

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 Projects, 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 Projects serve the western part of the state. They are unique in that all experimental plots are cooperatively located with Farmers, Ranchers, or Crop Improvement Associations, through 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

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This is an annual report and results published herein are therefore neither complete nor conclusive. 250 copies printed at an estimated cost of \$2.55 each.

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Weather Summary

The weather summaries presented in Tables 1 through 3 were obtained from the National Oceanic and Atmospheric Administration publication, Climatological Data - South Dakota and from South Dakota Crop-Weather Summary published by the South Dakota Statistical Reporting Service-USDA.

Air temperatures in Western South Dakota averaged three degrees above normal during August, four degrees below normal during September, two degrees below normal in October, and two degrees above normal in November. During the winter months air temperatures were six degrees below normal in December, two degrees below normal in January, and four degrees below normal in February. Springtime temperatures were above normal by four degrees in March, and six degrees in April and May. June was three degrees below normal, while July was two degrees above normal.

Precipitation patterns varied but rainfall was generally far below normal for the year. The Southwestern part of the state was driest being over seven inches short between January 1 and August 1. The West Central area was short by six inches, the Northwest by two to four inches, while the South Central area ranged from near normal to short by three inches.

Soil moisture conditions during the growing season are illustrated in the maps shown in table 2.

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 (Bennett County Reporting Station)***</u>				
Aug. 1984	75.3	3.0	.46	-1.62
Sept. 1984	58.2	-3.3	.82	-0.60
Oct. 1984	48.4	-2.3	.45	-0.59
Nov. 1984	37.4	1.8	1.26	0.91
Dec. 1984	22.9	-3.8	.13	-0.16
Jan. 1985	21.0	-1.5	.37	0.08
Feb. 1985	23.5	-3.2	.05	-0.36
Mar. 1985	38.0	5.9	.49	-0.18
Apr. 1985	51.7	5.9	1.40	-0.25
May 1985	61.5	5.4	.24	-2.71
June 1985	64.4	-0.8	1.17	-2.71
July 1985	75.2	1.9	1.49	-0.97

Table 1. Continued

Month & Year	Average Temperature*	Departure from Normal**	Total Precipitation*	Departure from Normal**
<u>Thunder Hawk (Lemmon-Corson County Reporting Station)</u>				
Aug. 1984	72.4	3.6	4.51	2.70
Sept. 1984	53.3	-4.1	1.44	0.05
Oct. 1984	43.6	-2.7	0.45	-0.38
Nov. 1984	30.7	0.9	0.40	-0.16
Dec. 1984	9.4	-9.5	0.55	-0.01
Jan. 1985	11.2	-0.5	0.13	-0.39
Feb. 1985	--	--	--	--
Mar. 1985	30.5	3.2	1.17	0.30
Apr. 1985	--	--	--	--
May 1985	59.0	4.9	3.03	0.35
June 1985	59.4	-4.1	2.11	-1.59
July 1985	--	--	--	--
<u>Philip (Haakon County Reporting Station)</u>				
Aug. 1984	76.9	3.5	1.09	-0.54
Sept. 1984	52.8	-3.2	0.86	-0.17
Oct. 1984	48.0	-1.3	0.34	-0.53
Nov. 1984	35.3	1.3	0.97	0.63
Dec. 1984	--	--	--	--
Jan. 1985	--	--	--	--
Feb. 1985	--	--	--	--
Mar. 1985	--	--	--	--
Apr. 1985	--	--	--	--
May 1985	--	--	--	--
June 1985	--	--	--	--
July 1985	--	--	--	--
<u>Ralph (Harding County Reporting Station)</u>				
Aug. 1984	73.3	5.4	1.00	-0.63
Sept. 1984	53.2	-3.3	1.60	0.39
Oct. 1984	44.1	-1.3	2.12	1.29
Nov. 1984	30.8	1.0	0.44	0.10
Dec. 1984	11.2	-8.5	0.69	0.41
Jan. 1985	14.3	1.0	0.10	-0.17
Feb. 1985	17.5	-2.5	Tr	-0.32
Mar. 1985	31.2	2.8	0.79	0.33
Apr. 1985	48.1	5.9	0.40	-1.14
May 1985	59.9	6.1	2.36	-0.25
June 1985	60.3	-2.4	2.31	-1.17
July 1985	73.4	3.8	1.33	-0.59

*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 specific locations.

Table 1. Continued

Month & Year	Average Temperature*	Departure from Normal**	Total Precipitation*	Departure from Normal**
<u>Wanblee</u> (Longvalley-Jackson County Reporting Station)				
Aug. 1984	76.0	2.4	0.90	-1.15
Sept. 1984	57.3	-6.0	1.03	-0.11
Oct. 1984	48.5	-3.2	0.32	-0.61
Nov. 1984	37.6	1.1	1.14	0.77
Dec. 1984	20.9	-6.2	0.09	-0.23
Jan. 1985	19.1	-2.6	0.47	0.23
Feb. 1985	22.3	-4.9	Tr	-0.42
Mar. 1985	36.1	2.4	1.02	-0.07
Apr. 1985	50.8	4.2	1.34	-0.83
May 1985	62.1	4.6	0.22	-2.55
June 1985	64.9	-2.8	1.82	-1.36
July 1985	77.9	2.7	1.51	-0.81
<u>Mundo</u> (Jones County Reporting Station)				
Aug. 1984	76.7	3.1	1.70	-0.15
Sept. 1984	60.7	-2.4	0.80	-0.31
Oct. 1984	50.0	-1.3	1.33	0.23
Nov. 1984	37.2	2.0	0.51	0.02
Dec. 1984	20.1	-3.6	0.36	-0.07
Jan. 1985	17.5	-0.1	0.82	0.51
Feb. 1985	22.0	-1.8	0.01	-0.45
Mar. 1985	37.5	5.5	2.29	1.21
Apr. 1985	53.3	6.7	1.21	-0.99
May 1985	64.9	6.8	0.55	-2.12
June 1985	64.8	-3.2	3.77	0.49
July 1985	77.3	2.7	1.51	-0.81
<u>Kennebec</u> (Lyman County Reporting Station)				
Aug. 1984	77.4	3.0	2.12	-0.11
Sept. 1984	60.4	-3.3	0.88	-0.33
Oct. 1984	50.3	-0.8	1.65	0.59
Nov. 1984	35.9	1.7	0.07	-0.44
Dec. 1984	19.0	-3.1	0.15	-0.23
Jan. 1985	15.6	0	0.72	0.47
Feb. 1985	19.6	-2.9	0.04	-0.04
Mar. 1985	37.5	5.5	1.38	0.49
Apr. 1985	53.0	5.7	0.75	-1.38
May 1985	65.1	6.2	1.83	-0.69
June 1985	65.8	-3.3	3.20	0.19
July 1985	77.1	1.3	3.55	1.26

*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.

