Weed Control in Wheat
One of Biggest Weed Problems in Wheat Production?
Be a Good Neighbor: Control your Volunteer Wheat

• Volunteer wheat can serve as a vector to several insects and diseases and consume soil moisture.
• Early emerging volunteer wheat can be the most serious.
• Wheat needs to be completely dead 2 weeks prior to emergence of new wheat in the vicinity to break bridge.
• Glyphosate provides best control of volunteer wheat, but may take 7 to 10 days for wheat to die.
• Paraquat causes rapid desiccation of wheat foliage, but less consistent kill than with glyphosate.
• Atrazine can provide residual control in fields going to corn or sorghum, but works better as a fall treatment than a mid-summer treatment.
Broadleaf Weeds in Wheat

- Broadleaf weed problems will vary by geography.
- Various mustard species are common throughout.
- Kochia and Russian thistle more common as you move west.
- Henbit and wild buckwheat more common in the eastern and central areas.
- Yield loss varies by species, density, year, and removal time.
Weed Competition with Wheat
March 30

- No Treatment
- Fall Treatment Nov 4
- Spring Treatment March 20
Weed Competition with Wheat
April 22

No Treatment
Fall Treatment
Nov 4
Spring Treatment
Mar 20
Weed Competition with Wheat

No Treatment: 8 bu/a
Fall Treatment: 55 bu/a
Spring Treatment: 18 bu/a
Mustard and Pennycress Control in Wheat

- Winter annual weeds.
- Generally easy and economical to control.
- Should be treated while in the rosette stage, either in the fall or early spring prior to bolting.
- Most Effective herbicides: MCPA, 2,4-D (spring only), SU Herbicides, Huskie, Quelex.
- ALS Resistance flixweed and bushy wallflower now present in parts of central Kansas.
Summer annual weeds
(Kochia, pigweeds, sunflower, etc)

• Often not a problem unless wheat stand is really thin and harvest gets delayed.
• Often a problem in stubble post-harvest.
Kochia

• Early summer annual, emerges in March & April.
• Common in west.
• Can interfere with harvest, especially if harvest is late.
• Herbicides: Banvel/Clarity, Starane, Huskie.
• May or may not be controlled by Finesse, Ally or other SU herbicides due to ALS resistant populations.
Russian Thistle

- Early summer annual, emerges in March & April
- Common in west.
- Can interfere with harvest, especially if harvest is late.
- Herbicides: 2,4-D, Banvel/Clarity, Huskie.
- May or may not be controlled by Finesse, Ally, or other SU herbicides due to ALS resistant populations.
Broadleaf weed control in winter wheat at Manhattan, KS, 2008 (Peterson & Thompson, WH200806).

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Application</th>
<th>Time (oz/A)</th>
<th>Rate (oz/A)</th>
<th>Hebi (%)</th>
<th>Flwe (%)</th>
<th>Wibw (%)</th>
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</thead>
<tbody>
<tr>
<td>MCPA</td>
<td>FP</td>
<td>12</td>
<td>67</td>
<td>100</td>
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<tr>
<td>Finesse + NIS</td>
<td>FP</td>
<td>0.3</td>
<td>100</td>
<td>100</td>
<td>97</td>
<td></td>
</tr>
<tr>
<td>Rave + NIS</td>
<td>FP</td>
<td>3</td>
<td>88</td>
<td>100</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>Huskie + MCPA + NIS + N</td>
<td>FP</td>
<td>11 + 8</td>
<td>98</td>
<td>100</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>2,4-D</td>
<td>SP</td>
<td>12</td>
<td>47</td>
<td>100</td>
<td>16</td>
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<tr>
<td>Finesse + NIS</td>
<td>SP</td>
<td>0.3</td>
<td>96</td>
<td>100</td>
<td>99</td>
<td></td>
</tr>
<tr>
<td>Rave + NIS</td>
<td>SP</td>
<td>3</td>
<td>63</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Huskie + MCPA + NIS + N</td>
<td>SP</td>
<td>11 + 8</td>
<td>99</td>
<td>100</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>LSD (5%)</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>NS</td>
<td>20</td>
</tr>
</tbody>
</table>
Winter Annual Grasses in Wheat
Winter Annual Grasses in Wheat

• Primarily a problem in continuous wheat and wheat-fallow-wheat.

• Best managed through crop rotation and preventing seed production during the rotational years.
Winter Annual Grasses in Wheat

- Cheatgrass – generic term for winter annual bromes
  - Downy brome: common throughout
  - Cheat: central and southern Kansas
  - Japanese brome: central and northcentral Kansas
- Jointed Goatgrass: more common in west
- Feral rye: primarily central Kansas
Cheat, Japanese brome, Downy brome
Winter Annual Grass Control in Wheat

- *Olympus*
- *PowerFlex HL*
- *Clearfield Wheat*
  - *Beyond*
Weed control and wheat response to herbicide application timing at Manhattan, KS in 2009 (WH200903).

