

WEST RIVER AGRICULTURAL RESEARCH AND EXTENSION CENTER
CROPS AND SOILS RESEARCH

Rapid City, South Dakota

Introduction

This is an annual progress report of the West River Crops and Soils Research Project, South Dakota Agricultural Experiment Station. The equipment storage and processing facilities are located approximately 1 mile southwest of the village of Box Elder. The office facilities are located on the Central States Fairgrounds at 801 San Francisco Street, Rapid City. Telephone 605/394-2236.

The Research Project serves the western part of the state. It is unique in that all experimental plots are cooperatively located with farmers, ranchers, crop improvement associations, or county extension agents.

The research conducted is not restricted to a specific area, crop, or soil, but by necessity of workload, investigates only those problems which are pertinent to general areas. This report contains results of selected research. It does not include results of incomplete work nor work conducted by projects headquartered from the campus at Brookings.

FIELD PLOT COOPERATORS

<u>Name</u>	<u>Address</u>	<u>County</u>
County Crop Impr. Ass'n	Martin 57551	Bennett
Lloyd Campbell	McIntosh 57650	Corson
Roger Rosenow	Ralph 57650	Harding
Lee Johanson	Okaton 57562	Jones
Steve Lien	Presho 57568	Lyman
Gary Hawks	Plainview 57771	Meade
Tim Komes	Sturgis 57785	Meade
Lavon Shearer	Wall 57790	Pennington
James C. Trevillyon	Wicksville 57767	Pennington
Bob Berg	Rapid City 57701	Pennington
Gary Wunder	Bison 57620	Perkins

This is an annual report and results published herein are therefore neither complete nor conclusive. 500 copies printed at an estimated cost of \$1.95 each.

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Acknowledgements

The following County Extension Agents assisted in locating cooperators and conducting the research: Gary C. Nies-Martin, Kenneth M. Nelson-Buffalo, Jerry L. Johnston-Sturgis, Lyndell Petersen-Rapid City, Jeanie K. Severson-Kennebec, Gary Erickson-Murdo, and Vincent J. Gunn-Bison.

The results reported in this pamphlet were funded under Plant Science Projects 1-87540 and 1-87466. Research was conducted by H. A. Geise-Research Agronomist, C. E. Stymiest-Extension Agronomist, and B. E. Jacobson-Assistant in Plant Science, and in conjunction with F. A. Cholick, P. E. Fixen, J. L. Gellner, D. L. Reeves, J. J. Bonnemann, R. J. Pollman, J. D. Weber, W. E. Arnold, and J. D. Smolik.

Weather Summary

The weather summaries presented in Tables 1 and 2 were obtained from the National Oceanic and Atmospheric Administration publication, Climatological Data - South Dakota.

Air temperatures during late summer of 1983 averaged 6 degrees above normal for the entire western half of the state. As October and November passed the temperatures continually dropped until December departures averaged 19 degrees below normal. The 1984 winter months of January through March were all above normal. February was the warmest month with average temperatures 9 degrees above normal. Springtime temperatures were normal to slightly below and continued that way through July, except in the northwestern corner and southcentral areas where temperatures were normal to slightly above normal during the month of July.

The precipitation patterns in western South Dakota during the beginning of the crop year varied. Overall the entire western half of the state was short of moisture with the southcentral being the most critical. During late autumn and winter the northern areas received little moisture, while the central and southern areas received slightly above normal. With the coming of spring in

March, all areas except the northwestern corner received moisture which ranged from 1 to 4 inches above normal. The precipitation which fell on dry soil provided enough moisture to establish good stands of small grain. Moisture in May was limited but good showers were received in June. Rainfall in July was above normal in the southern area but below normal in the northern area.

Table 1. Weather Data - Average Temperatures and Total Precipitation by Months, with Departures from Normal.

Month & Year	Average Temperature*	Departure from Normal**	Total Precipitation*	Departure from Normal**
<u>Martin</u> (Bennett County Reporting Station)***				
Aug. 1983	77.3	5.0	1.78	-0.30
Sept. 1983	63.3	1.8	0.23	-1.19
Oct. 1983	50.9	0.2	1.01	-0.03
Nov. 1983	34.9	-0.7	1.76	1.41
Dec. 1983	7.1	-19.6	0.66	0.37
Jan. 1984	26.1	3.6	0.15	-0.14
Feb. 1984	34.5	7.8	0.32	-0.09
Mar. 1984	34.4	2.3	0.83	-0.28
Apr. 1984	44.7	-1.1	1.71	-0.06
May 1984	55.9	-0.2	2.76	-0.19
June 1984	66.6	1.4	3.35	-0.53
July 1984	73.1	-0.2	3.64	1.18
<u>McIntosh</u> (Corson County Reporting Station)				
Aug. 1983	74.3	3.5	4.63	2.72
Sept. 1983	56.9	-2.4	0.75	-0.66
Oct. 1983	45.4	-2.7	2.11	1.21
Nov. 1983	31.4	0.8	0.68	—
Dec. 1983	-0.7	-19.6	0.49	0.06
Jan. 1984	19.2	8.1	0.05	-0.31
Feb. 1984	30.8	12.5	0.02	-0.39
Mar. 1984	27.8	0.0	0.84	0.10
Apr. 1984	43.7	0.3	3.26	1.57
May 1984	54.7	-1.1	0.90	-1.95
June 1984	63.3	-2.1	5.71	2.37
July 1984	71.4	-0.9	0.84	-1.35
<u>Ralph</u> (Harding County Reporting Station)				
Aug. 1983	75.7	7.8	1.15	-0.48
Sept. 1983	57.4	0.9	0.88	-0.33
Oct. 1983	47.5	2.1	0.79	-0.04
Nov. 1983	32.3	2.5	0.32	-0.02
Dec. 1983	0.9	-18.8	0.44	0.16
Jan. 1984	22.1	8.8	0.11	-0.16
Feb. 1984	32.3	12.3	0.12	-0.20
Mar. 1984	29.9	1.5	0.45	-0.01
Apr. 1984	42.5	0.3	3.78	2.24
May 1984	53.2	-0.6	0.59	-2.02
June 1984	62.5	-0.2	4.32	0.84
July 1984	71.9	2.3	0.47	-1.45

(continued on following page)

Table 1. Continued

Month & Year	Average Temperature*	Departure from Normal**	Total Precipitation*	Departure from Normal*
<u>Murdo (Jones County Reporting Station)</u>				
Aug. 1983	80.8	7.2	0.93	-0.92
Sept. 1983	65.8	2.7	0.46	-0.65
Oct. 1983	51.7	0.4	1.56	0.41
Nov. 1983	35.2	0.0	2.04	1.55
Dec. 1983	6.4	-17.3	1.04	0.61
Jan. 1984	25.8	8.2	0.02	-0.29
Feb. 1984	34.2	10.4	0.23	-0.23
Mar. 1984	33.0	1.0	1.90	0.82
Apr. 1984	45.2	-1.4	3.08	0.88
May 1984	57.1	-1.0	2.88	0.21
June 1984	68.8	0.8	3.13	-0.15
July 1984	75.5	0.3	2.56	0.47
<u>Kennebec (Lyman County Reporting Station)</u>				
Aug. 1983	81.2	6.8	0.89	-1.34
Sept. 1983	65.6	1.9	1.75	0.54
Oct. 1983	51.3	0.2	0.36	-0.70
Nov. 1983	34.1	-0.1	1.39	0.88
Dec. 1983	3.8	-18.3	0.31	-0.07
Jan. 1984	22.6	7.0	0.07	-0.18
Feb. 1984	32.7	10.2	0.35	-0.13
Mar. 1984	32.9	0.9	0.92	0.03
Apr. 1984	46.0	-1.3	4.56	2.43
May 1984	56.9	-2.0	2.10	-0.42
June 1984	69.1	0.0	4.01	1.00
July 1984	75.8	0.0	3.19	0.90
<u>Bear Butte Valley (Ft. Meade-Meade County Reporting Point)</u>				
Aug. 1983	78.9	7.2	1.41	-0.31
Sept. 1983	61.9	0.3	0.24	-0.95
Oct. 1983	50.2	-0.7	1.31	0.27
Nov. 1983	35.6	-0.3	0.86	0.16
Dec. 1983	9.5	-18.6	0.93	0.37
Jan. 1984	30.4	7.6	0.08	-0.39
Feb. 1984	36.3	8.4	0.07	-0.65
Mar. 1984	34.2	0.6	0.76	-0.26
Apr. 1984	43.1	-2.4	7.23	4.82
May 1984	55.2	-1.2	1.40	-1.91
June 1984	64.7	-1.1	7.92	4.11
July 1984	73.2	0.2	1.87	-0.36
<u>Plainview (Meade County Reporting Point)***</u>				
Aug. 1983	79.4	4.9	1.55	0.00
Sept. 1983	61.2	-1.1	1.21	0.15
Oct. 1983	47.7	0.7	2.61	-0.07
Nov. 1983	34.9	-1.1	1.15	0.69
Dec. 1983	3.1	-15.6	0.38	0.06
Jan. 1984	23.1	1.4	0.01	-0.14
Feb. 1984	31.8	4.0	0.01	-0.11
Mar. 1984	32.0	-2.9	0.84	-0.14
Apr. 1984	44.8	-2.8	2.67	1.71

(continued on next page)

Table 1. Continued

Month & Year	Average Temperature*	Departure from Normal**	Total Precipitation*	Departure from Normal**
May 1984	56.2	1.3	3.06	0.17
June 1984	65.5	-0.3	6.25	2.60
July 1984	73.8	-1.7	1.34	-0.79
<u>Rapid City (Rapid City Airport Reporting Station)</u>				
Aug. 1983	78.0	6.6	2.39	0.95
Sept. 1983	60.8	-0.1	0.33	-0.70
Oct. 1983	49.4	-0.3	1.74	0.93
Nov. 1983	34.9	0.0	1.07	0.56
Dec. 1983	8.1	-18.0	0.47	0.02
Jan. 1984	28.0	7.2	0.10	-0.32
Feb. 1984	36.1	10.1	0.18	-0.44
Mar. 1984	34.3	1.7	0.69	-0.33
Apr. 1984	43.8	-0.8	3.10	1.14
May 1984	53.6	-2.0	1.57	-1.06
June 1984	62.8	-2.4	4.72	1.46
July 1984	72.2	-0.4	1.57	-0.55
<u>Wall (Wasta-Pennington County Reporting Station)</u>				
Aug. 1983	79.8	6.5	3.19	1.68
Sept. 1983	62.3	0.1	0.36	-0.70
Oct. 1983	48.9	-1.5	1.82	0.90
Nov. 1983	35.6	0.5	1.21	0.72
Dec. 1983	5.3	-19.4	0.40	0.02
Jan. 1984	26.4	6.6	T	-0.35
Feb. 1984	35.5	9.5	T	-0.44
Mar. 1984	35.5	1.4	0.05	-0.80
Apr. 1984	46.0	-1.0	2.85	0.94
May 1984	53.4	0.0	3.15	0.00
June 1984	66.3	-1.4	3.85	0.72
July 1984	75.4	0.5	1.37	-0.68
<u>Meadow (Usta-Perkins County Reporting Station)***</u>				
Aug. 1983	78.6	6.5	2.13	-0.06
Sept. 1983	62.0	0.9	0.27	-0.35
Oct. 1983	50.4	2.1	1.87	-2.37
Nov. 1983	33.9	0.8	0.60	-0.40
Dec. 1983	0.5	-19.1	0.53	-0.32
Jan. 1984	23.2	3.6	T	-0.09
Feb. 1984	34.1	7.3	T	-0.09
Mar. 1984	32.3	-0.5	0.42	-0.32
Apr. 1984	42.9	-2.1	3.55	1.96
May 1984	54.9	-1.7	1.12	-1.22
June 1984	63.1	-1.9	4.24	1.15
July 1984	71.6	-2.7	0.51	-0.98

* Average temperatures and precipitation obtained from NOAA Climatological Data from reporting station nearest the experimental sites. Temperatures are reported in degrees Fahrenheit and precipitation in inches.

** Departures from normal are based on records for the period 1951-1980.

***Departures based on records for 1979-1984 at specified locations only.

Table 2. Weather Data - Date of Critical Temperatures and Total Useable-Precipitation in Counties with Experimental Plots, (1983-1984).

Location	Date of Temperature*		Total Useable Moisture**	
	Fall-First	Spring-Last	Aug. 83-July 84	April 84-July 84
Bennett County (Martin)	Sept. 20 (27°)	May 5 (27°)	18.20	11.46
Corson County (McIntosh)	Sept. 21 (22°)	May 1 (27°)	20.28	10.71
Harding County (Ralph)	Sept. 21 (25°)	May 26 (23°)	13.42	9.16
Jones County (Murdo)	Sept. 22 (28°)	May 1 (28°)	16.95	8.77
Lyman County (Wennebec)	Sept. 22 (24°)	May 9 (27°)	19.90	13.86
Meade County (Ft. Meade)***	Sept. 22 (28°)	May 1 (25°)	16.85	7.23
(Plainview)	Sept. 22 (28°)	May 1 (25°)	21.08	13.32
Pennington County (Rapid City)	Sept. 21 (25°)	May 1 (25°)	17.93	10.96
(Wasta)	Sept. 21 (28°)	May 9 (28°)	18.25	11.22
Perkins County (Usta)	Sept. 23 (27°)	May 3 (28°)	15.24	9.42

* First 28° temperature in Fall or last 28° temperature in Spring reported in degrees Fahrenheit.

** Sum of all precipitation where amounts were greater than 0.25 inch or totaled 0.25 inches in two contiguous days.

***Ft. Meade was used as the reporting point for Bear Butte Valley.

SMALL GRAIN VARIETY TRIALS

Objective: To observe and compare standard small grain varieties and experimental lines for winter hardiness, grain yield, grain quality, disease resistance, insect resistance, and other characteristics for area adaptability.

Hard Red Winter Wheat

Trials were located in Bennett, Harding, Meade (2 locations), Pennington, and Perkins Counties. All plots were seeded in non-fertilized fallow with a deep furrow type seeder. The seeding rate was 60 pounds per acre.

The plots were harvested with a Hege Model 125B self-propelled plot combine. Machine harvested plots contained a minimum of 125 square feet per sample. All plots contained six rows with a 12 inch spacing.

Table 3. Hard Red Winter Wheat Variety Trial-Bennett County (Martin), 1982-1984.

Variety	Percent Stand	Height (Inches)	Date of Heading	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield-Bu/A	1984 (3 yr av)
Colt	97	27	June 17	11.9	61.8	44.6	--
Bennett	98	30	17	13.5	61.1	44.1	43.4
Norstar	99	40	18	11.0	63.1	43.9	--
Rose	99	33	16	12.1	63.3	42.3	47.5
Winoka	99	39	17	13.0	63.2	42.1	40.6
Rocky	98	32	June 16	12.0	61.4	42.0	50.7
Agassiz	98	36	16	9.5	62.9	41.9	--
Gent	98	32	17	12.4	61.0	41.6	45.4
Rita	98	29	17	10.4	59.4	41.4	49.3
Nell	97	35	17	12.1	60.8	41.1	48.4
Roughrider	99	36	June 17	11.7	62.4	40.8	44.2
Siouxland	98	31	17	13.1	61.3	40.8	49.1
Lancer	98	32	17	12.7	61.6	40.1	46.0
Brule	96	29	17	9.1	58.2	39.9	50.9
SD75284	97	29	17	12.4	61.5	39.8	43.3
Agate	98	34	June 17	12.2	62.2	39.5	44.3
Nebred	97	33	16	10.6	61.7	39.2	42.5
Larned	98	30	17	11.3	61.5	39.2	47.3
SD82118	97	31	17	12.0	62.5	38.6	--
Scout 66	96	32	16	12.2	61.0	37.9	45.7
Centurk 78	99	32	June 17	11.4	61.0	37.3	47.5
SD82195	98	31	17	12.2	63.2	37.3	--
Sage	96	31	17	10.9	61.3	37.0	43.4
TAM 105	96	25	17	11.5	61.9	37.0	44.7
Archer	97	27	17	10.6	59.6	36.9	45.6
Centura	96	31	June 17	9.6	61.0	36.4	--
Dawn	97	27	17	9.9	61.0	34.5	48.3
MT7877	98	23	18	12.3	60.8	34.4	--
SD79219	94	34	17	10.6	60.3	34.2	--
Hawk	94	27	16	12.0	59.8	33.5	--
LSD(05) - 6.3 Bu/A		C.V. - 11.8%		Mean - 39.3			

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded September 14, 1983 and harvested August 1, 1984.