Table 1. Continued

Month & Year	Average Temperature*	Departure from Normal**	Total Precipitation*	Departure from Normal**
<u>Bear Butte Valley (Ft. Meade-Meade County Reporting Station)***</u>				
Aug. 1984	74.1	2.4	2.85	1.13
Sept. 1984	57.3	-4.3	1.05	-0.14
Oct. 1984	46.8	-4.1	0.59	-0.45
Nov. 1984	37.6	1.7	1.57	0.87
Dec. 1984	21.2	-6.9	0.67	0.11
Jan. 1985	23.3	0.5	0.28	-0.19
Feb. 1985	24.0	-3.9	0.04	-0.68
Mar. 1985	35.5	1.9	1.70	0.68
Apr. 1985	52.4	6.9	0.67	-1.74
May 1985	62.6	6.2	1.17	-2.14
June 1985	64.4	-1.4	1.89	-1.92
July 1985	75.6	2.6	1.13	-1.10
<u>Plainview (Meade County Reporting Point)***</u>				
Aug. 1984	76.8	2.3	2.52	0.97
Sept. 1984	57.3	-5.0	0.92	-0.14
Oct. 1984	45.7	0.7	0	-2.68
Nov. 1984	33.4	-2.4	0.49	-1.35
Dec. 1984	13.2	-5.5	0.65	0.33
Jan. 1985	14.4	-8.7	0.08	-0.06
Feb. 1985	18.8	-7.7	0.03	-0.08
Mar. 1985	35.0	5.1	1.05	0.06
Apr. 1985	51.3	3.2	0.95	-0.01
May 1985	61.9	5.8	1.12	-1.48
June 1985	62.7	-2.1	2.94	-0.60
July 1985	76.8	1.3	1.73	-0.40
<u>Rapid City Airport (Pennington County Reporting Station)</u>				
Aug. 1984	74.8	3.4	1.00	-0.44
Sept. 1984	57.2	-3.7	0.74	-0.29
Oct. 1984	47.2	-2.5	0.67	-0.14
Nov. 1984	37.5	2.6	0.51	0
Dec. 1984	21.4	-4.7	0.38	-0.07
Jan. 1985	21.6	0.8	0.46	0.04
Feb. 1985	23.8	-2.2	0.06	-0.56
Mar. 1985	35.9	3.3	1.55	0.53
Apr. 1985	52.0	7.4	0.32	-1.64
May 1985	61.8	6.2	1.24	-1.39
June 1985	62.1	-3.1	1.58	-1.68
July 1985	74.6	2.0	1.03	-1.09

*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 specific location.

Table 1. Continued

Month & Year	Average Temperature*	Departure from Normal**	Total Precipitation*	Departure from Normal**
<u>Wasta</u> (Pennington County Reporting Station)				
Aug. 1984	76.2	2.9	3.35	1.84
Sept. 1984	59.2	-3.0	0.25	-0.81
Oct. 1984	48.7	-1.7	0.15	-0.77
Nov. 1984	38.3	3.2	0.33	-0.16
Dec. 1984	19.7	-5.0	0.40	0.02
Jan. 1985	20.2	0.4	0.35	0
Feb. 1985	22.7	-3.3	0	-0.44
Mar. 1985	35.9	1.8	1.11	0.26
Apr. 1985	52.9	5.9	0.77	-1.14
May 1985	63.7	5.6	0.55	-1.96
June 1985	65.2	-2.5	2.37	-0.76
July 1985	76.9	2.0	0.74	-1.31
<u>Meadow</u> (Usta-Perkins County Reporting Station)***				
Aug. 1984	73.7	2.8	0.40	-0.90
Sept. 1984	55.6	-3.8	0.86	0.05
Oct. 1984	44.9	-1.4	0.13	-1.13
Nov. 1984	30.7	0.1	0.33	-0.13
Dec. 1984	8.4	-8.1	0.82	0.47
Jan. 1985	14.4	0.6	Tr	-0.26
Feb. 1985	18.4	-2.8	Tr	-0.26
Mar. 1985	31.0	0.4	1.17	0.54
Apr. 1985	48.8	8.1	0.70	-1.10
May 1985	60.7	8.7	2.61	0
June 1985	61.4	-2.6	2.08	-0.52
July 1985	73.2	0.4	1.60	-0.20
<u>Kirley</u> (Stanley County Reporting Station)****				
Aug. 1984	--	--	--	--
Sept. 1984	58.1	-4.2	0.72	-0.64
Oct. 1984	48.0	0.1	0.31	-0.68
Nov. 1984	34.8	1.6	0.67	0.28
Dec. 1984	12.1	-7.3	1.55	1.05
Jan. 1985	13.2	-2.6	0.61	0.26
Feb. 1985	17.9	-4.9	0.09	-0.49
Mar. 1985	33.8	0.6	1.51	0.50
Apr. 1985	--	--	--	--
May 1985	63.1	5.5	0.97	-1.65
June 1985	--	--	--	--
July 1985	--	--	--	--

*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.

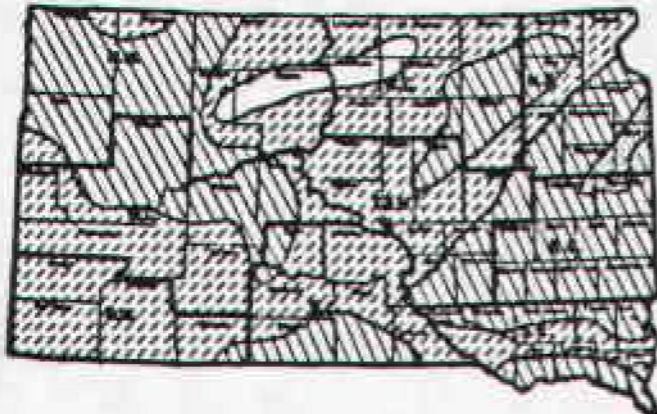
** Departures from normal are based on records for the period 1951-1980.

***Departures based on records for 1970-1984 at specific location.

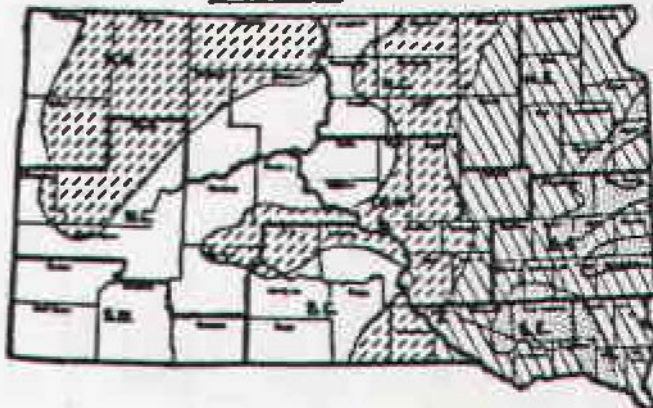
****Departures based on records of 14 years (1971-1984).

Table 2. Topsoil Moisture Conditions During Growing Season, April-September 1985. (Crop and Livestock Reporting Service-USDA)

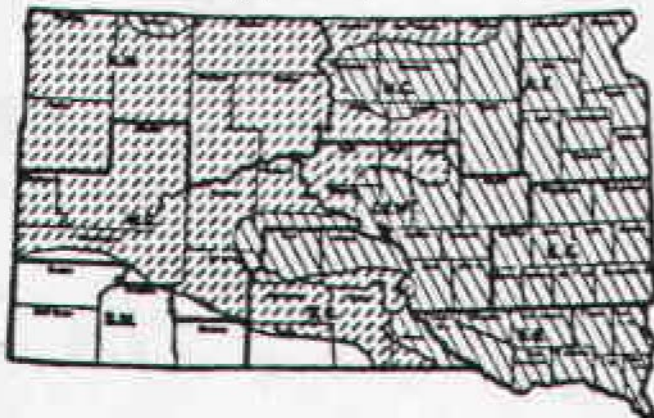
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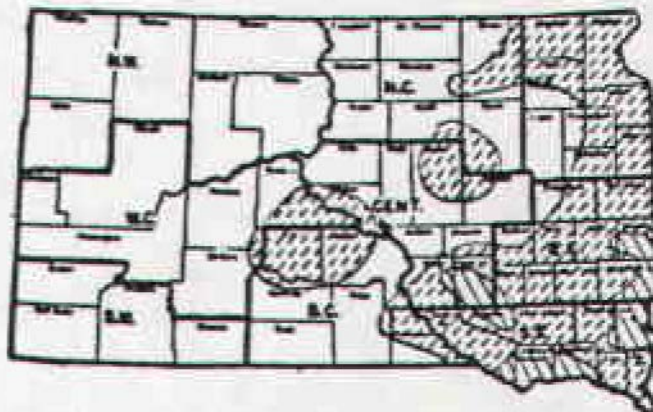
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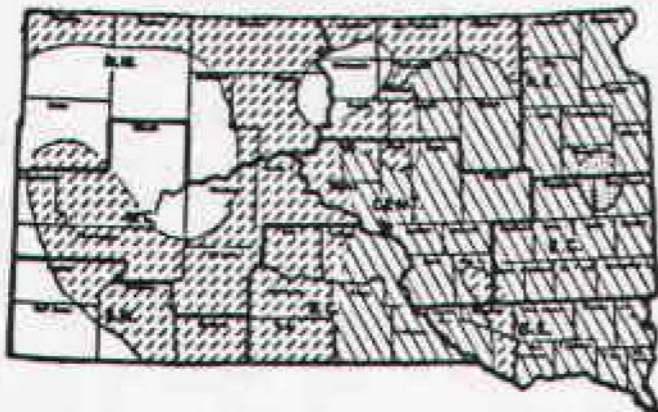
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As of Friday, July 12, 1985



