Midwest Cover Crops Council
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State Report for Indiana

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Research by Kladivko, grad students, colleagues

- N cycling with oilseed radish cover crop (Kaylissa Horton—see poster). Evaluate radish alone or with oats or rye, for N uptake and subsequent release. Also penetration resistance.

- Using bicultures to reduce loss of sediment and P from oilseed radish cover crops (Jason Cavadini—see poster). Evaluate radish alone or with oats or rye, for P uptake and subsequent release. Also erosion and P loss in runoff and sediment.

- New CIG led by Shaun Casteel—manure after wheat, w/ cover crops, soy “cover”, fallow, for nutrients (Edwin Suarez).
Cover crops following corn – planted 9/17/12
• OSR alone accumulated the most shoot DM
• But there is a large portion of DM in the roots also.

• OSR alone took up the most shoot N & P
• But cereal crops often have more N & P in the roots than in the shoots.

• OSR alone had highest soil P
• Mixed roots of bicultures may have taken up more P than tubers in OSR alone
Treatment significance is presented by depth. Treatment was not significant at depths without letters of significance.

- **Mass water content**-uniform across treatments & depths
- **In general OSR** had higher penetration resistance, while all other treatments were NS different from each other
Kladivko group (cont.)

- Cover crops for organic vegetable production (Jessica Garvert—see poster). Evaluate cover crops for improving soil quality and providing N to crop.

- CSCAP—large regional project on corn systems and climate (led by Iowa State). Includes rye vs. no rye, C and B. Evaluate resilience to climate stresses. Soil moisture, quality, soil nitrate, crop growth and yield.

- CIG—new project on soil health improvement using cover crops and no-till. Includes Purdue farms and farmer cooperators, in four regional hubs in Indiana. Joint w/ SWCD, NRCS, ISDA. Using oats/radish; rye; oats/radish/rye/crimson clover. (Sara Alford)
Experiment setup:

- Cover crops in organic vegetable production
- Sweet corn grown as nitrogen uptake crop
- Soil data showed greater soil NO3 and NH4 concentration following residue incorporation

Sweet corn harvest results:

<table>
<thead>
<tr>
<th></th>
<th>Dry wt grain (g/4plants)</th>
<th>% N grain</th>
<th>Dry wt stover (g/4plants)</th>
<th>% N stover</th>
<th>Total plant N (g N/plant)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clover</td>
<td>274.08 a</td>
<td>2.02 a</td>
<td>319.66 a</td>
<td>1.68 a</td>
<td>2.74 a</td>
</tr>
<tr>
<td>Bare</td>
<td>161.18 b</td>
<td>1.81 a</td>
<td>201.84 b</td>
<td>1.48 b</td>
<td>1.49 b</td>
</tr>
</tbody>
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No significant treatment difference in grain %N

Significant treatment differences: the plants recognize and utilize the increased available soil nitrogen.
Extension/Outreach/On-farm trials

- Pocket guide and selector tool— time to start revisions!
- New CIG project, partners w/ SWCD, NRCS, ISDA. Four regional hubs for trainings and workshops on soil health. Has included Advanced Cover Crops, and Advanced Conservation Cropping Systems. Also includes mentor farmers.
- Intro to Soil Health workshops (SARE state funds), incl. basic soils, cover crops, no-till. Four in Feb 2013.
- Conservation Cropping Systems Initiative (CCSI)
- New NRCS Soil Health Initiative— going strong!
- 1 new Extension factsheet (more planned!)
- Field days, winter meetings
• Purdue University (Indiana)
• Michigan State University
• USDA-Agricultural Research Service
• Iowa State University
• Ohio State University
• Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA)
• University of Guelph-Ridgetown Campus
• University of Minnesota
• University of Wisconsin
• North Dakota State University
• University of Illinois
• Other governmental and private organizations

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