The winter wheat variety trial in Bennett County was seeded into fallow soil which had received good showers in mid-August. However, further useable moisture was not received until mid-October. Sufficient moisture was retained from the August precipitation for germination and good uniform stands were obtained. Winter survival was good even though December temperatures were much below normal. Moisture was below normal for all months except November and July, and air temperatures were below normal during late Spring. This combination provided favorable conditions which resulted in an average yield of 39 bushels per acre. Weights per bushel were above normal but protein content was quite low. The data are presented in Table 3.

The winter wheat variety trial in Harding County was seeded into fallow soil in mid-September. A light shower was received the day before seeding. Germination was good but winter survival was poor due to drought and low temperature. Moisture was limited but averaged near normal for the season. The precipitation in April and June was sufficient and timely, and provided moisture necessary to produce an average grain yield of 24 bushels per acre. Test weights varied but averaged near standard. Protein content was low. Yield data are shown in Table 4.

Table 4. Hard Red Winter Wheat Variety Trial-Harding County (Ralph), 1984.

Variety	Percent Stand	Height (Inches)	Date of Heading	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield-Bu/A 1984
Agassiz	71	32	June 21	10.8	62.2	35.8
Agate	57	33	20	11.1	58.8	32.2
Brule	50	26	20	10.6	58.3	32.0
Buckskin	59	29	20	11.1	61.6	30.1
Colt	60	24	19	11.9	60.3	29.3
Siouxland	76	30	June 18	11.1	60.2	27.0
Rose	65	26	20	13.1	61.6	26.1
Roughrider	44	30	20	12.8	60.5	25.6
Bennett	41	27	19	14.3	60.3	25.2
Centura	39	28	19	11.3	60.2	25.0
Sage	61	26	June 18	12.7	61.2	24.9
TAM 105	65	23	17	—	60.2	24.6
Norstar	65	29	19	11.5	59.8	23.0
Rita	44	27	20	11.8	60.0	21.0
Scout 66	54	27	18	13.0	61.7	20.4
Archer	10	27	June 20	12.4	57.5	19.9
Centurk 78	30	25	19	11.4	60.4	19.4
Lancota	29	30	19	13.2	57.0	19.1
Dawn	29	32	19	12.2	59.9	18.6
Hawk	19	24	19	11.7	59.4	13.5
Rocky	11	29	20	13.1	58.8	13.5
LSD(05) - 7.6 Bu/A			C.V. - 22.1%		Mean - 24.1	

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded September 15, 1983 and harvested August 6, 1984.

Winter wheat varieties in Bear Butte Valley were seeded in fallow soil which was somewhat cloddy, dry at the surface but moist at seeding depth. The area received good showers in mid-August, and fair showers in early October. Above normal precipitation was received in April and June. Air temperatures were much below normal in December but above normal in January and February. Cool temperatures and good spring rains were favorable for growth resulting in excellent grain yields with above standard weights per bushel. Protein content was very low when compared with previous years values. Yield and other data are shown in Table 5.

Table 5. Hard Red Winter Wheat Variety Trial-Meade County (Bear Butte Valley), 1982-84.

Variety	Height (Inches)	Date of Heading	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield-Bu/A 1984 (3 yr av)	
Norstar	46	June 16	10.3	65.4	59.1	48.3
SD82195	38	14	12.4	64.8	54.7	—
Rose	35	13	11.3	64.7	53.4	47.0
SD82118	35	12	12.7	64.3	52.5	—
Winoka	43	12	10.7	64.6	51.6	43.3
Lancer	38	June 13	11.1	63.9	51.1	46.6
Agassiz	42	15	9.8	64.8	50.5	—
Colt	32	12	12.7	64.1	50.3	—
Agate	36	13	11.3	64.0	50.1	45.9
Roughrider	37	13	12.8	64.2	49.7	43.4
Siouxland	38	June 13	10.3	65.2	49.5	—
Brule	32	14	11.6	62.5	49.1	49.2
Nebred	36	12	11.9	64.3	47.6	—
SD75284	35	12	12.6	64.8	47.4	44.6**
SD75219	35	13	11.9	64.4	46.3	—
Nell	36	June 12	13.3	63.3	46.2	48.9
Centurk 78	35	12	11.4	64.1	44.1	45.3
Larned	35	11	12.2	64.0	43.9	—
Rocky	35	13	11.9	63.3	43.4	43.0
Gent	37	11	12.9	63.5	43.4	46.2
TAM 105	30	June 12	12.3	63.7	42.9	50.2
Hawk	34	12	12.0	63.3	42.3	43.0**
Archer	32	14	11.8	61.5	41.5	47.3
MT7877	26	14	11.3	63.6	40.5	—
Centura	34	12	12.0	63.8	40.0	—
Bennett	32	June 12	13.7	62.2	40.0	46.3
Sage	35	11	13.1	63.6	39.8	45.5
Dawn	34	13	11.3	63.4	39.7	45.3
Rita	34	14	12.1	60.8	38.7	42.6
Scout 66	35	11	12.2	63.6	36.3	45.0
LSD(05) - 5.8 Bu/A		C.V. - 7.7%		Mean - 40.2		

* Percent protein determined with Technicon 300 InfraAnalyzer.

**Two year average.

Note: Data presented within the table are an average of four replications. Plots were seeded September 13, 1983 and harvested July 27, 1984.

Winter wheat plots at Plainview were seeded into fallow soil which was mellow but in a dry condition. Some moisture had been received in mid-August and early September. Slightly over a third of an inch was received after planting, and an inch and a half of rain in early October. Germination and emergence were excellent resulting in thick uniform stands. Temperatures in October were above normal and below normal in November. That combination resulted in vigorous seedlings which hardened and were protected from the severe cold of December. Cool temperatures during spring with good rainfall resulted in above average yields of high quality grain. Yield and other data are shown in Table 6.

Table 6. Hard Red Winter Wheat Variety Trial-Meade County (Plainview), 1982-1984.

Variety	Height (Inches)	Date of Heading	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield-Bu/A	
					1984	(3 yr av)
SD82118	44	June 12	14.1	63.0	74.8	—
Norstar	51	17	12.8	62.6	72.2	53.5
Rocky	40	14	12.4	61.1	71.1	58.6
SD82195	41	15	12.5	61.7	69.2	—
Brule	36	14	11.5	60.2	66.6	58.3
Archer	34	June 14	12.1	59.1	66.1	57.5**
SD79219	39	14	12.0	61.1	65.6	—
SD75284	39	13	13.3	61.7	65.5	57.5
Agate	43	15	11.9	62.9	65.0	53.7
Rose	36	14	13.0	58.9	64.6	57.1
Roughrider	44	June 15	13.4	61.8	64.0	51.9
Siouxland	37	12	12.7	60.3	63.6	—
Gent	39	13	13.1	60.7	63.4	54.6
Nebred	41	13	13.1	61.8	62.9	—
Lancer	40	13	13.0	61.1	62.8	53.2
Centurk 78	37	June 14	11.9	62.4	62.5	55.2
Agassiz	46	17	12.6	60.0	61.4	—
Centura	38	13	12.2	61.8	59.2	—
Sage	38	12	12.5	60.2	59.2	53.9
Scout 66	38	12	13.2	61.3	58.0	55.2
Winoka	44	June 13	12.2	64.2	57.4	50.3
Larned	36	13	13.3	62.1	57.0	—
Dawn	33	15	11.9	59.9	56.5	53.1
Rita	33	16	13.1	58.6	55.9	51.5
Nell	39	14	14.8	61.0	55.6	51.9
Hawk	34	June 13	12.0	58.6	53.8	54.3**
TAM 105	44	13	12.7	61.3	53.8	53.1
Bennett	34	14	14.5	60.0	52.6	51.9
MT7877	42	16	11.6	60.5	50.8	—
Colt	29	15	13.8	60.7	50.6	—
ISD(05) - 18.0 Bu/A		C.V. - 18.0%		Mean - 61.4		

* Percent protein determined with Technicon 300 InfraAnalyzer.

**Two year average.

Note: Data presented within the table are an average of three replications. Plots were seeded September 13, 1983 and harvested July 26, 1984.

The winter wheat variety trial in Pennington County was seeded into fallow soil with fair moisture. A heavy shower was received in mid-August, a light shower in September just prior to seeding, and a light shower in early October. Precipitation during the winter was below normal and above normal during the spring.

The moisture received in late spring resulted in winter wheat yields of over 50 bushels per acre. The quality of grain was excellent with weights per bushel ranging from 59 to 64 pounds. Protein content ranged from 12% to 17.7%. Yield and other data are shown in Table 7.

Table 7. Hard Red Winter Wheat Variety Trial-Pennington County (Wall), 1982-1984.

Variety	Height (Inches)	Date of Heading	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield-Bu/A	
					1984	(3 yr av)
Brule	34	June 17	11.5	60.4	58.7	57.5
SD82118	35	17	13.7	62.2	58.4	--
Gent	35	14	12.9	64.0	58.0	48.9
Rose	34	15	13.2	62.3	57.1	57.0
Siouxland	36	15	12.5	62.3	57.1	56.2
Roughrider	42	June 18	14.1	62.7	57.0	53.8
Nell	35	15	13.9	63.2	56.8	54.6
SD82195	37	19	13.1	62.4	56.4	--
Scout 66	36	14	12.2	63.0	55.8	52.5
SD75284	34	15	12.7	61.5	55.7	54.3
Lancer	39	June 16	13.1	62.9	55.6	55.0
Sage	33	15	13.0	63.4	54.9	52.4
Agassiz	45	19	14.7	63.4	54.8	--
Agate	37	18	13.0	62.7	54.5	54.8
Norstar	45	20	13.2	60.6	54.4	59.5**
Rocky	36	June 16	12.8	62.5	53.8	54.6
Colt	28	17	13.0	61.6	53.3	--
Dawn	33	16	12.6	62.4	53.2	53.8
SD79219	36	18	12.9	61.6	52.6	--
Centurk 78	35	17	13.4	61.5	51.9	53.1
Nebred	37	June 16	13.8	62.6	51.8	50.9
Bennett	32	14	14.1	61.5	51.1	51.5
Larned	34	14	13.0	62.8	51.0	51.8
Winoka	42	17	13.2	64.2	50.1	50.2
Archer	29	17	12.9	59.8	49.7	51.7
Centura	33	June 16	13.0	61.9	49.7	--
Hawk	34	16	13.1	60.4	49.4	61.0**
TAM 105	28	14	12.4	63.0	46.7	52.7
MT7877	26	20	12.9	61.9	45.6	--
Rita	31	17	14.0	59.5	44.8	51.3
LSD(05) - 5.4 Bu/A		C.V. - 7.2%		Mean - 53.4		

* Percent protein determined with Technicon 300 InfraAnalyzer.

**Two year average.

Note: Data presented within the table are an average of four replications.

The trial in Perkins County was seeded in mid-September. Stored soil moisture was minimal because subnormal rainfall was received during the summer of 1983. Precipitation was limited throughout the fall and spring. However, April and June received above normal rainfall. That moisture was sufficient to produce above average wheat yields. Winterkill varied between varieties and ranged from slight to severe. Grain quality was good with average protein content and normal weights per bushel. Grain yield and other data are listed in Table 8.

Table 8. Hard Red Winter Wheat Variety Trial-Perkins County (Meadow), 1982-1984.

Variety	Percent Stand	Height (Inches)	Date of Heading	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield-Bu/A 1984	(3 yr av)
MT7877	95	26	June 21	12.4	61.1	59.3	--
Roughrider	97	40	21	13.9	60.8	55.8	46.5
Norstar	96	46	23	13.9	60.4	55.2	55.1**
Agassiz	91	44	21	13.8	61.8	55.1	--
Winoka	93	40	22	14.0	62.2	54.4	45.7
Nebred	90	38	June 20	13.7	60.7	53.2	40.7
Rose	86	33	20	13.7	62.5	52.3	48.8
Siouxland	87	34	19	13.1	59.6	51.5	41.3
SD82195	89	36	20	13.0	61.8	50.8	--
Nell	84	37	19	14.3	60.7	50.1	41.6
Agate	65	36	June 20	12.9	61.3	49.0	40.1
Gent	74	33	19	13.3	60.3	47.5	35.0
Colt	74	27	20	13.3	59.6	46.6	--
SD82118	73	35	19	14.0	62.2	46.3	--
Bennett	81	33	18	14.7	60.1	45.4	34.5
Rita	70	31	June 20	13.6	59.3	45.4	38.3
Sage	77	33	18	13.2	60.5	45.4	35.7
Larned	61	36	19	13.1	61.3	44.2	29.7
SD79219	63	38	21	12.9	59.8	44.0	--
Scout 66	73	35	19	13.0	61.0	43.2	31.7
SD75284	80	34	June 19	14.1	61.4	43.2	34.1
Lancer	80	37	20	13.2	60.6	42.9	36.3
Rocky	53	32	20	13.0	61.0	42.6	48.4**
Archer	66	30	20	12.8	58.2	42.3	34.6
TAM 105	71	26	18	12.8	60.4	41.8	35.3
Brule	63	31	June 20	11.5	58.2	38.3	37.5
Centura	59	34	19	12.3	60.1	36.8	--
Dawn	51	31	19	12.1	60.6	36.0	33.5
Hawk	44	31	19	12.6	60.3	35.9	43.8**
Centurk 78	34	35	20	12.3	61.0	33.9	34.8
LSD(05) - 9.5 Bu/A		C.V. - 14.7%		Mean - 46.3			

* Percent protein determined with Technicon 300 InfraAnalyzer.

**Two year average.

Note: Data presented within the table are an average of four replications. Plots were seeded September 16, 1983 and harvested August 7, 1984.

Hard Red Spring Wheat

Plots were seeded at seven locations in 1984. All trials were seeded on fallow with a six row plot seeder having an 8 inch row spacing.

Seeding rate was controlled by prepackaging all seed. Fertilizer requirements were predetermined by soil test. Harvesting was accomplished with a self-propelled plot combine. Grain yields and other data are reported in Tables 9 through 15.

Bennett County

Hard red spring wheat plots at Martin were seeded on April 20 in soil fallowed in 1983. Soil moisture was good at seeding time. Precipitation was slightly below normal through the spring, however, the showers which were received were timely. Rainfall in June was limited, but in early July two showers of over an inch each were received. Grain yields were similar to the two previous years. Test weights were reduced and protein content high which indicated kernel development was restricted by drought stress during maturation. Yield and other data are listed in Table 9.

Corson County

Spring wheat trials were seeded near McIntosh on May 10. The soil was mellow with good moisture from recent snow. The area received snow in mid-April, and again in late April when snow depth reached eight inches. May rainfall came early in the month just prior to seeding. June precipitation came as showers of several days duration and brought the season total to normal. July was a drought period with only one shower of .75 inch early in the month. The plants had few tillers but yields averaged 124% of the average (1965-1970) yields. Weights per bushel were below standard and proteins above normal because of moisture shortage during maturation. The yield and other data are presented in Table 10.

Harding County

Spring wheat variety trials at Ralph were seeded in early May. Soil moisture was excellent as a result of heavy snowfall in late April. Rainfall during May was 2 inches below normal, June was .84 inch above, and July was short by 1.45 inches. The yields were excellent when considering the shortage of moisture during July. The trial average was 150% of the county average for the years 1965-1970. Grain quality was excellent with most test weights over the standard weight and protein contents from 13% to 16%. Trial data can be found in Table 11.