As of Friday, August 16, 1985



As of Friday, September 13, 1985

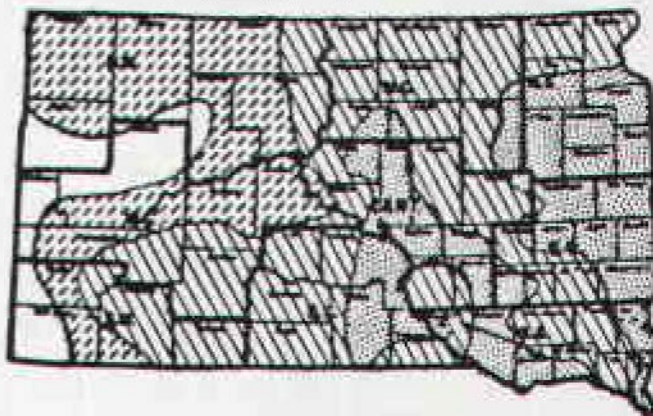


Table 3. Weather Data - Date of Critical Temperatures and Total Useable-Precipitation in Counties with Experimental Plots, (1984-1985).

Location	Date of Temperature*		Total Useable Moisture**	
	Fall-First	Spring-Last	Aug. 84-July 85	April 85-July 85
Bennett County (Martin)	Sept. 26 (27°)	May 17 (28°)	3.24	2.17
Corson County (Lemmon)	Sept. 23 (27°)	Apr 27 (28°)+	9.22++	3.25++
Hakon County (Philip)	Sept. 26 (23°)##	Apr 27 (22°)#	--	--
Harding County (Ralph)	Sept. 23 (26°)	Apr 26 (28°)	6.48	3.31
Jackson County (Long Valley)	Sept. 24 (26°)	May 6 (28°)	4.15	2.27
Jones County (Murdo)	Sept. 29 (25°)	Apr 27 (26°)	9.10	4.90
Lyman County (Kennebec)	Sept. 26 (24°)	Apr 26 (27°)	9.65	6.19
Meade County (Ft. Meade)	Sept. 24 (28°)	Apr 27 (28°)	7.11	2.07
Meade County (Plainview)	Sept. 26 (28°)	Apr 27 (26°)	6.60	3.47
Pennington County (Rapid City, AP)	Sept. 25 (24°)	Apr 9 (27°)	3.53	1.36
Pennington County (Wasta)	Sept. 25 (28°)	Apr 25 (26°)	5.10	1.58
Perkins County (Usta)	Sept. 26 (28°)	Apr 27 (25°)	5.54	4.28
Stanley County (Kirley)	Sept. 29 (26°)	Apr 27 (27°)##	--	--

*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.

+Missing Data - Closest reporting station was McIntosh.

++Estimated value, Data missing for February, April, and July.

#Missing Data - Closest reporting station was Cottonwood.

##Missing Data - Closest reporting station was Milesville.

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, Haakon, Harding, Jackson (2 locations), 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 sixty 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.

Bennett County

The winter wheat variety trial in Bennett county was seeded into fallow soil with a deep furrow seeder on September 21. Soil moisture was limited but adequate for germination. Subnormal rainfall had been received throughout the spring and summer, except during July. Subnormal moisture continued through the growing season.

Subnormal temperatures were experienced during most of the fall and winter. During March, April, and May air temperatures averaged 5.7 degrees above normal. In early April soil moisture was measured to a depth of 36 inches. The plots were topdressed with fertilizer for an anticipated yield of 75 bushels per acre. However, due to above normal spring temperatures very few tillers developed, and with a lack of spring rains the anticipated yields of forty five bushels per acre were reduced to twenty bushels per acre. Weeds were controlled by an application of Glean at one-third ounce per acre. The results of the trial are listed in table 4.

Haakon County

The variety trial was seeded on September 14 with a deep furrow drill into fallow soil. Soil moisture, although adequate for germination and emergence was limited. Further climatological data was unavailable but surrounding areas were extremely dry during the entire 1985 season. Plants were short in stature, there were few tillers, and heads were small. The average yield for the trial was twenty one bushels per acre. Results are listed in Table 5.

Harding County

The Harding County trial was seeded on September 19. Soil moisture was adequate for germination and emergence. Rainfall was above normal during the fall but was below normal during the following spring and summer. Air temperatures were near normal except during December when they were more than eight degrees below normal. March, April, and May air temperatures were much above normal.

Winterkill was severe with an average survival of 59%. Stored soil moisture was measured at 7.2 inches, and fertilizer applied for an anticipated yield of sixty bushels per acre. Under normal rainfall the anticipated yield was forty

TABLE 4. Hard Red Winter Wheat Variety Trials - Bennett County (Martin), 1983-85

Variety	% Stand May 1985	Height (Inches)	Maturity*	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield-Bu/A	
						1985	(3 yr av)
Quantum 555	85	22	M-E	14.6	57.3	23.8	—
Bounty 301	84	24	M	15.2	56.0	23.4	—
Gent	89	24	E	14.1	58.8	23.2	37.0
Bennett	84	20	E	14.1	58.2	23.0	35.7
Sage	90	22	E	13.1	58.5	22.8	32.9
Bounty 205	81	21	M	14.6	56.9	22.7	—
Rocky	84	22	M-E	13.3	58.6	22.5	39.4
Quantum 563	83	23	M-E	14.2	58.7	22.4	—
Brule	88	23	M	13.5	58.0	22.3	38.8
Agate	86	25	M-E	14.2	58.0	21.9	35.9
SD 76463-4	85	24	M-E	14.4	58.5	21.9	—
Norstar	91	27	L	16.0	56.1	21.6	33.0
Bounty 203	85	21	M	13.7	58.0	21.1	—
Thunderbird	89	21	M-E	15.4	60.3	20.6	—
Archer	81	20	E	13.0	57.6	20.6	34.8
Lancer	88	25	E	15.0	59.4	20.5	36.0
Quantum 554	91	22	M-E	13.3	58.0	20.2	—
Roughrider	91	23	M-E	15.1	58.3	20.1	35.6
SD 76598	89	20	M-E	14.1	59.2	20.0	—
Agassiz	90	24	M-L	15.9	58.3	19.6	—
Big Horn	88	19	M-E	14.4	57.7	19.3	—
Scout 66	89	20	E	13.8	58.8	19.3	36.1
Siouxland	88	23	E	13.7	58.5	19.2	37.5
Colt	89	19	M	15.1	58.5	18.7	—
Nell	90	20	E	14.8	58.4	18.6	33.9
SD 80259-18	85	20	M	15.6	59.8	18.6	—
SD 82195	89	21	M	15.4	59.0	18.5	—
Ram	88	21	M	14.0	55.9	18.5	—
Rose	90	20	M-L	14.6	59.3	18.3	35.5
Dawn	86	20	M-E	14.5	59.1	18.2	36.0
TAM 105*4/AMIGO	82	20	E	13.2	57.7	18.2	—
Centurk 78	88	20	M	13.8	59.9	18.2	35.8
Hawk	86	20	E	13.6	59.2	18.0	36.9
Centura	88	21	M-E	14.4	58.2	17.9	—
Norwin	89	19	M-L	14.3	58.1	17.4	—
Rita	88	20	M	15.3	56.7	17.1	35.8
SD 78207-17	84	20	M	15.7	59.1	15.7	—
<hr/>							
LSD (05) - 7.6 Bu/A		C.V. - 16.5%			Mean - 20.1		

*Maturity Index: E=early, M-E=medium early, M=medium, M-L=medium late, L=late.

