Project Title: Evaluation of Clearfield Winter Wheat Cultivars for Herbicide Tolerance - 2012

Project Leader: Bob Stougaard

Project Personnel: Brooke Bohannon, Phil Bruckner and Jim Berg

Objective: To evaluate experimental lines for herbicide tolerance and agronomic performance in environments and cropping systems representative of northwestern Montana.

Results:

The factorial treatment design consisted of three herbicide treatments and 7 herbicide-tolerant winter wheat lines (Table 2). The three herbicide treatments consisted of a non-treated control, and Beyond applied at the 2X rate (12 oz/A) with either MSO or NIS adjuvants. Treatments were applied on April 17 with a backpack sprayer in 20 GPA of water to individual plots which measured 4 by 15 feet. The experimental design was a split plot with three replications, where herbicide treatments represented the whole plot factor and experimental lines were the sub-plot effect. The treatments were assessed for herbicide injury on May 8th and the 22nd. Heading was recorded when 50 percent of the plants in a plot had half the head exposed. Height measurements and lodging were recorded near maturity. Stripe rust ratings were taking on July 1st and the 12th.

All wheat lines demonstrated excellent herbicide tolerance. Towards that end, none of the measured variables showed any response to the main effect of herbicide. Concurrently, crop injury rates were minor and no differences were observed among wheat lines. Nevertheless, difference did exist among the wheat lines for all remaining variables.

The average heading date was 168 (June 17). MTCL1133 and MTCL1127 had the latest (171) and earliest (164) heading dates, respectively. Stripe rust was prevalent throughout the nursery and none of the material evaluated displayed resistance to the disease. The average infection level for the nursery on July 12 was 69 percent. MTCL1127 recorded the highest infection level at 98 %, while AP503 CL2 had the lowest infection level (54%) for the nursery. Plant height averaged 44 inches and ranged from a high of 47 inches for MTCL1067 to a low of 39 inches for AP503CL2. Lodging was prevalent throughout the nursery and averaged 44 percent. Lodging ranged from 79 5 for MTCL1133 to 0 for MTCL1127. Overall yields were low due to the combined effect of stripe rust and lodging, and averaged only 57 bu/A. MTCL1131 had the highest yield at 83 bu/A while MTCL1127 had the lowest yield at 83 bu/A. In summary, while the lines appear to have adequate herbicide tolerance, the utility of these materials is limited by excessive plant height, lodging and the lack of stripe rust resistance.

Table 1. Material and Methods - Winter Wheat Clearfield Qualification - 2012

Seeding Date:	9/24/2011	Soil Type:	Creston SiL	Harvest Date:	8/13/2012
Seeding Rate:	80 lb/A	Soil Test:	None		
Previous Crop:	Fallow	Fertilizer:	PP 10-35-90-8.5-0.85/ TD 100-0-0		
Tillage:	Conventional	Herbicide:	None		
Irrigation:	None	Insecticide:	None		

Winter Wheat Clearfield Qualification, Kalispell, MT - 2012.

Treatment	Yield	Test weight	% Injury rating day15	% Injury rating day30	Heading date	Plant height	Stripe Rust % 1-Jul	Stripe Rust % 12-Jul	Lodging
	- bu/a -	- lb/bu -				- in -			- % -
Herbicide									
0X	54.8	55.4	0.0	0.0	168.7	44.0	51.1	66.8	48
2XMSO	58.8	55.2	0.0	0.0	168.7	44.0	56.9	70.1	42
2XNIS	57.6	55.0	2.6	0.5	168.0	43.6	51.6	70.5	42
Rate PLSD (0.05)	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**	**ns**
Rate CV%	**15.0**	**1.5**	**306**	**628**	**0.5**	**3.5**	**17.1**	**17.2**	**41.9**
Experimental line									
AP503 CL2	53.7	**59.1****	2.2	0.9	165.8	39.1	41.1	53.9	66
MTCL1067	52.6	55.1	1.1	0.0	168.3	46.9	56.7	72.0	44
MTCL1077	56.4	55.4	0.0	0.0	169.8	46.1	55.3	72.2	43
MTCL1127	41.8	48.7	0.6	0.0	164.4	40.3	74.8	98.1	**0****
MTCL1131	**82.9****	57.5	0.0	0.0	170.0	46.7	43.3	58.3	**13***
MTCL1132	59.6	55.5	0.0	0.0	169.8	44.8	48.9	64.4	63
MTCL1133	52.6	55.0	2.2	0.2	171.2	43.3	52.2	65.0	79
ID PLSD (0.05)	**9.1**	**0.8**	**ns**	**ns**	**0.8**	**1.5**	**8.9**	**10.7**	**18.0**
ID CV%	**16.8**	**1.6**	**317**	**628**	**0.5**	**3.5**	**17.7**	**16.4**	**43.3**
Grand Mean	**57.1**	**55.2**	**0.9**	**0.2**	**168.5**	**43.9**	**53.2**	**69.1**	**44.0**

No Rate*ID interactions for all dependent variables, except Yield (P = .0482).