INTERSEEDING COVER CROPS

Dan Towery

“Blending Ag Profitability While Enhancing the Environment”
INTERSEEDING COVER CROPS

EARLY

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“Blending Ag Profitability While Enhancing the Environment”
INTERSEEDING COVER CROPS

EARLY & LATER

Dan Towery

ACS Ag Conservation Solutions, LLC

“Blending Ag Profitability While Enhancing the Environment”
INTERSEEDING - LATER

- Typically late August to early September
- Approximately 6 weeks before potential harvest date
- Residual herbicides & rates may need to be tweaked
INTERSEEDING - LATER

• Seeded 8/23
• Annual ryegrass, crimson clover, radish

Harvested 9/21
SEEDING LATER – DURING HARVEST
SEEDING LATER – DURING HARVEST

- Annual ryegrass seeded with harvest
- Seeding dates need to match harvest dates
INTERSEEDING EARLY – NOT EXACTLY NEW

EFFICIENT CORN GROWING

The last cultivation of corn planted in contour strips.

COVER CROPS IN CORN

Where corn ground is not to go into winter grain, sowing a cover crop is always desirable. If successful it covers the soil and reduces winter washing and the leaching out of plant food. It also adds organic matter through its top and root growth and helps maintain soil condition. The cheapest, surest, and most generally satisfactory cover crop is domestic ryegrass sown at about 20 pounds to the acre. If sown before or right after the last cultivation, before the season normally becomes too dry, a good stand generally is secured. A cover crop is particularly valuable on washy slopes and where corn is to be followed by corn or potatoes.
WHERE WILL IT WORK? – NORTHERN CORN BELT

- Not widely adopted yet
- But innovators have been steadily increasing usage
- Quebec – acres > since 2009
- Research – Penn State, U of Wisconsin, U of Minnesota, Ohio State, Michigan State, Iowa State, N&S Dakota
INTERSEEDING PRINCIPALS

- Short residual herbicide program required
- Seed between V4 – V6 (6-10” tall)
- Covers grow 6-8” in height and go “semi-dormant” as
- Covers start growing again when corn dries down and more sunlight reaches the covers
- **NO YIELD DRAG** and occasionally a small yield bump.
- Improved weed control – observation
- Allows one to seed covers that need started before harvest (which increases diversity)
RESIDUAL HERBICIDES

• Used in many of our major crops
• Usually soil applied – but not always
• Generally provide 8 to 12 weeks of weed control
• If Half-life too short - lack of residual weed control (performance reduced)
• If Half life too long - carryover to following crop
• Interseeded cover crops are particularly vulnerable
HERBICIDE PERSISTENCE

- **Half-life**: the amount of time needed to degrade half of the herbicide present.
  
  50%  25%  12.5%  6%

- **2,4-D**: 1 day  14 days  28 days  35 days
- **Atrazine**: 60 days  120 days  180 days  240 days
# Grass Herbicides: Risk of Interseeded Cover Crop Injury

<table>
<thead>
<tr>
<th>Product</th>
<th>A. ryegrass</th>
<th>R. Clover</th>
<th>Annual Ryegrass Red Clover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual II Mag 7.64 EC 1.67 pt IX</td>
<td>NO</td>
<td>Maybe</td>
<td>NO</td>
</tr>
<tr>
<td>Zidua 85 WG 2.5 oz 1X</td>
<td>NO</td>
<td>Maybe</td>
<td>NO</td>
</tr>
<tr>
<td>Outlook 6 EC ½ pt ½</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Outlook 6 EC 1 pt</td>
<td>Maybe</td>
<td>OK</td>
<td>Maybe</td>
</tr>
<tr>
<td>Harness 7 EC 1 pt ½X PRE</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Harness 7 EC 2 pt 1X PRE</td>
<td>Maybe</td>
<td>OK</td>
<td>Maybe</td>
</tr>
<tr>
<td>Prowl H2O 3.8 CS 1.5 ½X PRE</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Prowl H2O 3.8 CS 3 pt 1X PRE</td>
<td>NO</td>
<td>Maybe</td>
<td>NO</td>
</tr>
</tbody>
</table>

