Missouri Cover Crop Report

Rich Hoormann
Charles Ellis
Region Specialist
March 1, 2013
2012 Willott CC Plot Corn Harvest Population

LSD (P=0.05)  NS

Plants/1,000 acre

<table>
<thead>
<tr>
<th>Plants/1,000 acre</th>
<th>Purple Top Turnip</th>
<th>Crimson clover</th>
<th>Spring Oats + A. Peas</th>
<th>Tillage Radish</th>
<th>Forage Turnip</th>
<th>Winter Oats</th>
<th>Gulf Ryegrass</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>23.8</td>
<td>25.2</td>
<td>23.8</td>
<td>25.0</td>
<td>25.3</td>
<td>24.6</td>
<td>24.7</td>
<td>24.7</td>
</tr>
</tbody>
</table>
Willott Farms CC Plots-North Plot

Corn Stalk Diameter

- Gulf Ryegrass: 0.6
- Winter Oats: 0.65
- Crimson Clover: 0.66
- Purple Top Turnip: 0.64
- Forage Turnip: 0.7
- Control: 0.61
- Spring Oats + Austrian Peas: 0.67
- Tillage Radish: 0.64

LSD (P=0.05) NS
LSD (P=0.10) 0.05
2012 Willott CC Plots Corn Yield

LSD (P=0.05)  7.8

Bu/ac

Gulf Ryegrass  26.1
Winter Oats  39.3
Crimson Clover  39.9
Purple Top Turnip  45.6
Forage Turnip  45.7
Control  46.0
Winter Oats + Austrian Peas  47.7
Tillage Radish  52.6

On Farm Research: Hoormann, Ellis, Shannon, Bolt, Willott
2012 Willott CC Plot “Normal” Ear

LSD (P=0.05)  4.25

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Normal ears/1,000 ac</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gulf Ryegrass</td>
<td>5.5</td>
</tr>
<tr>
<td>Winter Oats</td>
<td>10.8</td>
</tr>
<tr>
<td>C. Clover</td>
<td>10.9</td>
</tr>
<tr>
<td>Control</td>
<td>11.8</td>
</tr>
<tr>
<td>Spring Oats + A. Peas</td>
<td>12.3</td>
</tr>
<tr>
<td>Forage Turnip</td>
<td>12.9</td>
</tr>
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<td>Tillage Radish</td>
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2012 Willott Farms CC Plots

Biomass readings and Nitrogen Sidedress Recommendation using GreenSeeker NDVI Readings
Influence of DM lb/ac on Corn bu

Lb DM/ac

Bu/ac

R² = 0.6278
## North Plots Drilled Aug. 26, 2011

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
<th>Rank</th>
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<tbody>
<tr>
<td>Crimson Clover</td>
<td>70</td>
<td>A</td>
</tr>
<tr>
<td>Winter Oats + Crimson Clover</td>
<td>79</td>
<td>A</td>
</tr>
<tr>
<td>Winter Oats</td>
<td>88</td>
<td>A</td>
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<tr>
<td>Tillage Radish</td>
<td>101</td>
<td>AB</td>
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<tr>
<td>Control</td>
<td>101</td>
<td>AB</td>
</tr>
<tr>
<td>Forage Turnip</td>
<td>104</td>
<td>AB</td>
</tr>
<tr>
<td>Winter Oats + Austrian Peas</td>
<td>113</td>
<td>AB</td>
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<tr>
<td>Purple Top Turnip</td>
<td>141</td>
<td>B</td>
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<tr>
<td>Gulf Annual Ryegrass</td>
<td>145</td>
<td>B</td>
</tr>
<tr>
<td><strong>LSD (P=0.01)</strong></td>
<td><strong>52</strong></td>
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Drought Results

2012 Willott CC Plots Corn Yield

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LSD (P=0.05) 7.8

On Farm Research: Helmman, D.; Shannon, S.; Willett
Establishment methods/species being evaluated in a corn/soybean rotation.
Due to the severe drought in Missouri, extension personnel assisted cattle producers in incorporating cover crops in their crop rotation for fall grazing.
Demonstration plots were featured in fields at Laddonia in April and November. Over 60 producers, service suppliers and agency personnel attended to see soil pits of the cover crop species and fall establishment of cover crops.
Webinars were held in August and October
  – Four total for the year

Topics discussed included species selection, establishment methods and demonstration site yield results.
Soils & Crops Presentations:

- Audrain County Soils & Crops Conference
- Montgomery County Soils & Crops Conference
- Callaway County Soils & Crops Conference

Presentations to local suppliers, industry reps and farmers

- Fitting cover crops in corn-soybean rotations
- Grazing cover crops in crop rotations
- Seeding methods and timing
• Cover Crop presentations:
  – Bradford Farm
  – Graves Chapple Farm
  – Hundley-Whaley Farm

• Over 500 producers in attendance.
Demonstration site activity:

- Demonstrations were expanded
  - three sites in 2010
  - seven in 2011.

- The demonstration sites in Central, NW, EC, NC cropping regions
  - Laddonia, Silex, Truxton, Jonesburg, Jefferson City (Carver Farm, Lincoln University), Columbia (Bradford Farm, MU), Rockport (Graves-Chapel Farm, MU), Hundley-Whaley Farm
• The Lincoln University IPM Vegetable Workshop

• The Lincoln University Cove Crop Program
  – Small farmer orientation
Industry Presentations:

• Pilot Grove MFA
  – central Missouri for invitation only farm customers
  – Presented with cover crop farmer cooperator

• Fayette MFA
  – Open meeting in central Missouri

• Green Valley Seed Company
  – Presentations by farmer cooperators in SARE sponsored projects
    • Row crop systems
    • Grazing systems
USDA in Missouri:

- USDA Plant Materials Center
  - Staff held a joint meeting with MUEXT specialist Rich Hoormann and Charles Ellis in January 2012 to exchange demonstration protocols and exchange plot information and assist with increasing cover crop species growing information.

- Biomass for fuel Production
- Organic Farming
- AFRI grant Economic Decision Tool
  - ERS faculty in MU
  - Small and Medium farm decision tool
    - Vegetable
    - Row crops

- Soil Health Project
  - ARS
  - MU research appointments
  - Rich Hoormann
  - Characterization of undisturbed soil associations for base line
  - Characterization of physical and chemical changes in long term cover crop plots around the state
"Adopt new multidisciplinary theories and models to assist farm decision-making and in turn enhance farm efficiency and sustainability . . . ."

We propose an integrated research, extension and outreach effort focused on developing web-based decision tools that help farmers diversify their cropping systems.

This project will involve a combination of economic analysis, development of decision tools and modules, and verification of decision tools.
Lincoln University Grant Research:

- Dr. Todd Higgins has begun cover crop work for small farmers.
- Field Days were held in 2011 and 2012.
• **WC and CM Regions Cover Crop Conference:**
  – field faculty hosted a cover crop meeting featuring Josh Brown, and Ray Archuleta, NRCS. Both locations were well attended.

• **Cover Crops to Improve the Soil Health of Missouri River Flooded Soils**
  – Wayne Flanary, MUEXT Agronomist
• Organize teams to work on various aspects of cover crops for a state wide pooling of research, demonstration and education efforts for the next two years

• **2012 Crop Management Conference**  
  – *Cover Crops and Drought Management*

• **National Small Farmer Conference**  
  – *Columbia*
Summary

- Missouri Research Faculty
  - Pursuing and obtaining grant funding
- Agency cooperation in efforts
- Industry increasingly interested
  - Pioneer, MFA, etc.
- Rapid increase in farmer experimentation
- More questions from clientele