Cover Crops
Why to use them in Illinois

Mike Plumer
Illinois C-BMP
Your Reasons to Use Cover Crops

• Improved soil tilth
• Increase Organic Matter
• Increase soil biological activity
• Improve soil structure/reduce compaction
• Increase soil moisture holding capacity
• Add nitrogen
• Cycle nutrients
• Control soil erosion and protect water quality

Decide what is important to you
What to Look For in A Cover Crop

- Fast germination and emergence
- Competitiveness
- Tolerance to adverse climatic & soil conditions
- Ease of suppression/residue management
- Fertility/soil quality benefits
- Low-cost
Today’s Cover Crops managing for future productivity

- Radish accumulating fertility, weed control
- Cereal rye weed control, nematode reduction
- Hairy vetch weed control, nitrogen, tilth
- Annual ryegrass fertility, compaction, root growth, nematode reduction
- Crimson clover nitrogen, soil tilth
- Rapeseed disease and nematode reduction
- Spring oats weed control, increase growth
Blending cover crops

- Can be companion crop to enhance growth
  - Like oats
- Match blend to growth habit
- Some blends competitive/allelopathic
- Can be difficult to control in spring
  - Due to differences in growth patterns/maturity/species
Nitrogen Uptake

- after a corn crop
  - Pick up left over nitrogen and hold till spring
- After manure application grasses can:
  - 300-700 lbs of N taken up
  - Keeps N in the soil profile
  - Most N available if burn down applied before joint stage
Nitrogen Uptake

- Continuous no-till
- Corn after Corn
- 200#N/a = 215 bu/A
- 3642#/A. annual ryegrass Jan. 6
- 84#/a of Nitrogen from ryegrass water leachable

Annual ryegrass can uptake and hold 800#/a nitrogen and release in spring

OSU, 2010
Cover crops as a Forage

• Great fit after corn silage or wheat
• Manure will stimulate growth
• Graze in fall and spring or cut for haylage
• 1.5 to 4 tons of high quality forage
• Protein content will decrease after joint stage
Soil Quality

18month old corn stalks
No decomposition,
Poor Soil activity

Severe rooting reduction

Tillage reduced OM
Top 8” 3%,
below untilled 5.5+ %
6 years cover crops and no-till effects on corn root development

20 To 23”

23 to 28”

37 to 43”

46 to 50”
WEED CONTROL

Cereal rye
Soil Tests in ryegrass Cover Crop

4 years, 3 reps
C-S rotation

Plumer, U of IL
## DISEASE CONTROL

<table>
<thead>
<tr>
<th>Treatment</th>
<th>SCN eggs/100cc</th>
<th>SDS Foliar Disease DX 8/26</th>
<th>Foliar Disease AUDPC</th>
<th>Yield (bu/A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fallow (No winter crop)</td>
<td>+589 a</td>
<td>25.2 a</td>
<td>157.7 a</td>
<td>65.4 b</td>
</tr>
<tr>
<td>Cover crop (rapeseed)</td>
<td>-313 b</td>
<td>16.8 b</td>
<td>103.9 a</td>
<td>67.5 ab</td>
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<tr>
<td>Green manure (rapeseed)</td>
<td>-691 b</td>
<td>5.5 c</td>
<td>37.1 b</td>
<td>69.6 a</td>
</tr>
</tbody>
</table>

*P > F*.002 .0001 .001 0.07

J. Bond, SIU
### Soybean Cyst Nematode Egg Count

<table>
<thead>
<tr>
<th></th>
<th>Bare</th>
<th>Cereal Rye</th>
<th>Annual Ryegrass</th>
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</thead>
<tbody>
<tr>
<td>NW</td>
<td>7533</td>
<td>717*</td>
<td>117**</td>
</tr>
<tr>
<td>SW</td>
<td>3650</td>
<td>320*</td>
<td>0**</td>
</tr>
<tr>
<td>LF</td>
<td>1559</td>
<td>722*</td>
<td>386*</td>
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<tr>
<td>JA</td>
<td>1202</td>
<td>390*</td>
<td>279*</td>
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### Soybean Cyst nematode suppression

<table>
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<tr>
<th>Treatment</th>
<th>NW Plot yield</th>
<th>SW Plot yield</th>
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<tbody>
<tr>
<td>Bare soil</td>
<td>48.9</td>
<td>48.2</td>
</tr>
<tr>
<td>Cereal rye</td>
<td>53.8</td>
<td>52.3</td>
</tr>
<tr>
<td>Annual ryegrass</td>
<td>55.7</td>
<td>60.6</td>
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</table>

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Yield advantage

2007 3” rain-April-Oct.
Claypan soil

<table>
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<th>Method</th>
<th>2006</th>
<th>2007</th>
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<tr>
<td>conventional</td>
<td>101.9</td>
<td>52.5</td>
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<tr>
<td>no-till</td>
<td>79</td>
<td>121</td>
</tr>
<tr>
<td>conv 06/notill07</td>
<td>61.5</td>
<td>155.7</td>
</tr>
<tr>
<td>notill + ryegrass cover</td>
<td>121</td>
<td>121</td>
</tr>
</tbody>
</table>

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9 replications 2006
8 replications 2007
Effects in Dry Weather 2012

Tillage and no cover crop

12 years cont. no-till corn + cover crop
Herbicide Carryover Issues for planting cover crops

• No rain, no decomposition?
• No label directions?
• What are a concern
  – Atrazine
  – Princep
  – Calisto
  – Corvus
• Most sensitive is brassicas