Clover Cover Crop & Nitrogen Rate Effect on Corn Production

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Objective
To evaluate the effect of clover cover crop and nitrogen rates on corn production.

Background

<table>
<thead>
<tr>
<th>Cooperator</th>
<th>O.A.R.D.C. NW Branch</th>
<th>Soil test:</th>
</tr>
</thead>
<tbody>
<tr>
<td>County:</td>
<td>Wood</td>
<td>Fertilizer: 300 lb/ac 10-27-25, urea at planting, sidedress 28% N</td>
</tr>
<tr>
<td>Nearest Town:</td>
<td>Hoytville</td>
<td>Planting Date: 5-12-09</td>
</tr>
<tr>
<td>Drainage:</td>
<td>Tile, well-drained</td>
<td>Planting Rate: 30,000</td>
</tr>
<tr>
<td>Soil type:</td>
<td>Hoytville, clay</td>
<td>Row Width: 30 in.</td>
</tr>
<tr>
<td>Tillage:</td>
<td>notill</td>
<td>Herbicides: Lexar, Honcho</td>
</tr>
<tr>
<td>Previous Crop:</td>
<td>wheat</td>
<td>Harvest Date: 11-4-09</td>
</tr>
<tr>
<td>Variety:</td>
<td>Becks 5335HXR</td>
<td></td>
</tr>
</tbody>
</table>

Methods

The entries were replicated four times in a randomized complete block design. Plot size- 10 x 70 feet each entry. Harvest data was collected from the center rows. All systems in this comparison were no-till. Medium red clover was frost seeded in wheat on April 18, 2008. After wheat harvest, clover was allowed to grow until 10-29-08 when Roundup and Clarity herbicides were applied to kill the clover. Corn was planted at same time in all plots as no-till. Sidedress nitrogen was applied on 6-16-09 at V6 growth stage. All plots harvested center two rows. Wheat straw was chopped and left on plots. At corn planting time, soil moisture levels were similar in all treatments.

Results

<table>
<thead>
<tr>
<th>Cover Crop</th>
<th>Sidedress Nitrogen Rate</th>
<th>Corn Yield (bu/ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No clover</td>
<td>0</td>
<td>39.9 A</td>
</tr>
<tr>
<td>Clover</td>
<td>0</td>
<td>47.6 B</td>
</tr>
<tr>
<td>No clover</td>
<td>80</td>
<td>93.3 C</td>
</tr>
<tr>
<td>Clover</td>
<td>80</td>
<td>103.2 D</td>
</tr>
<tr>
<td>No clover</td>
<td>160</td>
<td>129.5 E</td>
</tr>
<tr>
<td>Clover</td>
<td>160</td>
<td>135.4 E</td>
</tr>
</tbody>
</table>

LSD(0.10) 6.3
Summary

Cost of clover analysis:

At 80 lb/ac sidedress nitrogen clover cover crop increased corn yield by 9.9 bu/ac.
\[
9.9 \text{ bu/ac x } \$3.50/\text{bu} = \$34.65
\]

\[
\text{cost of clover} - 12 \text{ lb/ac x } \$1.75/\text{lb} = \$21.00
\]

\[
\text{net return on clover} = \$13.65
\]

At 160 lb/ac sidedress nitrogen, the clover cover crop increased corn yield but it was not significantly different from no clover treatments.

Cost of nitrogen analysis: \$0.66/lb Nitrogen

No clover
80 lb N = \$52.80 93.3 bu/ac x \$3.50/bu = \$326.55  \$273.75 net

No clover
160 lb N = \$105.60 129.5 bu/ac x \$3.50/bu = \$453.25  \$347.65 net

Positive return from 80 additional lb/ac nitrogen – corn yield increase value = \$73.90/ac

Clover
80 lb N = \$52.80 103.2 bu/ac x \$3.50/bu = \$361.20  \$308.40 net

Clover
160 lb N = \$105.60 135.4 bu/ac x \$3.50/bu = \$473.90  \$368.30 net

Positive return from 80 additional lb/ac nitrogen – corn yield increase value = \$59.90/ac

There was a significant benefit from the cover crop at 80 lb/ac nitrogen. The optimum N rate at 160 lb/ac, however, was similar whether a cover crop was present or not.

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