

**Foxtail control in spring wheat with three application times at Rosemount, MN - 2020.** Durgan, Beverly R., Douglas W. Miller and Ryan Mentz. This experiment was designed to evaluate foxtail control with several herbicides applied at three different foxtail stages. The experiment was conducted at Rosemount, MN on a Waukegon silt loam soil (15% sand, 50% silt, 35% clay) with pH 5.9 and 4.5% organic matter. Soil test for P and K were 34 lbs/A and 250 lbs/A, respectively. Following soybeans, the experimental area was fall chisel plowed. On April 6, the area was tilled with a soil finisher. On April 9, the area was fertilized with 70 lbs/A N, 60 lbs/A P, and 120 lbs/A K and field cultivated. The area was field cultivated again on April 22 and 'Linkert' hard red spring wheat was seeded with a 12 foot wide drill at 120 lbs/A. Broadleaf weeds were controlled with an application of bromoxynil + MCPA ester (0.375 lb ai/A + 0.375 lb ae/A) on May 21. The experimental design was a randomized complete block with three replications. Plot size was 10 by 24 ft. All herbicide treatments were applied to a 6 foot wide strip with a backpack type CO<sub>2</sub> powered sprayer delivering 10 gpa at 35 psi using 11001 flat fan nozzles with 18 inch spacing. Target application stages were 1 leaf, 3-4 leaf, and 5-6 leaf foxtail. Application data and environmental conditions are listed below. Weed control and wheat injury were visually rated. Yields were determined by harvesting a 5.74 X 24 foot strip in the treated area with a small plot combine. Foxtail emergence was monitored weekly in 1 ft<sup>2</sup> quadrants in the weedy check plots.

Treatment Date	May 7	May 29	June 5
<u>Foxtail (giant 85% and yellow 15%)</u>			
leaf stage	85%-1 lf, 15%-2 lf	10%-1 lf, 25%-2 lf, 20%-3 lf, 20%-4 lf 20%-5 lf, 5%-6 lf	17%-3 lf, 19%-4 lf, 15%-5 lf, 28%-6 lf, 19%-7 lf, 2%-8 lf
height (inch)	0.25-0.75	0.5-8	1-14
density (#/ft <sup>2</sup> )	17	70	70
<u>Wheat</u>			
stage (Haun)	1.5-1.8 leaf (Zadoks Z12)	5.5-5.8 leaf (Zadoks Z16, Z22-23, Z31-32)	6.7-7.0 (Zadoks Z16, Z23-24, Z39)
tillers	0	2-3	3-4
height (inch)	3-4.5	10-12	16-19
Air temperature (°F)	54	59	78
Relative humidity (%)	32	55	46
Dew point (°F)	23	43	56
Sky	75% clouds	70% clouds	clear
Wind	NNW 2-6 mph	NNE 7-11 mph	N 4-8 mph
Soil conditions	moist at 1"	moist	moist
Soil temperature (°F)	60	54	69
Rainfall before Application			
Week 1 (inch)	0.00	2.30	0.71
Rainfall after Application			
Week 1 (inch)	0.12	0.71	1.52
Week 2 (inch)	3.77	1.52	0.75

## **Results**

Final foxtail densities averaged 70/ft<sup>2</sup>. Foxtail began emerging 3-5 days prior to the first application date on May 7 with 24% of foxtail emerged on that day. Rain and/or wind delayed the second and third applications beyond our target stages until May 29, and June 5, respectively. No new foxtail emerged after the May 29 application date.

Overall foxtail control was lowest for treatments applied at the early application timing compared to the two later applications due to foxtail emerging after the early May 7 application. All treatments applied at the second and third application timing resulted in excellent foxtail control.

Slight injury (stunting) occurred early with most treatments. Little or no injury symptoms remained visible at the later rating dates.

Average treatment yields did not differ between the three application dates. All herbicide treatments generally produced significantly greater wheat yields than the untreated checks.

