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.

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

*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.

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