National Cover Crops and Soil Health Conference
December 7, 2017
Rodney Rulon
rodney@rulonenterprises.com
Our Cropping System:
PRODUCTIVE & SUSTAINABLE

- 4th Generation family farm
- North Central Indiana
- 100% No-Till since 1989
- 90% CB Rotation, 10% CAC
- 15 years cover crops
- Liquid Hog manure 320 a/yr (No-Till)
- 1 acre grid management w/ full VRT
- Conservation is the best economic model
- We are accountable for what leaves our farm

We are a Legacy Farm
SUSTAINABLE REQUIRES
CARBON CAPTURE TECHNOLOGY
Healthy Soil is a System

- No-Till (infiltration/OM/cover/biology)
- Cover Crops (rooting/temp/OM/feed biology)
- Soil Carbon/Soil Health
- Drainage (Managing Air/Water)
- VRT N, P, K, Seed etc.
- VRT Lime/Gypsum/amendments/Manure
- Variety Selection (Plant health and Yield)
- Balance
- Compaction/Controlled traffic
What healthy soil returns to us:

- Increased Yield
- Increased Biology (Big and Small)
- Nutrient Efficiency and Cycling
- Drought Tolerance/decreased soil temp/evaporation
- Increased water infiltration/water holding
- Improved Plant Health (reduced disease and insects)
- Improved Structure=Improved Trafficability (Timing)
- Improved Economics/Agronomics
What we do to manage soil Quality:

- Continuous No-Till – not rotational
  - Eliminate catastrophic tillage events
  - Allow soil to build structure and biology
What we do to manage soil Quality:

- Drainage – Foundational to No-till and soil quality
What we do to manage soil Quality:

- 1 Acre grid Fertility
- Hi-Cal Lime/Gypsum
- Balanced Soil is More Stable
What we do to manage soil Quality:

- Low Disturbance N-Applicator/Manure
What we do to manage soil Quality:

- Cover Crops
- Manage for long term soil health-FAST
Remove compaction without tillage (Soil repair)
Transition from tillage to no-till
Rotational Advantage
Take no-till and soil quality/Biology to the next level
Trap nitrogen from manure/carryover/soybeans
Erosion Control
Break disease cycle in CAC
Cycle expensive nutrients
Build Organic Matter/Structure
Economics/Agronomics
Grandpa used cover crops and he was pretty smart
Choose the right cover for your goal
- Compaction removal
- Ease of management
- Disease control
- Nutrient cycling
- Erosion control
- Enhance Rotations
Cover Crop Choices on Our Farm

- Cereal (winter) Rye, Annual Rye Grass
- Oats, Radish, Clover, Rape, Barley
- Austrian Winter Peas, Vetch, Mixes of all the above

For others see the SARE cover-crop handbook
www.sare.org/publications/covercrops/covercrops.pdf
Fall 2017 Mixes

