The Effect of Cereal Rye Cover Crop on No-till Soybeans

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Objective

To determine the effect of spring kill management of a cereal rye cover crop on soybean yield.

Background

Crop Year: 2013
Location: O.A.R.D.C. NW Ag Research Station
County/Town: Custar, OH , Wood County
Soil Type: Hoytville clay loam
Drainage: systematic subsoil
Previous Crop: corn

Tillage: No-till
Planting Date: May 30, 2013
Nitrogen: 300 # 9-23-31
Seeding Rate: 175,000
Harvest Date: October 12, 2013

Methods

The treatments were replicated four times in a randomized complete block design. Plot size was 10 x 80 feet for each treatment. Harvest data was collected from the center 7 feet. All treatments received the same tillage, fertility, and seeding rate. On September 12, 2012 cereal rye was broadcast applied (overseeded), on designated treatments, to standing corn by using a Hagie highboy sprayer equipped with a Gandy seeder which delivered seed via rubber tubes to the soil surface between corn rows. On October 25, 2012 cereal rye was seeded, on designated treatments, with a no-till drill following corn harvest. Both treatments applied about 1.5 bushel per acre of cereal rye seed. The remaining corn residue was not tilled. The following spring, all treatments were no-till and drill seeded to Pioneer 92Y92 soybeans. Herbicides or roll treatments were used to control cereal rye growth according to the plot plan. A cultipacker was used after planting on designated treatments to roll down the cereal rye.

Results

Yield by treatment effect

Treatment	Cover Crop	April 23 Herbicide	May 30 Herbicide	June 19 Herbicide	Yield bu/ac
1	None	Canopy EX	Glyphosate	Glyphosate	47.4 BC
2	None		Glyphosate	Glyphosate	49.9 C
3	Cereal rye drill	Canopy EX	Glyphosate	Glyphosate	43.7 A
4	Cereal rye drill		Glyphosate	Glyphosate	45.5 AB
5	Cereal rye drill		roller	Glyphosate	49.9 C
6	Cereal rye Overseed	Canopy EX	Glyphosate	Glyphosate	45.1 AB
7	Cereal rye Overseed		Glyphosate	Glyphosate	44.6 A
8	Cereal rye Overseed		roller	Glyphosate	44.7 A
9	None		roller	Glyphosate	48.7 C

LSD (0.05) 2.6

Summary

Treatment economics

treatment	Gross income bu/acre x $12.50	April 23 Herbicide cost $/acre	May 30 Herbicide cost $/acre	Rye seed cost $/acre	Adjusted income $/acre	Economic advantage $ / acre
1	592.50	17	13	0	562.50	67.25
2	623.75	0	13	0	610.75	115.50
3	546.25	17	13	21	495.25	0
4	568.75	0	13	21	534.75	39.50
5	623.75	0	0	21	602.75	107.50
6	563.75	17	13	21	512.75	17.50
7	557.50	0	13	21	523.50	25.25
8	558.75	0	0	21	537.75	42.50
9	608.75	0	0	0	608.75	113.50

Economics: gross income = yield x $12.50 /bu; April herbicide = Canopy EX at 1.5 oz/ac + application cost; May herbicide = glyphosate at 1 quart/ac + COC + application; rye seeding rate 1.5 bu/ac at $14.00/bu

Discussion: This one year study has not had cover crops planted previously. Cereal rye growth was about 6 inches higher in the overseed treatments. Cover crop treatments did not significantly increase yield over the controls (no cover crops). Treatment # 2 (no cover crop + glyphosate) had the highest economic return. Drilled cereal rye + all herbicide treatments had the lowest yield and lowest economics. Drilled cereal rye + roller had significantly higher yield than any other rye treatment and was not significantly different yield compared to no rye treatments. The use of a preplant herbicide (Canopy EX) did not significantly increase yields or income. The use of a roller with delayed Glyphosate herbicide compared equally in yield to more costly herbicide treatments. This study will be repeated in 2014.

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