Meade County (Bear Butte Valley)

Variety trials of spring wheat in Bear Butte Valley were seeded in fallow soil. Soil moisture at seeding was adequate because of snow received in early April. In late April, heavy snow which yielded 6.5 inches of water was received. Rainfall was limited in May, much above normal in June, and was short in July with none received after mid-month. Cool temperatures during April, May, and June resulted in much tillering and vigorous plants. Test weights were good but were reduced because of changes in seed coat after maturity. Grain yields were considerably above the previous year's yields as shown by the 3 year average. Yields and other data can be found in Table 12.

Meade County
(Plainview)

The spring wheat variety trial at Plainview was seeded into soil which had been fallowed in 1983, and had fair moisture content. Below normal precipitation fell in March, wet snow in late April, normal precipitation in May, above normal by 2.6 inches in June, and .79 inch short in July. Temperatures were below normal during April, above normal in May, and below normal during July. Grain yields were below the 1983 average but were double the 1981-82 average. Weights per bushel were slightly reduced because of moisture shortage during late July and August. The trial data are reported in Table 13.

Pennington County

The variety trial at Wall was seeded in fallow on April 17. Soil moisture was adequate for germination and emergence. Snowfall in late April and above normal rain showers in June provided moisture necessary to produce above average grain yields. Weights per bushel were normal. The trial data are reported in Table 14.

Perkins County

The spring wheat variety trial in Perkins County was seeded on May 10 in fallow soil. Soil moisture was adequate for germination and emergence. Snow received in April and above normal rain during June, along with cool temperatures resulted in above average grain yields. The quality of grain was fair with weights per bushel ranging from 52 to 58 pounds. Protein content ranged from 14.8% to 18.0%. The trial data are reported in Table 15.

Table 9. Hard Red Spring Wheat Variety Trial - Bennett County (Martin), 1982-84.

Variety	Height (Inches)	Date of Heading	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/A	
					1984	(3 yr av)
SD8026	32	June 25	16.4	59.8	42.0	—
Alex	34	25	16.4	58.8	41.5	38.4
SD2956	28	26	15.4	57.9	40.7	—
Wheaton	26	26	15.4	56.0	39.6	—
Leif	28	25	16.6	56.0	39.3	—
Guard	27	June 26	14.9	59.2	39.2	36.6
Norseman	24	26	16.4	54.9	38.6	—
Causmex A99AR	34	25	16.1	53.0	38.4	—
Victory 283	34	25	16.5	61.4	38.3	—
Angus	28	25	16.2	57.2	38.1	35.6
Success	29	June 26	15.4	52.4	38.1	—
Causmex A88	20	27	15.2	59.0	38.0	—
Erik	27	26	16.2	49.8	37.8	—
Norak	25	26	15.5	58.6	37.5	—
Stoa	34	25	17.0	56.8	37.4	—
Len	28	June 25	17.1	56.3	37.2	36.6
Marshall	24	26	15.5	54.6	36.6	36.6
2369	27	26	16.3	58.7	36.3	36.0
Challenger	25	26	15.4	57.0	35.7	—
Centa	32	24	15.9	61.0	35.7	36.1
Era	26	June 26	15.2	54.7	35.6	34.4
Olaf	28	25	16.4	56.2	35.2	36.4
Oslo	24	26	14.8	56.5	34.7	37.0
SD 8036	30	25	15.4	60.1	34.7	—
Buckshot	26	27	15.8	52.7	34.6	—
Apex	24	June 26	15.0	58.0	34.1	—
711	27	26	15.5	57.3	34.1	35.0
Eureka	34	25	16.9	56.5	34.0	33.8
Butte	34	25	16.2	59.6	34.0	—
SD2968	30	26	16.6	56.7	33.7	—
James	30	June 25	16.5	56.5	32.5	34.6
Pondera	28	26	16.6	57.2	30.3	29.3
Chris	35	26	16.6	56.0	29.6	29.5
LSD(05) - 3.9 Bu/A		C.V. - 7.7%		Mean - 36.5		

*Percent protein determined with Technicon 300 InfraAnlayzer.

Note: Data presented within the table are an average of four replications. Plots were seeded on April 20 and harvested August 2, 1984.

Table 10. Hard Red Spring Wheat Variety Trial - Corson County (McIntosh), 1984.

Variety	Height (Inches)	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield Bu/Acre
Guard	26	14.9	58.3	38.7
Wheaton	26	15.0	56.3	38.6
Norak	23	14.1	57.5	38.3
Norseman	25	15.9	55.1	38.2
SD295	27	14.6	58.4	38.0
2369	27	13.8	58.1	35.9
Olaf	28	15.8	58.9	35.2
Oslo	25	13.9	56.3	34.9
Success	29	15.3	55.9	34.8
Challenger	25	14.4	57.4	34.6
Apex	24	14.2	57.8	34.5
Leif	28	14.7	57.5	34.1
711	26	14.4	58.4	32.6
Angus	28	14.9	59.1	32.6
Buckshot	28	15.9	54.4	32.4
Len	28	16.5	56.8	31.7
Era	28	14.6	56.0	30.6
SD2968	29	15.2	58.8	30.5
Marshall	25	15.7	54.8	28.7
Causmex A88	20	16.0	56.9	27.5
Erik	27	15.2	52.4	27.2
Victory 283	32	17.6	57.4	25.7
SD8026	31	17.9	55.9	23.5
Centa	32	15.8	59.2	22.5
Pondera	31	17.4	56.8	21.3
SD8036	27	17.7	55.6	19.4
Eureka	32	18.1	55.0	18.9
Stoa	31	17.2	55.4	18.7
Chris	35	17.0	56.0	18.2
Alex	31	18.9	57.0	17.5
Butte	32	16.6	57.2	16.9
James	30	17.8	54.9	16.6
Causmex A99AR	34	17.8	52.5	15.6
LSD(05) - 6.8 Bu/A		C.V. - 17.1%	Mean - 28.6	

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded May 10 and harvested August 22, 1984.

Table 11. Hard Red Spring Wheat Variety Trial - Harding County (Ralph), 1982-1984.

Variety	Height (Inches)	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/Acre	
				1984	(3 yr av)
SD2956	25	14.4	62.7	38.6	--
Guard	24	14.3	62.2	36.5	47.0
Oslo	23	12.9	60.2	36.0	43.1
SD2968	25	14.8	63.2	33.6	--
Angus	25	14.2	62.5	33.5	--
2369	24	14.5	61.8	33.4	40.6
Len	26	16.0	61.6	33.0	41.8
711	25	14.2	62.1	32.0	38.6
Norak	24	13.1	62.8	32.0	--
Norseman	22	15.0	60.2	31.6	--
Wheaton	23	14.6	58.7	31.3	--
Leif	25	13.6	61.6	31.1	--
Olaf	25	15.1	60.5	30.8	43.0
Marshall	22	14.1	60.1	28.9	43.0
Buckshot	23	14.5	60.8	28.3	--
Challenger	23	13.8	61.2	27.0	--
Apex	23	13.5	62.2	26.1	--
Alex	27	13.9	61.5	26.0	43.8
Success	24	13.7	59.2	26.0	--
Stoa	26	13.9	60.3	25.2	--
Victory 283	26	14.9	62.2	25.2	--
Era	18	14.0	61.0	24.7	36.8
Erik	24	14.4	57.8	24.4	--
Centa	25	14.5	63.4	23.8	39.8
Eureka	26	15.0	59.8	23.6	38.9
Butte	25	14.6	62.5	23.4	41.0
Pondera	24	14.3	62.7	23.1	35.0
SD8026	24	13.6	59.3	23.0	--
SD8036	23	12.9	63.7	22.6	--
Causmex A99AR	26	14.3	58.0	22.4	--
James	24	15.8	60.6	21.8	39.1
Causmex A88	18	13.5	60.1	20.9	--
Chris	26	15.2	60.3	20.4	33.6
LSD(05) - 5.0 Bu/A		C.V. - 12.9%		Mean - 27.9	

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded May 9 and harvested August 13, 1984.

Table 12. Hard Red Spring Wheat Variety Trial - Meade County (Bear Butte Valley), 1982-84.

Variety	Height (Inches)	Date of Heading	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/A 1984 (3 yr av)	
Apex	29	June 24	13.6	59.6	58.7	—
Challenger	30	25	13.7	58.7	58.2	—
Oslo	29	24	13.8	57.5	56.0	42.6
Causmex A88	22	24	14.9	56.7	54.7	—
Wheaton	29	29	14.0	55.8	53.2	—
Buckshot	31	June 30	14.1	56.8	53.2	—
SD8036	34	26	14.0	60.5	51.4	—
711	30	29	13.9	58.6	51.1	36.8
SD2956	30	28	14.7	57.4	50.6	—
SD8026	37	26	14.1	59.4	50.4	—
Success	33	July 2	14.8	58.4	50.3	—
Norak	28	June 28	14.0	57.6	50.3	—
Norseman	29	July 1	14.0	56.3	50.1	—
Marshall	29	1	15.0	56.5	50.1	35.5
Leif	32	1	15.2	59.4	49.8	—
Angus	31	July 1	14.9	60.8	49.6	—
2369	30	June 28	14.1	60.3	49.1	—
Centa	37	24	15.5	59.9	48.0	37.0
Era	30	July 2	14.2	58.7	46.9	—
Guard	31	June 27	14.8	58.7	46.7	—
James	36	June 26	15.3	57.0	46.6	36.8
Erik	31	July 2	14.6	59.6	46.3	—
Causmex A99AR	38	1	15.2	60.3	43.3	—
Stoa	38	June 30	15.2	58.8	42.9	—
Butte	36	26	15.6	59.8	41.4	34.4
Olaf	31	June 30	14.8	57.6	40.1	34.3
Victory 283	35	28	15.7	59.2	38.4	—
Pondera	30	28	15.3	58.6	38.1	32.5
Alex	36	30	14.7	61.5	36.9	31.1
Len	30	30	15.5	56.5	36.2	30.4
Chris	37	June 28	16.7	59.8	35.5	—
Eureka	38	30	16.2	58.0	34.7	32.5
SD2968	31	July 1	16.3	58.6	34.4	—

LSD(05) - 4.4 Bu/A

C. V. - 6.7%

Mean - 46.8

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded April 23 and harvested August 15, 1984.

Table 13. Hard Red Spring Wheat Variety Trial - Meade County (Plainview), 1982-84.

Variety	Height (Inches)	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/Acre	
				1984	(3 yr av)
SD2956	25	15.5	59.4	27.4	—
Marshall	23	15.9	54.6	27.2	28.9
Era	22	14.7	53.6	26.8	—
Norseman	22	16.0	54.0	26.8	—
Angus	25	15.7	57.2	26.3	—
Buckshot	25	16.0	52.1	25.5	—
Butte	28	15.4	60.8	25.3	32.1
Olaf	25	15.7	57.2	24.7	28.8
Stoa	28	16.3	55.4	24.5	—
Erik	23	16.1	52.4	24.2	—
Apex	25	14.9	59.4	24.2	—
Centa	29	14.8	62.4	23.9	30.2
SD8026	27	15.0	60.4	23.8	—
Victory 283	29	15.7	58.6	23.7	—
Challenger	23	—	60.1	23.3	—
Alex	29	16.8	55.9	22.9	30.3
James	27	15.9	57.7	22.8	28.4
Success	24	15.8	50.2	22.3	—
Len	25	16.4	56.9	22.2	26.6
Causmex A99AR	29	16.9	50.8	22.0	—
Leif	24	16.0	54.4	22.0	—
Guard	23	15.3	57.7	22.0	—
SD8036	25	14.6	63.0	21.6	—
Wheaton	21	15.8	56.2	21.4	—
Chris	28	17.2	57.4	20.9	—
711	25	14.6	58.5	20.9	—
2369	24	15.9	59.9	20.8	—
Oslo	21	15.1	58.5	20.6	29.6
Causmex A88	17	15.3	58.9	20.4	—
SD2968	25	15.6	56.7	19.8	—
Norak	23	15.5	59.4	19.7	—
906R	23	14.9	55.0	19.1	26.4
Pondera	25	16.6	60.1	19.0	28.1
Eureka	29	16.8	56.4	18.4	24.8

ISD(05) - 7.6 Bu/A

C.V. - 20.6%

Mean - 22.8

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of three replications. Plots were seeded May 15 and harvested August 14, 1984.

Table 14. Hard Red Spring Wheat Variety Trial - Pennington County (Wall), 1982-84.

Variety	Height (Inches)	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/Acre	
				1984	(3 yr av)
Wheaton	28	16.2	53.6	45.4	—
Apex	28	15.0	55.5	44.0	—
Challenger	28	15.4	56.2	42.4	—
Oslo	28	14.4	54.6	42.2	39.8
Guard	30	16.1	56.6	41.5	36.6
Norseman	27	16.0	53.1	41.1	—
SD2956	30	15.7	55.7	40.5	—
Marshall	28	15.1	55.6	39.9	37.3
711	28	15.1	56.5	39.4	34.9
Causmex A88	22	15.2	53.2	39.3	—
Norak	28	15.1	55.2	39.1	—
Buckshot	30	15.2	54.1	38.9	—
2369	29	16.1	57.8	38.8	37.6
Leif	32	16.0	58.1	38.0	—
906R	28	15.3	54.0	37.4	37.8
Era	30	14.8	55.6	37.1	35.2
SD8026	34	15.5	57.3	35.9	—
Angus	30	15.9	57.2	35.4	33.5
Erik	31	15.2	53.9	35.3	—
Centa	34	15.8	57.5	34.6	37.0
Olaf	30	16.4	55.2	34.4	35.6
SD8036	32	15.7	57.7	33.9	—
Success	32	14.7	53.0	33.8	—
Butte	33	15.2	56.5	33.6	37.7
Victory 283	36	16.4	57.5	32.9	—
Causmex A99AR	37	15.8	54.1	32.5	—
Alex	35	15.5	56.7	32.5	35.1
Eureka	36	16.8	54.6	32.2	33.1
Stoa	36	16.2	54.9	32.0	—
Len	30	17.0	54.0	31.9	35.2
James	32	15.5	53.8	31.4	34.9
SD2968	32	16.3	56.3	30.2	—
Chris	36	16.0	55.8	29.6	30.2
Pondera	29	16.5	55.7	28.4	30.2
LSD(05) - 4.4 Bu/A C.V. - 8.7% Mean - 36.3					

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded April 17 and harvested August 23, 1984.

Table 15. Hard Red Spring Wheat Variety Trial - Perkins County (Bison), 1981-1984.

Variety	Height (inches)	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/Acre 1984	(4 yr av)
Apex	29	15.1	55.6	44.3	—
Leif	33	15.5	58.3	39.8	—
SD2956	32	15.5	55.9	39.2	—
Norak	28	15.1	55.7	38.8	—
Challenger	28	15.2	55.6	38.7	—
Norseman	27	16.1	52.6	38.6	—
Oslo	28	14.8	55.1	38.5	29.8
Guard	31	15.9	57.0	38.2	—
Wheaton	29	15.9	52.2	38.1	—
Angus	31	16.6	57.5	37.6	29.0
Buckshot	30	16.0	52.4	36.4	—
2369	31	15.6	55.9	36.3	—
Centa	37	16.3	56.5	36.3	—
Olaf	32	16.1	57.2	36.0	28.2
Causmex A88	23	15.3	54.1	35.7	—
SD8036	35	16.0	56.7	35.1	—
Success	31	16.2	53.2	34.3	—
SD8026	35	16.2	56.0	34.1	—
Era	29	14.9	54.3	33.9	30.3
Butte	38	17.4	56.4	33.6	28.2
Len	30	17.0	55.5	33.3	30.0
Victory 283	36	16.9	57.4	33.2	—
711	31	14.9	56.3	33.0	29.5
Eureka	37	16.2	54.7	32.4	26.7
Marshall	28	15.5	53.6	32.4	29.5
Stoa	36	16.6	55.1	32.2	—
Pondera	32	17.3	56.4	32.2	28.6
SD2968	33	16.1	57.6	31.7	—
James	34	17.0	52.7	31.6	25.9
Erik	30	16.4	53.3	30.6	—
Alex	37	16.9	57.4	30.4	27.9
Causmex A99AR	38	16.4	52.3	29.6	—
Chris	40	18.0	54.7	24.9	24.2
<hr/>					
LSD(05) - 3.8 Bu/A	C.V. - 7.8%		Mean - 34.9		

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded May 10 and harvested August 21, 1984.

