

**Project Title:** 2021 Winter Wheat Preliminary CoAXium Trial

**Objective:** To evaluate the crop safety of Quizalofop herbicide in CoAXium winter wheat.

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**Summary:**

Twenty five winter wheat lines were evaluated for tolerance of Quizalofop herbicide, trade name Aggressor®. The study was planted on September 28, 2020 and managed under rainfed conditions (Table 1.) Aggressor herbicide was applied postemergence at a rate of 24 fl oz/A to wheat at Feekes 4 to Feekes 5 growth stages. This is a higher than labeled herbicide rate and was utilized to maximize crop injury in order to distinguish differences in tolerance between winter wheat lines.

There were ten varieties that were under 20% injured from the Aggressor herbicide 35 days after POST treatment (DAP) (Table 2). They ranged from 5.8% for MTAX21198 to 19.1% for MTAX21200. Fourteen of the varieties were above 20% injury, ranging from 22.2% for MTAX21195 to 49.2% for MTAX21192. Winter wheat injury was generally higher 21 days after POST treatment and all lines showed signs of recovery by 35 days after POST treatment, with the exception of FourOsix. The variety FourOsix was not tolerant to Aggressor and the herbicide treatment caused mortality 35 days after POST treatment. Battle AX is a known CoAXium traited wheat variety, however it was significantly injured at 29.8% at 35 days after POST treatment. Experimental varieties that displayed more tolerance than Battle AX indicate that safer wheat varieties are being produced for use with CoAXium trait tolerance.

The average grain yield was 126.3 bu/A, with the lowest being 101.6 bu/A for MTAX21202 and the highest at 143.9 bu/A for MTAX21187. The average protein percentage was 11.6%, with the lowest at 10.5% for MTAX21189 and the highest at 13.1% for MTAX21202 (Table 3).

**Table 1.** Management information

<b>Seeding date:</b>	9/28/2020	<b>Field Location:</b>	Y6
<b>Julian date:</b>	264	<b>Harvest date:</b>	8/13/2021
<b>Seeding rate:</b>		<b>Julian date:</b>	225
<b>Previous crop:</b>	Canola	<b>Soil type:</b>	Silty Clay Loam
	Aggressor 24 fl oz/A		
<b>Herbicide:</b>	+ MSO 1% V/V	<b>Tillage:</b>	Conventional
	May 5, 2021		
<b>Insecticide:</b>	None	<b>Soil residual nutrient</b>	Fall 2020,
		<b>(NO3-1, P, K lb/A):</b>	10-60-50-15S
<b>Fungicide:</b>	None	<b>Nutrient fertilizer applied</b>	Spring 2021,
		<b>(N, P2O5, K2O lb/A):</b>	150-0-0

**Table 2.** Aggressor herbicide injury of the winter wheat varieties

Variety/Line	Aggressor Herbicide Injury %	
	21 DAP	35 DAP
MTAX21198	<b>25.7</b>	<b>5.8</b>
MTAX21199	<b>18.9</b>	<b>7</b>
MTAX21203	<b>25.7</b>	<b>8.6</b>
MTAX21189	<b>25</b>	<b>10.4</b>
MTAX21196	34.7	<b>10.5</b>
MTAX21187	<b>21.4</b>	<b>13.1</b>
MTAX21184	42.1	<b>13.2</b>
MTAX21185	<b>23.9</b>	<b>13.3</b>
MTAX21197	<b>27.9</b>	<b>14.1</b>
MTAX21200	<b>28.2</b>	<b>19.1</b>
MTAX21195	31.8	22.2
MTAX21186	31.1	23.2
MTAX21188	32.5	25.9
MTAX21193	38.2	26.4
MTAX21182	42.8	27.6
Battle AX	43.2	29.8
MTAX21181	42.1	32.5
MTAX21201	43.2	34.1
MTAX21183	42.8	35.4
MTAX21202	43.2	35.5
MTAX21194	47.1	37.8
MTAX21191	50.7	40.3
MTAX21190	48.9	41.7
MTAX21192	52.5	49.2
FourOsix	73.6	95
<b>Average</b>	<b>37.5</b>	<b>26.9</b>
<b>LSD (0.05)</b>	<b>11.5</b>	<b>14.7</b>
<b>C.V. (%)</b>	<b>12.9</b>	<b>24.3</b>
<b>PR&gt;F</b>	<b>&lt;.0001</b>	<b>&lt;.0001</b>

<sup>a</sup>**Abbreviations:** DAP, Days after POST application

**Bold** = indicates lowest value within a column

**Bold** = indicates varieties with values equal to lowest value based on LSD (p =0.05)

**Table 3.** Agronomic performance of the winter wheat

Variety/Line	Stand 3-May	HD (julian)	HT (in)	YLD (bu/A)	PRO (%)	TWT (lb/bu)
MTAX21187	95.1	161	30.2	<b>143.9</b>	11.5	60
MTAX21196	96.9	163	30	<b>141.6</b>	12.1	60
MTAX21185	95.6	165	31.1	<b>141</b>	10.9	60
MTAX21189	96.3	164	32.3	<b>138.1</b>	10.5	59
MTAX21197	95.9	159.5	28.5	<b>137</b>	11.9	59.6
MTAX21198	97.2	160	28.8	<b>136.5</b>	11	58.7
MTAX21201	95.8	161	31.8	<b>136.3</b>	11.2	59.4
MTAX21203	96.5	162.5	30.8	<b>132.1</b>	11.6	<b>62</b>
MTAX21182	95	162	29.8	<b>131.2</b>	11.4	59.9
MTAX21200	97.5	159.5	28.2	<b>130.6</b>	11.3	57.6
MTAX21195	95	166	28.1	<b>130.2</b>	11.4	59.5
MTAX21184	96.1	167	31.2	<b>129.9</b>	12.4	60.3
MTAX21188	95.5	164	30.7	<b>128.6</b>	10.9	60.5
Battle AX	93.9	162.5	27.8	127.9	11.3	59.7
MTAX21181	97	163	27.4	124.2	12.2	60.3
MTAX21183	95.1	164	29.3	123.8	11	59.9
MTAX21190	95.7	165.5	29.5	118.7	12.1	<b>61.4</b>
MTAX21199	94.9	159.5	28.4	117.9	11.6	58.4
MTAX21191	95.9	163.5	26.1	117.7	12.3	60
MTAX21186	96.7	160	27.5	115.5	11	58.1
MTAX21193	95.6	156.5	24.7	114.2	11.5	58.7
MTAX21192	95.6	165	26.1	111.1	12	59.3
MTAX21194	95.6	159	28.5	101.8	11.7	59.4
MTAX21202	96.8	165	26.8	101.6	13.1	58.3
FourOsix	95.8	-	-	-	-	-
<b>Mean</b>	<b>95.9</b>	<b>162.4</b>	<b>28.9</b>	<b>126.3</b>	<b>11.6</b>	<b>59.6</b>
<b>LSD</b>	<b>ns</b>	<b>3</b>	<b>2.9</b>	<b>15.6</b>	<b>0.5</b>	<b>0.8</b>
<b>C.V. (%)</b>	<b>1.4</b>	<b>0.9</b>	<b>4.9</b>	<b>6</b>	<b>2.1</b>	<b>0.6</b>
<b>PR&gt;F</b>	<b>0.8205</b>	<b>&lt;.0001</b>	<b>0.0013</b>	<b>0.0001</b>	<b>&lt;.0001</b>	<b>&lt;.0001</b>

HD = heading date, HT = height, YLD = yield, PRO = protein, TWT = test weight

**Bolding** denotes equal value to highest or earliest value within a column based on LSD(0.05)