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## RESULTS OF AGRONOMIC AND WEED SCIENCE RESEARCH CONDUCTED IN SOUTH CENTRAL MONTANA - 2001

The Annual Report of the Investigations at and Administration of the  
Southern Agricultural Research Center, Huntley, Montana

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- PROJECT TITLE:** Dryland Soft White Winter Wheat Performance Trial near Huntley, Montana. (Exp. 015008).
- PROJECT LEADERS:** Kenneth D. Kephart, Agronomist, SARC, Huntley  
Peggy F. Lamb, Research Associate, SARC, Huntley
- PROJECT PERSONNEL:** Phil L. Bruckner, Winter Wheat Breeder, PSPP, Bozeman  
James E. Berg, Winter Wheat Research Associate, PSPP, Bozeman  
Tom A. Fischer, Research Specialist and Farm Foreman, SARC, Huntley
- OBJECTIVES:** To provide wheat growers in south central Montana with a reliable, unbiased, up-to-date source of information that will permit valid comparisons among new experimental lines and existing soft white winter wheat varieties. This information should help producers in south central Montana select soft white winter wheat varieties best suited to their particular area and growing conditions.
- METHODS:** The 2001 on-station soft white winter wheat trial had 15 soft white winter wheat entries and 'Neeley' as a hard red winter wheat check cultivar. The trial 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 standard bushel 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 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:** Drought stress severely reduced the yield and test weight performance of the soft white winter wheats tested at Huntley during 2001. Average yield of the trial in 2001 was 16.4 bu/ac, compared to 77.8 bu/ac in 2000 and 59.4 bu/ac in 1999. Differences in cultivar yield were observed in 2001, with 'Lewjain' producing the highest yield at 22.1 bu/ac. Seven other wheats tested in this trial, including 'Bruehl', 'Daws', 'Eltan', 'Hill 81', 'Kmor', Neeley hard red winter wheat and 'Rod', produced yields statistically equal to those of Lewjain. Test weights averaged 57.3 lb/bu and varied from 53.1 lb/bu for 'Malcolm' to 59.4 lb/bu for Lewjain. Grain protein averaged 16.3 percent, ranging from 15.0 percent for Rod to 17.5 percent for 'Madsen'.
- SUMMARY:** Although yield differences were observed among the soft white winter wheats tested at Huntley during 2001, two-year and three-year averages indicated no long-term differences in yield between cultivars under the dryland conditions that prevail at Huntley, Montana. Grain protein has averaged 15.5 percent, 13.7 percent and 16.7 percent during 1999, 2000 and 2001, respectively, which far exceed acceptable protein levels for this market class. Almost all soft white winter wheats tested were developed for higher yielding environments than the dryland

environments common to south central Montana. With no yield advantage over hard red winter wheats adapted to this region, and grain protein levels difficult to manage under low moisture conditions, production of soft white winter wheat as a dryland crop in south central Montana makes little sense.

**FUTURE PLANS:**

The dryland soft white winter wheat performance trial will continue in 2002 at the Southern Agricultural Research Center. It has been recommended that subsequent soft white winter wheat trials be conducted under irrigated conditions for south central Montana.

Table 1. Performance of 15 soft white winter wheat cultivars compared to Neeley hard red winter wheat under dryland conditions near Huntley, Montana during 2001. Cultivars listed alphabetically. (Exp. 015008).

Cultivar	1/			Test Weight	Grain Moisture	2/		Heading Date	
	Grain Yield					Grain Protein	Plant Height	Julian	Calendar
	2001	2000-2001	1999-2001						
	----- bushels/acre -----			lb/bu	%	%	inches		
Bruehl	<b>17.9*</b>			58.6	7.5	16.8	18	162.7	Jun 11
Cashup	13.1	43.3	48.6	55.8	7.6	16.7	15	160.7	Jun 9
Daws	<b>18.8*</b>	46.4	51.5	57.1	7.9	15.7	14	160.7	Jun 9
Eltan	<b>17.3*</b>	50.1	54.5	58.5	8.0	16.4	16	162.3	Jun 11
Hill 81	<b>18.7*</b>	54.0	53.8	57.1	7.8	17.0	18	160.3	Jun 9
Kmor	<b>18.9*</b>	50.3	54.7	58.2	7.7	15.6	15	162.3	Jun 11
KW3683	13.7			56.3	7.6	15.4	17	160.3	Jun 9
Lambert	14.1	48.8	52.3	58.3	7.8	16.9	17	158.3	Jun 7
Lewjain	<b>22.1**</b>	50.3	53.8	59.4	7.9	15.6	16	163.7	Jun 12
MAC-1	16.4	44.8		57.8	7.7	16.3	18	160.3	Jun 9
MacVicar	13.1	44.8	48.7	57.1	7.9	17.3	17	162.3	Jun 11
Madsen	14.2	42.0	47.0	55.9	7.4	17.5	16	161.7	Jun 10
Malcolm	10.7	47.8	51.1	53.1	7.6	17.3	17	163.3	Jun 12
Neeley (HRWW)	<b>19.5*</b>	49.2	53.7	58.1	8.2	15.3	19	159.7	Jun 8
Rod	<b>20.0*</b>	47.9	50.8	55.8	7.8	15.0	17	162.7	Jun 11
Stephens	13.7	49.2	51.9	58.9	8.0	16.3	15	162.7	Jun 11
Average	16.4	47.8	51.7	57.3	7.8	16.3	16	161.5	Jun 10
LSD (p=0.05)	5.3	ns	ns	2.3	ns	-	2.0	2.0	
CV%	19.5	24.5	17.5	2.5	4.3	-	7.3	0.7	

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 the 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).

Huntley Dryland Soft White Winter Wheat (Exp. 015008)

Planted: September 26, 2000  
 Harvested: August 17, 2001  
 Fertility: 18-46-00, 100 lb/a preplant incorporated, September 1, 2000  
 Herbicide: Harmony Extra, 0.33 oz/a; Bronate, 1 pt/a; R-11, 1 pt/a, April 25, 2001  
 Insecticide: Di-Syston 8E, 16 oz/a preplant incorporated, September 13, 2000  
 Previous Crop: summer fallow  
 Precipitation: 12.17 inches