**Protein content determined with a Technicon 300 InfraAnalyzer.

NOTE: Seeded September 21, 1984 and harvested July 19, 1985.

one bushels per acre, but due to adverse weather was reduced to thirty two bushels per acre. The trial data are published in Table 6.

TABLE 5. Hard Red Winter Wheat Variety Trial - Haakon County (Philip), 1985.

Variety	Rust Reaction*		Wheat Streak Mosaic*	Winter Survival	Percent Protein	Test Weight Lbs/Bu	Yield Bu/A
	Leaf	Stem					
Buckskin	S	R	MS	Good	16.0	60.0	31.7
TAM 105	MS	S	S	Fair	15.0	60.6	27.8
Centurk 78	S	R	MS	Good	15.6	60.1	24.4
Rita	R	MR	S	Good	16.3	56.9	21.9
Centura	MR	MR	MS	Good	15.4	60.8	21.5
Sage	MR	R	MR	Good	16.4	60.6	21.4
Prule	R	R	MS	Good	14.8	57.4	21.4
Scout 66	S	MR	MR	Fair	15.4	62.7	20.7
Rocky	S	R	MS	Good	15.6	57.5	20.3
Nell	S	MS	S	Good	15.8	58.6	20.2
Roughrider	S	R	S	Excellent	16.3	58.1	19.5
Dawn	MR	R	MR	Fair	16.1	59.1	19.0
Lancer	S	R	MS	Good	16.1	59.2	18.4
Agassiz	R	S	S	Excellent	16.9	56.2	17.3
Rose	MR	MS	S	Excellent	16.8	58.9	11.5

LSD(05) - 2.8 Bu/A

C.V. - 9.5%

Mean - 21.2

*Letter indicates reaction to disease: S - susceptible, MS - moderately susceptible, MR - moderately resistant, R - resistant, Tol - tolerant.

NOTE: Seeded September 14, 1984 and harvested July 22, 1985.

Jackson County

Winter wheat trials in Jackson County were seeded on September 13 and 18. The soil had been fallowed and seeding was done with deep furrow drills. Soil moisture was adequate for germination and emergence. Rainfall was subnormal during the entire year, with soil moisture classed as short or critically short. Normal rainfall during the spring season is in excess of ten inches but in 1985 less than five inches were received. Grain yields for the sites averaged 25.6 and 31.3 bushels per acre. The results of the two trials are printed in Table 7 and Table 8.

TABLE 6. Hard Red Winter Wheat Variety Trials - Harding County (Ralph), 1984-85.

Variety	Stand	Height	Maturity*	Percent Protein**	Test Wt. (Lbs/30)	Grain Yield-Bu/A	
	May 1985	(Inches)				1985	(2 yr. av)
Quantum 554	81	30	M-E	13.7	55.1	37.6	—
Erule	84	27	M	12.8	58.0	37.0	34.5
SD 76463-4	78	32	M-E	14.0	59.2	36.5	—
SD 82195	86	29	M	14.8	60.2	35.8	—
Rita	85	26	M	14.3	56.3	35.4	28.2
Quantum 568	82	26	M-E	14.2	56.9	35.3	—
SD 78207-17	85	26	M	15.1	59.8	35.2	—
Rose	88	26	M-L	14.6	60.9	34.4	30.1
Scout 66	82	29	E	14.2	59.4	34.2	27.3
Nell	82	28	E	13.7	57.5	33.9	—
Roughrider	89	30	M-L	14.6	59.7	33.9	29.8
Quantum 555	78	26	M-E	13.8	57.4	33.9	—
Norwin	85	24	M-L	14.6	57.9	33.9	—
Siouxland	85	27	E	14.3	56.3	33.6	30.3
Agassiz	90	34	M-L	14.9	58.7	33.6	34.7
Centurk 78	69	26	M	13.4	57.4	33.5	26.4
Asate	84	30	M-E	14.5	57.7	33.4	32.8
SD 76598	80	28	M-E	14.1	58.6	33.3	—
Norstar	90	34	L	13.4	58.8	33.2	28.1
Gent	82	26	E	14.7	59.5	32.3	—
Big Horn	32	23	M-L	15.8	55.4	32.3	—
Ram	70	26	M	13.9	54.4	31.5	—
Lancer	82	29	E	14.7	59.4	31.2	—
Sage	84	26	E	14.4	58.4	31.1	28.0
TAM105#4/Amigo	62	22	E	14.4	58.0	30.7	—
Centura	78	27	M-E	15.8	59.0	30.7	27.8
Colt	81	23	M	14.5	58.0	29.9	29.6
Archer	69	23	E	14.6	53.9	29.8	24.8
Bennett	72	25	E	14.7	57.1	29.8	27.5
Hawk	50	25	E	13.3	58.5	29.6	21.6
SD 80259-18	72	26	M	15.0	57.2	28.9	—
Bounty 301	46	26	M	14.8	56.2	28.8	—
Dawn	64	24	M-E	14.5	58.4	28.0	23.3
Thunderbird	75	24	M-E	15.5	56.5	27.3	—
Rocky	50	29	M-E	14.9	53.4	27.3	20.4
Bounty 205	62	25	M	14.6	56.3	26.4	—
Bounty 203	42	25	M	14.7	52.1	25.5	—
LSD (05) - 4.5 Bu/A		C.V. - 10.0%		Mean - 32.1			

*Maturity Index: E=early, M-E=medium early, M=medium, M-L=medium late, L=late.

**Percent protein determined with a Technicon 300 InfraAnalyzer.

Note: Seeded September 19, 1984 and harvested August 5, 1985.

TABLE 7. Hard Red Winter Wheat Variety Trial - Jackson County (Kadoka), 1985.

Variety	Rust Reaction*		Wheat Streak Mosaic*	Winter Survival	Percent Protein	Test Weight Lbs/Bu	Yield Bu/A
	Leaf	Stem					
Scout 66	S	MR	MR	Fair	13.2	60.7	29.1
Rocky	S	R	MS	Good	13.4	60.0	28.7
Centura	MR	MR	MS	Good	13.5	60.3	27.5
Buckskin	S	R	MS	Good	13.6	58.9	27.3
Dawn	MR	R	MR	Fair	13.5	59.6	26.9
TAM 105	MS	S	S	Fair	13.1	59.7	26.7
Lancer	S	R	MS	Good	13.9	60.5	26.4
Brule	R	R	MS	Good	13.0	58.2	25.9
Centurk 78	S	R	MS	Good	13.5	59.8	25.9
Nell	S	MS	S	Good	14.0	59.4	25.5
Sage	MR	R	MR	Good	14.1	59.9	24.1
Roughrider	S	R	S	Excellent	14.6	59.5	23.8
Rose	MR	MS	S	Excellent	14.3	59.4	21.7
Agassiz	R	S	S	Excellent	14.8	57.0	19.3

LSD(05) - 2.2 Bu/A

C.V. - 5.1%

Mean - 25.6

*Letter indicates reaction to disease: S - susceptible, MS - moderately susceptible, MR - moderately resistant, R - resistant, Tol - tolerant.

NOTE: Seeded September 13, 1984, harvested July 22, 1985.

TABLE 8. Hard Red Winter Wheat Variety Trial - Jackson County (Wanblee), 1985.