Durum Wheat

Durum wheat variety trials were seeded at seven locations in 1984. The remarks and discussion pertinent to these trials were included in the Hard Red Spring Wheat section and can be found on pages 13, 14, and 15. The yields and other data are listed in Tables 16 through 22.

Table 16. Durum Wheat Variety Trial - Bennett County (Martin), 1982-84.

Variety	Height (Inches)	Date of Heading	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/A 1984 (3 yr av)	
Edmore	35	June 26	15.0	56.5	41.9	29.2
Vic	32	27	14.9	57.7	39.7	30.3
Ward	32	26	15.0	57.2	38.9	29.8
Crosby	32	27	15.7	58.9	38.2	29.3
Rugby	33	27	15.3	55.8	38.0	29.7
Lloyd	27	28	15.7	52.7	37.4	29.8

LSD(05) - 2.6/A

C.V. - 4.6%

Mean - 39.0

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded April 20 and harvested August 2, 1984.

Table 17. Durum Wheat Variety Trial - Corson County (McIntosh), 1984.

Variety	Height (Inches)	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield Bu/Acre
Crosby	31	11.4	61.3	22.6
Edmore	33	13.2	61.3	20.3
Lloyd	25	10.5	59.2	20.1
Ward	32	13.9	60.9	17.9
Vic	31	12.0	61.2	17.0
Rugby	30	13.9	60.2	15.2

LSD(05) - 5.1 Bu/A

C.V. - 20.8%

Mean - 16.5

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded May 10 and harvested August 22, 1984.

Table 18. Durum Wheat Variety Trial - Harding County (Ralph), 1982-84

Variety	Height (Inches)	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/A	
				1984	(3 yr av)
Lloyd	25	11.8	55.3	42.6	45.8
Crosby	29	12.8	60.8	38.6	43.0
Vic	30	13.6	56.3	38.4	41.5
Ward	30	13.7	56.9	38.4	43.0
Rugby	32	13.3	57.3	36.4	43.4
Edmore	30	13.7	56.5	36.1	37.9
LSD(05) - 3.5 Bu/A		C.V. - 6.3%	Mean - 33.4		

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded May 9 and harvested August 13, 1984.

Table 19. Durum Wheat Variety Trial - Meade County (Bear Butte Valley), 1982-1984.

Variety	Height (Inches)	Date of Heading	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/A	
					1984	(3 yr av)
Vic	37	July 1	14.3	63.1	49.1	36.7
Crosby	37	June 28	13.3	61.0	44.8	35.7
Edmore	39	30	14.1	62.2	44.6	35.2
Ward	36	29	13.9	60.8	44.3	--
Rugby	37	30	14.4	60.3	40.1	35.6
Lloyd	28	July 1	13.3	55.0	37.5	31.1
LSD(05) - 5.5 Bu/A		C.V. - 8.9%		Mean - 43.4		

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded April 23 and harvested August 15, 1984.

Table 20. Durum Wheat Variety Trial - Meade County (Plainview), 1982-84.

Variety	Height (Inches)	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/A	
				1984	(3 yr av)
Crosby	30	13.9	58.8	29.2	25.6
Edmore	30	14.7	56.1	28.5	27.6
Ward	30	14.0	57.2	27.8	--
Rugby	30	14.2	56.0	25.6	25.8
Lloyd	23	13.7	52.4	24.5	--
Vic	30	14.1	55.6	24.4	25.9
LSD(05) - 2.1 Bu/A		C.V. - 4.6%	Mean - 26.6		

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of three replications. Plots were seeded May 15 and harvested August 14, 1984.

Table 21. Durum Wheat Variety Trial - Pennington County (Wall), 1982-84.

Variety	Height (Inches)	Date of Heading	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/A	
					1984	(3 yr av)
Crosby	36	July 1	14.4	57.2	34.6	22.5
Ward	35	2	14.7	57.6	32.0	23.1
Vic	35	2	13.9	57.5	31.0	21.6
Edmore	34	2	13.9	58.0	30.7	20.5
Rugby	34	2	14.2	56.9	28.7	22.2
Lloyd	28	3	13.9	52.0	27.9	23.0
LSD(05) - 2.9 Bu/A		C.V. - 6.4%		Mean - 30.8		

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded April 17 and harvested August 23, 1984.

Table 22. Durum Wheat Variety Trial - Perkins County (Bison), 1982-84.

Variety	Height (Inches)	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/A	
				1984	(3 yr av)
Crosby	36	14.7	58.9	35.4	32.6
Ward	34	14.5	59.4	34.6	33.2
Vic	34	14.3	61.0	32.8	32.5
Edmore	34	14.5	59.3	30.7	31.3
Rugby	35	14.3	58.8	30.6	32.7
Lloyd	24	13.3	57.5	28.7	33.9
LSD(05) - 4.3 Bu/A		C.V. - 9.4%		Mean - 32.1	

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded May 10 and harvested August 21, 1984.

Triticales

Plots were seeded at four locations in 1984. All trials were seeded in fallow with a six row plot seeder having an eight row spacing. Seeding rate was controlled by prepackaging all seed. Fertilizer requirements were predetermined by soil test. Harvesting was accomplished with a self-propelled plot combine. Grain yields and other data are reported in Tables 23 through 26.

Triticale varieties seeded at the four locations had yields similar to the adjacent durum wheat varieties. The climatic conditions under which the tests were conducted are discussed under the hard red spring wheat trials. The present varieties have an inherent shrivelled kernel which has a standard weight of 50 pounds per bushel. It is best utilized as a grain feed for swine or poultry.

Table 23. Triticales Variety Trial - Corson County (McIntosh), 1984.

Variety	Height (Inches)	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield (Bu/Acre)
SD9009	36	10.0	49.8	12.6
Kramer	32	9.9	49.0	11.7

Mean - 12.2

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded May 10 and harvested August 22, 1984.

Table 24. Triticales Variety Trial - Harding County (Ralph), 1983-84.

Variety	Height (Inches)	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/Acre 1984	(2 yr av)
SD9009	36	9.7	49.3	38.2	33.0
Kramer	32	10.0	50.3	36.8	32.3

Mean - 37.5 32.6

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded May 9 and harvested August 13, 1984.

Table 25. Triticales Variety Trial - Meade County (Bear Butte Valley), 1984.

Variety	Height (Inches)	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield (Bu/Acre)
Kramer	33	10.1	46.0	44.3
SD9009	38	9.8	46.6	40.1

Mean - 42.2

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded April 23 and harvested August 15, 1984.

Table 26. Triticales Variety Trial - Perkins County (Bison), 1983-84.

Variety	Height (Inches)	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/Acre 1984	(2 yr av)
SD9009	42	11.2	46.5	32.1	37.2
Kramer	39	11.7	45.5	27.6	34.8

Mean - 29.8 36.0

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented with the table are an average of four replications. Plots were seeded May 10 and harvested August 21, 1984.

Oat Variety Trials

Oat variety trials were conducted on a cooperative basis at seven locations in 1984. Seeding dates ranged from April 17 to May 15. All trials were seeded on fallow with six row plot seeder having an 8 inch row spacing. Seeding rates were controlled by prepackaging all seed. Fertilizer requirements were predetermined by soil test. Harvesting was accomplished with a self-propelled plot combine. Grain yields and other data are reported in Tables 27 through 33.

Table 27. Oat Variety Trial - Bennett County (Martin), 1982-84.

Variety	Height (Inches)	Date of Heading	Test Weight (Lbs/Bu)	Grain Yield-Bu/A	
				1984	(3 yr av)
Lang	28	June 19	37.2	85.1	80.0
Porter	31	28	38.8	83.2	74.5
Ogle	29	23	36.4	82.5	79.1
Wright	35	26	39.3	78.2	71.0
Haylander II (BL)	36	25	37.2	78.1	--
Otee	30	June 21	39.5	77.5	73.6
Wheaton	29	19	35.7	77.3	--
Benson	32	26	39.3	76.2	73.6
Lyon	38	27	37.0	75.8	68.6
Bates	27	20	36.9	75.4	72.8
Larry	27	June 20	38.4	74.4	78.2
SD800043	35	26	37.6	72.5	--
Moore	36	26	37.5	72.1	74.5
SD800312	34	22	37.7	71.0	--
Nodaway 70	32	20	40.7	70.3	69.0
Exp 100 (BL)	32	June 20	39.5	69.9	--
Steele	34	27	38.0	69.0	--
Preston	32	20	37.8	68.6	67.0
Kelly	31	20	38.5	67.4	66.1
SD790400	32	26	38.1	66.1	--
Noble	30	June 21	37.7	65.8	69.4
Lancer	30	26	38.8	65.5	72.9
Burnett	33	21	39.9	64.3	70.6
SD810095	35	27	43.4	63.6	--
345M (BL)	30	24	37.0	63.4	--
Chief	32	June 22	39.1	60.1	65.4
Centennial	34	27	39.3	59.0	--
SD790188	35	27	39.6	55.1	--
Proat (MN79229)	34	29	39.3	48.9	--
SD800287	32	26	39.3	44.8	--
Pierce	30	29	38.4	24.5	--
LSD(05) - 15.3 Bu/A		C.V. - 16.1%		Mean - 67.9	

Note: Data presented within the table are an average of four replications. Plots were seeded April 20 and harvested August 1, 1984.

Bennett County

Oat variety plots at Martin were seeded on April 20 into fallowed soil. Soil moisture was good at seeding time. Precipitation was limited through the spring, but showers were timely. Heavy showers were received in early July. Although temperatures and moisture were unfavorable during the growing season, the grain quality was excellent. The top yields were similar to 1983 top yields, but the lower yields were much lower. The yield of some late maturing varieties were reduced because of grasshopper damage. Grain yield and other data are listed in Table 27.

Table 28. Oat Variety Trial - Corson County (McIntosh), 1984.

Variety	Height (Inches)	Date of Heading	Percent Oil*	Percent Protein	Test Wt (Lbs/Bu)	Grain Yield Bu/Acre
Ogle	29	June 27	7.2	12.3	33.9	85.0
Porter	29	--	8.4	16.3	34.3	83.0
Lang	28	25	8.0	16.3	33.3	78.8
Larry	27	26	8.7	12.9	34.0	77.7
Bates	27	26	8.9	13.8	38.1	71.9
Moore	34	--	10.2	13.4	34.1	71.2
Webster	30	June 24	8.5	13.4	35.5	69.6
SD790400	32	--	7.8	14.6	34.7	69.6
Nodaway 70	33	26	6.8	12.9	38.3	69.0
345M (BL)	28	28	7.6	15.1	35.2	68.6
SD800312	32	--	7.7	14.0	34.0	68.0
Haylander II (BL)	34	--	10.0	15.6	35.0	67.6
SD800043	32	--	7.7	14.5	34.3	67.4
Otee	29	June 27	8.8	16.2	37.8	66.8
SD810095	36	--	--	--	39.3	66.3
Lancer	31	--	7.0	15.7	38.4	65.3
Wright	34	--	9.8	15.7	36.9	65.3
Exp 100 (BL)	29	June 27	7.9	15.5	36.2	64.4
Steele	33	--	8.5	15.5	35.4	64.0
Kelly	29	June 25	7.2	16.5	36.4	61.5
Lyon	36	June 26	9.2	14.5	37.6	61.3
Preston	29	26	9.5	18.0	37.1	60.7
Pierce	30	--	9.1	15.1	36.1	60.5
SD790188	33	--	8.3	15.2	33.1	60.4
Centennial	30	--	6.3	13.1	36.5	58.4
Proat (MN79229)	32	--	8.5	15.7	36.2	57.6
Benson	30	--	7.4	14.7	35.6	57.5
Chief	30	June 27	6.3	14.4	36.4	56.3
Noble	28	27	7.5	14.9	35.5	54.8
SD800287	31	28	7.6	12.8	36.9	54.4
Burnett	30	28	5.9	13.3	38.5	51.0
LSB(05) - 10.1 Bu/A C.V. - 11.0% Mean - 65.6						

*Percent protein and oil determined with Technicon 300 InfraAnalyzer.
 Note: Data presented within the table are an average of four replications.
 Plots were seeded May 10 and harvested August 7, 1984.

Corson County

Oat variety plots near McIntosh were seeded on May 10. The soil moisture level was good, the result of wet snow received in late April. June precipitation was above normal and brought the season total to normal. July was droughty with only 1 shower early in the month. The weights per bushel averaged 36 pounds. Yield average was double the 1974-75 average, however, the grain contained 5% less protein than the 1983 production. Oil content was similar to 1983 oat grain. The agronomic and grain quality data are listed in Table 28.

Table 29. Oat Variety Trial - Harding County (Ralph), 1982-84.

Variety	Height (Inches)	Percent Oil*	Percent Protein*	Test Weight (lbs/Bu)	Grain Yield-Bu/A 1984	Grain Yield-Bu/A (3 yr av)
Bates	25	9.4	12.1	40.3	64.6	—
Larry	23	9.0	13.6	39.9	63.2	63.3
Ogle	25	6.9	11.8	38.1	60.3	67.3
Webster	25	8.4	13.5	37.9	59.2	—
Lang	25	7.7	12.3	38.6	58.1	63.8
345M (BL)	27	7.3	12.8	39.4	55.4	—
SD810095	30	7.3	14.5	41.2	53.1	—
Burnett	29	6.1	12.9	41.2	51.9	62.3
Porter	26	8.1	15.7	39.4	51.4	66.9
Preston	25	9.6	15.6	39.8	49.6	54.4
Steele	26	7.8	15.5	39.2	48.3	—
Lancer	25	7.0	13.5	39.8	48.2	59.7
SD800043	26	7.0	12.9	40.1	47.3	—
Nodaway 70	26	6.5	13.8	42.6	47.3	58.3
Moore	26	9.2	13.9	40.3	46.4	64.5
Haylander II (BL)	25	9.3	13.2	40.3	45.3	—
Exp 100 (BL)	25	8.4	15.5	40.5	45.0	—
SD790400	25	7.5	14.6	39.1	44.9	—
Wright	28	9.5	14.6	39.3	44.6	57.8
Lyon	30	8.9	14.4	38.1	44.6	60.3
Otee	23	8.2	15.0	39.9	44.0	56.1
SD800312	24	7.0	14.1	39.8	44.0	—
Noble	24	7.4	15.1	39.4	43.9	52.9
Kelly	26	7.5	14.7	40.6	42.7	54.3
SD790188	26	7.2	14.8	39.8	42.7	—
SD800287	25	7.1	14.0	39.0	40.6	—
Chief	27	6.4	13.7	39.6	39.6	52.7
Pierce	23	8.8	16.2	40.4	38.8	—
Centennial	24	6.0	13.3	39.6	36.6	—
Proat (MN79229)	25	8.3	15.9	38.1	36.6	—
Benson	26	7.1	13.9	38.4	35.1	54.8
LSD(05) - 7.4 Bu/A C.V. - 11.1% Mean - 47.5						

*Percent protein and oil are reported on dehulled kernels and were determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded May 9 and harvested August 13, 1984.

