Weed Management in Peas

Drew Lyon and Ian Burke
Presentation Outline

- Thoughts on Integrated Weed Management
  - Pea Competitiveness
  - Seedbank Management
- Broadleaf Weed Management
  - PPI and PRE approaches
  - Postemergence options
- Grass Weed Management
  - PPI and PRE options
  - Postemergence options
Herbicide options are limited, particularly for postemergence control of broadleaf weeds

Integrated weed management critical to success

Do not allow weeds, particularly broadleaves, to produce seed in other phases of the rotation

Grow a competitive pea crop
Establish a Competitive Crop

- Seed into a firm, moist seed bed
- Seed on shallow side of recommended depths
  - 1.5-2.0”
- Avoid seeding into cold soils
  - 40F and rising
- Use seed treatments
Establish a Competitive Crop

- Use a narrow row spacing
  - 6.0-7.5”
- Use upper end of recommended seeding rates
  - 150-175 lb/A
Seeding Rate Effects

Adapted from Baird et al. 2009
Seeding Rate Effects

Adapted from Boerboom and Young 1995
Seeding Rate Effects

Adapted from Boerboom and Young 1995
Leaf area index increased as seeding rate increased.
Seedbank Management

- Stale seedbed preparation with and without irrigation
- Irrigation or rainfall can be used in conjunction with tillage to stimulate weed seed germination
- Tillage + water → 2-4 weeks → Non-selective herbicide application → 2-4 weeks → plant

Weeds that respond to tillage (light or disturbance):
- Common lambsquarters
- Redroot pigweed
- Mayweed chamomile
- Mustards
- Kochia
- Prickly lettuce
## Avoid Harmful Herbicide Residues

<table>
<thead>
<tr>
<th>Trade name</th>
<th>Common name</th>
<th>Min. rotation interval (mo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ally XP</td>
<td>metsulfuron</td>
<td>10 – 34 (depending on pH)</td>
</tr>
<tr>
<td>Amber</td>
<td>triasulfuron</td>
<td>4 &amp; field bioassay</td>
</tr>
<tr>
<td>Beyond</td>
<td>imazamox</td>
<td>0 (dry pea &amp; Clfld. lentil) – 18</td>
</tr>
<tr>
<td>Everest 2.0</td>
<td>flucarbazone</td>
<td>10 – 24 (depending on crop, pH)</td>
</tr>
<tr>
<td>Finesse Cereal &amp; Fallow</td>
<td>chlorsulfuron + metsulfuron</td>
<td>24 (dry pea) – 36 (lentil); field bioassay if soil pH&gt;6.5</td>
</tr>
<tr>
<td>GoldSky</td>
<td>florasulam, fluroxypyr + pyroxsulam</td>
<td>10 (pH&gt;6) – 18 (pH&lt;6)</td>
</tr>
<tr>
<td>Huskie</td>
<td>pyrasulfotole + bromoxynil</td>
<td>9</td>
</tr>
<tr>
<td>Maverick</td>
<td>sulfosulfuron</td>
<td>17 – 22 (depending on pH)</td>
</tr>
<tr>
<td>Olympus</td>
<td>propoxycarbazone</td>
<td>12 – 18</td>
</tr>
<tr>
<td>PowerFlex HL</td>
<td>pyroxsulam</td>
<td>10 (pH&gt;6) – 18 (pH&lt;6)</td>
</tr>
<tr>
<td>WideMatch</td>
<td>clopyralid + fluroxypyr</td>
<td>18</td>
</tr>
</tbody>
</table>
PPI and PRE Broadleaf Herbicides

**PPI**
- Imazethapyr  
  - Pursuit
- Pendimethalin  
  - Prowl H₂O
- Saflufenacil  
  - Sharpen
- Metribuzin  
  - Various
- Triallate  
  - Far-Go
- Trifluralin  
  - Treflan, others

**PRE**
- Metribuzin (various)
- S-metolachlor  
  - Dual
- Saflufenacil  
  - Sharpen
- Clomazone  
  - Command
- Halosulfuron  
  - Sandea
- Imazethapyr  
  - Pursuit
- Pendimethalin  
  - Prowl H₂O
Crop Injury in Dry Pea – Pullman, 2016

Visual injury (%)

- BroadAxe
- BroadAxe + Lorox
- Dual Magnum + Prowl + Tricor
- Zidua + Spartan
- Zidua + Spartan + Lorox
- Zidua + Prowl + Tricor
- Outlook + Spartan
- Outlook + Spartan + Lorox
- Outlook + Prowl + Tricor
- Outlook + Command
- Zidua + Pursuit
Common Lambsquarters Control in Dry Pea – Pullman, 2016

- BroadAxe
- BroadAxe + Lorox
- Dual Magnum + Prowl + Tricor
- Zidua + Spartan
- Zidua + Spartan + Lorox
- Zidua + Prowl + Tricor
- Outlook + Spartan
- Outlook + Spartan + Lorox
- Outlook + Prowl + Tricor
- Outlook + Command
- Zidua + Pursuit