Variety	Rust Reaction*		Wheat Streak Mosaic*	Winter Survival	Percent Protein	Test Weight Lbs/Bu	Yield Bu/A
	Leaf	Stem					
Centurk 78	S	R	MS	Good	14.3	62.5	35.6
Centura	MR	MR	MS	Good	13.9	63.0	34.6
Rita	R	MR	S	Good	15.2	61.1	34.0
Rall	MS	R	MR	Fair	14.3	62.2	33.8
Dawn	MR	R	MR	Fair	14.2	61.8	32.6
Agassiz	R	S	S	Excellent	15.0	61.3	32.2
Sage	MR	R	MR	Good	14.5	63.1	32.0
Scout 66	S	MR	MR	Fair	13.9	63.5	31.5
Brule	R	R	MS	Good	13.9	62.8	31.5
TAM 105	MS	S	S	Fair	13.9	64.0	31.0
Roughrider	S	R	S	Excellent	15.3	61.6	30.4
Nell	S	MS	S	Good	14.6	62.6	29.7
Buckskin	S	R	MS	Good	16.9	61.0	29.6
Rocky	S	R	MS	Good	14.9	63.1	29.6
Lancer	S	R	MS	Good	14.6	62.5	27.9
Rose	MR	MS	S	Excellent	16.1	61.3	24.7

LSD(05) - 3.5 Bu/A

C.V. - 8.0%

Mean - 31.3

*Letter indicates reaction to disease: S - susceptible, MS - moderately susceptible, MR - moderately resistant, R - resistant, Tol - tolerant.

NOTE: Seeded September 18, 1984 and harvested July 22, 1985.

Meade County
(Bear Butte Valley)

Winter wheat varieties in Bear Butte Valley were seeded on September 20, 1984. The soil was dry at the surface but moist at seeding depth. Germination and emergence were good. Cool temperatures in September and October reduced fall growth but ground cover was near normal. Subnormal temperatures in December did not affect the survival because of snow cover insulation. Air temperatures in March, April, and May were above longtime averages while rainfall from April on were far below normal.

Available soil moisture in early April was 4.2 inches. Normal seasonal precipitation of 14 inches would have resulted in estimated grain yields of 50 bushels per acre. The trials were fertilized to provide nutrients in excess of that requirement. However, only 46% of the anticipated moisture was received. The effect of the abnormal temperatures and precipitation was limited tillering, short plants, and reduced yields. Grain yields averaged 32 bushels per acre, weights per bushel were exceptionally high and grain protein was normal. The results can be found in Table 9.

Meade County
(Plainview)

The variety trial at Plainview was seeded on September 19. The soil was firm with good moisture. Germination and emergence was excellent resulting in an exceptional vigorous stand and good ground cover. Precipitation was limited during the fall and subnormal air temperatures were common from November through February. However, during March, April, and May temperatures were above normal but moisture was much below normal. As in other locations tillering was limited and heads were short. The yields shown in Table 10 were less than half those of the previous 2 years. Weeds were controlled by applying the herbicide Glean at 0.6 ounce per acre.

TABLE 9. Hard Red Winter Wheat Trials—Meade County (Bear Butte Valley), 1983-85.

Variety	Y Stand May 1985	Height (Inches)	Date of Heading	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield-Bu/A 1985 (3 yr av)	
Quantum 555	94	25	May 25	13.1	63.4	38.5	—
Quantum 554	91	30	25	13.8	63.4	37.8	—
Rose	95	28	27	15.3	63.4	37.0	41.1
Norstar	94	32	June 1	14.7	61.1	36.8	40.2
Quantum 568	92	26	May 23	14.8	63.6	35.4	—
Siouxland	92	28	May 23	15.0	62.7	34.4	—
Centurk 78	95	26	25	14.7	63.4	34.4	38.1
Colt	94	26	25	15.4	63.2	34.0	—
Ram	91	25	25	14.1	61.4	33.8	—
Norwin	95	23	30	14.9	64.1	33.8	—
Rocky	92	26	May 26	15.0	64.2	33.6	37.2
Roughrider	94	32	31	16.4	61.9	33.5	38.4
Nell	94	26	25	15.2	62.2	33.2	38.9
Thunderbird	94	24	24	15.4	65.4	32.9	—
Dawn	94	24	24	15.7	63.9	32.8	33.1
SD 76598	90	27	May 25	14.9	62.5	32.8	—
Lancer	94	29	26	14.6	63.4	32.7	39.9
Bounty 301	90	26	26	14.9	63.2	32.6	—
Scout 66	91	26	22	15.6	63.0	32.3	36.2
Agate	90	23	26	14.9	63.4	31.7	38.3
Hawk	91	24	May 24	14.9	64.0	31.4	39.1
Bennett	92	24	22	16.9	64.7	31.4	37.3
Rita	92	26	27	15.7	61.0	31.3	35.4
SD 82195	95	28	29	14.5	60.9	31.2	—
Sage	92	26	24	15.4	63.4	31.2	35.5
Brule	90	26	May 25	14.5	61.5	31.0	39.0
Bounty 203	90	26	25	14.9	63.4	31.0	—
SD 76463-4	92	27	26	15.4	63.2	30.8	—
SD 78207-17	91	26	27	16.3	62.0	30.7	—
Big Horn	92	24	28	15.5	63.7	30.0	—
Agassiz	95	30	May 30	15.9	61.4	29.7	—
Bounty 205	90	24	25	15.0	64.0	29.4	—
Archer	95	23	24	14.9	63.7	29.0	37.0
Gent	92	26	24	16.2	63.4	28.9	36.3
SD80259-18	94	25	25	15.8	64.5	28.8	—
Centura	92	24	May 22	15.8	63.0	28.1	—
TAM 105*4/AMIGO	89	24	22	—	62.5	26.3	—
LSD (05) - 6.3 BU/A				C.V. - 14.0%		Mean - 32.3	

*Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Seeded September 20, 1984 and harvested July 15, 1985.

TABLE 10. Hard Red Winter Wheat Trials - Meade County (Plainview), 1983-85.

Variety	% Stand May 1985	Height (Inches)	Maturity*	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield-Bu/A 1985 (3 yr av)
Norstar	90	33	L	15.5	56.8	35.6 47.1
Bounty 205	70	25	M	14.2	56.4	34.9 —
Norwin	78	22	M-L	15.3	57.4	34.4 —
SD32195	85	25	M	14.4	57.4	33.1 —
Bennett	78	25	E	15.5	57.8	29.7 42.2
Lancer	82	26	E	14.7	57.9	29.6 45.9
Quantum 568	72	24	M-E	14.5	57.4	29.6 —
Siouxland	90	25	E	15.0	55.4	29.4 —
Rocky	82	27	M-E	14.8	58.8	29.1 49.7
Dawn	80	26	M-E	13.9	57.5	28.8 44.6
SD80259-18	70	24	M	15.1	57.5	28.8 —
Archer	60	22	E	14.7	55.4	28.3 48.1
Bounty 203	68	23	M	14.8	56.3	27.8 —
Ram	58	25	M	14.4	55.7	27.8 —
Agate	68	28	M-E	15.5	58.1	27.6 44.7
Bounty 301	33	27	M	14.2	56.2	27.6 —
Colt	80	22	M	14.3	56.7	27.5 —
Agassiz	82	30	M-L	15.9	56.8	27.3 —
Rita	85	25	M	15.4	55.7	26.9 42.8
Rose	90	26	M-L	15.8	58.3	26.8 47.3
Thunderbird	78	25	M-E	14.9	57.7	26.8 —
SD78207-17	82	25	M	15.2	57.7	26.7 —
SD76463-4	68	24	M-E	15.4	56.6	26.5 —
Brule	80	26	M	13.1	55.7	26.0 48.5
SD76598	68	26	M-E	15.1	57.4	25.6 —
Hawk	75	23	E	14.8	57.7	26.1 44.9
Roughrider	88	30	M-L	16.2	57.2	26.0 43.7
Gent	60	28	E	15.5	56.2	26.0 45.3
Centurk 78	82	24	M	14.7	57.2	25.4 45.0
TAM105*4/AMIGO	78	18	E	14.6	57.0	24.0 —
Big Horn	55	23	M-L	16.7	56.2	24.0 —
Nell	88	25	E	15.4	56.7	23.0 40.9
Centura	78	25	M-E	14.8	57.0	22.8 —
Scout 66	60	27	E	14.9	57.7	20.5 42.2
Sage	68	29	E	15.8	57.0	19.9 40.1
Quantum 555	75	23	M-E	—	53.9	4.4*** —
Quantum 554	68	26	M-E	17.2	55.6	3.4*** —

(not statistically analyzed)

Mean - 26.0

*Maturity Index: E=early, M-E=medium early, M=medium, M-L=medium late, L=late.

