

On-Farm Corn and Soybean Management Demonstration Trials

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Introduction

Maximizing yield potential for farming systems is a challenge for corn and soybean farmers in Iowa. Many small changes in products, practices, and timing can lead to very different results in yields. However, managing for maximum yield outputs rarely is the most economically sound investment for farmers. Striking that balance is key to success. The objective of these trials was to investigate what affect various corn and soybean management practices would have on grain yield.

Materials and Methods

In 2020, seven trials investigating various management practices in corn and soybean were conducted (Table 1). In trial 200103, corn planted with down pressures of 100, 225, and 350 psi were compared with each other. Trial 200107 and 200102 investigated utilizing many additional treatments in corn and soybean production to try and achieve a higher yield. A treatment of a micronutrient package 3X of boron, zinc, manganese at 1 pt/acre, 8-16-11 fertilizer applied at 1 gallon/acre, Intensify® (Growth Promotant) applied 1X at 0.2 oz/acre and two applications of fungicide Aproach Prima® at 5 oz/acre per treatment were compared with no treatments. Trial 200203 compared yield based on directional planting in the field of north/south versus east/west row alignment. In trials

200404, 200410, and 200413, different hybrids were evaluated based on harvest timing of September 25, October 1, October 13 and October 16, 2020. Some trials were conducted on-farm by farmer cooperators using the farmer's equipment and some trials were conducted on research farms. Strips were arranged in a randomized complete block design with at least three replications per treatment. Strip width and length varied from field-to-field depending on field and equipment size. All strips were machine harvested for grain yield.

Results and Discussion

Trials 200102, 200103, and 20017 did not show any significant yield differences between treatments to a level of $P \leq 0.10$ significance. In trials 200404, 200410, and 200413, corn yields and moisture levels decreased significantly ($P \leq 0.10$) as harvest timing was delayed. The corn harvested September 25 yielded 32 bushels/acre more than the corn harvested October 16 in trial 200404 and 51 bushels/acre more for the same dates in trial 200410. Trial 200413 had a first harvest date of October 1 and it yielded 42 bushels/acre more than the October 16 harvest date. The yields reported are corrected to 15.5 percent moisture. Moisture levels for all three trials were significant to the $P \leq 0.10$ level and decreased with later harvest dates. There appeared to be no difference in ear droppage or harvest shell loss from inside combine cab observations taken at the different harvest times. Combine settings were kept consistent for all harvest timings with no adjustments for grain conditions. With these observations, the reason for the yield difference is unknown, but research has shown actual kernel dry matter loss is most likely not happening. It does show the importance of a timely harvest.

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, planting date, planting population, previous crop, and tillage practices in on-farm trials investigating various management practices in corn and soybean in 2020.

Trial	County	Variety	Row spacing (in.)	Planting date	Planting pop. (seeds/ac)	Previous crop	Tillage
Corn							
200103	Sioux	Pioneer P1057AM	30	4/24/20	34,000	Oats	Conventional
200107	Sioux	Pioneer P1057AM	30	4/24/20	34,000	Soybean	Conventional
200203	Buena Vista	Champion 52A18 VT2 RIB	30	4/22/20	35,000	Soybean/ fall winter wheat CC	No-till
200404	Hancock	Pioneer P1197AM	30	4/19/20	35,000	Soybean	Conventional
200410	Hancock	Wyffels 4196	30	4/20/20	35,000	Soybean	Conventional
200413	Hancock	Pioneer P0688AM	30	4/19/20	35,000	Soybean	Conventional
Soybean							
200102	Sioux	Pioneer 23A15X	30	4/21/20	140,000	Corn	No-till

Table 2. Yields for on-farm corn and soybean trials investigating various management issues in 2020.

Trial	Treatment	Moisture	Yield (bu/ac) ^a	P-value ^b
Corn				
200103	Planted with 100 psi down pressure		200 a	0.85
	Planted with 225 psi down pressure		205 a	
	Planted with 350 psi down pressure		205 a	
200107	High yielding corn treatment		196 a	0.64
	Control		187 a	
200203	North/south directional rows		154 a	0.68
	East/west directional rows		157 a	
200404	P1197AM harvested 9/25/20	20.5 a	176 a	0.02
	P1197AM harvested 10/1/20	18.3 a	176 a	
	P1197AM harvested 10/13/20	13.3 b	152 b	
	P1197AM harvested 10/16/20	13.3 b	144 b	
200410	Wyffels 4196 harvested 9/25/20	25.2 a	198 a	<0.01
	Wyffels 4196 harvested 10/1/20	19.0 b	191 a	
	Wyffels 4196 harvested 10/13/20	13.9 c	163 b	
	Wyffels 4196 harvested 10/16/20	13.6 c	147 b	
200413	P0688AM harvested 10/1/20	27.4 a	197 a	<0.01
	P0688AM harvested 10/13/20	15.8 b	167 b	
	P0688AM harvested 10/16/20	15.2 c	155 c	
Soybean				
200102	High yielding soybean treatment		67 a	0.27
	Control		65 a	

^aValues denoted with the same letter within a trial are not statistically different at the significance level of 0.10.

^bP-Value = the calculated probability that the difference in yields can be attributed to the treatments and no 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. This is consistent with demonstration trials.