CORN 18
25# Oats
2# Radish
3# Rape
5# Crimson Clover
15# Cereal Rye

SOYBEAN 18
25# Oats
2# Radish
3# Rape

35# Cereal Rye
<table>
<thead>
<tr>
<th>Description</th>
<th>Ingredients</th>
<th>#/Acre</th>
<th>$/Lb</th>
<th>$/Acre</th>
<th>PreMixed Price</th>
<th>$/lb Per Acre</th>
<th>Cost Per Acre</th>
<th>Total Cost</th>
<th>ACTUAL Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mix #1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 Way</td>
<td>25</td>
<td>0.34</td>
<td>8.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early After Soybeans</td>
<td>Radish</td>
<td>2</td>
<td>1.98</td>
<td>3.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corn Cost 2018</td>
<td>Crim Clover</td>
<td>5</td>
<td>1.50</td>
<td>7.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Essex Rape</td>
<td>3</td>
<td>1.18</td>
<td>3.54</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL MIX #1</td>
<td>35</td>
<td>23.50</td>
<td>29.70</td>
<td>0.59</td>
<td>20.79</td>
<td>27,027</td>
<td>1,300</td>
<td></td>
</tr>
<tr>
<td>Mix #2</td>
<td>Three Way</td>
<td>25</td>
<td>0.34</td>
<td>8.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Late After Soybeans</td>
<td>Radish</td>
<td>2</td>
<td>1.98</td>
<td>3.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corn Cost 2018</td>
<td>Essex Rape</td>
<td>3</td>
<td>1.18</td>
<td>3.54</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL MIX #2</td>
<td>30</td>
<td>16.00</td>
<td>25.20</td>
<td>0.50</td>
<td>15.12</td>
<td>19,656</td>
<td>1,300</td>
<td></td>
</tr>
<tr>
<td>Mix #3</td>
<td>Three Way</td>
<td>15</td>
<td>0.34</td>
<td>5.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early After Corn</td>
<td>Cereal Rye</td>
<td>15</td>
<td>0.32</td>
<td>4.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bean Cost 2018</td>
<td>Essex Rape</td>
<td>3</td>
<td>1.18</td>
<td>3.54</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL MIX #3</td>
<td>33</td>
<td>13.44</td>
<td>22.50</td>
<td>0.45</td>
<td>14.85</td>
<td>19,305</td>
<td>1,300</td>
<td></td>
</tr>
<tr>
<td>Mix #4</td>
<td>Single Product</td>
<td>35</td>
<td>0.23</td>
<td>8.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Late After Corn</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bean Cost 2018</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL MIX #4</td>
<td>35</td>
<td>8.05</td>
<td>10.35</td>
<td>0.21</td>
<td>7.25</td>
<td>9,419</td>
<td>1,300</td>
<td></td>
</tr>
</tbody>
</table>

Total Seed Cost = $75,407
Cost Per Acre Planted = $14.50
<table>
<thead>
<tr>
<th>Date</th>
<th>Cover Crop Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer (Aug 10)</td>
<td>Lots of Choices</td>
</tr>
<tr>
<td>September 15</td>
<td>Austrian Peas</td>
</tr>
<tr>
<td>October 1</td>
<td>Oats/Radish/Clover</td>
</tr>
<tr>
<td>October 21</td>
<td>Annual Rye Grass/Rape</td>
</tr>
<tr>
<td>November 10</td>
<td>Cereal Rye</td>
</tr>
</tbody>
</table>

**CORN and SOYBEAN MATURITIES MATTER**

Check out Midwest Cover Crop Council
Cover Crop Selection Tool
http://www.mccc.msu.edu(selectorINTRO.html)
Planting Methods

- Aerial/Surface
- Air Cart/harrow/VT
- No-Till Drill
- Precision Planter

CONSIDER:
- Seed size (Hopper size)
- Planting date (Timing)
- Moisture required to germinate
- Fall growth needs
- Seeding rates and cost
- Mixes
- Coatings
- Inoculants
Planting Methods

- Precision Planter

CONSIDER:

- Seed size (Plate selection)
- Planting date
- Moisture required to germinated
- Fall growth needs
- Seeding rates and cost
- In row spacing
- Mixes
- Inoculants/coatings
Planting Methods

- No-Till Drill/VT
- CONSIDER:
  - Seed size{rate/depth)
  - Planting date
  - Moisture required to germinate
  - Fall growth needs
  - Seeding rates and cost
  - In Row Spacing
  - Inoculants
  - Coatings
  - Mixes
Aerial Seeding/Surface APP

CONSIDER:
- Seed size (expense/suitability)
- Planting date (crop stage)
- Moisture required to germinate
- Fall growth needs
- Seeding rates and cost
- Mixes
- Inoculants
- Coatings
Mixes

- Root types
- Growth rate
- Planting date/Method
- Feeder/Scavenger/Storage
- Legume/Grass/Brassica
- Build OM
- Boost cash crop
- Save on inputs
- Improve winter survival
- Termination method/timing
Other things to worry about

- Quality Seed Source/Supply
- Bulk blending/delivery
- Spring germination of fall seeding
- Aerial misapplication
- Seeding rates
- Chemical Programs
  - Residuals from cash crop
  - Termination of cover crop
- Test Strips
- Tile lines (Roots?)
- Voles
What do roots look like in our tiles?

Cool

Good

Not good
Vole Holes? Who else has them?

Crop Type
- Annual Ryegrass
- Cereal Ryegrass
- Oats/Radish Mix

Lbs Applied
- (18#)
- (35#)
- (32# & 2.5#)

Considerably less vole holes in the Oats/Radish mix strips.
THANK YOU!!