**Percent protein determined with a Technicon 300 InfraAnalyzer.

***Beardless varieties - were severely damaged by grazing deer.

Note: Seeded September 19, 1984 and harvested August 14, 1985

Pennington County

The winter wheat trials in Pennington County were seeded in fallow soil on September 13. The soil was loose but had sufficient subsurface moisture for germination and emergence. Rainfall was above normal in August but was below normal during the remainder of the crop year ending in July 1985. Air temperatures in September and October were below normal, and were far below normal in December. During April and May the temperatures were over 8 degrees above normal, resulting in few tillers being formed. Plants were short, protein content of the grain was high, and weights per bushel below standard. The trial results are listed in Table 11.

Perkins County

The winter wheat trial in Perkins County was seeded on September 19, 1984. Soil moisture was limited because of subnormal precipitation during July and August. However, there was sufficient moisture for germination and emergence. Soil moisture was in short supply during the entire year but during July and August 1985 was critically short.

Air temperatures were below normal during most of the fall and winter. In December they were over 8 degrees below longtime averages. This resulted in severe winterkill. During April and May, temperatures were over 8 degrees above normal, resulting in small grain with few tillers, stunted plants and small heads.

Spring soil moisture was present to a depth of 30 inches. That amount plus normal rainfall would have provided moisture to produce 37 bushels of grain per acre. However, because of subnormal rainfall, moisture was available to produce only a calculated yield of 30 bushels per acre. The grain produced had protein content 3 per cent above the 1984 production while weights per bushel were 3 pounds less. Actual yields averaged 28 bushel per acre, 20 bushels less than the 1984 acre yields. The results are presented in Table 12.

TABLE 11. Hard Red Winter Wheat Variety Trials - Pennington County(Wall),1983-85.

Variety	% Stand May 1985	Height (Inches)	Date of Heading	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield-Bu/A 1985	(3 yr av)
Rose	81	26	May 31	16.4	54.4	42.9	56.8
Quantum 554	85	29	29	15.4	58.4	42.1	---
Quantum 555	81	24	30	14.3	56.0	41.6	---
Agassiz	92	32	June 2	14.9	56.5	41.4	---
Bounty 301	70	26	30	15.6	60.3	41.3	---
SD76463-4	79	28	May 31	15.2	54.1	41.2	---
Agate	89	26	29	15.3	59.9	41.1	54.2
Centurk 78	80	25	30	15.6	58.1	40.2	55.4
Colt	77	24	30	15.2	55.4	40.1	---
Sage	86	26	27	15.0	60.8	39.0	53.6
SD82195	85	27	June 1	15.5	54.1	38.6	---
Ram	86	24	28	15.9	58.0	38.4	---
Lancer	85	27	31	15.2	57.4	38.3	54.8
Norwin	84	24	June 2	16.0	55.8	38.2	---
Rocky	84	25	May 28	16.0	58.0	37.8	55.6
Norstar	94	36	June 2	14.9	59.4	37.7	52.2
Siouxland	91	26	May 27	14.6	60.1	36.6	54.3
Roughrider	89	30	June 1	15.3	59.6	36.4	53.4
Scout 66	60	28	May 28	14.5	53.4	36.4	52.2
TAM105*4/ANIGO	70	22	25	16.0	55.1	36.0	---
Bounty 203	83	24	May 30	15.5	58.3	36.0	---
Quantum 568	88	24	28	15.9	59.4	36.0	---
SD76598	81	26	30	15.6	56.7	35.9	---
Hawk	78	23	30	15.8	55.3	35.5	---
Gent	84	26	28	16.5	59.9	35.0	50.0
Bennett	82	24	May 28	16.2	58.3	34.9	50.3
Centura	81	24	28	14.8	57.5	34.4	---
Brule	85	26	30	14.9	55.9	34.4	55.1
Rita	88	24	June 2	16.6	54.0	34.2	50.4
SD80259-18	82	24	May 30	16.1	58.6	34.2	---
Thunderbird	82	24	May 30	16.6	60.0	34.2	---
Bounty 205	84	26	28	15.5	58.0	33.6	---
Archer	90	23	29	15.5	58.0	33.4	51.6
Big Horn	86	24	31	16.2	58.6	33.0	---
Dawn	86	25	29	15.9	58.4	32.9	52.0
Nell	88	24	May 30	16.1	57.6	32.8	53.0
SD78207-17	85	24	June 1	17.2	56.5	29.7	---
LSD(05) - 5.7 Bu/A				C.V. - 11.0%		Mean - 36.9	

*Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Seeded September 13, 1984 and harvested July 16, 1985

TABLE 12. Hard Red Winter Wheat Variety Trials - Perkins County (Meadow), 1983-85.

Variety	2 Stand May 1985	Height (Inches)	Maturity*	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield-Bu/A 1985 (3 yr av)	
Quantum 554	69	29	M-E	15.5	57.7	33.8	--
Quantum 568	84	24	M-E	15.8	58.0	32.6	--
Big Horn	79	22	M-L	16.4	58.0	32.4	--
SD 76598	75	26	M-E	14.9	59.5	31.8	--
Archer	58	23	E	15.6	56.2	31.2	40.4
Brule	82	24	M	14.4	56.9	31.2	39.6
Rose	89	23	M-L	16.0	59.4	31.1	46.8
Centurk 78	76	26	M	15.4	59.8	30.8	39.6
Lancer	82	26	E	15.8	59.3	30.7	40.5
Gent	82	27	E	16.4	58.9	30.5	40.6
SD 78207-17	80	24	M	17.0	58.9	30.4	--
Quantum 555	70	25	M-E	15.7	56.5	30.2	--
SD 82195	85	27	M	16.0	60.2	29.9	--
Agate	72	28	M-E	15.5	59.1	29.8	41.9
SD 76463-4	79	28	M-E	15.9	59.1	29.7	--
Rocky	55	26	M-E	15.4	59.2	29.2	42.0
Siouxland	86	27	E	15.3	57.4	29.2	42.1
Norwin	89	21	M-L	15.2	59.8	29.2	--
Colt	80	21	M	15.3	57.2	29.0	--
Rita	61	25	M	15.6	54.7	28.8	40.4
Agassiz	90	31	M-L	17.7	58.1	28.8	--
Centura	82	25	M-E	15.7	58.1	28.6	--
Nell	86	26	E	16.5	58.4	28.6	43.5
Bennett	80	23	E	16.4	58.8	28.5	37.5
SD 80259-18	80	22	M	16.4	56.8	28.2	--
Sage	82	25	E	15.9	58.4	28.1	38.8
Norstar	89	31	L	16.1	57.7	27.1	45.8
Scout 66	79	24	E	16.6	58.9	27.1	36.3
Thunderbird	68	22	M-E	16.1	59.1	26.4	--
Roughrider	89	26	M-L	--	57.9	26.3	43.3
TAM105*4/Amigo	59	20	E	15.2	58.3	25.7	--
Ram	50	22	M	15.6	56.2	24.5	--
Dawn	50	24	M-E	16.3	57.9	23.2	34.8
Hawk	52	22	E	15.5	58.4	22.6	36.7
Bounty 203	16	23	M	15.7	57.1	19.9	--
Bounty 205	30	22	M	16.3	57.0	19.1	--
Bounty 301	20	23	N	16.4	54.6	16.3	--
LSD (05) - 5.3 Bu/A		C.V. - 13.4%		Mean - 28.1			

*Maturity Index: E=early, M-E=medium early, M=medium, M-L=medium late, L=late.

**Percent protein determined with a Technicon 300 InfraAnalyzer.

Note: Seeded September 19, 1984 and harvested August 7, 1985.

Hard Red Spring Wheat

Plots were seeded at seven locations in 1985. 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 13 through 26.

