Interseeding Cover Crops into Field Crops Systems: Geography makes a Difference

Marisol Berti, Professor
Douglas Toussaint Farms
North Dakota State Univ.

Karen Renner, Professor
Hasenick Brothers Farms
Michigan State Univ.

Aaron Brooker, PhD
graduate student

Aaron Brooker, PhD
graduate student
Why Interseed cover crops?

- Build soil organic matter by adding carbon to the soil
- Protect the soil from erosion in the fall and spring
- Improve nutrient cycling
- Increase microbial activity
- Suppress weeds
Interseeding cover crops in corn V2-V7:

- Limited window to seed a cover crop following corn grain harvest in Michigan
Interseeding cover crops in corn V2-V7:

- Limited window to seed a cover crop following corn grain harvest
- Weather may limit interseeding in early fall when corn senesces in Michigan
Interseeding cover crops in corn V2-V7: Why?

• Limited window to seed a cover crop following corn grain harvest
• Weather may limit interseeding in early fall when corn senesces
• Provide a longer time period to benefit from cover crops
  • Soil health benefits
  • Weed suppression
TERMINOLOGY for the MWCCC and the other regional organizations

• **Aerial** seeding = airplane

• **Interseeding** = seeding in a growing crop
  • **Drill** interseeding
  • **Broadcast** interseeding

Where does the term ‘overseeding’ fit?
Research Questions in Michigan

1. Can cover crops establish successfully in corn from V1-V7?

2. Are interseeded cover crops competitive with corn?

3. Can preemergence herbicides be used to suppress weeds in interseeded cover crops?
Interseeding Cover Crops – Timing in Michigan

Corn planted April 29
V2 May 21

2015

Corn planted May 9
V2 May 31

2016

VE V1 V2 V3 V4 V5 V6 V7 R6
ON-FARM in Michigan: V3 V6 R6 only

Interseeding timings
7 days after seeding at V2 – it takes about a week after the first rain for the interseeding to emerge
Rainfall soon after interseeding affected cover crop establishment.

Green circles represent corn planting each year. Blue and orange circles represent interseeding dates.
Cover Crops Interseeded in Michigan-fall 2015

Crimson clover \textsuperscript{v5}

Annual ryegrass \textsuperscript{v6}

Tillage Radish\textsuperscript{® v5}
Tillage radish interseeded in V4 corn on June 3 in Michigan

Picture taken on July 15
Cover crops on October 15 in Michigan 2015
Cover Crops in October – 2016

Crimson clover V4
Annual ryegrass V6
Tillage Radish® V5
RESULTS:

1. All three cover crops established every year at every interseeding timing
RESULTS:

1. All three cover crops established every year at every interseeding timing

2. Annual ryegrass and tillage radish established better than crimson clover
RESULTS:

1. All three cover crops established every year at every interseeding timing

2. Annual ryegrass and tillage radish established better than crimson clover

3. 2015 cover crops establishment was much better compared with 2016 when no rainfall occurred for 6 weeks in June and early July 😞
Research Questions in Michigan

1. Can cover crops establish successfully in corn from V1-V7?

2. Are interseeded cover crops competitive with corn?

3. Can preemergence herbicides be used to suppress weeds in interseeded cover crops?
Grain yield was reduced at the V1 interseeding timing in 2015 only.
What About On-Farm Results?
Dedecker – Presque Isle
Burk Farms- Bay County
Hasenick Farms- Springport
Jackson County
<table>
<thead>
<tr>
<th>Location</th>
<th>Soil Type</th>
<th>Corn Planting Date</th>
<th>Planting Population Seeds/A</th>
<th>Corn Yield* (bu/ac)</th>
<th>Interseeding Timing</th>
<th>Cover Crops Interseeded</th>
</tr>
</thead>
<tbody>
<tr>
<td>KBS – SW MI</td>
<td>Loam</td>
<td>4/25</td>
<td>26,000</td>
<td>145</td>
<td>V3 V6</td>
<td>annual ryegrass (15 lb/ac) crimson clover (15 lb/ac), dwarf essex rape</td>
</tr>
<tr>
<td>Dedecke Northern</td>
<td>Silt Loam</td>
<td></td>
<td>26,000</td>
<td>65</td>
<td>V3 V7</td>
<td>annual ryegrass (15 lb/ac) crimson clover (15 lb/ac)</td>
</tr>
<tr>
<td>Burk - Thumb</td>
<td>Loam</td>
<td>4/17</td>
<td>37,500</td>
<td>178</td>
<td>V3 V6</td>
<td>annual ryegrass (15 lb/ac) crimson clover (15 lb/ac)</td>
</tr>
<tr>
<td>Hasenick - S MI</td>
<td>Sandy Loam</td>
<td>5/21</td>
<td>31,750</td>
<td>166</td>
<td>V3 V6</td>
<td>annual ryegrass (8 lb/ac) crimson clover (6 lb/ac) Tillage Radish® (3 lb/ac) 3-way mix (7.5 lb/ac)</td>
</tr>
<tr>
<td>Baker – SE MI</td>
<td>Loam</td>
<td>5/25</td>
<td>32,000</td>
<td>177</td>
<td>V5</td>
<td>annual ryegrass + crimson clover; crimson clover + red clover</td>
</tr>
</tbody>
</table>

* Corn yield did not differ between cover crop treatments and the no cover crop ‘control’ in 2016.
Research Answers to Date in MICHIGAN

1. Can cover crops establish successfully in corn from V1-V7? **YES – species differ**

2. Are interseeded cover crops competitive with corn? **NO when seeded at V2 or later**

3. Can preemergence herbicides be used to suppress weeds in interseeded cover crops? **YES – if seeding a cover crop mixture herbicide options are more limited**
Hasenick Brothers Farms experience with interseeding cover crops
Hasenick Brothers Farms: 30 miles south of here and 30 miles east....

• Seeding cover crops:
  • After wheat harvest in late July
  • Standing corn in the fall
  • Interseeding Corn V2-V6
  • Aerial seeding soybeans
Hasenick Brothers Farms: Soils

• Sandy Loam
• non-irrigated
• Soil Organic Matter less than 1.5%
• Rocks....

• We are all no-till

• Corn yields 150-180 bu/A
Hasenick Brothers Farms: Cover Crop Species we have seeded

- Annual Ryegrass
- Cereal Rye
- Medium Red Clover
- Crimson Clover, other clovers
- Tillage Radish
- Rape
- Kale
- Buckwheat
- many Mixtures
**Why** we seed Cover Crops:

• We need to build Soil Organic Matter
• We want the biological activity in the soil year round
• We want root mass –not necessarily aboveground biomass...
The interseeder we built
Interseeder
Hasenick’s loading cover crop seed
Interseeding in “Tall” Corn in September
Interseeding Small Corn into Residue
March 10... just before the snow
Annual ryegrass, clovers, rape
Planting soybeans