Harding County

Soil moisture was excellent on May 9 when oat variety plots were seeded near Ralph. Rainfall during May, June, and July was below normal. However, because of the wet snow in April sufficient moisture was available to produce grain of excellent weight per bushel. Protein content was 6% lower, while oil content was similar to that in 1983. The results of the trial are presented in Table 29.

Table 30. Oat Variety Trial - Meade County (Bear Butte Valley), 1982-84.

Variety	Height (Inches)	Date of Harvest	% Oil*	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield-Bu/A 1984	(3 yr av)
Ogle	38.2	June 26	8.0	14.2	38.2	98.7	85.2
Porter	38.5	July 1	8.4	14.7	40.0	96.7	80.9
Haylander II (BL)	42.5	June 28	9.5	13.9	38.8	93.0	--
Moore	41.2	30	9.6	13.6	37.9	89.5	75.7
Nodaway 70	41.0	22	6.7	14.5	42.4	87.0	77.1
345M (BL)	36.8	June 25	6.8	13.6	38.3	84.4	--
Wright	41.5	28	9.2	15.4	41.2	82.7	72.6
Webster	37.2	23	6.8	13.9	38.8	82.2	--
Lang	35.2	23	7.3	13.3	38.6	81.3	80.5
Lyon	42.5	28	8.4	15.2	39.5	81.3	73.9
SD800312	41.8	June 27	7.0	13.6	38.1	79.4	--
Bates	35.2	22	9.0	15.5	39.3	79.1	--
SD800043	41.0	30	--	--	35.8	78.8	--
SD790400	40.2	28	7.1	13.9	38.7	77.6	--
Proat (MN79229)	39.8	29	8.1	16.9	40.3	77.0	--
Noble	37.2	June 26	7.3	14.1	40.5	76.7	77.2
SD810095	43.8	27	7.5	16.1	43.8	75.7	--
Otee	34.5	25	9.0	17.2	39.5	75.0	71.4
Larry	34.8	24	8.6	13.1	38.7	74.6	72.5
Benson	40.2	28	7.0	15.5	38.8	71.9	76.6
Preston	36.0	June 24	9.5	18.2	40.7	68.1	70.0
Steele	43.5	29	7.4	14.9	38.0	67.0	--
Chief	37.5	24	6.3	14.2	39.5	65.4	69.7
SD800287	38.2	27	--	--	39.6	64.6	--
Pierce	37.2	July 1	9.1	16.3	39.5	63.9	--
Exp 100 (BL)	35.8	June 22	7.8	16.3	40.3	63.0	--
SD790188	40.5	28	7.1	13.3	37.4	61.9	--
Centennial	39.8	28	5.7	13.2	39.3	58.7	--
Burnett	43.0	26	5.8	13.9	39.7	54.7	69.1
Kelly	39.0	23	7.2	15.6	41.4	54.1	--
Lancer	38.0	26	6.5	14.8	40.0	50.0	66.7
LSD(05) - 13.2 Bu/A		C.V. - 12.6%		Mean - 74.6			

*Percent protein and oil are reported on dehulled kernels and were determined with Technicon 300 InfraAnalyzer.

Note: Data within the table are an average of four replications. Plots were seeded April 24 and harvested August 9, 1984.

Meade County
(Bear Butte Valley)

The oat variety trial in Bear Butte Valley was seeded in fallow soil on April 24. Soil moisture was good due to wet snow in early April. In late April, snow which yielded in excess of 6 inches of water was received. Moisture was limited in May and July, but above normal in June. Air temperatures were below normal in April, May, and June. The cool temperatures were ideal for development of vigorous plants and an abundance of tillers. The plants were tall and produced grain of excellent quality, weight per bushel, and yield. The trial results are reported in Table 30.

Table 31. Oat Variety Trial - Meade County (Plainview), 1982-84.

Variety	Height (Inches)	Percent Oil*	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/A 1984	(3 yr av)
Bates	24	8.6	14.8	37.4	69.6	—
Lang	25	7.0	12.6	36.3	69.3	65.7
Larry	23	8.3	13.5	38.1	67.9	69.7
Ogle	25	6.5	13.8	34.8	67.8	68.6
Porter	26	6.9	16.4	36.1	66.7	71.7
SD800043	30	6.7	14.7	35.1	66.0	—
Webster	25	7.3	13.2	36.6	65.5	—
SD790400	28	6.9	15.4	37.3	64.1	—
Moore	31	9.0	13.9	35.1	61.8	68.1
Steele	31	6.6	17.5	35.7	61.0	—
Wright	33	8.2	15.8	37.8	60.9	62.2
SD800312	30	—	—	36.8	59.7	—
345M (BL)	27	7.3	15.9	34.5	58.9	—
SD800287	28	6.5	13.0	36.7	58.6	—
Otee	28	7.2	15.9	38.6	58.3	62.2
Noble	26	6.8	14.9	37.4	58.2	57.7
Proat (MN79229)	28	7.1	17.9	34.3	57.6	—
Burnett	30	5.2	14.1	39.5	55.8	62.4
Pierce	26	7.7	16.1	37.0	55.7	—
Lancer	28	6.9	15.3	37.8	54.8	62.1
Haylander II (BL)	30	8.6	14.0	36.5	54.5	—
Exp 100 (BL)	25	7.2	16.5	41.6	54.0	—
Preston	26	8.4	17.2	38.8	53.5	56.2
SD810095	31	6.6	13.0	40.4	51.3	—
Kelly	27	6.8	16.4	38.7	50.9	—
Chief	29	6.2	14.9	38.1	50.8	55.1
Benson	30	6.5	16.4	34.2	50.5	60.0
Nodaway 70	29	6.2	13.4	40.7	50.2	59.6
Lyon	31	7.6	15.4	35.2	50.0	58.6
SD790188	31	6.7	13.3	36.8	47.7	—
Centennial	30	5.7	13.9	35.7	43.7	—

LSD(05) - 6.8 Bu/A

C.V. - 7.3%

Mean - 57.9

*Percent protein and oil are reported on dehulled kernels and were determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of three replications. plots were seeded May 15 and harvested August 14, 1984.

Meade County
(Plainview)

Oat varieties were seeded at Plainview in mid-May. The date of seeding was late because of wet snow in late April. Temperatures were above normal after seeding. The combination of late seeding and above normal temperatures resulted in few tillers being formed. The weights per bushel were several pounds heavier than in 1983. The top yields of 1984 were similar to those of 1983, however, the lower yielding varieties produced 10 bushel per acre less than in 1983. Overall, the trial average yield was almost the same for both years. The data are reported in Table 31.

Table 32. Oat Variety Trial - Pennington County (Wall), 1982-84.

Variety	Height (Inches)	Date of Heading	Percent Oil*	Percent Protein*	Test Weight (lbs/bu)	Grain Yield-bu/A	
						1984	(3 yr ave)
Ogle	33	June 24	6.3	13.7	37.2	79.3	80.7
Porter	32	July 1	8.1	15.5	42.5	77.5	84.6
Lang	30	June 22	7.5	13.4	40.8	77.4	71.3
Nodaway 70	34	21	7.0	15.6	43.2	74.1	70.4
Larry	32	23	8.6	13.8	39.9	71.9	70.8
Wright	38	June 28	8.8	15.4	41.0	71.4	69.8
Moore	37	30	9.5	14.9	38.7	71.0	70.6
Bates	30	21	9.1	14.7	41.7	70.2	75.8
Webster	32	21	7.9	13.6	34.7	69.5	—
SD790470	35	July 2	—	—	39.4	69.3	—
345M (BL)	33	June 24	6.9	16.0	37.2	66.6	—
Haylander II (BL)	38	28	9.0	16.6	39.2	64.8	—
Preston	33	21	9.3	18.2	41.5	64.1	63.8
Otee	32	22	8.0	18.3	40.0	63.2	68.1
SD800312	35	26	—	—	40.2	63.2	—
Exp 100 (BL)	35	June 21	7.8	17.1	40.5	62.8	—
Steele	36	July 3	7.6	15.3	39.6	62.4	—
Lyon	39	2	8.8	16.9	40.4	61.5	64.1
Benson	36	2	7.1	15.4	40.1	59.6	63.8
SD810095	37	June 24	7.2	17.1	41.2	59.2	—
Kelly	34	June 22	7.2	16.6	40.8	58.2	66.4
Lancer	34	23	7.0	17.0	39.0	58.1	61.4
SD800043	35	July 2	—	—	39.8	57.7	—
SD790188	38	2	7.0	14.7	42.0	57.5	—
Noble	32	June 23	7.3	15.3	41.2	55.6	64.6
Chief	34	June 23	6.3	15.8	42.0	54.0	62.3
Proat (M79229)	34	30	7.7	18.4	40.0	49.5	—
Burnett	36	22	5.9	16.4	40.3	47.0	62.4
SD800287	37	23	7.0	15.1	41.6	45.4	—
Pierce	33	July 1	8.4	17.5	41.4	42.4	—
Centennial	36	3	6.0	15.2	41.2	39.4	—

LSD(05) = 8.6 bu/A

C.V. = 9.9%

Mean = 62.1

*Percent protein and oil are reported on dehulled kernels and were determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average four replications. Plots were seeded April 17 and harvested July 31, 1984.

Pennington County

The oat variety trial in eastern Pennington County was seeded April 17. The fallowed soil had adequate moisture for germination and emergence. Heavy wet snow fell in late April and above normal rains fell in June. Normal plant growth occurred even though conditions were not always favorable. Weights per bushel were excellent, but protein content was several percent lower than in 1983. Grain yields averaged 27 bushel per acre less than in 1983 but were 12 bushel per acre higher than in 1982. The trial data are listed in Table 32.

Table 33. Oat Variety Trial - Perkins County (Bison), 1982-84.

Variety	Percent Lodging	Percent Oil*	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/A 1984	(3 yr av)
Lang	17	7.4	14.1	37.9	74.6	73.9
Webster	22	8.4	14.5	37.9	70.3	--
Larry	18	8.7	16.0	37.9	70.1	70.3
Porter	42	8.2	18.2	34.0	65.3	67.8
Bates	18	9.2	17.0	39.1	65.1	69.0
Ogle	18	7.2	13.6	35.5	65.0	74.2
Nodaway 70	91	7.2	15.4	40.3	64.3	62.7
Otee	38	8.2	17.7	39.4	56.9	60.4
Exp 100 (BL)	88	8.0	16.4	38.9	54.1	--
SD790400	58	7.6	15.5	36.9	53.7	--
Haylander II (BL)	60	10.1	16.2	37.6	53.4	--
Moore	58	9.8	15.2	37.4	52.1	66.8
Lyon	65	9.1	15.7	37.0	51.2	63.9
Preston	85	9.9	18.9	39.3	49.6	58.1
Wright	35	9.7	16.6	38.1	48.9	64.4
345M (BL)	30	7.5	15.5	37.4	47.9	--
Kelly	90	7.4	16.0	38.9	47.4	60.1
Lancer	60	6.8	16.3	40.9	47.2	63.2
Steele	28	8.6	18.4	38.8	45.4	--
SD800312	65	9.6	15.4	36.6	45.4	--
SD800043	62	7.4	16.3	35.5	42.7	--
SD810095	50	7.7	16.5	42.9	42.3	--
Benson	68	7.4	14.8	37.1	42.3	62.8
Noble	32	7.4	14.9	39.3	41.5	56.1
Proat (MN79229)	62	8.6	18.1	38.4	41.0	--
SD790188	65	7.9	14.7	37.3	40.4	--
Chief	58	6.6	15.4	39.1	40.3	53.7
Pierce	35	8.7	17.2	38.8	38.4	--
Burnett	58	6.1	14.0	41.2	36.5	62.4
SD800287	62	7.3	16.0	40.0	30.3	--
Centennial	48	6.1	14.8	39.8	28.7	--
LSD(U5) - 9.7 Bu/A	C.V. - 13.8%			Mean - 50.1		

*Percent protein and oil are reported on dehulled kernels and were determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded May 10 and harvested August 8, 1984.

Perkins County

The oat variety trial at Meadow was seeded on May 10 in fallow soil. Heavy wet snow, which fell in late April, delayed seeding but provided the moisture necessary to start growth. Above normal rain in June and cool temperatures permitted normal growth. Protein levels were 5% lower than in 1982. Weights per bushel ranged from 34.0 to 42.9 pounds. Grain yields, the lowest in the last 3 years, were 26 bushel per acre less in 1984 than in 1983. The trial data are reported in Table 33.

Spring Barley Trials

Spring barley variety trials were conducted on a cooperative basis at seven locations in 1984. Soil moisture was adequate for germination and emergence at all sites. Seeding was accomplished with a six row plot seeder having an eight inch row spacing. Rate of seeding was controlled by prepackaging all seed. Fertilizer requirements were predetermined by soil test. The dates of seeding ranged from April 17 to May 15. Harvesting was completed with a self-propelled plot combine between July 30 and August 14. Trial data are reported in Tables 34 through 40.

Table 34. Spring Barley Variety Trial - Bennett County (Martin), 1982-84.

Variety	Height (Inches)	Date of Heading	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/A	
					1984	(3 yr av)
Clark	30	July 1	12.3	49.6	69.3	49.3
Azure	32	June 28	12.2	49.4	69.2	53.8
Hazen	30	28	11.7	49.3	68.0	—
Robust	31	29	12.5	49.1	63.1	49.3
Morex	32	29	11.9	48.1	62.9	49.9
Glenn	30	June 29	12.2	47.2	61.0	48.8
Bowman	29	23	12.2	52.1	60.6	—
Bumper	30	29	12.1	46.5	54.7	46.2
Primus II	28	19	11.5	49.4	53.8	44.2
Larker	31	29	12.6	49.4	52.8	45.6
LSD(05) - 14.7 Bu/A					C.V. - 16.7%	
					Mean - 61.6	

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Plots were seeded April 20 and harvested August 1, 1984.

Bennett County

The spring barley variety trial at Martin was seeded on April 20 into fallowed soil. Soil moisture was adequate for germination and emergence. Precipitation was limited, but timely, through the spring season. Heavy showers were received in early July. The quality of grain was better than in previous years and was considered normal. Weights per bushel were near standard weight, and protein was 2% below normal. Grain yields were almost double those of 1982, and were 149% those of 1983. The trial data are listed in Table 34.

Corson County

Spring barley variety trials were seeded on May 10 near McIntosh. Soil moisture was good and soil condition excellent. Snow and rain had been received prior to seeding. Showers through May and June provided normal precipitation to support plant growth. July was droughty with only 1 shower early in the month. Grain quality was poor with weights per bushel ranging from 38.5 up to 49.8 pounds per bushel. Grain yield averaged 44 bushel per acre which was 143% of the 1965-1970 average. The trial data are reported in Table 35.

Table 35. Spring Barley Variety Trial - Corson County (McIntosh), 1984.

Variety	Height (Inches)	Date of Heading	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield (Bu/Acre)
Robust	32	—	9.5	43.2	50.3
Primus II	30	June 25	9.4	45.0	49.8
Glenn	29	28	10.4	38.8	46.2
Bowman	29	28	9.7	49.8	46.2
Morex	32	28	9.3	41.4	44.5
Azure	30	--	11.9	41.8	44.4
Hazen	30	--	9.9	41.8	44.3
Larker	30	June 28	12.2	43.3	39.6
Clark	27	—	11.4	44.6	37.7
Bumper	31	—	12.3	38.5	37.1

LSD(05) - 6.4 Bu/A

C.V. - 10.7%

Mean - 44.0

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded May 10 and harvested August 7, 1984.

Harding County

Experimental plots containing 13 varieties were seeded near Ralph on May 9. Soil moisture was excellent which promoted immediate germination and emergence. Rainfall during May, June, and July was subnormal, resulting in moisture stressed plants. There were few tillers and plants were short. Weights per bushel averaged slightly over standard at 49.7 pounds. Grain yield averaged 12 bushel per acre above the 1983 trials. The trial data are presented in Table 36.

Table 36. Spring Barley Variety Trial - Harding County (Ralph), 1982-84.