Bennett County

Spring wheat plots at Martin were seeded on April 10 in soil fallowed in 1984. Soil moisture was adequate at seeding time because of heavy wet snow received in early March. Moisture was present in the soil to a depth of 36 inches. Rainfall through the spring and early summer was much below normal and topsoil moisture was classed as critically short from April through July. Air temperatures were below normal most of the winter. During March, April, and May the temperatures were nearly 6 degrees above longtime averages. The combination of high temperatures and limited moisture resulted in stunted plants, few tillers, and small heads. Grain yields were about half of the 1984 yields and a third of the 3 year average. Weights per bushel were low and protein content high because of the drought stress. The trial results are shown in Tables 13 and 21.

Corson County

The spring wheat variety trials were seeded near Thunder Hawk on April 30. The soil was mellow and had a good moisture supply. The rainfall was above normal through the month of May. Air temperatures, as at other locations were above normal during the spring months. The plots contained vigorous growing plants which produced high yields of grain with good test weights and high protein content. The results are shown in Tables 14 and 22.

Harding County

Spring wheat variety trials at Ralph were seeded in fallow soil on April 23. Stored soil moisture was present to 36 inches and was calculated at 7.2 inches. Rainfall from March through July was below longtime averages, resulting in a shortage of topsoil moisture during most of the growing season. Air temperatures averaged 6 degrees above normal during April and May, were 2.4 degrees below normal in June, and 3.8 degrees above normal in July.

The overall effect of moisture and temperature during the growing season was limited tillering, and reduced yields. Protein content was high but weight per bushel was slightly below normal. The trial data are reported in Tables 15, 16, and 23.

TABLE 13. Hard Red Spring Wheat Variety Trial - Bennett County (Martin), 1983-85.

Variety	Height (Inches)	Relative Maturity*	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre	
					1985	(3 yr av)
SD 2956	20	3	15.3	55.4	22.0	—
Stoa	22	4	17.2	54.3	21.6	32.1
Marshall	19	8	16.2	52.8	21.6	32.5
Oslo	20	0	14.4	55.1	21.2	31.1
Norak	19	3	15.7	55.5	21.0	—
711	22	3	15.2	56.5	20.9	31.3
SD 2962	22	0	16.1	57.8	20.8	—
Eureka	24	7	17.2	52.8	20.6	29.3
SD 2968	20	4	15.7	55.3	20.5	—
Norseman	18	8	16.9	52.4	20.5	—
Wheaton	19	6	15.9	53.0	20.5	32.5
Victory 283	21	3	16.2	56.0	20.4	30.4
Leif	20	6	16.1	53.0	20.4	—
Buckshot	20	6	16.9	51.8	20.1	—
A'HD 300X	19	8	15.9	53.5	20.0	—
Erik	20	9	17.3	51.3	19.9	32.1
Celtic	21	5	16.1	54.0	19.8	—
Guard	19	1	15.7	56.3	19.8	32.5
ND 597	21	1	16.5	54.9	19.7	—
Alex	22	5	17.4	54.6	19.5	32.5
Len	20	4	16.6	53.4	19.2	30.9
Olaf	20	4	16.4	54.6	19.0	31.1
Challenger	20	1	14.8	57.2	19.0	—
A99AR	24	6	16.7	52.2	18.7	30.4
SD2980	22	0	15.8	58.5	18.7	—
2369	19	4	16.2	55.0	18.5	30.6
Success	21	8	17.2	51.2	18.5	—
Angus	20	4	16.5	54.6	17.9	30.6
Centa	22	0	15.9	56.9	17.9	29.3
Butte	22	0	16.3	57.4	17.7	28.5
SD8036	21	0	15.8	57.5	17.3	—
Apex 83	19	1	14.8	58.4	17.3	—
Chris	22	4	17.2	53.6	17.1	25.4
906R	19	7	15.9	55.3	16.8	—
SD8026	22	-1	16.2	54.9	14.0	31.3
LSD(05) - 3.3 Bu/A		C.V. - 12.1%		Mean - 19.4		

*Indicates relative heading time in days based on earliest heading date.

**Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were seeded April 10 and harvested August 13, 1985.

TABLE 14. Hard Red Spring Wheat Variety Trial - Corson County(Thunder Hawk), 1985.

Variety	Height (Inches)	Relative Maturity	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield (Bu/Acre)
Leif	30	6	15.8	60.1	58.1
ND597	34	1	16.5	59.8	57.5
Oslo	29	0	14.1	59.3	56.3
Apex 83	28	1	15.6	59.4	55.9
Norak	27	3	15.7	60.4	55.8
Success	30	8	14.8	58.0	55.5
SD2968	30	4	15.6	60.0	55.4
SD8036	34	0	16.4	60.4	54.7
Marshall	27	8	14.8	58.0	54.6
711	28	3	15.4	60.5	54.5
2369	28	4	16.2	60.8	54.3
Olaf	31	4	16.0	58.9	54.1
Buckshot	28	6	15.8	57.7	54.0
Guard	32	1	15.5	60.5	53.6
Butte	34	0	16.7	59.7	53.6
Angus	28	4	16.2	60.4	53.6
Stoa	36	4	15.6	58.7	53.2
Challenger	28	1	15.6	58.9	52.8
Norseman	26	8	15.3	58.2	52.5
300X	27	8	14.7	58.1	52.4
Len	29	4	16.0	58.5	52.2
SD2956	29	3	15.9	60.1	52.2
Centa	36	0	17.0	60.1	52.1
Erik	28	9	13.8	56.5	51.7
Celtic	32	5	15.8	59.4	51.1
SD 2980	34	0	15.6	61.8	50.5
Wheaton	27	6	16.1	57.7	50.4
SD2962	35	0	16.4	61.0	49.9
Alex	34	5	16.0	59.7	49.8
906R	28	7	16.1	58.1	47.6
Victory 83	34	3	15.8	60.0	47.0
A99AR	34	6	15.1	56.5	47.0
Chris	36	4	17.2	58.8	46.9
Eureka	35	7	16.7	58.0	44.4
SD 8026	34	-1	17.1	59.5	35.6**
ISD(05) - 4.5 Bu/A		C.V. - 6.2%		Mean - 52.0	

*Percent protein determined with a Technicon 300 InfraAnalyzer.

**Yield was severely reduced because of shattering.

NOTE: Plots were seeded April 30 and harvested August 20, 1985.

TABLE 15. Hard Red Spring Wheat Variety Trial - Harding County (Ralph), 1983-85.

Variety	Height (Inches)	Relative Maturity	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre	
					1985	(3 yr av)
Marshall	28	8	14.8	56.8	52.9	—
Norseman	28	8	15.3	56.8	49.6	—
Buckshot	30	6	15.8	56.8	49.2	40.1
300X	26	8	14.7	56.8	49.2	40.1
Erik	29	9	13.8	56.3	48.2	—
Leif	28	6	15.8	58.0	47.1	—
Alex	34	5	16.0	58.5	46.6	—
Success	29	8	14.8	55.8	44.8	—
A99AR	32	6	15.1	55.9	42.8	34.1
Stoa	33	4	15.6	57.0	42.7	36.1
Celtic	30	5	15.8	59.0	42.4	32.6
SD 2968	29	4	15.6	59.0	41.6	—
Norak	26	3	15.7	59.4	41.1	—
Wheaton	26	6	16.1	56.1	41.1	—
Eureka	35	7	16.7	56.2	41.1	—
2369	28	4	16.2	59.0	40.3	35.2
Angus	30	4	16.2	58.8	40.0	—
Len	29	4	16.0	58.4	39.7	34.6
Olaf	30	4	16.0	57.5	39.6	—
Guard	28	1	15.5	59.2	39.6	32.4
711	29	3	15.4	59.2	39.3	—
Oslo	27	0	14.1	57.2	38.8	—
SD 2956	28	3	15.9	58.0	38.8	34.0
ND597	30	1	16.5	58.8	38.7	34.4
Victory 283	31	3	15.8	59.0	38.3	34.0
SD 2980	30	3	15.6	61.0	36.8	—
SD 8036	30	0	16.4	58.9	36.6	33.2
Apex 83	27	1	15.6	60.1	36.4	—
906R	26	7	16.2	58.5	36.3	33.0
Butte	32	0	16.7	59.9	36.3	32.8
Challenger	27	1	15.6	58.9	35.7	32.4
Centa	31	0	17.0	58.8	35.0	31.8
SD 2962	30	0	16.4	60.2	34.2	30.6
Chris	35	4	17.2	56.8	34.0	—
SD 8026	32	-1	17.1	57.4	23.0**	25.1

LSD(05) - 4.7 Bu/A

C.V. - 8.3%

Mean - 40.5

*Percent protein determined with a Technicon 300 InfraAnalyzer.