Rodney Rulon
rodney@rulonenterprises.com
www.rulonenterprises.com
INCREASE SOIL CARBON CONTENT: AVG = .5%

Organic Matter 2002 vs. 2012 = + 1.1%
2.47 (1.4 to 4.0) vs. 3.58 (1.8 to 6.1)


Final Yield Average:
Oats/Radish = 219.32 bu/ac
Cereal Rye = 205.03 bu/ac
Annual Rye = 204.25 bu/ac
No Cover = 209.06 bu/ac

Cover Crop Yield + 10.26 bu/ac
(Oats/Radish Vs No Cover)
Final Yield Average:
- Oats/Radish = 177.1 bu/ac
- Cereal Rye = 176.8 bu/ac
- Annual Rye = 166.9 bu/ac
- No Cover = 164.3 bu/ac

Cover Crop Yield + 12.8 bu/ac
More Data! (2013)

### Cover Crop vs N Rate Study 2013

<table>
<thead>
<tr>
<th>Nitrogen Rate</th>
<th>Cover</th>
<th>Rep1</th>
<th>Rep2</th>
<th>Avg</th>
<th>Rank</th>
<th>AVG For N Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>Oats/Radish</td>
<td>153</td>
<td>153</td>
<td>153</td>
<td>1</td>
<td>149.56</td>
</tr>
<tr>
<td></td>
<td>Annual Rye</td>
<td>148.9</td>
<td>155.6</td>
<td>152.25</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No Cover</td>
<td>148.8</td>
<td>150.4</td>
<td>149.6</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cereal Rye</td>
<td>139</td>
<td>147.8</td>
<td>143.4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>95</td>
<td>Oats/Radish</td>
<td>203.7</td>
<td>203.7</td>
<td>203.7</td>
<td>1</td>
<td>183.4</td>
</tr>
<tr>
<td></td>
<td>Annual Rye</td>
<td>180.8</td>
<td>178.8</td>
<td>179.8</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cereal Rye</td>
<td>172.6</td>
<td>180.6</td>
<td>176.6</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No Cover</td>
<td>173.3</td>
<td>173.7</td>
<td>173.5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>115</td>
<td>Oats/Radish</td>
<td>193.7</td>
<td>187.2</td>
<td>190.45</td>
<td>1</td>
<td>184.05</td>
</tr>
<tr>
<td></td>
<td>Cereal Rye</td>
<td>192.5</td>
<td>175.7</td>
<td>184.1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Annual Rye</td>
<td>181.7</td>
<td>183.2</td>
<td>182.45</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No Cover</td>
<td>168.5</td>
<td>189.9</td>
<td>179.2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>135</td>
<td>Oats/Radish</td>
<td>204.8</td>
<td>193.1</td>
<td>198.05</td>
<td>1</td>
<td>189.81</td>
</tr>
<tr>
<td></td>
<td>Cereal Rye</td>
<td>194.6</td>
<td>189.1</td>
<td>191.85</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Annual Rye</td>
<td>181.6</td>
<td>191.7</td>
<td>186.65</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No Cover</td>
<td>178.1</td>
<td>185.5</td>
<td>181.8</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>175</td>
<td>Oats/Radish</td>
<td>208.4</td>
<td>194.4</td>
<td>201.4</td>
<td>1</td>
<td>190.9</td>
</tr>
<tr>
<td></td>
<td>Annual Rye</td>
<td>190.3</td>
<td>190.5</td>
<td>190.4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cereal Rye</td>
<td>182.8</td>
<td>193.1</td>
<td>187.95</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No Cover</td>
<td>173.3</td>
<td>194.4</td>
<td>183.85</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

### Actual N Applied

<table>
<thead>
<tr>
<th>Total N Rate</th>
<th>50# N on planter</th>
<th>50# Bean Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>55 + 80</td>
<td>135#</td>
<td></td>
</tr>
<tr>
<td>95 + 80</td>
<td>175#</td>
<td></td>
</tr>
<tr>
<td>115 + 80</td>
<td>195#</td>
<td></td>
</tr>
<tr>
<td>135 + 80</td>
<td>215#</td>
<td></td>
</tr>
<tr>
<td>175 + 80</td>
<td>255#</td>
<td></td>
</tr>
</tbody>
</table>