Visual control (%)
Command in Peas

Can cause bleaching of sensitive varieties (and off target sensitive vegetation!)
Typical Soil-Residual Herbicide Programs

- Dual II Magnum (Soil texture and organic matter dependent)
- Pendimethalin (Soil texture and organic matter dependent)
  - Annual small seeded broadleaf weeds and certain grasses
  - Dual will suppress yellow nutsedge
- Metribuzin (soil texture, organic matter, and pH dependent)
  - Broadleaf and grass weeds
  - Resistance
- Sharpen (up to 2 fl oz/A, 0.75 oz maximum PRE)
  - PRE or in split-applied applications (early preplant with Roundup and then PPI or PRE)
Postemergence Herbicides – Expect Some Injury

- MCPA → Mustards, thistles
- MCPB → Broadleaves, thistles
- Bentazon → Needs warm temperatures, broadleaves
  - Basagran
- Imazamox → Certain grasses, considerable resistance in mustards
  - Raptor
- Metribuzin → Small broadleaf and grass weeds, potential resistance issues
  - Various
### Basin Pigweed Resistance – Ser\textsubscript{274} Target Site Resistance

Response of eleven resistant pigweed populations collected from mint fields to terbacin. RI = resistance index.

<table>
<thead>
<tr>
<th>Biotype</th>
<th>% Injury (2 WAT)</th>
<th>Terbacil ED\textsubscript{50}</th>
<th>RI</th>
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<tbody>
<tr>
<td>Susc. Control</td>
<td>100</td>
<td>0.13</td>
<td>--</td>
</tr>
<tr>
<td>M19 (Powell)</td>
<td>67</td>
<td>0.18*</td>
<td>1.3*</td>
</tr>
<tr>
<td>M18</td>
<td>75</td>
<td>0.38</td>
<td>2.8</td>
</tr>
<tr>
<td>M11</td>
<td>23</td>
<td>0.43</td>
<td>3</td>
</tr>
<tr>
<td>M10</td>
<td>28</td>
<td>0.59</td>
<td>4</td>
</tr>
<tr>
<td>M5</td>
<td>53</td>
<td>0.78</td>
<td>6</td>
</tr>
<tr>
<td>M21 (Powell)</td>
<td>16</td>
<td>0.87</td>
<td>6</td>
</tr>
<tr>
<td>M13</td>
<td>32</td>
<td>1.14</td>
<td>9</td>
</tr>
<tr>
<td>M15</td>
<td>17-50</td>
<td>1.37</td>
<td>10</td>
</tr>
<tr>
<td>M20 (Powell)</td>
<td>16</td>
<td>1.41</td>
<td>11</td>
</tr>
<tr>
<td>M4 (Powell)</td>
<td>16-48</td>
<td>1.51</td>
<td>11</td>
</tr>
<tr>
<td>M14</td>
<td>12-20</td>
<td>2.39</td>
<td>18</td>
</tr>
</tbody>
</table>

PSII Resistance in amaranths – redroot pigweed and Powell amaranth, Boydston
## PPI and PRE Grass Herbicides

### PPI
- Imazethapyr
  - Pursuit
- Pendimethalin
  - Prowl H₂O
- Triallate
  - Far-Go
- Trifluralin
  - Treflan, others

### PRE
- S-metolachlor
  - Dual
- Imazethapyr
  - Pursuit
- Pendimethalin
  - Prowl H₂O
Postemergence Grass Herbicide Options

- Clethodim
  - SelectMax and others
    - 21/30 days PHI succulent/field
- Quizalofop
  - Assure II and others
    - 30/60 days PHI succulent/field
- Sethoxydim
  - Poast
    - 15/30 days PHI succulent/field
Weed Management in Pulses

- Cultural inputs are critical for success
  - Seeding rate and ensuring early season seedling vigor
- Understanding how and when soil-residual herbicides are activated is key!
- Don’t roll, it doesn’t appear to help
- Metribuzin resistance is likely a bigger problem than we are aware of
Weed Control

- Move in the industry to mixtures of active ingredients
- Know what the individual components are doing for you!
- Beware of overkill or blanket prescriptions
Submit Samples to the WSU Resistance Testing Program

Submitting a sample to the WSU Resistance Testing Program is easy. The best approach is to put a few coin envelopes (size A4 is best) in the combine or your scouting rig. The amount of seed required for testing varies for each species - we need several hundred seed if possible. Put this envelope in another envelope or a small box for mailing and do not use plastic bags.

Make sure the sampling occurs across the area of interest, not just at one spot. If you are interested in the entire field you need to sample the entire field. If you are looking at a small patch, sample throughout that area. Print out a submission form and include it with the sample. If you include an email, you’ll receive updates including confirmation of receipt.

Send in those samples!

Additional questions can be directed to Ian Burke, WSU weed scientist. He can be reached at 509-335-2858 or icharke@wsu.edu.
Acknowledgements

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- Washington Grain Alliance
Questions?