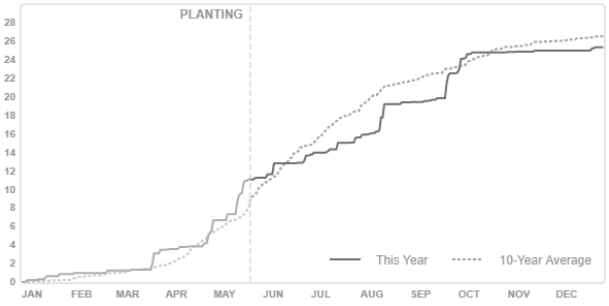
Effect of Interseeding Cover Crops at Planting on Organic Corn

Study ID: 641047201701
County: Dawson
Soil Type: Cozad fine sandy loam; Cozad silt loam; Hord silt loam wet sub-stratum
Planting Date: 5/24/17
Harvest Date: 11/11/17
Population: 34,500
Row Spacing (in): 36
Hybrid: Great Harvest 59R5
Reps: 3
Previous Crop: Alfalfa
Tillage: Full Tillage, Chisel 3/15/17
Herbicides: ***Pre:*** None ***Post:*** None
Seed Treatment: SoilBiotics humic acid

Foliar Insecticides: None
Foliar Fungicides: None
Fertilizer: 19.17 tons/ac beef manure on 12/2/16
Irrigation: Pivot, Total: 19.5"
Rainfall (in):



Introduction: This study evaluated the effects of planting cover crops at the same time corn is planted. The corn is under organic production. Three cover crop treatments were evaluated, along with a no cover crop control, and a twin row corn planting established by planting corn twice with a standard planter. The three cover crop treatments being evaluated were:

12 lb/ac soybeans

2 lb/ac clover

5 lb/ac mixture consisting of phacelia, lentils, and turnips.

The clover and mix treatments were planted 5/15/17. A rain event delayed further field work until 5/24/17. The soybeans, twin row, and control plots were field cultivated on 5/24/17 and then soybean cover crop treatment and corn cash crop were planted. The clover and mix treatments did not receive a cultivation.

Yield was analyzed for each treatment across the whole field. In addition, sub-field analysis was conducted to measure yield for each treatment within each soil series and across the elevation gradient of the field with a goal of determining if the treatments had a different impact on yield in different portions of the field with different field characteristics.

Results:

Table 1. Yield, moisture, and net return for each treatment on a whole field basis.

	Corn Moisture (%)	Corn Yield (bu/acre)†	Marginal Net Return‡ ($/ac)
Check	16.3 B*	232 A	2,082.99 A
Cover Crop - Clover	16.5 AB	235 A	2,105.22 A
Cover Crop - Beans	16.5 AB	234 A	2,090.23 A
Cover Crop - Mix	16.7 A	235 A	2,094.46 A
Twin Row Planting	16.3 B	238 A	2,130.13 A
P-Value	0.020	0.584	0.654

*Values with the same letter are not significantly different at a 90% confidence level.
†Yield values are from cleaned yield monitor data. Bushels per acre corrected to 15.5% moisture.
‡Marginal net return based on $9/bu organic corn, $17.15/ac for the cover crop mix, $14/ac for the soybean cover, $12/ac for the clover cover crop, and $8/acre for twin row corn planting. Costs of all products include $8/ac for an extra trip across the field.

Further analysis by soil type *(Figure 1* and *Table 2)* shows that the highest yields for all treatments occurred in the Hord silt loam, 0-1% slopes. There were no clear trends indicating one cover crop type resulted in lower performing corn yields in a specific soil region of the field.