Variety	Height (Inches)	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/A	
				1982	(3 yr av)
Apex	20	11.3	50.1	63.5	—
Clark	24	10.9	49.6	63.3	53.1
Bowman	24	11.2	51.8	61.2	—
Robust	27	10.8	49.5	57.9	49.9
Bellona	21	10.7	49.9	56.0	—
Azure	28	11.0	50.1	55.6	50.5
Hazen	27	10.8	49.8	55.0	—
Bumper	27	11.1	47.3	54.3	51.2
Nova	24	13.1	53.4	53.7	—
Larker	26	11.3	49.3	51.9	49.1
Morex	27	11.3	47.2	51.6	48.2
Glenn	26	12.1	47.5	48.3	47.5
Primus II	26	10.8	49.1	46.4	47.4

LSD(05) - 7.1 Bu/A

C.V. - 9.1%

Mean - 55.3

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded May 9 and harvested August 6, 1984.

Meade County
(Bear Butte Valley)

Spring barley varieties were seeded in western Meade County on April 24. Soil moisture was good because of snow earlier in the month. Heavy snow fell several days after seeding and provided moisture for growth during May. June had above normal rainfall resulting in vigorous plants. Weights per bushel were several pounds above standard weight and yields were 15 bushel per acre over the 1983 yields. The trial data are reported in Table 37.

Table 37. Spring Barley Variety Trial - Meade County (Bear Butte Valley), 1982-84.

Variety	Height (Inches)	Date of Heading	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/A	
					1984	(3 yr av)
Hazen	33	June 25	11.5	49.8	82.0	--
Robust	34	25	12.0	51.7	77.6	--
Clark	31	29	11.3	52.7	77.2	64.9
Morex	34	24	12.0	49.3	76.5	68.6
Bumper	35	28	10.8	49.2	73.1	59.2
Glenn	35	June 23	11.6	50.3	71.7	67.8
Bowman	33	25	11.7	53.7	71.5	--
Larker	34	26	12.1	51.3	67.6	64.0
Primus II	34	22	12.1	50.8	65.8	65.4
Azure	35	26	10.6	51.9	58.5	62.8
LSD(05) - 10.4 Bu/A		C.V. - 10.1%		Mean - 72.2		

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded April 24 and harvested August 9, 1984.

Meade County
(Plainview)

The spring barley trial at Plainview was seeded on May 15. Snow received in April and rain in early May prevented seeding at an earlier date. Above normal temperatures resulted in few tillers. Grain quality was fair with weight per bushel ranging from 45.9 pounds up to 51.7 pounds. Grain yields were only 35% of the 1983 trial, and 79% of the 1982 trial. The data are reported in Table 38.

Table 38. Spring Barley Variety Trial - Meade County (Plainview), 1982-84.

Variety	Height (Inches)	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/A	
				1984	(3 yr av)
Glenn	23	13.2	46.7	31.7	40.7
Hazen	24	12.6	45.9	28.1	--
Clark	23	13.0	48.5	26.3	36.0
Primus II	25	12.9	47.8	25.5	39.7
Bumper	25	13.0	47.0	25.2	32.5
Robust	24	13.0	48.3	23.5	--
Bowman	23	11.8	51.7	23.3	--
Larker	23	13.1	49.4	22.0	36.7
Azure	24	11.5	48.2	20.4	36.9
Morex	25	12.5	46.5	20.0	38.6
LSD(05) - 9.2 Bu/A		C.V. - 22.5%		Mean - 24.6	

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented with the table are an average of three replications. Plots were seeded May 15 and harvested August 14, 1984.

Pennington County

Variety trial plots of spring barley were seeded near Wall on April 17. Soil moisture was adequate for germination and emergence. Heavy snow was received later in the month and provided needed moisture later on. Above normal precipitation was received in June. Plants were vigorous and were well tillered but were under moisture stress as they neared maturity. The grain produced was of good weight per bushel. Grain yield was below the 1983 production but was 300% of the 1983 production. The trial data are reported in Table 39.

Table 39. Spring Barley Variety Trial - Pennington County (Wall), 1982-84.

Variety	Height (Inches)	Date of Heading	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/A	
					1984	(3 yr av)
Bowman	31	June 25	11.9	54.5	73.0	—
Glenn	33	23	12.8	48.0	71.2	55.2
Primus II	34	20	12.1	52.0	68.4	55.8
Clark	30	29	13.0	49.6	66.9	49.6
Robust	34	26	12.6	50.6	66.8	56.4
Hazen	31	June 26	10.9	48.0	65.5	—
Azure	32	25	12.6	49.8	65.1	57.0
Morex	32	24	10.7	48.6	60.5	51.7
Bumper	33	28	12.9	46.3	56.2	51.7
Larker	32	25	12.9	50.6	49.3	48.1
LSD(05) - 8.5 Bu/A		C.V. - 9.3		Mean - 64.3		

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded April 17 and harvested July 30, 1984.

Perkins County

The spring barley trial at Meadow was seeded in fallow soil. Soil moisture was excellent due to snow received in April. The delay in seeding due to wet soil conditions was tempered by cool temperatures in June. The late seeding also resulted in later maturity. Those varieties which were the latest in maturing had lower test weights and higher protein content which was indicative of moisture stress. Yields were comparable to 1983. The data are presented in Table 40.

Table 40. Spring Barley Variety Trial - Perkins County (Bison), 1982-84.

Variety	Height (Inches)	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/A	
				1984	(3 yr av)
Bowman	34	12.4	52.6	66.4	—
Primus II	37	12.5	47.7	58.5	52.0
Clark	34	13.4	49.1	55.0	55.3
Glenn	36	13.7	44.8	54.0	52.7
Morex	38	12.6	44.2	52.6	49.7
Robust	37	12.6	47.9	51.2	48.5
Azure	39	12.9	47.7	46.4	48.3
Bumper	37	13.6	43.7	44.4	49.4
Hazen	37	12.4	46.9	43.3	—
Larker	36	13.8	48.5	41.0	44.1
LSD(05) - 4.8 Bu/A		C.V. - 6.62		Mean - 51.3	

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Data presented within the table are an average of four replications. Plots were seeded May 10 and harvested August 8, 1984.

Flax Trial

Flax variety trials were conducted at two locations in 1984. Soil moisture was adequate for germination and emergence at both sites. Seeding was accomplished with a six row plot seeder having an eight inch row spacing. Rate of seeding was controlled by prepackaging all seed. Fertilizer was predetermined by soil test. Harvesting was completed with a self-propelled plot combine. Trial data are reported in Tables 41 and 42.

Corson County

The flax variety trial at McIntosh was seeded May 10. Seeding was delayed because of snow in April and showers in early May. Stands were good and were uniform. At harvest, grasshoppers were damaging the plants. The grain yields averaged 3.4 bushel per acre higher than the 1965-70 county average. Trial data are reported in Table 41.

Table 41. Flax Variety Trial - Corson County (McIntosh), 1984.

Variety	Test Weight (Lbs/Bu)	Grain Yield (Bu/Acre)
Wishek	54.8	15.3
Clark	54.7	12.5
Flor	55.0	10.7
Culbert 79	55.0	8.7
		Mean - 11.8

Note: All varieties were badly damaged by grasshoppers. Data presented within the table are an average of four replications. Plots were seeded May 10 and harvested August 22, 1984.

Harding County

Flax varieties were seeded in replicated plots near Ralph on May 9. Seeding of the trial was delayed because of wet soil conditions. Snow and rain had been received during April and May. Stands were uniform. Plants grew quite well, although moisture was short during May, June, and July. Grain yields averaged 4.5 bushel above the 1967-1970 county average. Trial data are presented in Table 42.

Table 42. Flax Variety Trial - Harding County (Ralph), 1984.

Variety	Test Weight (Lbs/Bu)	Grain Yield (Bu/Acre)
Clark	55.0	14.6
Flor	54.7	13.9
Wishek	55.2	13.5
Culbert 79	55.2	13.1
		Mean - 13.8

Note: Data presented within the table are an average of four replications. Plots were seeded May 9 and harvested August 13, 1984.

SORGHUM VARIETY TESTING

Grain Sorghum

Objective: To compare the performance of grain sorghum hybrids and varieties for yield and other agronomic characteristics.

A grain sorghum variety trial was seeded in Pennington County in 1984. Included were commercial varieties which varied in maturity from short-season to medium-season.

The trial was seeded on June 20. Showers were received in late May and continued intermittently until mid-June. The frequency of showers prevented the soil from drying so it could be tilled. After seeding only 1 light shower was received until July. Germination and emergence was good. Two weeks after seeding a shower of high intensity was received which compacted the soil. No further effective rain was received until mid-August.

The plants lacked vigor and did not head until late August when cumulative showers of over 2.75 inches were received. Nearly all of the varieties produced heads and grain. The trial was abandoned after deer moved into the area and destroyed the developing heads.

Sorghum Forage Trials

Objective: To compare the various Forage Sorghums, Sorghum-Sudangrass crosses, Sudangrass, and Pearl Millet as to their adaptability, their forage production, and their forage quality. Yield and agronomic data are presented in Tables 43 and 44.

Table 43. Forage Sorghum Variety Trial - Pennington County (Wall), 1984.

Variety	Height (Inches)	HCN (ppm)*	Percent Dry Matter	Percent Protein**	Forage Yield Tons/Acre***
Waconia	46	2630	85.1	16.69	2.38
WS51	30	2526	52.2	10.06	1.67
FS455	35	--	52.1	10.94	1.61
WS60	39	2200	49.9	9.31	1.56
1515F	29	--	60.0	9.69	1.52
WS50	34	1967	48.2	10.12	1.49
FS5	39	2172	57.5	7.79	1.39
340	46	--	45.9	10.06	1.25
30F	37	--	50.6	11.25	1.22
KFS-1	43	1904	42.5	8.94	1.08
KFS-2	33	2173	50.1	8.38	0.90
WS65	37	2230	56.5	9.50	0.69
931	46	2150	44.3	11.63	0.66
Rancher	34	630	63.1	7.06	0.58

LSD(05) - 0.7 T/A C.V. - 31.5% Mean - 1.30

* HCN or Prussic Acid levels above 600 ppm should be considered as potentially toxic.

** Percent protein was calculated from Kjeldahl nitrogen analysis and is reported on an oven dry basis.

***Forage yield reported on a basis of 12% moisture.

Note: Plots were seeded in replicated single 36 inch spaced rows on June 20.

Weather favored the spring planting because of cool temperatures following seeding. Stands were better in the spring seeded plots and the yields reflected this.

Average grain yield was 1.5 bushel higher for spring seeded versus fall seeded. Grain quality in fall seeded was better showing slightly heavier weight per bushel. Spring seeded plots lodged less than fall seeded.

A similar study in 1982-83 produced yields from fall seeding (September 20) double those seeded on March 3, and 2.5 times those seeded April 20. Winter survival in 1983 was 99% compared to 64% for those in 1984.

The results from this study and the previous study are in direct conflict and indicate the need for more study. The data for 1983-84 are presented in Table 45.

Table 45. Winter Barley Variety Date of Planting - Pennington County (Wall), 1984.

Variety	Height (Inches)	Percent Stand	Percent Lodging	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield (Bu/Acre)
Date of Planting: September 19, 1983						
Composite 142	33	69	64	14.9	43.1	44.8
Composite 10	31	65	74	12.5	44.0	36.1
Dundy	26	68	30	13.2	47.0	36.1
Kearney	33	59	85	13.9	46.4	32.5
Composite 129	32	72	65	13.8	46.2	29.3
Nebar	33	50	38	13.2	46.2	15.9
Date of Planting: October 7, 1983						
Dundy	25	20	62	12.6	38.1	11.4
Composite 142	25	12	58	13.0	38.5	11.1
Composite 10	30	9	79	13.9	38.8	10.5
Kearney	28	12	73	14.5	32.6	9.8
Nebar	30	21	36	13.4	34.8	8.6
Composite 129	31	22	69	--	35.8	8.5
Date of Planting: April 15, 1984						
Kearney	28	96	82	13.0	46.4	43.9
Composite 129	28	95	55	13.6	48.1	38.6
Composite 142	28	95	64	13.9	43.5	35.9
Dundy	23	95	6	12.6	45.9	33.8
Composite 10	27	95	70	14.5	42.5	33.6
Nebar	30	94	8	13.3	39.3	17.3

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Percents stand and lodging were visually estimated prior to harvest. Data presented within the table are an average of four replications. Harvesting was completed on July 30, 1984.

Fallow Alternatives and Seeding Methods

Objectives:

- (1) To compare the three fallow alternatives of zero-till, subsurface or mulch tillage, and black fallow, by measuring grain yield and quality. Soil changes are to be monitored by soil sampling.
- (2) To compare the long term effects of nitrogen and phosphorus fertilizer when applied in combinations with fallow alternatives.
- (3) To compare drill openers and press wheel combinations when used under different fallow procedures.
- (4) To compare the effects of fallow techniques on soil tilth, organic accumulation, plant pathogens, nematodes, and weed populations.

Procedures:

An experiment was established in which a winter wheat-fallow system was utilized to study the residue management of three fallow procedures. The system consisted of (1) a black fallow, (2) a stubble mulch fallow, and (3) a zero-till or chemical fallow.

The fallowed areas were subdivided into five subtreatments in order to study the effect of different drill openers-press wheel combinations when used in three different fallow procedures.

The fallowed areas were further subdivided and a fertility factor in which nitrogen, phosphorus, and the combination of nitrogen plus phosphorus were incorporated. The plots were seeded to Hard Red Winter Wheat (Rose) in September 1983.

Results:

A review of wheat yields in 1984 indicated a positive response to the application of phosphorus fertilizer. The wheat yield in 1983 was positively influenced by the addition of nitrogen. Consequently, the 3 year averages (Table 46) does not present a true picture.

During the summer and fall of 1983, the area received above normal rainfall which saturated the soil and interfered with normal nitrogen accumulation. For that reason a severe nitrogen deficiency occurred during the fall and following spring. In 1983 the area received average precipitation resulting in normal nitrogen accumulation. With normal nitrogen and soil moisture levels there was a response to the addition of phosphorus (Table 47).

The method of fallow did not result in large yield differences (Table 48). The lower yields were received under mulch fallow and was probably due to less moisture in the loose surface soil at seeding time. The highest yields in 1984 were harvested from the chemical assisted fallow method. However, the three year average indicated the highest yields in most instances were produced under a black fallow system.

The effect of type of furrow openers on the drill was significant at the 5% confidence level. The highest yield was produced when the wheat was seeded with the 4 inch shoe (Table 49). The lowest yields were obtained with slot openers such as spear point or HZ, while double disc openers were intermediate. The type of packer wheel was not important.

Table 46. Influence of Fallow Method and Fertilizer Variables on Grain Yield of Hard Red Winter Wheat (Rose), Pennington County (Wall), 1982-84.

Fallow Method	Fertilizer Treatment	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/Acre	
				1984	(3 yr av)
Mulch	Check	12.5	62.9	62.6	53.9
	30# Nitrogen	13.4	60.7	61.5	60.2
	40# Phosphorus	11.8	62.1	67.8	54.7
	30# N + 40# P	13.3	62.0	66.7	59.8
Black	Check	10.4	61.4	65.4	58.9
	30# Nitrogen	13.3	60.4	60.2	57.4
	40# Phosphorus	12.1	62.4	74.8	62.1
	30# N + 40# P	13.3	60.5	66.2	59.7
Chemical	Check	12.5	62.2	68.5	57.1
	30# Nitrogen	13.6	61.5	64.2	57.1
	40# Phosphorus	11.9	63.1	74.7	58.6
	30# N + 40# P	13.5	61.8	73.6	60.0

LSD(05) - 6.6 Bu/A

C.V. 9.2%

Mean - 67.2

*Percent protein determined with Technicon 300 InfraAnalyzer.

Note: Protein and test weights are reported on one replication only.