**Potential High Risk Products**

- containing Dual: Acuron, Bicep/Cinch, Camix, Expert, Halex GT, Lumax/Lexar, Zemax
- containing Zidua: Anthem

**Penn State Extension**
RED CLOVER

Resolve (1 oz)
Atrazine 4L (2 pt)
Callisto (5.36 oz)
Sharpen (3 oz)
Prowl H2O (3 pt)
Harness (2 pt)
Outlook (1 pt)
Dual (1.67 pt)

% Change from Untreated Check

-100 -75 -50 -25 0 25 50 75 100
# BROADLEAF HERBICIDES: RISK OF INTERSEEDED COVER CROP INJURY

<table>
<thead>
<tr>
<th>Herbicide/Rate</th>
<th>A. ryegrass</th>
<th>R Clover</th>
<th>A Ryegrass &amp; C Clover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolve 25 DF 0.5 oz ½X</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Resolve 25 DF 1 oz 1X</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Atrazine 1 pt ½X</td>
<td>OK</td>
<td>Maybe</td>
<td>Maybe</td>
</tr>
<tr>
<td>Atrazine 2 pt 1X</td>
<td>Maybe</td>
<td>Maybe</td>
<td>Maybe</td>
</tr>
<tr>
<td>Atrazine 3 pt 1½X</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Metribuzin 4 oz 1X</td>
<td>NO</td>
<td>OK</td>
<td>Maybe</td>
</tr>
<tr>
<td>Sharpen 1.5 fl oz ½X PRE</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Sharpen 3 fl oz 1X PRE</td>
<td>Maybe</td>
<td>Maybe</td>
<td>Maybe</td>
</tr>
<tr>
<td>Balance Flex 2 SC 5.3 fl oz 1X PRE</td>
<td>Maybe</td>
<td>Maybe</td>
<td>Maybe</td>
</tr>
</tbody>
</table>

**HIGH RISK:** Callisto 4 SC 5.4 fl oz 1X PRE~ containing Callisto: Acuron, Camix, Halex GT, Instigate, Lumax/Lexar, Realm, O'Revulin, Resicore, Zemax containing >1.5 lb atrazine: Expert, Bicep/Cinch Magnum.
CROP CROP INTERSEEDING OPTIONS

Winners
- Annual Ryegrass
- Crimson Clover
- Berseen clover
- Diakon radish
- Medium red clover
- Hairy vetch
- Rapeseed
- Turnip
- Cowpea

Maybe? - in Northern Cornbelt
- Cereal rye
- Oats
SEEDING TECHNIQUES

• Hand seeding
SEEDING EQUIPMENT

- Seeding covers while side-dressing N
INTERSEEDING COVERS
IOWA
INTERSEEDING - ROTARY HOE WITH LINEAR SEEDER
INTERSEEDING TECHNIQUES

High clearance seeder
INTERSEEDING COVERS - WISCONSIN
INTERSEEDER DRILL
– PENN STATE
BEST OPPORTUNITIES

- Corn < 36,000 population
- Corn >36,000 population use upright leaf
- N-S rows allow more sunlight between the rows than E-W rows
- Corn < 7 feet tall
AMBIENT LIGHT

- N-S rows 17% more light than E-W rows
- 24K vs 30K – 28% less ambient light N-S rows
- 30K vs 35K – 14% less ambient light N-S rows
- 24K vs 30K – 19% less ambient light E-W rows
- 30K vs 35K - 7% less ambient light E-W rows
INTERSEEDING POTENTIAL ISSUE
CORN POPULATION >35K WITH HORIZONTAL LEAF ARCHITECTURE

TOO MUCH SHADE
INTERSEEDING RESULTS
EARLY NOVEMBER
ADDITIONAL RESOURCES

- https://extension.psu.edu/cover-crop-interseeder-and-applicator
- https://extension.psu.edu/cover-crop-interseeder-improving-the-success-in-corn
- http://ipcm.wisc.edu/blog/2017/05/considerations-for-2017-cover-crop-interseeding/
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