Value of Cover Crops

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Cover crops - what are they worth to you?
<table>
<thead>
<tr>
<th>No.</th>
<th>Crop</th>
<th>Rate (lb/ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>No cover crop</td>
<td></td>
</tr>
<tr>
<td>2)</td>
<td>Oats</td>
<td>72</td>
</tr>
<tr>
<td>3)</td>
<td>Cereal rye</td>
<td>60</td>
</tr>
<tr>
<td>4)</td>
<td>Oilseed radish</td>
<td>12</td>
</tr>
<tr>
<td>5)</td>
<td>Mix rye + radish</td>
<td>30+8</td>
</tr>
<tr>
<td>5)</td>
<td>Forage peas</td>
<td>150</td>
</tr>
<tr>
<td>6)</td>
<td>Hairy vetch</td>
<td>25</td>
</tr>
</tbody>
</table>
Economics Bothwell-2007

Profit margins ($/ha)

Cover Crop

- Oats + N fertilizer
- Rye + N fertilizer
- Oilseed radish + rye + N fertilizer
- No cover crop + N fertilizer
- Oats + 0N
- Oilseed radish + rye + 0N
- No cover crop + 0N
- Rye + 0N

Bars labeled with letters indicate significant differences in profit margins.
- Seeding cost of planting $12/ac
- Cost of cover crop seed($/lb, $/ac):
  - Oats - $0.3227, $26.14
  - Rye - $0.2727, $18.27
  - OSR - $2.10, $33.60
  - OSR + Rye - same as above, $28.18
- Cost of the burndown was $20.75/ac
Cover crops profits higher or as good as No-cover

Sweet corn 2007

Sweet corn 2008
Economics – Cover Crops

Cover crops higher or as good as No-cover

Cucumbers 2009, 2010

Tomatoes 2010, 2011
### Soil Characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>6.3</td>
</tr>
<tr>
<td>Soil texture</td>
<td>75:18:7</td>
</tr>
<tr>
<td>Sandy loam</td>
<td></td>
</tr>
<tr>
<td>% OM</td>
<td>3.5</td>
</tr>
<tr>
<td>CEC (cmol kg⁻¹)</td>
<td>9.4</td>
</tr>
<tr>
<td>P (ppm)</td>
<td>52</td>
</tr>
<tr>
<td>K (ppm)</td>
<td>248</td>
</tr>
<tr>
<td>Ca (ppm)</td>
<td>927</td>
</tr>
<tr>
<td>Mg (ppm)</td>
<td>79</td>
</tr>
</tbody>
</table>
## Comparing planting costs

<table>
<thead>
<tr>
<th>high</th>
<th>mid</th>
<th>low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radish, Oilseed - Tradename</td>
<td>Millet, Pearl or Japanese</td>
<td>Buckwheat</td>
</tr>
<tr>
<td>Clover, Ladino</td>
<td>Sorghum-sudangrass</td>
<td>Cereals, Spring or Winter</td>
</tr>
<tr>
<td>Alfalfa</td>
<td>Mustard, Oriental</td>
<td>Ryegrass, Annual</td>
</tr>
<tr>
<td>Vetch, Chickling</td>
<td>Radish, Oilseed - General</td>
<td>60% WC Rye/40% OSR</td>
</tr>
<tr>
<td></td>
<td>Clover, Red</td>
<td>60% Oats/40% OSR</td>
</tr>
<tr>
<td></td>
<td>Sweetclover</td>
<td>50% F. Pea/50% Oats</td>
</tr>
<tr>
<td></td>
<td>Pea, Field/Forage</td>
<td>40% HV/60% WC Rye</td>
</tr>
<tr>
<td></td>
<td>Vetch, Hairy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>%Oats Pea Vetch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50% Tim/30%fes/20%ARG</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RC / Tim/ alsike clover</td>
<td></td>
</tr>
<tr>
<td></td>
<td>70% PRG/30% OSR</td>
<td></td>
</tr>
</tbody>
</table>
Rye + hairy vetch mixture, fall drilled, chemically killed **before no-till tomato.**

- **Rye** – allelopathic to weeds
- **Hairy vetch** – most versatile of winter hardy legumes – well adapted to mixtures with rye (Snapp et al., 2005)
- **Tomato** responds positively to no-till, and to rye/vetch CC
Rye + hairy vetch mixture, fall drilled, chemically killed before NT tomato.

Costs:
- rye seed: 45 kg/ha x $0.15/kg = $2.75/ac
- vetch seed: 40 kg/ha x $3/kg = $50 + vetch rhizobia
- drill pass: = $11/ac
- burndown glyphosate 4L/ha = $16 (or glyphosate 2.5 L/ha + 2,4-D 1L/ha) wait 2 wk to plant

Total Costs = $195/ha = $80/ac
Savings:
- reduced herbicide: \(= \$20/\text{ac}\) (Poast or reduced rate metribuzin)
- Value of N: \(60 \text{ kg/ha} \times \$1/\text{kg} = \$25/\text{ac}\)
- elimination of 2-3 tillage operations: \(= \$50/\text{ac}\) (Lonsbary et al., 2004)

- assume yield neutral vs. conventional (conservative)

- **Total Costs** \(= \$195/\text{ha} = \$80/\text{ac}\)
- **Total Savings** \(= \$230/\text{ha} = \$93/\text{ac}\)
- **Profit** \(= \$35/\text{ha} = \$13/\text{ac}\)
Thank you

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Why slight yield boost?

- Nitrogen plays a role
- Is there something else?
  - Improved soil health
  - Increase soil organic matter?
    - Active fraction?
Cover crops – Money Saver

- Makes economic sense
- Seeing slight yield boosts
- Soil organic matter
- Soil health, soil biota
- Minimize erosion
- No brainer
WELCOME TO THE MIDWEST COVER CROPS COUNCIL WEBSITE

The goal of the Midwest Cover Crops Council (MCCC) is to facilitate widespread adoption of cover crops throughout the Midwest, to improve ecological, economic, and social sustainability.

WHO WE ARE?

The MCCC is a diverse group from academia, production agriculture, non-governmental organizations, commodity interests, private sector, and representatives from federal and state agencies collaborating to address soil, water, air, and agricultural quality concerns in the Great Lakes and Mississippi river basins (including Indiana, Michigan, Ohio, Manitoba, Ontario, Illinois, Wisconsin, Minnesota, Iowa, and North Dakota).

WHY COVER CROPS?

Cover crops are an effective tool to reduce soil erosion and increase nutrient recycling on farmlands, thereby also decreasing the soil and nutrient loads entering lakes and waterways. Cover crops can have numerous other benefits including improvement of soil quality, pest management, fertility management, water availability, landscape diversification, and wildlife habitat.
Soil Health

No-cover lower than with cover crops

Soil Quality Scoring (Ontario Soil Health Project - Cornell Test)

- No CC
- Oats
- OSR
- Peas
- Rye
- Vetch

Soil Quality (100 points total)
Soil Health

Cornell Soil Health

Online resource:
Cornell Soil Health Assessment Training Manual
2nd Edition

Project Leaders:
Bianca Moebius-Clune
Project Coordinator
Crop and Soil Sciences (Ithaca)
soilhealth@cornell.edu

Cornell Soil Health Testing for 2012

- Read more about our soil health testing services for 2012, and how to prepare and ship samples.
- View the Cornell Soil Health Assessment Training Manual.