

**Project Title:** 2021 Kochia and Wild Oat Control in Spring Wheat



**Objective:** To evaluate herbicide combinations on weed control performance in spring wheat in environments and cropping systems representative of northwestern Montana

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**Summary:**

Spring wheat was planted on April 27<sup>th</sup>, 2021 and thirteen different herbicide treatments were applied throughout the spring of 2021, with a non-treated as a control (Tables 1 & 2).

The treatments (2) Sharpen followed by (fb) Axial Star, (4) Zidua fb Axial Star, (5) Anthem Flex fb Axial Star, (6) Prowl fb Axial Star, (7) Axial Star, and (8) Axial Star + Affinity TankMix all provided greater than 90% wild oat control. All herbicide treatments applied resulted in a high level of kochia control. This is likely due to a low presence of kochia in the study area.

Lambsquarters was controlled greater than 90% by the treatments (6) Prowl fb Axial Star, (8) Axial Star + Affinity TankMix, (9) Axial XL + Talinor, (10) Huskie + Axial XL, (11) Opensky, (12) Opensky + 2,4-D, (13) Varro + Starane Ultra, and (14) WideMatch + Affinity TankMix. Pennycress control was high with all herbicide treatments except for (3) Zidua, (4) Zidua fb Axial Star, and (7) Axial Star with the lowest control at 37.5% for the Zidua treatment (Table 3).

Weed density was assessed five weeks after the final post treatments were applied. Wild oat was only found in treatments (1) non-treated, (3) Zidua, and (14) WideMatch + Affinity Tankmix (Table 4). Kochia was only found at 1 plant per square meter in the non-treated control. Lambsquarter density was higher in treatments with poor control performance, including (1) non-treated, (2) Sharpen fb Axial Star, (3) Zidua, (4) Zidua fb Axial Star, (5) Anthem Flex fb Axial Star, and (7) Axial Start (Table 4).

Crop injury was low across all treatments, with the exception of treatment (9) Axial XL + Talinor; this treatment caused 16% injury at three weeks after treatment (Table 5). Spring wheat recovered from this injury as there was no effect on yield (Table 5). Herbicide treatment had no significant effect on spring wheat yield. Average yield was 109.4 bu/A across all herbicide treatments.

**Table 1.** Management information

<b>Seeding date:</b> 4/27/2021	<b>Field Location:</b> P2
<b>Julian date:</b> 117	<b>Harvest date:</b> 9/2/2021
<b>Seeding rate:</b>	<b>Julian date:</b> 245
<b>Previous crop:</b> Barley	<b>Soil type:</b> Silty Clay Loam
<b>Herbicide:</b> Table 2	<b>Tillage:</b> Conventional
<b>Insecticide:</b> None	<b>Soil residual nutrient (NO3-1, P, K lb/A):</b> 103-28-478
<b>Fungicide:</b> None	<b>Nutrient fertilizer applied (N, P2O5, K2O lb/A):</b> 110-30-25-10S

**Table 2.** Herbicide Treatments

<b>Treatment #</b>	<b>Treatment Name</b>	<b>Application Timing</b>
1	Non-treated	
2	Sharpen 4 FL OZ/A Axial Star 16.4 FL OZ/A	Pre-Plant Post-Emergence
3	Zidua 1.5 OZ WT/A	Delayed Pre-Emergence
4	Zidua 1.5 OZ WT/A Axial Star 1.75 FL OZ/A	Delayed Pre-Emergence Post-Emergence
5	Anthem Flex 2.75 FL OZ/A Axial Star 16.4 FL OZ/A	Pre-Emergence Post-Emergence
6	Prowl 1.5 PT/A Axial Star 16.4 FL OZ/A	Early Post-Emergence Post-Emergence
7	Axial Star 16.4 FL OZ/A	Post-Emergence
8	Axial Star 16.4 FL OZ/A Affinity TankMix 1 OZ WT/A	Post-Emergence Post-Emergence
9	Axial XL 16.4 FL OZ/A Talinor 13.7 FL OZ/A	Post-Emergence Post-Emergence
10	Huskie 11 FL OZ/A Axial XL 16.4 FL OZ/A	Post-Emergence Post-Emergence
11	Opensky 1 PT/A	Post-Emergence
12	Opensky 1 PT/A 2,4-Dester LV6 7 FL OZ/A	Post-Emergence Post-Emergence
13	Varro 6.85 FL OZ/A Starane Ultra 0.3 PT/A	Post-Emergence Post-Emergence
14	WideMatch 1 PT/A Affinity TankMix 1 OZ WT/A	Post-Emergence Post-Emergence