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Treatment	Rate (Product/A)	Foxtail Control				Wheat Injury				Wheat Yield (Bu/A)
		6/11 (%)	6/23 (%)	7/11 (%)	7/18 (%)	5/11 (%)	6/11 (%)	6/23 (%)	7/11 (%)	
<b>Application #1 (May 7)</b>										
Everest 3.0 + Widematch + MCPA ester + Preference + AMS	2 oz + 1 pt + 0.5 pt + 3.2 oz + 2.35 pt	85	85	88	86	3	0	0	0	56
OpenSky + Widematch + MCPA ester + Preference + AMS	1 pt + 1 pt + 0.5 pt + 3.2 oz + 2.35 pt	87	89	90	90	5	7	5	2	50
Varro + Widematch + MCPA ester + Preference + AMS	6.85 oz + 1 pt + 0.5 pt + 3.2 oz + 2.35 pt	90	85	85	83	5	5	2	0	49
Rimfire Max + Widematch + MCPA ester+ Destiny HC	3 oz + 1 pt + 0.5 pt + 0.75 pt	82	78	77	70	5	7	0	0	47
Axial XL+ Widematch + MCPA ester	16.4 oz+ 1 pt + 0.5 pt	85	85	66	63	0	0	0	0	48
Wolverive Advanced	27.4 oz	77	78	85	86	8	0	0	0	55
Huskie Complete	13.7 oz	88	87	87	91	5	0	0	0	53
PerfectMatch + Activator 90 + AMS	1 pt + 6.4 oz + 3.5 pt	87	87	87	83	5	2	0	0	50
Axial Bold+ Widematch + MCPA ester	15 oz+ 1 pt + 0.5 pt	80	77	80	78	5	0	0	0	51
<b>Application Date Mean*</b>		<b>84b</b>	<b>83b</b>	<b>83b</b>	<b>81b</b>	--	--	--	--	<b>51</b>
<b>Application #2 (May 29)</b>										
Everest 3.0 + Widematch + MCPA ester + Preference + AMS	2 oz + 1 pt + 0.5 pt + 3.2 oz + 2.35 pt	95	99	99	99	--	3	0	0	50
OpenSky + Widematch + MCPA ester + Preference + AMS	1 pt + 1 pt + 0.5 pt + 3.2 oz + 2.35 pt	93	97	99	99	--	12	7	3	48
Varro + Widematch + MCPA ester + Preference + AMS	6.85 oz + 1 pt + 0.5 pt + 3.2 oz + 2.35 pt	95	99	99	99	--	5	0	0	52
Rimfire Max + Widematch + MCPA ester+ Destiny HC	3 oz + 1 pt + 0.5 pt + 0.75 pt	87	85	99	99	--	2	0	0	52
Axial XL+ Widematch + MCPA ester	16.4 oz+ 1 pt + 0.5 pt	93	95	99	99	--	0	0	0	54
Wolverive Advanced	27.4 oz	95	96	99	99	--	3	0	0	53
Huskie Complete	13.7 oz	96	99	98	96	--	0	0	0	51
PerfectMatch + Activator 90 + AMS	1 pt + 6.4 oz + 3.5 pt	92	93	99	99	--	3	2	0	51
Axial Bold+ Widematch + MCPA ester	15 oz+ 1 pt + 0.5 pt	95	99	99	99	--	2	0	0	50
<b>Application Date Mean*</b>		<b>93a</b>	<b>96a</b>	<b>99a</b>	<b>99a</b>	--	--	--	--	<b>51</b>
<b>Application #3 (June 5)</b>										
Everest 3.0 + Widematch + MCPA ester + Preference + AMS	2 oz + 1 pt + 0.5 pt + 3.2 oz + 2.35 pt	--	99	99	99	--	5	2	0	50
OpenSky + Widematch + MCPA ester + Preference + AMS	1 pt + 1 pt + 0.5 pt + 3.2 oz + 2.35 pt	--	95	99	99	--	2	7	0	54
Varro + Widematch + MCPA ester + Preference + AMS	6.85 oz + 1 pt + 0.5 pt + 3.2 oz + 2.35 pt	--	99	99	99	--	2	2	2	51
Rimfire Max + Widematch + MCPA ester+ Destiny HC	3 oz + 1 pt + 0.5 pt + 0.75 pt	--	90	99	99	--	5	2	0	56
Axial XL+ Widematch + MCPA ester	16.4 oz+ 1 pt + 0.5 pt	--	99	99	93	--	7	0	0	53
Wolverive Advanced	27.4 oz	--	99	99	99	--	2	2	0	52
Huskie Complete	13.7 oz	--	98	99	99	--	2	0	0	52
PerfectMatch + Activator 90 + AMS	1 pt + 6.4 oz + 3.5 pt	--	98	99	99	--	3	0	0	53
Axial Bold+ Widematch + MCPA ester	15 oz+ 1 pt + 0.5 pt	--	99	99	99	--	3	2	2	49
<b>Application Date Mean*</b>		--	<b>97a</b>	<b>99a</b>	<b>98a</b>	--	--	--	--	<b>52</b>
Weedy Check #1	--	--	--	--	--	0	0	0	0	43
Weedy Check #2	--	--	--	--	--	0	0	0	0	40
LSD (0.05) **		7.5	6.3	12.8	15.8	2.2	4.9	2.6	ns	6.3

Everest 3.0 1.75SC = flucarbazone-sodium & cloquintacet (safener).

Widematch 1.5E = clopyralid (0.75 lb ae/gal) & fluroxypyr (0.75 lb ae/gal).

MCPA Ester 4E.

Preference = nonionic surfactant.

AMS = N-PaK AMS = 34% ammonium sulfate solution (3.4 lbs ammonium sulfate/gal).

OpenSky 1.057L = pyroxsulam (0.107 lb ai/gal) & fluroxypyr (0.95 lb ae/gal).

Varro 0.083OD = thiencazone-methyl & safener.

Rimfire Max 6.67WDG = propoxycarbazone-sodium (4.76%) & mesosulfuron-methyl (1.91%).

Destiny HC = methylated soybean oil, high fructose corn syrup, sorbitan fatty acid esters.

Axial XL 0.42EC = pinoxaden and adigor adjuvant.

Wolverine Advanced 1.58E = fenoxaprop-p-ethyl (0.40 lb ai/gal) & pyrasulfotole (0.13 lb ai/gal) & bromoxynil (1.05 lb ai/gal).

Huskie Complete 1.76L = thiencazone-methyl (0.042 lb ai/gal) & pyrasulfotole (0.26 lb ai/gal) & bromoxynil phenol equivalent (1.46 lb ai/gal).

PerfectMatch 1.61SE = clopyralid (0.75 lb ae/gal) & fluroxypyr (0.75 lb ae/gal) & pyroxsulam (0.11 lb ai/gal).

Activator 90 = nonionic surfactant.

Axial Bold 0.685EC = pinoxaden (0.457 lb/gal) & fenoxaprop-p-ethyl (0.228 lb/gal).

\* Application date means followed by same letter are not significantly different as determined by factorial anova (P=0.05, LSD).

\*\* LSD for comparing all herbicide treatment means.