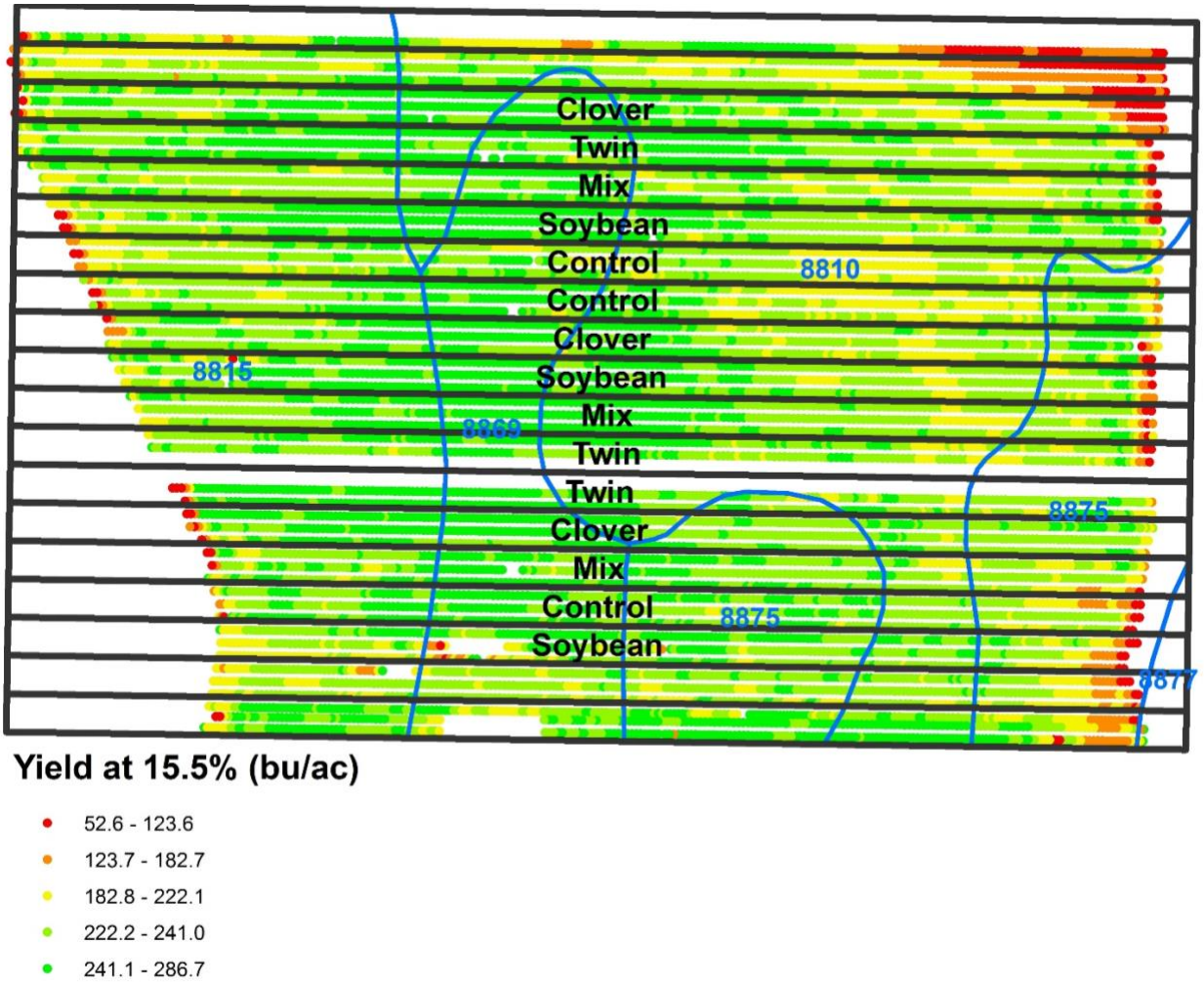


Figure 1. Yield data with soil map unit.

Table 2. Yield by treatment and soil map unit.