**Table 3.** Weed Control (8 WAT\*)

Treatment	Wild Oat %	Kochia %	Lambsquarter %	Pennycress %
2	<b>97.5</b>	99.0	<b>81.0</b>	<b>92.0</b>
3	35.0	99.0	43.8	37.5
4	<b>93.0</b>	99.0	62.3	84.5
5	<b>96.5</b>	99.0	63.8	<b>91.8</b>
6	<b>96.5</b>	99.0	<b>99.0</b>	<b>99.0</b>
7	<b>94.3</b>	99.0	82.0	82.0
8	<b>92.5</b>	99.0	<b>99.0</b>	<b>99.0</b>
9	<b>88.5</b>	99.0	<b>96.8</b>	<b>98.0</b>
10	<b>87.5</b>	99.0	<b>99.0</b>	<b>99.0</b>
11	75.0	99.0	<b>99.0</b>	<b>99.0</b>
12	<b>87.5</b>	99.0	<b>99.0</b>	<b>94.5</b>
13	<b>88.8</b>	99.0	<b>99.0</b>	<b>94.3</b>
14	75.0	99.0	<b>98.0</b>	<b>95.8</b>
<b>Mean</b>	<b>85.2</b>	<b>99.0</b>	<b>86.3</b>	<b>83.3</b>
<b>CV</b>	<b>11.6</b>	<b>0.0</b>	<b>13.2</b>	<b>11.5</b>
<b>LSD</b>	<b>14.1</b>	–	<b>16.4</b>	<b>13.7</b>
<b>PR&gt;F</b>	<b>&lt;0.001</b>	<b>0.468</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>

\* Weeks after treatment

**Table 4.** Weed Density (5 WAT\*)

Treatment	Wild Oat plants/m <sup>2</sup>	Kochia plants/m <sup>2</sup>	Lambsquarter plants/m <sup>2</sup>	Pennycress plants/m <sup>2</sup>
1	<b>17.0</b>	1.0	<b>3.5</b>	0.5
2	0.0	0.0	<b>2.5</b>	0.0
3	<b>18.5</b>	0.0	1.5	0.0
4	0.0	0.0	<b>4.0</b>	0.5
5	0.0	0.0	0.5	0.5
6	0.0	0.0	0.0	0.0
7	0.0	0.0	<b>3.5</b>	0.5
8	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0
14	<b>16.0</b>	0.0	0.0	0.0
<b>Mean</b>	<b>3.7</b>	<b>0.1</b>	<b>1.1</b>	<b>0.1</b>
<b>CV</b>	<b>86.6</b>	<b>748.3</b>	<b>154.2</b>	<b>359.5</b>
<b>LSD</b>	<b>4.6</b>	–	<b>2.4</b>	–
<b>PR&gt;F</b>	<b>&lt;0.001</b>	<b>0.47</b>	<b>0.002</b>	<b>0.624</b>

\* Weeks after treatment

**Table 5.** Crop Injury & Yield

<b>Treatment</b>	<b>Injury (%) 2 WAT*</b>	<b>Yield (bu/A)</b>
1	0.0	108.7
2	0.0	115.6
3	0.0	112.5
4	2.5	103.5
5	0.0	118
6	2.8	108.8
7	0.8	111.9
8	2.5	118.5
9	<b>16.3</b>	106.9
10	1.3	106
11	5.0	99.3
12	2.5	108.7
13	6.3	119.5
14	3.8	94.3
<b>Mean</b>	<b>3.1</b>	<b>109.4</b>
<b>CV</b>	<b>105.4</b>	<b>12.5</b>
<b>LSD</b>	<b>4.7</b>	<b>–</b>
<b>PR&gt;F</b>	<b>&lt;0.001</b>	<b>0.2015</b>

\* Weeks after treatment