Table 47. Yield of Hard Red Winter Wheat Seeded with a Combination of Drill Openers and Press Wheels in Soil Fallowed by Three Different Techniques - Pennington County (Wall), 1982-84.

Drill Opener	Press Wheel	Fert.	Method of Fallow			Mean
			Black	Mulch	Chemical	
Spear Point	Steel "V"	O	55.4	54.4	66.0	58.6
		N	47.8	51.7	56.0	52.0
		P	64.2	63.3	77.2	68.2
		NP	56.4	62.7	66.5	61.9
Double Disc	2" Rubber	O	74.2	64.1	68.4	68.9
		N	63.5	59.6	65.0	62.6
		P	79.4	66.4	75.0	73.6
		NP	61.8	60.9	74.7	65.8
HZ (Slot)	Steel "V"	O	67.4	64.1	67.7	66.4
		N	63.6	59.8	64.3	65.6
		P	73.7	63.4	64.7	68.9
		NP	67.6	65.6	72.4	68.5
4" Shoe	2" Rubber	O	68.7	67.0	70.3	68.7
		N	65.6	76.3	71.6	70.0
		P	79.7	73.0	79.1	78.4
		NP	76.6	78.0	81.6	78.7
Double Disc	Steel "V"	O	61.1	63.7	70.4	65.1
		N	60.7	64.0	63.5	62.7
		P	76.7	64.8	77.6	73.0
		NP	68.2	66.5	72.9	69.2

LSD(05) - 6.6 Bu/A

C.V. - 9.2%

Mean - 67.2

Table 48. Influence of Drill Opener & Fallow Method on Grain Yield and Other Agronomic Characteristics of Hard Red Winter Wheat - Pennington County, 1982-84.

County, 1982-84.						
Drill Opener	Press Wheel	Method of Fallow	Percent Protein*	Test Weight (Lbs/Bu)	Grain Yield-Bu/Acre 1984	(3 yr av)
Spear Point	Steel "V"	Mulch	12.4	61.2	54.4	41.5
		Black	12.6	59.6	55.4	54.4
		Chemical	12.9	61.2	66.0	54.4
Double Disc	2" Rubber	Mulch	13.0	61.0	64.1	57.1
		Black	13.2	60.8	74.2	63.4
		Chemical	12.6	61.1	68.4	55.0
HZ (Slot)	Steel "V"	Mulch	13.0	61.5	64.1	57.2
		Black	13.1	60.7	67.4	60.8
		Chemical	13.6	61.3	67.7	55.8
Shoe 4"	2" Rubber	Mulch	12.8	61.7	67.0	60.6
		Black	12.4	61.9	68.7	60.6
		Chemical	13.0	62.0	70.3	59.2
Double Disc	Steel "V"	Mulch	12.7	60.9	63.7	56.2
		Black	12.9	60.8	61.1	56.7
		Chemical	12.4	61.6	70.4	60.6
LSD(05) - 6.6 Bu/A		C.V. - 9.2%		Mean - 67.2		

*Percent protein determined with Technicon 300 InfraAnalyzer.

Table 49. Effects of Drill Opener and Fertilizer Variables on Grain Yield of Hard Red Winter Wheat (variety - Rose) - Pennington County (Mo.), 1982-84.

Drill Opener	Press Wheel	Fertilizer Applied	Percent Protein*	Test Weight (Lbs/Bu)	Grain 1984	Yield-Bu/A (3 yr av)
Spear Point	Steel "V"	Check	12.7	62.1	58.6	51.6
		30# Nitrogen	13.2	59.2	52.0	52.0
		40# Phosphorus	11.4	62.2	68.2	57.2
		30# N + 40# P	13.2	61.3	61.9	55.6
Double Disc	2" Rubber	Check	12.5	62.6	68.9	58.6
		30# Nitrogen	13.3	61.0	62.6	59.1
		40# Phosphorus	12.2	62.7	73.6	61.1
		30# N + 40# P	13.6	62.6	65.8	59.9
HZ (Slot)	Steel "V"	Check	12.8	61.8	66.4	57.1
		30# Nitrogen	13.6	61.3	65.6	60.5
		40# Phosphorus	12.8	63.2	68.9	56.3
		30# N + 40# P	13.6	61.5	68.5	59.1
Shoe 4"	2" Rubber	Check	12.4	61.9	68.7	58.9
		30# Nitrogen	13.6	62.1	70.0	62.2
		40# Phosphorus	11.5	62.8	78.4	62.0
		30# N + 40# P	13.3	61.2	78.7	64.7
Double Disc	Steel "V"	Check	12.3	62.2	65.1	57.0
		30# Nitrogen	13.5	60.8	62.7	58.4
		40# Phosphorus	11.8	61.7	73.0	59.2
		30# N + 40# P	13.2	60.8	69.2	60.0
LSD(05) - 6.6 Bu/A					C.V. - 9.2%	
					Mean - 67.2	

*Percent protein determined with Technicon 300 InfraAnalyzer.

Effects of Tillage on Grain Yield of Hard Red Winter Wheat

Pennington County - 1984

Objective: To evaluate winter wheat yields grown on no-till fallow vs. conventionally tilled fallow.

Plot Information: Eight replications were harvested on July 18, 1984, with a Hege Model 125B combine.

Table 50. Effects of Tillage on Grain Yield of Hard Red Winter Wheat - Pennington County (Wicksville), 1984.

Treatment	Bushels/Acre								Ave.
	1	2	3	4	5	6	7	8	
No-tillage	31.9	35.9	35.6	32.4	33.3	38.3	36.5	35.4	34.9
Conventional Tillage	36.4	33.2	35.2	35.2	38.4	42.3	40.6	35.6	37.1

Summary: The no-tillage treatment had an average test weight of 61.6 pounds per bushel and a protein content of 9.8 percent. Conventional tillage averaged 61.8 pounds per bushel and had protein content of 10.0 percent.

A statistical analysis showed that there was no significant difference in yields due to tillage.

Stubble Seeding of Alfalfa

Meade County - 1984

Objective: To evaluate alfalfa establishment in stubble using chemical weed control and a no-till method of seeding.

Plot Information: On May 17, 1984, two herbicides were applied to standing wheat stubble: Roundup was applied to one half of the experiment at 8 oz/acre and Paraquat at 2 pints/acre to the other half. Agate alfalfa was seeded at 18 lbs/acre on May 30, 1984. Stand counts were made on July 2 & 3, 1984.

Table 51. Alfalfa Establishment in Stubble - Meade County (Elm Springs), 1984.

Seeder	Double Disk Hoses	Incorporation	Plants/Square Foot	
			Roundup	Paraquat
J.D. Double Disk	IN		27	34
J.D. Double Disk	OUT	Rotary Hoe	35	31
J.D. Double Disk	OUT		35	37
Whirly Bird		Rotary Hoe	35	29
Whirly Bird			22	27

Summary: Only the Roundup treatment with double disks and with hoses in and the Whirly Bird were significantly lower. An exceptional stand was achieved due to the amount of moisture (3.5-4.0 inches) received in June. Paraquat and Roundup worked equally well in burning down existing weeds. Further information will be collected in spring of 1985.

Herbicide X Variety

Pennington County - 1981

Objective: To evaluate the herbicide Metribuzin (Sencor) and its effect on 38 dormant winter wheat varieties.

Plot Information: A 3/8 pound per acre spray solution of Metribuzin was applied to a clay loam soil with a pH of 7.1 and an o.m. content of 2.5%. This soil was very high in phosphorus and very high in potassium. (See Table 54.)

Summary: The application of Metribuzin to the winter wheat varieties did not, on the average, change the yields. Some varieties such as Rita and Centurk 78 were hurt by the application but others such as Bennett and C0745597 benefited from the weed control provided. This is only one year's data and more work in this area is planned.

Jones County

Fall and Spring - 1983-1984

Objective: To evaluate herbicide injury to 18 winter wheat varieties.

Plot Information: October 5, 1983, the winter wheat was in the 3 leaf stage of growth and brace roots were just starting to develop. Herbicides were applied to the 20 foot wide plots with a 3 wheeler using 8001 nozzles set at 30 PSI and 5 gallon per acre of spray solution. April 4, 1984, the winter wheat had broken dormancy but was off to a slow start. (See Table 55.)

Summary: The addition of a soil active herbicide in most cases held down the growth of a dense stand of downy brome grass and thus increased the yield over the control which received no herbicide. Rose was the least affected by the addition of a soil active herbicide followed by Brule, Agassiz and Rocky.

SMY 1500 + Metribuzin applied in the fall held the highest yields across varieties followed by Metribuzin fall applied at 0.375 pounds per acre.

This is only one year's data and more work in this area is planned.

Lyman County - 1983-1984

Objective: To evaluate herbicide injury to 33 winter wheat varieties.

Plot Information: October 5, 1983, the 25 foot wide plots were sprayed with a 5 gallon/acre spray solution, using 8001 nozzles at 30 PSI. The winter wheat was in a 3 to 4 leaf stage with some varieties showing tillering and early development of crown roots. The soil was silty clay loam in texture, had a pH of 7.6 and contained 2.9% organic matter. (See Table 56.)

Summary: This field had very few weeds in it when it was sprayed. The soil active herbicides had a very detrimental effect on the wheat yields in some cases. If the field would have been weedy the results would have been different. It will pay to wait and see if you have weeds before you apply these soil active herbicides. SMY-1500 + Metribuzin showed the least amount of damage, while Rocky and Hawk were the varieties least affected. This is only one year's data and more work in this area is planned.

Table 54. Effect of 3/8 Pound Per Acre of Metribuzin on 38 Varieties of Winter Wheat - Pennington County (Wall), 1981.

Variety	3/8# of Metribuzin (Rep. IV)	Control (Ave.) (Rep. I, II, III)
Agate	59	58
Bennett	62	52
Buckskin	55	58
Centurk 78	53	62
Eagle	49	57
Gent	52	57
Lancer	47	57
Larned	55	58
Archer	62	58
Nebred	50	54
Newton	47	55
Norstar	49	51
Rall	54	56
Rocky	62	58
Roughrider	47	53
Sage	52	55
Scout 66	54	55
TAM 105	52	59
Winoka	49	53
SD7279	44	59
Rita	52	61
SD73177	52	50
SD75284	47	54
SD76598	57	52
SD76705	49	45
SD76709	37	44
Dawn	52	59
C0745597	60	49
NE75414	44	51
NE77663	49	49
ND7481	42	56
MT7431	49	45
SD74221	44	45
MPV-1	44	48
Bronze	42	47
Wings	48	47
Lancota	44	50
Vona	59	56

Table 55. Effect of 12 Herbicide and Herbicide Combinations on 18 Varieties of Hard Red Winter Wheat - Jones County (Murdo), 1983-84.

Variety	Herbicides*						
	(Fall Application)						
	Metribuzin		SMY 1500 + Metribuzin		Glean		DPX-B-5882
	0.375	0.25	1.0 + 0.125	1/2	1/3	1/4	1.0
Archer	49	46	39	45	48	51	48
Agassiz	55	55	55	51	49	46	45
Agate	41	42	44	40	44	47	31
Buckskin	53	54	54	44	47	49	32
Brule	58	53	54	50	48	45	40
Bennett	52	48	42	42	44	47	35
Colt	47	42	55	36	39	38	34
Centura	44	40	48	43	39	42	30
Dawn	47	48	53	43	45	46	28
Hawk	43	33	46	40	41	37	16
Lancota	41	32	45	44	38	41	30
Rose	57	59	65	57	55	53	49
Rita	51	45	49	40	42	43	31
Rocky	51	53	58	52	50	55	44
Roughrider	54	48	51	45	47	47	36
Sage	47	41	48	42	41	41	35
Scout 66	50	46	49	45	46	51	41
TAM 105	39	40	47	39	34	45	25

Variety	Herbicides*						
	(Spring Application)						
	SMY 1500 + Metribuzin		Glean		DPX-B-5882		Control
	1.0 + 0.125	1/2	1/3	1/4	1.0		
Archer	47	45	48	51	48		43
Agassiz	47	46	50	51	49		48
Agate	46	40	43	41	41		35
Buckskin	45	35	36	45	44		51
Brule	57	46	47	55	51		47
Bennett	49	42	43	42	45		48
Colt	48	43	43	46	46		47
Centura	37	33	41	39	33		43
Dawn	43	41	40	42	40		46
Hawk	33	33	33	41	37		44
Lancota	44	39	41	42	41		44
Rose	54	57	56	58	53		59
Rita	39	45	41	43	39		34
Rocky	46	45	46	47	42		47
Roughrider	48	45	42	45	45		50
Sage	40	39	41	39	38		48
Scout 66	40	42	44	47	36		42
TAM 105	37	38	37	39	24		28

*Metribuzin - 0.375 pounds active/acre = 1/2#/acre - 75 DF.

- 0.50 pounds active/acre = 2/3#/acre - 75 DF.

DPX-B-5882 - 1.0 oz active/acre.

Glean - 0.187 oz active/acre = 1/4 oz/acre.

- 0.25 oz active/acre = 1/3 oz/acre.

- 0.375 oz active/acre = 1/2 oz/acre.

SMY 1500 - 1.0 pound active/acre.

+ Metribuzin - 0.125 pounds active/acre.

Table 56. Effect of 6 Herbicides on the Yield of 33 Hard Red Winter Wheats - Lyman County (Presho), 1983-84.

Variety	Herbicides* (Fall applied)						SMY 1500 + Metribuzin 1.0 + 0.125
	Metribuzin		DPX-B-5882 1.0	Glean		Control	
	0.375	0.50		0.25	0.187		
RH1030	58	57	39	55	50	61	61
Hail	58	47	34	53	57	62	71
RH830301	58	52	42	51	57	69	60
Cargil 301	65	52	31	58	58	68	77
Hawk	64	52	48	51	46	72	45
Cargil 203	56	36	24	58	61	85	72
Wthr. Mstr. 101	53	45	48	47	53	69	62
Rocky	53	51	42	51	50	74	61
Wthr. Mstr. 106	62	50	41	47	48	84	63
Wthr. Mstr. 104	50	47	43	45	47	64	61
Lancota	43	45	43	56	35	35	49
Wthr. Mstr. 108	59	50	34	50	52	62	68
Wthr. Mstr. 110	40	32	17	35	33	45	55
Centura	48	42	28	41	44	57	52
Wthr. Mstr. 140	44	41	32	41	44	47	48
Bennett	55	51	41	49	40	52	43
Colt	53	44	40	49	46	60	51
Brule	52	40	40	50	54	65	47
Rose	59	51	44	49	41	61	37
Agassiz	61	47	42	44	39	60	47
Sage	47	41	38	37	39	54	35
Archer	50	37	37	41	40	58	53
Centurk 78	52	43	31	46	49	60	67
Dawn	61	28	45	45	51	67	69
Scout 66	66	51	35	43	49	64	63
Buckskin	67	48	21	41	51	66	67
Rita	56	49	37	46	46	60	63
Agate	58	43	29	50	54	63	65
Roughrider	52	41	32	41	50	61	64
Norstar	55	45	46	54	51	65	53
Lancer	61	47	27	47	52	64	63
Dekalb 554	45	41	29	42	47	57	55
TAM 105	45	43	26	42	50	52	55

*Metribuzin - 0.375 pounds active/acre = 1/2#/acre - 75 DF.

- 0.50 pounds active/acre = 2/3#/acre - 75 DF.

DPX-B-5882 - 1.0 oz active/acre.

Glean - 0.25 oz active/acre = 1/3 oz/acre

- 0.187 oz active/acre = 1/4 oz/acre.

SMY 1500 - 1.0 pound active/acre.

+ Metribuzin - 0.125 pounds active/acre.

Control of Downy Bromegrass in Winter Wheat
Date and Rate of Herbicide Application
Fall and Spring - 1983-1984
Pennington County

Objective: To evaluate several experimental herbicides and date of application for control of downy bromegrass in winter wheat.

