

Project Title: Evaluation of Clearfield Winter Wheat Lines for Herbicide Tolerance.

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Objectives: Evaluate crop tolerance, yield potential and agronomic attributes of experimental herbicide resistant winter wheat lines.

Results:

During the 2005-06 season, twelve herbicide resistant (Clearfield) winter wheat lines were evaluated for their agronomic performance when treated with Beyond (imazamox) applied at 1 and 2 times the label rate (6 and 12 oz/ac, respectively). Herbicides were applied on April 25, 2006 when plants were at the jointing stage. Non-treated controls were included for comparison.

Adequate soil moisture at planting resulted in a good stands. However, tillering was reduced due to low winter temperatures and dry spring conditions. These abiotic stress factors caused heading to occur one week earlier than the previous season and also caused a reduction in plant height. Stripe rust resurfaced during 2006, which negatively affected yields. Stripe rust infection ranged from 2 to 95 percent, depending on the cultivar, while yields varied from 43 to 84 bu/ac. Despite the stripe rust, test weight was above normal and ranged from 61 to 66 lb/bu. Herbicide injury was minimal among the entries evaluated. Herbicide treatments had no effect on yield or yield-related traits.

Summary:

Several entries (MTCL0509, MTCL0538 and MTCL0550) showed excellent resistance to stripe rust, and all materials demonstrated excellent herbicide tolerance.

Future Plans:

Continue to evaluate herbicide resistant winter wheat materials for herbicide tolerance and agronomic attributes.

Table 1. Agronomic data from the Clearfield winter wheat lines grown at the Northwestern Agricultural Research Center, Kalispell, MT in 2005-06 season.

Planted: September 22, 2005

Harvested: August 2, 2006

Entry	ID	Yield (bu/ac)			Test weight (lb/bu)			Grain moisture (%)			Protein (%)		
		0X	1X	2X	0X	1X	2X	0X	1X	2X	0X	1X	2X
11	MTCL0549	80.9	83.9	84.4	64.4	64.7	64.6	10.0	10.0	9.8	10.4	11.0	10.6
5	MTCL0489	73.1	65.1	68.8	64.4	64.2	64.5	9.9	9.9	9.9	10.7	11.4	11.1
12	MTCL0550	72.3	71.1	70.7	64.5	64.7	64.7	9.9	9.7	10.0	11.7	11.7	11.7
9	MTCL0537	71.7	71.5	76.4	65.6	65.7	66.2	9.9	10.0	9.9	12.1	12.1	12.0
7	MTCL0508	67.5	63.0	61.9	65.8	65.6	65.9	9.4	9.5	9.2	12.9	13.8	13.8
8	MTCL0509	67.5	75.1	72.0	65.4	66.1	65.7	9.8	9.4	9.5	12.7	13.4	12.7
3	MTCL0477	61.2	78.3	75.9	65.4	65.6	65.7	10.0	9.7	9.9	11.4	11.3	11.2
4	MTCL0486	58.8	55.4	59.8	64.3	64.5	64.1	9.6	9.7	10.0	12.3	12.4	11.9
10	MTCL0538	57.4	61.2	58.8	65.4	65.8	65.6	10.3	9.8	10.1	14.1	13.9	13.6
2	MTCL0316	55.3	59.2	55.8	65.8	65.6	65.4	9.9	10.0	9.7	12.4	12.6	12.5
1	Above	46.5	51.1	49.3	60.9	61.7	61.0	9.9	9.6	9.7	12.0	11.6	11.5
6	MTCL0501	44.1	42.9	43.8	64.2	65.1	65.3	9.7	9.7	9.8	12.9	13.3	13.1
	<b>Mean</b>	63.0	64.8	64.8	64.7	64.9	64.9	9.9	9.7	9.8	12.1	12.4	12.2
	<b>LSD (0.05) Entry Rate</b>		<b>5.59 NS</b>			<b>0.56 NS</b>			<b>0.21 NS</b>				

NS: Not significant at 0.05 level.

Table 2. Heading, plant height, crop injury and stripe rust infection in Clearfield winter wheat lines grown at the Northwestern Agricultural Research Center, Kalispell, MT in 2005-06 season.

Planted: September 22, 2005

Harvested: August 2, 2006

Entry	ID	Heading date (Julian)			Plant height (in)			Crop injury (14 DAT) (%)			Crop injury (28 DAT) (%)			Stripe rust (%)		
		0X	1X	2X	0X	1X	2X	0X	1X	2X	0X	1X	2X	0X	1X	2X
11	MTCL0549	152.3	152.7	152.7	32.0	33.1	31.9	0.0	0.0	0.0	0.0	0.0	1.7	15.0	10.0	8.3
5	MTCL0489	146.3	146.0	146.3	28.2	27.6	28.2	0.0	0.0	0.0	0.0	0.0	0.0	31.7	53.3	33.3
12	MTCL0550	146.0	146.0	146.7	29.1	28.9	27.8	0.0	0.0	0.0	0.0	0.0	3.3	4.0	5.0	5.0
9	MTCL0537	153.0	152.3	153.0	34.3	35.6	35.4	0.0	0.0	0.0	0.0	0.0	0.0	21.7	10.7	10.0
7	MTCL0508	146.0	146.0	146.0	32.0	29.1	29.9	0.0	0.0	1.7	0.0	1.7	0.7	10.0	6.7	8.3
8	MTCL0509	148.0	149.3	149.0	32.5	33.1	31.9	0.0	0.0	2.3	0.0	0.0	1.7	2.5	1.7	3.0
3	MTCL0477	149.0	149.0	148.3	31.6	32.9	31.9	0.0	0.0	1.7	0.0	0.0	1.7	40.0	26.7	23.3
4	MTCL0486	148.3	149.0	149.0	30.6	29.7	31.0	0.0	0.0	1.7	0.0	0.0	1.7	80.0	73.3	66.7
10	MTCL0538	146.3	146.7	147.0	29.8	31.1	29.8	0.0	0.0	0.0	0.0	1.7	3.3	5.0	10.0	6.7
2	MTCL0316	144.7	144.7	144.7	30.6	29.9	29.1	0.0	0.7	0.0	0.0	0.0	0.0	50.0	46.7	46.7
1	Above	142.0	142.0	142.0	28.7	27.2	26.4	0.0	0.0	0.0	0.0	0.0	0.0	92.5	93.3	95.0
6	MTCL0501	149.7	149.0	150.0	31.5	28.9	26.9	0.0	0.0	0.7	0.0	0.0	1.7	83.3	76.7	56.7
	<b>Mean</b>	147.6	147.7	147.9	30.9	30.6	30.0	0.0	0.1	0.7	0.0	0.3	1.3	36.3	34.5	30.3
	<b>LSD (0.05)</b>															
	<b>Entry Rate</b>		<b>0.42</b>			<b>1.45</b>			<b>NS</b>			<b>NS</b>			<b>6.6</b>	
			<b>NS</b>			<b>NS</b>			<b>0.47</b>			<b>NS</b>			<b>NS</b>	

DAT: Days after herbicide application.  
NS: Not significant at 0.05 level.