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Timing</th>
<th>Wheat Injury (%)</th>
<th>Wheat Yield (Bu/a)</th>
<th>Downy Brome (%)</th>
<th>Jap. Brome (%)</th>
<th>Cereal Rye (%)</th>
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<tbody>
<tr>
<td>PowerFlex</td>
<td>Fall</td>
<td>0</td>
<td>83</td>
<td>93</td>
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<td>“</td>
<td>0</td>
<td>81</td>
<td>91</td>
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<td>0</td>
</tr>
<tr>
<td>Beyond</td>
<td>“</td>
<td>0</td>
<td>80</td>
<td>99</td>
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<td>97</td>
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<td>80</td>
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<tr>
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<td>0</td>
<td>76</td>
<td>82</td>
<td>100</td>
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<tr>
<td>Beyond</td>
<td>“</td>
<td>0</td>
<td>78</td>
<td>89</td>
<td>99</td>
<td>82</td>
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<tr>
<td>PowerFlex</td>
<td>Spring</td>
<td>9</td>
<td>81</td>
<td>75</td>
<td>100</td>
<td>0</td>
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<tr>
<td>Olympus</td>
<td>“</td>
<td>5</td>
<td>77</td>
<td>82</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Beyond</td>
<td>“</td>
<td>1</td>
<td>82</td>
<td>83</td>
<td>99</td>
<td>90</td>
</tr>
<tr>
<td>Untreated</td>
<td></td>
<td>0</td>
<td>75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LSD (5%)</td>
<td></td>
<td>1</td>
<td>NS</td>
<td>7</td>
<td>NS</td>
<td>5</td>
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Fall = 11/9/08; Winter = 1/8/09; Spring = 3/13/09.
Grass control in winter wheat at Manhattan, KS in 2010 (Peterson and Thompson).

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Rate</th>
<th>Timing</th>
<th>Downy brome</th>
<th>Cheat</th>
<th>Rye-grass</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(oz/a)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Olympus</td>
<td>0.6</td>
<td>PRE</td>
<td>78</td>
<td>100</td>
<td>57</td>
</tr>
<tr>
<td>Olympus</td>
<td>0.9</td>
<td>FP</td>
<td>87</td>
<td>100</td>
<td>95</td>
</tr>
<tr>
<td>Olympus</td>
<td>0.9</td>
<td>SP</td>
<td>73</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Olympus/Olympus</td>
<td>0.6/0.6</td>
<td>PRE/SP</td>
<td>98</td>
<td>100</td>
<td>98</td>
</tr>
<tr>
<td>Olympus/Olympus</td>
<td>0.9/0.3</td>
<td>FP/SP</td>
<td>96</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>LSD (5%)</td>
<td>8</td>
<td>11</td>
<td>17</td>
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<td></td>
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</table>
Grass control in winter wheat at Manhattan, KS in 2012 (Peterson and Thompson).

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Rate (oz/a)</th>
<th>Timing</th>
<th>Downy brome (%)</th>
<th>Cheat (%)</th>
<th>Rye-grass (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olympus</td>
<td>0.6</td>
<td>PRE</td>
<td>38</td>
<td>95</td>
<td>25</td>
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<tr>
<td>Olympus</td>
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<td>FP</td>
<td>86</td>
<td>100</td>
<td>83</td>
</tr>
<tr>
<td>Olympus</td>
<td>0.9</td>
<td>SP</td>
<td>59</td>
<td>100</td>
<td>30</td>
</tr>
<tr>
<td>Olympus/Olympus</td>
<td>0.6/0.6</td>
<td>PRE/SP</td>
<td>76</td>
<td>100</td>
<td>30</td>
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<tr>
<td>Olympus/Olympus</td>
<td>0.9/0.3</td>
<td>FP/SP</td>
<td>89</td>
<td>100</td>
<td>88</td>
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<tr>
<td>LSD (5%)</td>
<td></td>
<td></td>
<td>23</td>
<td>12</td>
<td>18</td>
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</table>
Jointed Goatgrass Control in Wheat

• Crop Rotation is best long-term management strategy
• Seed production must be prevented during the rotational years
• Clearfield wheat and Beyond is the only selective herbicide option
Feral Rye in Wheat
Rye Control Options

- Crop Rotation
- Beyond in Clearfield Wheat
- Wick Applications with Glyphosate
- Hand Weeding
2-gene Clearfield Wheats

- Designated as CL2 or CL+ varieties.
- Clearfield wheat varieties with enhanced tolerance to Beyond herbicide.
- Can use methylated seed oil (MSO) adjuvants and the higher labeled Beyond rates on CL2 varieties for enhanced rye and downy brome control without wheat injury concerns.
- Do not use MSO on 1 gene Clearfield wheat varieties.
Strip of Protection wheat in front of plot and 2 gene Clearfield wheat in back of plot.
Fall application of Beyond at 6 oz/A + MSO + UAN.
Beyond+NIS+28%N
Fall Postemergence
ALS Resistant Cheatgrass