**Final Yield**

- Final Yield Corn/Oats+Radish = 190.5
- Final Yield Corn/Rye = 187.6
- Final Yield Corn/No Cover = 183.4
## 2012, 2014, 2016 CCSI Plot Soybean Harvest Data Summary

### Cover Crop vs N Rate Study - Bean Average Yields

<table>
<thead>
<tr>
<th>Year</th>
<th>Cover</th>
<th>Rep1</th>
<th>Rep2</th>
<th>Avg</th>
<th>Rank</th>
<th>Field Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>Annual Rye</td>
<td>-</td>
<td>63.4</td>
<td>63.4</td>
<td>1</td>
<td>60.20</td>
</tr>
<tr>
<td></td>
<td>Cereal Rye</td>
<td>-</td>
<td>59.8</td>
<td>59.8</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oats/Radish</td>
<td>-</td>
<td>59.5</td>
<td>59.5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No Cover</td>
<td>-</td>
<td>58.1</td>
<td>58.1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>Oats/Radish</td>
<td>76.3</td>
<td>72.7</td>
<td>74.5</td>
<td>1</td>
<td>73.43</td>
</tr>
<tr>
<td></td>
<td>Cereal Rye</td>
<td>72.8</td>
<td>75.4</td>
<td>74.1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Annual Rye</td>
<td>72.3</td>
<td>74.8</td>
<td>73.55</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No Cover</td>
<td>73.5</td>
<td>69.6</td>
<td>71.55</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>Oats/Radish</td>
<td>68.4</td>
<td>67.8</td>
<td>68.1</td>
<td>1</td>
<td>63.93</td>
</tr>
<tr>
<td></td>
<td>Cereal Rye</td>
<td>66</td>
<td>62.9</td>
<td>64.5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Annual Rye</td>
<td>64.7</td>
<td>61.3</td>
<td>63.0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No Cover</td>
<td>64.3</td>
<td>56</td>
<td>60.2</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

*Rep #1 in 2012 was harvested by 2 different combines and data was too inaccurate to summarize.

**Cover Crop Yield + Up To 7.9 bu/ac Over No Cover in Long term test**

- 2012 Annual Rye = +5.3 bu/ac
- 2014 Oats/Radish = +2.95 bu/ac
- 2016 Oats/Radish = +7.9 bu/ac
- Three Year Avg = +5.4 bu/ac
Less temp change = less stress
**2016 Rulon Aggregate Stability**

<table>
<thead>
<tr>
<th>Date</th>
<th>Management</th>
<th>Cash Crop</th>
<th>Cover Crop</th>
<th>Plot#</th>
<th>MWD</th>
<th>Treatment MWD</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>No Till</td>
<td>Soybeans</td>
<td>Annual Ryegrass</td>
<td>RR3</td>
<td>3.50</td>
<td>3.71</td>
<td>0.29</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RR7</td>
<td>3.91</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>No Till</td>
<td>Soybeans</td>
<td>Cereal Rye</td>
<td>RR2</td>
<td>3.83</td>
<td>3.92</td>
<td>0.12</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RR6</td>
<td>4.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>No Till</td>
<td>Soybeans</td>
<td>No Cover</td>
<td>RR4</td>
<td>3.52</td>
<td>3.52</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RR8</td>
<td>3.53</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>No Till</td>
<td>Soybeans</td>
<td>Radish/Oat</td>
<td>RR1</td>
<td>3.81</td>
<td>3.83</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RR5</td>
<td>3.84</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Dr. Eileen Kladivko  
Agronomy Department
**WHAT ARE THE ECONOMIC BENEFITS OF COVER CROPS?**