Map Symbol	Map Unit	Clover	Control	Mix	Soybean	Twin	Clover	Control	Mix	Soybean	Twin
		Yield (bu/ac)					Percent of Trial				
8810	Cozad fine sandy loam, 0 to 1 percent slopes	232.3	228.8	232.4	236.1	236.1	8.3%	6.6%	7.4%	7.6%	9.0%
8815	Cozad silt loam, 0 to 1 percent slopes	237.8	231.9	233.8	232.5	242.0	6.2%	5.9%	5.9%	5.7%	6.1%
8869	Hord silt loam, 0 to 1 percent slopes	248.7	243.1	247.4	242.9	248.2	2.6%	3.5%	2.9%	3.1%	2.3%
8875	Hord silt loam, wet substratum, 0 to 1 percent slopes	232.0	227.9	225.7	165.9	226.0	3.2%	4.0%	3.6%	3.4%	2.7%

Yield by treatment by elevation analysis did not result in any clear differentiation of cover crop performance by field elevation *(Figure 2)*.

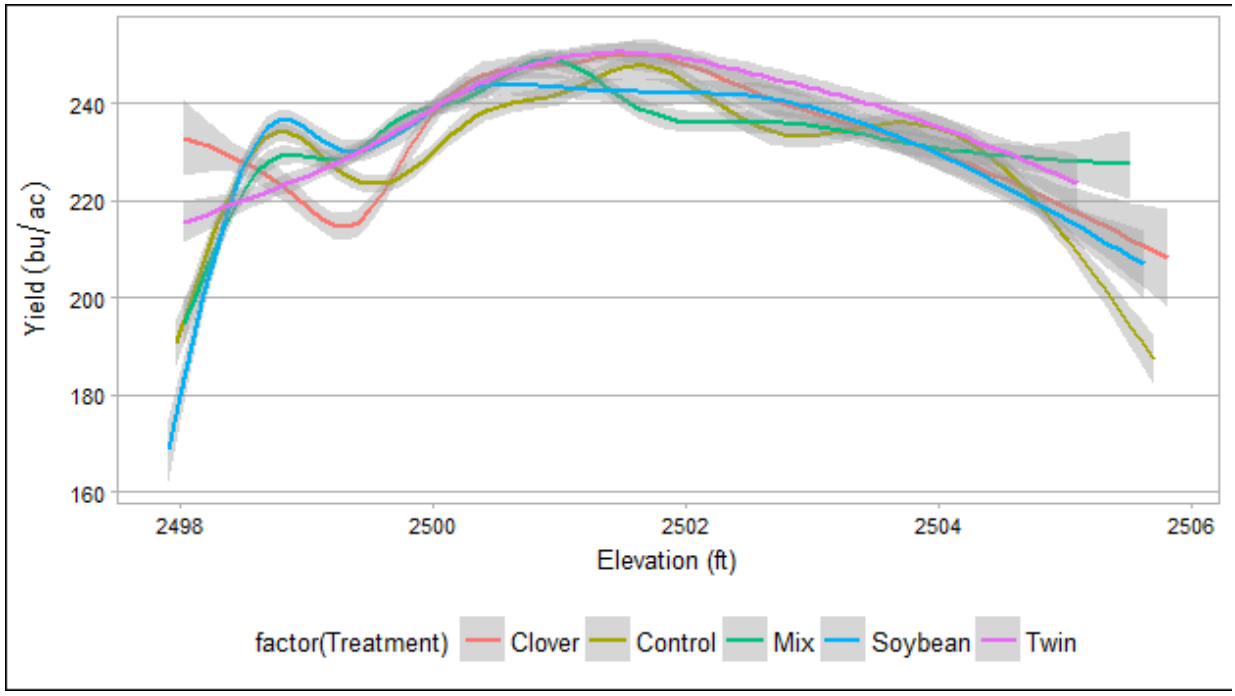


Figure 2. Yield by elevation for each of the treatments.

Summary:

Yield was very consistent across all treatments when considered on a whole field or subfield basis.

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