PROJECT TITLE: Evaluation of Commercial Cultivar and Sawfly-Resistant Winter Wheat Breeding Lines near Molt, Montana. (Exp. 995781).

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OBJECTIVES: To provide the wheat breeder and wheat growers in south central Montana with a reliable, unbiased, up-to-date source of information that will permit valid comparisons between breeding lines selected for sawfly-resistance and improved wheat varieties. This information will help the breeder select sawfly-resistant winter wheat lines for further evaluation in south central Montana.

METHODS: The 1999 sawfly-resistant winter wheat trial had 21 breeding lines and seven commercial entries and was planted using a randomized complete block design with three replications. Test plots consisted of a 15-foot, 4-row plot with 12-inch row spacing. All rows of each test plot were trimmed 36 inches and harvested using an experimental-plot combine. Recorded grain yields were adjusted to 13% grain moisture content, and are reported in bushels per acre based on a 60 pound per bushel test weight. Test weight (pounds per bushel) and percent grain moisture content were obtained for each plot using a Dickey-john GAC 2100 grain analyzer. Grain protein (%) was determined for each entry bulked across replications. Grain protein values were adjusted to 12% grain moisture content. Plant height was measured in inches from the soil surface to the top of the head, excluding the awns if present. Reported values have been rounded to the nearest inch. Heading date was noted at the Huntley irrigated and Huntley dryland site when 50% of the heads in a plot had extended above the flag leaf collar. Heading dates were recorded in Julian days (number of days from January 1) for statistical purposes. Corresponding calendar dates also are presented.

RESULTS and SUMMARY: Agronomic performance of the sawfly-resistant winter wheat breeding lines and commercial entries tested during near Molt is presented in Table 1. Grain yields were lower than expected due to non-uniform soil conditions at the site coupled with below average precipitation. Sawfly-resistant winter wheat yields averaged 43.2 bu/ac and ranged from 54.2 bu/ac for 'Morgan' to 28.5 bu/ac for MTS99125. Nine of the 21 breeding lines yielded between 53.5 and 44.4 bu/ac, which was equal to the yield of Morgan. Five of the commercial cultivars yielded between 49.0 and 43.3 bu/ac, which was also equal to the yield of Morgan. Dryer than normal conditions also adversely influenced grain test weights. Overall, test weights were low with only 'MTS99127', 'Erhardt' and 'Rocky' having test weights greater and 60 lb/bu.

FUTURE PLANS: The sawfly-resistant winter wheat evaluation will continue in 2000 near Molt.

Table 1. Performance of seven commercial hard red winter wheat cultivars and 21 sawfly-resistant breeding lines tested under dryland conditions near Molt, Montana during 1999. (Exp. 995781).

Cultivar	1/ Grain Yield	Test Weight	Grain Moisture	2/ Grain Protein	Plant Height
	bu/ac	lb/bu	%	%	inches
Erhardt	43.9*	60.2	8.4	13.8	29
Judith	49.0*	58.0	8.2	13.4	30
Morgan	54.2**	59.8	8.4	12.5	32
Neeley	41.5	58.0	8.2	14.2	32
Rampart	47.0*	58.7	7.9	15.3	30
Rocky	48.2*	60.6	8.2	12.5	32
Vanguard	43.3*	58.1	8.0	15.3	29
MTS97104	53.5*	57.5	8.0	13.7	30
MTS9719	41.7	56.9	7.8	14.1	31
MTS9720	50.9*	57.9	8.2	13.6	31
MTS9860	32.1	55.7	7.4	14.7	30
MTS9862	38.5	57.8	7.7	15.0	30
MTS9864	35.0	57.3	8.1	14.5	30
MTS9868	51.0*	57.3	7.8	14.9	31
MTS9869	45.3*	57.1	8.1	14.1	33
MTS9871	41.3	59.2	8.2	14.1	28
MTS9873	42.0	59.2	8.5	15.4	29
MTS9882	44.4*	58.1	8.3	13.9	28
MTS99119	48.3*	57.6	8.4	13.0	31
MTS99120	49.9*	55.8	7.9	13.6	30
MTS99121	45.5*	58.8	7.9	13.7	33
MTS99122	40.5	57.7	7.8	14.9	32
MTS99123	44.8*	58.1	8.1	13.7	31
MTS99124	37.9	57.6	8.1	14.5	31
MTS99125	28.5	57.4	7.9	16.0	27
MTS99126	38.5	58.4	8.3	14.8	32
MTS99127	37.4	60.4	8.4	14.2	30
MTS99128	33.9	57.7	7.8	15.8	29
Average	43.2	58.1	8.1	14.3	30
LSD (p=0.05)	11.0	1.8	ns	-	2.6
CV%	15.5	1.9	4.6	-	5.2

1/ Yields are based on 60 pound standard bushel weight and adjusted to 13.0 percent moisture content.
2/ Grain protein values adjusted to 12 percent grain moisture content.
** Indicates highest yielding cultivar.
* Indicates cultivars yielding equal to highest yielding cultivar based on Fisher's protected LSD (p=0.05).
ns Indicates no significant difference between cultivars within a column based on Fisher's protected LSD (p=0.05).

Sawfly-resistant Winter Wheat Evaluation (Exp. 995781)

Planted:	September 29, 1998
Harvested:	August 11, 1999
Fertility:	11-52-00, 100 lb/ac, in-furrow, September 29, 1998
Herbicide:	Maverick (MON 37503), 9.4 g ttl; R-11, 1% v/v, March 26, 1999
Insecticide:	none
Previous Crop:	summer fallow
Precipitation:	not available
Other:	rogued for volunteer wheat