**Central Indiana PFR**

### BECK'S Soybean After Cover Crop Study - 2014

<table>
<thead>
<tr>
<th>Brand &amp; Treatment</th>
<th>Percent Moisture</th>
<th>Bushels(^1) Per Acre</th>
<th>Bu./A. Difference</th>
<th>Net(^2) Return</th>
<th>Return on(^3) Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BECK 278R4</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>11.3</td>
<td>57.5</td>
<td>-</td>
<td>$644.00</td>
<td>$+41.20</td>
</tr>
<tr>
<td>40 lb. Beck’s Cereal Rye</td>
<td>11.5</td>
<td>63.0</td>
<td>+5.5</td>
<td>$686.20</td>
<td>$+44.20</td>
</tr>
<tr>
<td>24 lb. Beck’s Bean Builder Mix</td>
<td>11.6</td>
<td>54.9</td>
<td>-2.6</td>
<td>$577.68</td>
<td>$-30.32</td>
</tr>
<tr>
<td><strong>AVERAGE</strong></td>
<td>11.6</td>
<td>55.5</td>
<td>+1.5</td>
<td>$636.63</td>
<td>$-12.56</td>
</tr>
<tr>
<td><strong>BECK 328R2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>10.9</td>
<td>57.9</td>
<td>-</td>
<td>$648.48</td>
<td>$+88.24</td>
</tr>
<tr>
<td>40 lb. Beck’s Cereal Rye</td>
<td>10.8</td>
<td>67.6</td>
<td>+9.7</td>
<td>$736.72</td>
<td>$+88.24</td>
</tr>
<tr>
<td>24 lb. Beck’s Bean Builder Mix</td>
<td>10.8</td>
<td>60.7</td>
<td>+2.6</td>
<td>$642.64</td>
<td>$-5.84</td>
</tr>
<tr>
<td><strong>AVERAGE</strong></td>
<td>10.8</td>
<td>62.1</td>
<td>+6.3</td>
<td>$675.95</td>
<td>$+41.20</td>
</tr>
<tr>
<td><strong>BECK 358R4</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>11.3</td>
<td>63.8</td>
<td>-</td>
<td>$714.56</td>
<td>$+31.04</td>
</tr>
<tr>
<td>40 lb. Beck’s Cereal Rye</td>
<td>11.2</td>
<td>67.5</td>
<td>+3.7</td>
<td>$735.60</td>
<td>$+21.04</td>
</tr>
<tr>
<td>24 lb. Beck’s Bean Builder Mix</td>
<td>11.0</td>
<td>57.5</td>
<td>-3.3</td>
<td>$606.60</td>
<td>$-107.75</td>
</tr>
<tr>
<td><strong>AVERAGE</strong></td>
<td>11.1</td>
<td>62.9</td>
<td>-1.3</td>
<td>$685.65</td>
<td>$-43.36</td>
</tr>
</tbody>
</table>

### COVER CROP SUMMARY

- **Control**: 6.3 Bu./A.
- **40 lb. Beck’s Cereal Rye**: 6.3 Bu./A.
- **24 lb. Beck’s Bean Builder Mix**: 6.3 Bu./A.

### SUMMARY

The use of Beck’s Cereal Rye resulted in yield increases across all varietes, with a 6.3 Bu./A. average advantage over the control. The Beck’s Bean Builder Mix, on the other hand, was less successful. A positive yield response was only recorded in one variety and a 2 Bu./A. yield loss was realized overall. Return on investment was affected similarly, Beck’s Cereal Rye provided a $64.56/A. average return, while the use of the Beck’s Bean Builder Mix resulted in a $60.22/A. loss. It will be interesting to see how the two crops work to reduce soil compaction, improve tillth and control erosion over time. Losses may be recouped in the future if overall soil health is improved to promote yield increases in later growing seasons.

*Bu./A.: corrected to 13% moisture. Net return is gross minus ($1.30/ac) mixing treatment cost. Return on investment is Bu./A. difference x $11.20/Bu. minus treatment cost and application cost, if applicable. $0.36/lb. Beck’s Cereal Rye; $1.30/lb. Beck’s Bean Builder Mix and $0.00/A. application cost.*

Visit [www.beckshybrids.com/pfrvideos](http://www.beckshybrids.com/pfrvideos) to view more information about Beck’s new Flo-Rite Seed Firmers.

---

Cereal Rye = + 6.3 Bu/Ac
In Conclusion…

- There are many potential benefits to cover crops
- Match the cover crop to your goals
- It’s not cheap or easy and may not show immediate returns
- No-Till is not easy, Cover crops may be able to help with some of the challenges
- Soil Quality Should Be the GOAL
There are many potential benefits to cover crops. Match the cover crop to your goals. It's not cheap or easy and may not show immediate returns. No-Till is not easy, cover crops may be able to help with some of the challenges.
There are many potential benefits to cover crops. Match the cover crop to your goals. It's not cheap or easy and may not show immediate returns. No-Till is not easy, cover crops may be able to help with some of the challenges.