• ALS resistant cheat and Japanese brome populations are present in Kansas.
• Cross resistance occurs among all ALS herbicides evaluated, but to a lesser degree with Beyond than to Olympus, Maverick, or PowerFlex.
• Producers will have to rely on cultural practices to manage cheatgrass problems in fields where ALS resistance has developed.
Zidua

- Now labeled for delayed preemergence or early postemergence application in wheat for residual control of Italian ryegrass and cheatgrass suppression.
- Rates: 0.7 to 1.25 oz/acre Delayed Pre 1 to 2 oz/acre Early Post
- Timing: after 80% of germinated wheat seedlings have ½ inch shoot through 4 tiller
- Does not control emerged weeds
Anthem Flex

• New premix of Zidua + Aim from FMC labeled for delayed preemergence or early postemergence application in wheat for residual control of Italian ryegrass and cheatgrass suppression and postemergence control of certain winter annual broadleaves.
• Rates: 2 to 4.5 oz/acre depending on soil type
• Timing: after 80% of germinated wheat seedlings have ½ inch shoot through 4 tiller
• Does not control emerged grasses
Other Considerations

• Be aware of application timing guidelines:
  – Do not apply 2,4-D in the fall or until wheat is fully tillered in the spring
  – Do not apply Banvel/Clarity or any product with dicamba after wheat starts to joint in the spring

• Applications with topdress fertilizer can work fine as long as you follow label guidelines

• Be aware of long crop rotation restrictions with Finesse, Ally, Ally Extra, Agility SG, Amber, Rave, Maverick, Olympus, and PowerFlex, including many cover crops.

• Residual activity may be beneficial in some eco-fallow situations.
Pigweed Control in Wheat Stubble Demonstration
South of Solomon, KS
Post-Harvest Weed Control

• A good wheat stand and weed control in the wheat crop will help with post harvest weeds.
• Weed control in wheat stubble has become much more difficult with glyphosate resistant weeds.
• 2,4-D and dicamba not as effective by themselves as we thought.
• Weed size and timing critical for control.
• Consider Gramoxone SL (paraquat) as an alternative to glyphosate if glyphosate resistant weeds present.
Bucaneer 5 Plus + AMS
32 oz + 13 lb/100 Gal
Bucaneer 5 Plus + 2,4-D A4+ AMS
32 oz + 27.5 oz + 13 lb/100 Gal
Bucaneer 5 Plus + 2,4-D A4 + Sharpen + AMS
32 oz + 27.5 oz + 1 oz + 13 lb/100 Gal
Gramoxone 2LS + NIS
3 pt + 1 qt/100 Gal
Large crabgrass and Palmer amaranth control in wheat stubble (Peterson and Thompson).

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Rate</th>
<th>Large crabgrass</th>
<th>Palmer amaranth</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>2 WAT</td>
<td>4 WAT</td>
</tr>
<tr>
<td>2,4-D LV4</td>
<td>1 pt</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2,4-D LV$</td>
<td>2 pt</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Clarity</td>
<td>8 oz</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Clarity</td>
<td>16 of</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2,4-D+Clarity</td>
<td>2pt+8oz</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sharpen+MSO+AMS</td>
<td>2 oz</td>
<td>45</td>
<td>25</td>
</tr>
<tr>
<td>Sharpen+2,4-D+MSO+AMS</td>
<td>2oz+2pt</td>
<td>48</td>
<td>38</td>
</tr>
<tr>
<td>Paraquat+NIS</td>
<td>3 pt</td>
<td>94</td>
<td>93</td>
</tr>
<tr>
<td>LSD (5%)</td>
<td></td>
<td>4</td>
<td>8</td>
</tr>
</tbody>
</table>
Gramoxone 2LS + NIS
3 pt + 1 qt/100 Gal
2 WAT
Sharpen + MSO + AMS
2 oz + 1% + 8.5 lb/100 gal
2 WAT
Clarity
16 oz
2 WAT
2,4-D LV4 + Clarity
2 pt + 8 oz
2 WAT
Gramoxone SL

- Rates: 2 to 4 pt
- Adjuvants: NIS or OC
- Spray coverage important: 15 to 20 gpa
- Enhanced burndown and residual control by addition of atrazine, metribuzin, or Sharpen herbicides where rotation plans allow.
- Avoid spray drift.
Critical Factors for Gramoxone Performance

- Requires NIS or OC
- Spray coverage
  - Minimum 15 gpa
  - Avoid Very coarse or very fine sprays
- Moderate Sprayer speeds
- Weed size
- Enhanced by atrazine, metribuzin, or Sharpen
- Be aware of potential for spray drift
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