	30	5/13/13	32,000	Soybean	Field cultivator
130145	2	O'Brien	Channel C199-54	30	5/14/13	36,000	Soybean	Fall manure, spring field cultivate
130165	3	O'Brien	Channel 203-44	30	5/13/13	36,000	Soybean	Fall manure, spring field cultivate
130166	4	O'Brien	DKC 4812	30	5/13/13	36,000	Soybean	Fall manure, spring field cultivate
130167	5	O'Brien	DKC 4994	30	5/13/13	36,000	Soybean	Fall manure, spring field cultivate
130168	6	O'Brien	DKC 5077	30	5/13/13	36,000	Soybean	Fall manure, spring field cultivate
130169	7	O'Brien	Pioneer 193	30	5/13/13	36,000	Soybean	Fall manure, spring field cultivate
130170	8	O'Brien	Pioneer 216	30	5/13/13	36,000	Soybean	Fall manure, spring field cultivate
130171	9	O'Brien	Pioneer 392	30	5/14/13	36,000	Soybean	Fall manure, spring field cultivate
130172	10	O'Brien	Pioneer 448	30	5/15/13	36,000	Soybean	Fall manure, spring field cultivate
130173	11	O'Brien	Pioneer 9748	30	5/15/13	36,000	Soybean	Fall manure, spring field cultivate
130509	12	Story	6408 VT3RIB	30	4/30/13	33,500	Soybean	Conventional

Table 4. Yield from corn planter studies.

Exp. No.	Trial	Treatment	Yield (bu/A)*	P-value
130133	1	E-Set precision planting disk	181.5 a	0.69
		John Deere VAC disk	182.4 a	
130145	2	Hydraulic down pressure	188.3 a	0.02
		Spring down pressure	184.9 b	
130165	3	Hydraulic down pressure	188.1 a	0.86
		Spring down pressure	188.0 a	
130166	4	Hydraulic down pressure	201.9 a	0.77
		Spring down pressure	202.8 a	
130167	5	Hydraulic down pressure	192.9 a	0.14
		Spring down pressure	190.8 a	
130168	6	Hydraulic down pressure	213.5 a	0.14
		Spring down pressure	210.4 a	
130169	7	Hydraulic down pressure	206.3 a	0.91
		Spring down pressure	205.8 a	
130170	8	Hydraulic down pressure	197.9 a	0.99
		Spring down pressure	197.7 a	
130171	9	Hydraulic down pressure	190.5 a	0.11
		Spring down pressure	189.1 a	
130172	10	Hydraulic down pressure	188.1 a	0.59
		Spring down pressure	186.8 a	
130173	11	Hydraulic down pressure	196.0 a	0.29
		Spring down pressure	199.1 a	
130509	12	1-in. planting depth	174.5 a	0.11
		2-in. planting depth	187.2 a	
		3-in. planting depth	162.3 a	

*Values denoted with the same letter within a trial are not statistically different at the significance level 0.05.