Plot Information: The fall application of October 6, 1983, was applied to wheat with 1 leaf emerged and downy bromegrass that had not yet emerged. Tk 4 nozzles putting out 20 gallons of spray solution at 10 PSI on 40 inch spacings were used on the fall application. All spring applications involved using 8002 nozzles, 40 PSI and 20 gallons of spray solution per acre. The April 11, 1984, treatment was applied to downy bromegrass that had 3 tillers and 1 1/2" of growth. Downy bromegrass had 3 old leaves and 3/4" of new growth while the winter wheat was showing 1/2" to 3/4" of new growth. All plots were 10 ft. x 75 ft.

Table 57. Effects of Different Herbicides, Different Rates and Dates of Application on Downy Bromegrass Control in Hard Red Winter Wheat - Pennington County (Rapid City Airport), 1983 and 1984.

<u>Herbicides</u>	<u>Rates</u>	<u>Percent⁺ Weed Control</u>	<u>Yield⁺ (Bu/A)</u>
<u>Fall Application*</u>			
<u>Pre-emergence</u>			
Metribuzin	3/8 lb/a	37	26.3
Metribuzin	1/2 lb/a	78	39.7
Control		00	18.9
DPX-B-5882	0.5 oz/a	95	44.7
DPX-B-5882	1.0 oz/a	96	42.9
DPX-B-5882	2.0 oz/a	91	42.2
<u>Spring Application**</u>			
<u>Post-emergence</u>			
DPX-B-5882	0.5 oz/a	93	44.6
DPX-B-5882	1.0 oz/a	83	42.6
DPX-B-5882	2.0 oz/a	85	45.1
SMY-1500	3/4 lb/a	62	26.9
SMY-1500***	1.0 lb/a		
+ Metribuzin	0.125 lb/a	85	52.1

* Fall Application - October 6, 1983.

** Spring Application - March 22, 1984.

***Spring Application - April 11, 1984.

⁺Average of three replications.

Summary: The addition of the above herbicides suppressed the downy bromegrass mat and increased the winter wheat yield from a low of 7.4 bu/acre to a high of 33.2 bu/acre over the control plot. This study was on fallow.

Control of Downy Bromegrass in Winter Wheat
Rate of Herbicide Application
Pennington County 1983-84

Objective: To evaluate the use of herbicide DPX-B-5882 for the selective control of downy bromegrass in winter wheat.

Plot Information: Plots were sprayed on October 6, 1983. The wheat had 1 leaf emerged and there were no downy bromegrass plants emerging. Soil pH was 6.6, o.m. 3.4%, Phosphorus 24#/acre, Potassium 1110#/acre, Salts 0.8 and fine textured. The spray solution was applied with Tk 4 nozzles at 10 PSI and 20 gallon/acre. Plots were 10 ft. x 75 ft. and harvested with a Hege combine.

Table 58. Effects of Different Rates of Herbicide DPX-B-5882 on Downy Bromegrass Control and Winter Wheat Yields - Pennington County (Rapid City Airport), 1983-84.

Herbicides	Rate oz/a	Percent Control			Average
		I	II	III	
DPX-B-5882	0.5	95	99	95	96
DPX-B-5882	1.0	90	90	99	93
DPX-B-5882	2.0	99	99	99	99

Herbicides	Rate oz/a	Bushels/Acre			Average
		I	II	III	
DPX-B-5882	0.5	32	32	28	31
DPX-B-5882	1.0	27	28	28	28
DPX-B-5882	2.0	26	22	24	24
Control	--	17	20	17	18

Summary: The DuPont experimental herbicide DPX-B-5882 was very effective at the low rate of 0.5 oz/acre, giving 95-99% control in a very dense downy bromegrass stand, plus affording the least amount of damage to the winter wheat. The higher rates of DPX-B-5882 were very clean also but did show some side effects on the wheat, such as a decrease in yield.

Broad Leaf Weed Control in Winter Wheat
Rate of Herbicide Application
Pennington County - 1984

Objective: To evaluate several different herbicides and their rates of application on the control of lambsquarters.

Plot Information: The winter wheat was fully tillered and in an early joint stage. Lambsquarters in the plot area was 1-2" tall. On May 10, 1984, a spray solution was applied at 5 gallon per acre using 8001 nozzle tips. The soil was dry on top at the time of application and within one week the area had received (1+) inches of rain.

Table 59. Effect of Six Broad Leaf Herbicides on the Control of Lambsquarters in Winter Wheat - Pennington County (Wicksville), 1984.

Herbicide	Rate (oz ai/a)	% Control of Lambsquarters	Yield (Bu/A)
DPX-M6316 + S	0.125	87	35
DPX-M6316 + S	0.250	95	31
DPX-M6316 + S	0.375	97	35
DPX-M6316 + S	0.500	96	33
DPX-M6316 + S	1.000	97	36
Ally* + S	0.030	90	37
Ally + S	0.060	98	34
Ally + S	0.090	99	35
Ally + S	0.125	99	35
Glean + S	0.060	85	34
Glean + S	0.125	91	36
Glean + S	0.250	96	36
Control		00	36
2,4-D Amine + Tordan	8.000	92	16
Banvel + 2,4-D Amine	2.000	96	36
Racer	4.000	96	31
Racer	8.000	98	33

*Ally (T6376)

Summary: In evaluating the plots on May 29, 1984, all the treatments provided excellent control of lambsquarters. The 8 oz rate of 2,4-D Amine + Tordan did some damage to the wheat and produced the lowest yield. This field had only a light infestation of weeds.

Table 60. Characteristics of Hard Red Winter Wheat Varieties.

Variety	Origin Year	Maturity	Straw Strength	Quality Ranking	Winter Hardiness	Disease Resistance*		
						Wheat Streak Mosaic	Leaf Rust	Stem Rust
Archer	NAPB-81	Early	Good	Good	Fair	S	MS	R
Bennett	Neb-78	Early	Good	Good	Good	S	S	R
Gent	SD-74	Early	Good	Good	Good	MR	MR	R
Lancer	Neb-63	Early	Good	Good	Good	MS	S	R
Larned	Kan-76	Early	Good	Good	Fair	MR	S	R
Well	SD-81	Early	Good	Excellent	Good	S	S	MS
Sage	Kan-73	Early	Good	Good	Good	MR	MR	R
Scout 66	Neb-66	Early	Fair	Good	Fair	MR	S	MR
TAM 105	Tex-79	Early	Excellent	Satisfactory	Fair +	S	MS	S
Agate	Neb-76	M-Early	Good	Good	Good +	MS	S	R
Burkskin	Neb-73	M-Early	Good	Excellent	Good	MS	S	R
Brule	Neb-82	M-Early	Good	Good	Good	S	R	R
Centura	Neb-83	M-Early	Good	Good	Good	MS	MS	MR
Centurk 78	Neb-78	M-Early	Good	Good	Good	MS	S	R
Colt	NE-83	M-Early	Excellent	Good	Fair	S	MR	MS
Dawn	SD-80	M-Early	Good	Good	Fair-Good	MR	MR	R
Hawk	NAPB-81	M-Early	Good	Good	Fair	MR	R	R
Rocky	NAPB-78	M-Early	Good	Good	Good	MS	S	R
Siouxland	NE-84	M-Early	Good	Good	Good	S	R	R
SD75284	SD—	M-Early	—	—	Excellent	—	—	—
SD79219	SD—	M-Early	—	—	—	—	—	—
SD82118	SD—	M-Early	—	—	—	—	—	—
SD82195	SD—	M-Early	—	—	—	—	—	—
Nebred	Neb-83	Medium	Fair	Good	Good	S	S	S
Rita	SD-80	Medium	Excellent	Good	Good	S	R	MR
MI7877	MT—	Medium	Good	—	Good	—	—	—
Agassiz	ND-83	M-Late	Fair	Good	Excellent	—	MS	MR
Lancota	Neb-75	M-Late	Good	Excellent	Good	MR	R	R
Rose	SD-81	M-Late	Excellent	Excellent	Good-Exc.	S	MR	MS
Roughrider	ND-74	M-Late	Fair	Good	Excellent	S	S	R
Norstar	Can-77	Late	Fair	Good	Excellent	S	S	S
Winoka	SD-68	Late	Fair	Good	Excellent	S	S	R

*S = Susceptible, MS = Moderately Susceptible, MR = Moderately Resistant, R = Resistant.

Table 61. Characteristics of Hard Red Spring Wheat Varieties.

Variety	Origin Year	Relative Days In Heading	Straw Strength	Quality Rating	Disease Resistance*	
					Leaf Rust	Stem Rust
WPB Apex	WPB-83	0	Good	N/A	R	MR
Butte	ND-77	0	Poor-Fair	Satisfactory	MS	R
Centa	SD-82	0	Fair-Good	Poor	MS	R
SD8026	SD—	0	—	—	—	—
SD8036	SD—	0	—	—	—	—
Challenger	WPB-83	1	Good	Good	R	MR
Guard	SD-83	1	Good	Poor	R	R
James	SD-79	1	Good	Satisfactory	MR	R
Oslo	NAPB-82	1	Good	Poor	MS	MR
SD2956	SD—	1	—	—	—	—
SD2968	SD—	2	—	—	—	—
Victory 283	MPV-83	3	Good	Poor	MR	MR
NK711	NK-80	3	Good	Poor	MS	R
Angus	MN-78	4	Good	Good	R	R
Chris	MN-65	4	Poor	Excellent	MS	MR
Eureka	SD-78	4	Good	Satisfactory	MS	R
Len	ND-79	4	Good	Good	R	R
Norak	R+H-84	4	Good	Poor	R	R
Olaf	ND-74	4	Good	Satisfactory	MS	MR
Pondera	MT-80	4	Good	Satisfactory	MS	R
Stoa	ND-84	4	Fair	Satisfactory	R	R
Pioneer 2369	PIO-82	4	Good	Poor	MS	MR
Alex	ND-81	5	Poor	Satisfactory	R	MS
Causmex A88	Causmex	5	Good	Poor	—	—
Causmex A99AR	Causmex	6	Good	Good	MS	MS
Buckshot	NAPB-83	6	Good	N/A	MR	MR
Norseman	NAPB—	6	Excellent	Good	R	MR
Leif	R+H-84	6	Good	N/A	R	R
Wheaton	MN-82	7	Good	Poor	R	R
Marshall	MN-82	7	Good	Poor	R	R
Era	MN-71	8	Good	Poor	R-MR	R
Eric	NAPB-83	8	Good	Poor	MR	MR
Success	NAPB-83	8	Good	N/A	R	R

*S = Susceptible, MS = Moderately Susceptible, MR - Moderately Resistant, R = Resistant.

Table 62. Characteristics of Spring Oat Varieties.

Variety	Origin & Year	Relative		Straw Strength	Grain Color	% Groat Protein	Disease Resistance			
		Days In Heading					Red Leaf	Loose Smut	Stem Rust	Crown Rust
Lang	IL-76	0		Good	Yellow	17	MR	MS	S	S
Kelly	SD-84	1		Fair	White	19	—	R	S	MR
Preston	MN-82	1		Fair	Lt. Tan	21	MS	R	MS	R
Webster	IA-84	1		Good	Yellow	14**	—	R	S	R
Bates	MD-76	2		Fair	Dark	17	R	R	S	MR
Nodaway 70	MD-69	2		Poor	White	17	S	R	S	MS
Exp. 100*	AH—	2		—	—	16**	—	—	—	—
Larry	IL-80	3		Good	Yellow	18	MR	MS	S	S
Burnett	IL-76	4		Poor	Ivory	16	S	R	S	S
Chief	SD-71	4		Fair	Yellow	18	S	MR	MS	MS
Lancer	SD-79	4		Good	White	19	S	MR	MR	MR
Noble	IN-74	4		Good	Yellow	18	R	R	S	S
Ogle	IL-80	4		Good	Yellow	16	MR	MS	S	MS
Oree	IL-73	4		Fair	Ivory	20	R	MR	MS	MR
145E*	AH-84	4		Fair	White	—	—	R	MS-MR	R
343*	AH-84	4		Good	Mixed	15**	—	MS-MR	S	MS-MR
SD800312	SD—	4		—	—	14**	—	—	—	—
Benson	MN-79	6		Fair	White	18	S	R	S	MR
Centennial	WI-83	7		Fair	Yellow	16	S	R	MS	R
Lyon	MN-77	7		Good	White	19	S	R	MR	R
Wright	WI-76	7		Fair	Lt. Tan	19	MR	R	MR	MR
SD790400	SD—	7		—	—	19**	—	—	—	—
SD80043	SD—	7		—	—	15**	—	—	—	—
SD800287	SD—	7		—	—	14**	—	—	—	—
Haylander II	AH-84	8		Good	White	15**	—	R	S	R
Moore	MN-79	8		Good	White	18	—	R	S	R
Steel	ND-84	8		Good	Lt. Tan	16**	—	R	R	R
SD790188	SD—	8		—	—	14**	—	—	—	—
SD810095	SD—	8		—	—	15**	—	—	—	—
Pierce	ND-83	10		Fair	White	16**	—	MR	S	MR
Porter	IN-82	11		Good	Lt. Tan	17	R	R	MS	S
Proat	MN-84	11		—	—	17**	—	—	—	—

* Blend

** West River Averages

***S = Susceptible, MS = Moderately Susceptible; MR = Moderately Resistant; R = Resistant.

Table 63. Characteristics of Spring Barley Varieties.

Varieties	Origin & Year	Relative Days In Heading	Straw Strength	Quality	Row Type	Disease Resistance**		
						Loose Seed	Stem Rust	Leaf Spot
Glenn	ND-78	0	Fair	Malt	6-Row	R	R	MR
Primus II	SD-66	0	Fair	Feed	6-Row	S	R	S
Bowman	ND-84	1	Good	Feed	2-Row	S	R	MS
Morex	ND-78	1	Fair	Malt	6-Row	R	R	R
Hazen	ND-84	2	Good	Feed*	6-Row	S	R	MS
Larker	ND-61	2	Fair	Malt	6-Row	S	R	S
Azure	ND-82	3	Fair	Malt	6-Row	S	R	MR
Robust	MN-83	3	Good	Malt	6-Row	S	R	R
Bumper	NAPB-80	5	Fair	Feed	6-Row	S	R	MR
Clark	MT-81	5	Fair	Feed	2-Row	S	R	MS
Apex	WE--	--	Good	--	2-Row	--	--	--
Bellona	WE--	--	Good	--	2-Row	--	--	--
Nova	WE--	0	Good	Malt	2-Row	--	--	--

* Not yet classified for malting acceptability.

**S = Susceptible, MS = Moderately Susceptible, MR = Moderately Resistant, R = Resistant.

Table 64. Characteristics of Flax Varieties.

Variety	Origin Year	Relative Days In Flowering	Disease Resistance*		Seed Size	Percent Oil Content**
			Wilt	Rust		
Culbert 79	SD-79	0	MR	R	Med-Sm	40.0
Wishek	ND-79	0	MS	R	Medium	40.4
Clark	SD-83	1	MR	R	Medium	40.6
Flor	ND-81	3	MS	R	Medium	40.5

* S = Susceptible, MS = Moderately Susceptible, MR = Moderately Resistant, R = Resistant.

**Data from 1984 statewide average.

Table 65. Characteristics of Durum Wheat Varieties.

Variety	Origin Year	Relative Days In Heading	Straw Strength	Quality Rating	Disease Resistance*	
					Leaf Rust	Stem Rust
Crosby	ND-76	-1	Fair	Satisfactory	R	R
Ward	ND-72	0	Fair	Satisfactory	R	R
Edmore	ND-78	1	Good	Satisfactory	MR	R
Rugby	ND-73	1	Good	Satisfactory	R	R
Vic	ND-79	1	Good	Strong Gluten	R	R
Lloyd**	ND-82	3	Very Good	Strong Gluten	R	R

* S = Susceptible, MS = Moderately Susceptible, MR = Moderately Resistant, R = Resistant.

**Semidwarf



