

On-Farm Cover Crop Trials

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Introduction

Cover crops can benefit farmers by aiding in erosion control, increasing organic matter in the soil, and reducing nitrate losses into the surface waters. Cover crops also have been promoted to alleviate soil compaction and improve soil drainage. Cover crops are an important practice in meeting Iowa's nutrient reduction strategy goals. However, some research indicates that planting corn following a rye cover crop can result in corn grain yield losses, especially if the cover crop is not killed at least two weeks prior to planting the corn. The objective of these trials was to evaluate whether a fall-seeded small grain cover crop would affect corn yield.

Materials and Methods

In 2015, cover crop use was examined in three trials in corn (Table 1). All trials were conducted on-farm by farmer cooperators using the farmer's equipment. Strips were arranged in a randomized complete block design with at least three replications treatment. Strip width and length varied from field to field depending on field and equipment size. All strips were machine harvested for grain yield.

In Trials 1 and 2, 1.5 bushels/acre of rye was no-till drilled in mid-October of 2014 following a soybean harvest. The rye was sprayed with glyphosate when it was about 8 in. tall on April 17, 2015. Corn was planted 15 days later in both trials. In Trial 3, triticale was no-till drilled at three bushels/acre into soybean stubble in early October. The triticale was disked on April 23, 2015 and corn planted two days later. Corn without a cover crop was compared with the corn planted after a cover crop in all trials.

Results and Discussion

In Trial 1, there was a significant yield increase of three bushels/acre ($P = 0.01$) with the corn planted after the rye cover crop compared with corn planted without the cover crop (Table 2). In Trial 2, there was a significant yield decrease of three bushels/acre ($P < 0.01$) with the corn planted after the rye cover crop compared with corn planted without a cover crop. The rye took about two weeks to die in both trials. In Trial 3, there was no difference in yield between the corn planted after a triticale cover crop and the corn planted without the cover crop.

The results of these trials indicate corn can be planted following a rye or triticale cover crop with little to no effect on the corn yield.

Table 1. Hybrid, row spacing, planting date, planting population, previous crop, and tillage practices from cover crop trials in corn in 2015.

Exp. no.	Trial	County	Hybrid	Row spacing (in.)	Planting date	Planting population (seeds/A)	Previous crop	Tillage practices
150216	1	Buena Vista	Syngenta E98	30	5/2/15	34,000	Soybean	No-till
140217	2	Buena Vista	Syngenta E98	30	5/2/15	34,000	Soybean	Disc, field cultivate
140118	3	Sioux	Pioneer PO216AM	30	4/25/15	34,000	Soybean	Conventional

Table 2. Yield from corn cover crop trials in 2015.

Exp. no.	Trial	Treatment	Yield (bu/A) ^a	P-value ^b
150216	1	1.5 bushels/acre rye cover crop seeded 10/17/14	211 a	0.01
		No cover crop	208 b	
150217	2	1.5 bushels/acre rye cover crop seeded 10/17/14	198 a	<0.01
		No cover crop	201 b	
150118	3	3 bushels/acre triticale cover crop seeded 10/4/14	231 a	0.67
		No cover crop	232 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.