Corn and Soybean Yield Response to Strip Tillage

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Objective
To compare the yield response and economics for strip tillage, no tillage, conventional tillage and minimum tillage.

Methods
This study was designed to evaluate the impact of strip tillage against no tillage and other tillage systems. All treatments were replicated a minimum of 4 times in alternating strips (2 treatment trials) or in randomized strips (trials with more than 2 treatments). All strip tillage work was conducted in the fall of 2015 using an Orthman 1TRPR. Where noted fertilizer was applied in the strip and then matched equally in the spring. Fertilizer was applied on the surface in the spring to minimized nutrient loss associated with fall applied surface fertilizer. Within each trial location, all planting, fertilizing, pesticide application and harvesting was consistent.

Measureable data points included yield, economics, soil temperature at planting, and average growth stage at a particular date. Stated soil temperatures and growth stages are the mean of 10 measurements per treatment. Yield data were analyzed using a simple Analysis of Variance (ANOVA) and considered to be significant at P<.05. Economics were calculated using relevant crop prices and custom tillage/fertilizer application rates from the 2016 Ohio Farm Custom Rates Survey.

Results
For easier readability, see results chart on the next page.

Discussion
In the Ohio trials, three out of four trials showed no statistical difference in yield for strip tillage and the highest yielding treatment. In one trial, strip till showed a statistically significant yield difference over a no tillage system. In Michigan, the disk ripper followed by spring cultivator showed a statistically significant yield increase over strip tillage in the corn crop. However, the soybean strip tillage trials showed one trial where strip tillage was significant over the disk ripper system and one trial where strip tillage was not significant. It is important to remember that these trials represent one year’s worth of data from one region of the country. Multi-year data will increase the validity and confidence of these research results.
# Acknowledgements
Support for this project was provided by Michigan Center For Excellence, OSU Conservation Technology Conference and OSU Extension Fulton County. Thanks to Countryside Land Management for assisting with these strip tillage plots. Thanks to OSUE Fulton intern Ben Eggers for assistance with data collection and processing.

## Ohio-Michigan Strip Till Data

<table>
<thead>
<tr>
<th>Location</th>
<th>Soil</th>
<th>Crop</th>
<th>Tillage Treatment</th>
<th>Fertilizer Applied</th>
<th>Soil Temp at Plant</th>
<th>Stage on 7/1</th>
<th>Mean Yield (bu/ac)</th>
<th>Significant Difference (p&lt;.05)</th>
<th>Net Return over Cost*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lenawee Co-1</td>
<td>Hoytville</td>
<td>Soybeans</td>
<td>Strip till</td>
<td>Broadcast VRT over both treatments</td>
<td>58.1</td>
<td>7/1</td>
<td>LSD 7.10, CV 4.9</td>
<td>$500.15</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Disk ripper/S. Cultivate</td>
<td></td>
<td>63.6</td>
<td>a</td>
<td>Not significant</td>
<td>$540.55</td>
<td></td>
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<tr>
<td>Lenawee Co-2</td>
<td>Hoytville</td>
<td>Soybeans</td>
<td>Strip till</td>
<td>Broadcast VRT over both treatments</td>
<td>53.4</td>
<td>7/1</td>
<td>LSD 3.23, CV 2.63</td>
<td>$457.85</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Disk ripper/S. Cultivate</td>
<td></td>
<td>49.5</td>
<td>b</td>
<td>Significant</td>
<td>$413.65</td>
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<td>Hoytville</td>
<td>Corn</td>
<td>Strip till</td>
<td>Broadcast VRT over both treatments</td>
<td>165.8</td>
<td>7/1</td>
<td>LSD 2.54; CV .088</td>
<td>$557.55</td>
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<td>Disk ripper/S. Cultivate</td>
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<td>181.8</td>
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<td>Significant</td>
<td>$604.45</td>
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<td>Hoytville</td>
<td>Corn</td>
<td>Strip till</td>
<td>Broadcast VRT over both treatments</td>
<td>219.5</td>
<td>7/1</td>
<td>LSD 3.23; CV 1.07</td>
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<td>Disk ripper/S Cultivate</td>
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<td>229.8</td>
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<td>Significant</td>
<td>$772.45</td>
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</tr>
</tbody>
</table>

*Equipment costs based on 2016 Ohio Farm Custom Rates

- Soybean Price: $9.00
- Corn Price: $3.50
- Strip till with fertilizer: $22.75
- Dry bulk fertilizer: $6.25
- Disk Rip/Disk Chisel: $17.85
- Spring Cultivate/Finish: $14.00

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