Fall vs Spring Herbicide Application for PRE Weed Control in Field Peas

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Downy brome

• Is a common weed problem in western North Dakota
• Emerges in the fall or early spring
• Is very competitive for soil moisture and nutrients
  • A density of 50 plants per square foot can remove all available soil moisture to a depth of 2.5 feet
  • Can reduce establishment of spring planted crops
• Will emerge on the soil surface or at depths of up to 4 inches
• Can be a problem both in cropland and pasture/range
Preemergence Herbicide

• Are active on weed seedlings

• Require rainfall or tillage for activation
  • In western ND, most fields are under no-till production
  • Spring rainfall in western ND is not always reliable
  • Failure to activate herbicides with rainfall leads to poor weed control

• Fall application of Preemergence herbicides
  • Most herbicides are degraded through biological activity
  • Cold soil temperatures limit soil microbial activity
  • Herbicides can be incorporated through rainfall in the fall, through melting snow, or with early spring rains
  • Can help to keep field clean of weeds that will speed up planting in spring
Fall vs Spring application of Dual II Magnum and BroadAxe in Field Pea, 2016-17

- Compared fall applied preemergence treatments with glyphosate alone
  - Glyphosate (32 oz) + BroadAxe (19 oz)
  - Glyphosate (32 oz) + BroadAxe (25 oz)
  - Glyphosate (32 oz) + BroadAxe (19 oz) + Dual II Magnum (10 oz)
  - Glyphosate (32 oz) + BroadAxe (19 oz) + Dual II Magnum (26 oz)
  - Glyphosate (32 oz) + Dual II Magnum (32 oz)
  - Glyphosate (32 oz)

- Treatments applied on October 28, 2016 or May 5, 2017
- Peas planted on May 5, 2017
  - Only 0.23 inches of rainfall during 1st week after planting
  - Only 0.58 inches of rainfall during 1st month after planting
Downy brome control with fall applied herbicides

* All PRE treatments were tank-mixed with glyphosate (32 oz/A); evaluate on May 26 (3 weeks after spring application)
Glyphosate (32 oz/A) + BroadAxe (25 oz/A)
Glyphosate (32 oz/A) + Dual II Magnum (32 oz/A)
Pea establishment following fall applied herbicides

Pea population (number/m²)

- Untreated
- BroadAxe 19 oz/A
- BroadAxe 25oz/A
- BroadAxe + Dual 19 oz + 10 oz/A
- BroadAxe + Dual 19 oz + 26 oz/A
- Dual 32 oz/A
- Glyphosate 32 oz/A

LSD (0.10) = 15

Fall and Spring
Fall vs Spring application of Dual II Magnum and BroadAxe in Field Pea, 2018

- Compared fall vs spring applied PRE treatments with glyphosate alone
  - Glyphosate (32 oz) + BroadAxe (19 oz)
  - Glyphosate (32 oz) + BroadAxe (25 oz)
  - Glyphosate (32 oz) + BroadAxe (19 oz) + Dual II Magnum (10 oz)
  - Glyphosate (32 oz) + BroadAxe (19 oz) + Dual II Magnum (16 oz)
  - Glyphosate (32 oz) + Dual II Magnum (32 oz)
  - Glyphosate (32 oz) fall only, spring only, and fall and spring
- Treatments applied on October 17, 2017 or May 5, 2018
- Peas planted on May 3, 2018
- Rainfall of 0.92 inches in 1st week after spring herbicide application
- Rainfall of 1.61 inches in 1st month after spring herbicide application
Downy brome control with fall vs spring applied herbicides

- **Fall**
  - Broad Axe 19 oz/A
  - Broad Axe 25 oz/A
  - Broad Axe + Dual 19 + 10 oz/A
  - Broad Axe + Dual 19 + 16 oz/A
  - Dual 32 oz/A
  - Glyphosate 32 oz/A

- **Spring**
  - Broad Axe 19 oz/A
  - Broad Axe 25 oz/A
  - Broad Axe + Dual 19 + 10 oz/A
  - Broad Axe + Dual 19 + 16 oz/A
  - Dual 32 oz/A
  - Glyphosate 32 oz/A

**16 DAT (Spring)**

**LSD (0.05) = 2**
Shepherd’s purse control with fall vs spring applied herbicides

Control (%)

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Fall</th>
<th>Spring</th>
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</thead>
<tbody>
<tr>
<td>BroadAxe 19 oz/A</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>BroadAxe 25oz/A</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>BroadAxe + Dual 19 + 10 oz/A</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>BroadAxe + Dual 19 + 16 oz/A</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Dual 32 oz/A</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Glyphosate 32 oz/A</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

LSD (0.05) = 7

16 DAT (Spring)
Kochia control with fall vs spring applied herbicides

27 DAT (Spring)
LSD (0.05) = 6

Control (%)

<table>
<thead>
<tr>
<th>Product</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>BroadAxe 19 oz/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BroadAxe 25oz/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BroadAxe + Dual 19 + 10 oz/A</td>
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<tr>
<td>BroadAxe + Dual 19 + 16 oz/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dual 32 oz/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glyphosate 32 oz/A</td>
<td></td>
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</table>
Lambsquarters control with fall vs spring applied herbicides

27 DAT (Spring)
LSD (0.05) = 4
Green foxtail control with fall vs spring applied herbicides

Control (%)

27 DAT (Spring)

LSD (0.05) = 5

- BroadAxe 19 oz/A
- BroadAxe 25 oz/A
- BroadAxe + Dual 19 + 10 oz/A
- BroadAxe + Dual 19 + 16 oz/A
- Dual 32 oz/A
- Glyphosate 32 oz/A
Untreated Control

27 DAT (Spring)
Fall BroadAxe (25 oz/A)

27 DAT (Spring)
Spring BroadAxe (25 oz/A)
Fall + Spring Glyphosate (32 oz/A)
Fall applications of preemergence herbicides

- Ensures that herbicide is activated by rainfall prior to spring planting
- Might lose some activity of some herbicides
  - Metolachlor has a shorter residual than sulfentrazone
- Can be applied while controlling downy brome in the fall
- Need to plan ahead to what you will be planting
  - You can’t plant wheat or canola after Broadaxe or Dual applications
- May need an in-crop application for summer annual grass control