**Yield was severely reduced because of shattering.

NOTE: Plots were seeded April 23 and harvested August 19, 1985.

**TABLE 16. Hard Red Spring Wheat Advanced Line Yield Trial - Harding County
(Ralph), 1985.**

Variety	Height (Inches)	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield (Bu/Acre)
SD2956	29	17.7	58.3	34.9
SD2988	28	16.0	60.0	34.5
PR2369	27	16.6	59.6	34.5
SD3002	28	16.7	57.4	34.4
SD2991	28	17.2	59.0	34.2
SD2992	31	17.6	61.4	34.1
Norseman	25	17.1	55.9	34.1
Len	28	18.2	59.6	34.0
SD3000	32	17.0	58.2	33.8
SD3005	29	17.1	58.8	33.6
Guard	27	18.1	56.7	33.6
SD2978	31	17.1	59.6	33.2
SD2994	31	17.5	58.5	33.2
SD2983	29	15.4	57.0	33.2
Buckshot	28	18.9	56.1	33.2
A99AR	33	17.1	55.7	33.2
Centa	33	17.6	59.6	33.1
Challenger	27	16.3	59.0	32.9
SD3004	29	16.5	59.6	32.8
SD2999	30	17.7	57.8	32.7
Stoa	31	17.2	56.5	32.4
SD3006	27	17.8	55.9	32.4
SD2995	27	16.8	58.8	32.2
SD8052	31	16.2	58.4	32.2
ND597	28	16.9	58.8	32.1
SD8051	30	17.1	60.1	31.9
SD8054	27	16.8	57.4	31.9
SD2997	30	16.7	59.7	31.5
SD2968	28	18.9	57.5	31.3
Apex 83	26	15.9	60.0	31.2
SD8036	28	17.5	58.8	31.2
SD2993	30	17.1	57.4	31.2
SD2996	28	15.4	56.2	31.2
SD2998	30	16.6	57.3	31.0
SD2990	28	16.9	58.6	30.9
Marshall	24	16.9	56.3	30.8
Wheaton	26	16.5	55.9	30.7
SD2980	30	17.3	59.6	30.6
SD2962	29	17.8	60.1	29.6
SD2982	30	18.0	58.4	29.5
Butte	30	17.2	58.8	29.4
SD2961	30	16.5	57.8	29.4
SD8055	30	18.8	58.2	28.5
Chris	32	18.8	57.4	28.1
SD8053	29	18.3	56.9	27.4
SD2981	30	17.8	57.2	25.6
SD3003	32	17.7	58.0	23.4
SD8026	33	16.7	57.2	21.3
SD3001	30	17.2	56.1	14.6

LSD(05) - 3.5 Bu/A

C.V. - 6.7%

Mean - 31.2

*Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were seeded April 23 and harvested August 19, 1985.

Meade County
(Bear Butte Valley)

The variety trials in Bear Butte Valley were seeded on April 16. The soil was cloddy with little surface moisture. Subsurface moisture was also limited. The lack of soil moisture resulted in irregular emergence and very spotty stands. Precipitation was below normal from April on. Topsoil moisture was classed as short through June when it became critically short. Air temperatures were above normal during March, April, and May.

Due to above normal temperatures and lack of moisture, there were few tillers and plants were short with small heads. Protein content was exceptionally high, and weight per bushel was low due to droughtly conditions. There was also a high population of grasshoppers in the area. The data are listed in Tables 17 and 24.

Meade County
(Plainview)

Spring wheat plots at Plainview were seeded on April 16. Soil moisture, although limited, was adequate for germination and emergence. Rainfall was below normal during May, June, and July. Air temperatures were above normal during March, April, and May. Plants were short, there were few tillers, and heads were small. Due to extreme drought stress at maturity the protein content was very high and test weight low. However, the average yield for the trial was over 5 bushel higher than the 1984 average yield. Trial data are listed in Table 18.

Pennington County

Variety plots of spring wheat were seeded in fallow near Wall on April 9, 1985. Soil moisture was adequate for germination and emergence, but was in short supply during the remainder of the growing season. Useable moisture during April through July was only 1.58 inches. Air temperatures were over 5 degrees above normal during April and May. In June they were 2.5 degrees below normal. The effect of the warm spring and lack of moisture was few tillers and small heads. The subnormal temperatures in June permitted the grain to partially fill resulting in low weight per bushel and high protein content. The results are listed in Tables 19 and 25.

Perkins County

Spring wheat variety plots were seeded near Meadow on April 11. Soil moisture was good and available to a depth of 30 inches. Precipitation was below normal but was not as short as at other locations. Air temperatures during April and May were over 8 degrees above normal. Plants were severely drought stressed at maturity. The protein contents were several percent above normal and weights per bushel ranged from 52.9 pounds up to 61.2 pounds. Grain yields were similar to those of 1984 and are reported in Tables 20 and 26.

TABLE 17. Hard Red Spring Wheat Variety Trial - Meade County (Bear Butte Valley), 1984-85

Variety	Height (Inches)	Relative Maturity*	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre	
					1985	(2 yr av)
Oslo	26	0	14.5	49.4	33.5	44.8
Norak	28	3	16.2	47.1	29.0	39.6
Challenger	27	1	15.5	49.7	28.7	43.4
906R	26	7	16.3	49.6	28.6	--
Wheaton	26	6	17.2	44.4	27.0	40.1
Apex 83	25	1	15.5	51.0	26.5	42.6
SD2980	31	0	16.5	52.1	26.4	--
SD2956	27	3	16.9	48.9	26.0	38.3
Celtic	28	5	17.1	47.1	25.1	--
SD2968	26	4	16.8	47.8	24.8	29.6
Centa	29	0	16.6	49.8	24.1	36.0
Norseman	23	8	17.4	43.2	23.6	36.8
Leif	27	6	17.7	46.0	23.5	36.6
711	27	3	15.8	49.1	23.4	37.2
SD8036	28	0	16.2	51.3	22.3	36.8
Olaf	28	4	16.9	49.6	22.2	31.2
Guard	23	1	17.1	49.4	21.8	34.2
A99AR	32	6	17.6	44.5	21.7	32.5
Victory 283	30	3	17.0	50.4	21.2	29.8
Len	27	4	17.4	45.8	20.9	28.6
Angus	28	4	16.6	46.4	20.8	35.2
Success	27	8	17.7	41.7	20.4	35.4
Buckshot	24	6	17.2	42.0	20.1	36.7
Stoa	32	4	18.3	44.3	19.9	31.4
300X	24	8	16.6	44.7	19.6	--
SD2962	30	0	16.3	53.8	19.5	--
Eureka	32	7	18.0	44.3	19.5	27.1
ND597	30	1	17.0	50.3	19.1	--
Chris	33	4	17.9	47.3	18.9	27.2
Marshall	24	8	17.2	45.5	18.7	34.4
Butte	30	0	17.2	47.8	17.4	29.4
SD8026	31	-1	16.9	48.6	15.9	33.2
2369	26	4	16.8	50.2	15.9	32.5
Alex	31	5	18.7	47.1	15.4	26.2
Erik	27	9	17.9	43.3	12.6	29.4

1SD(05) - 3.6 Bu/A

C.V. - 10.1%

Mean - 22.1

*Indicates relative heading time in days based on earliest heading date.

**Percent protein determined with Technicon 300 InfraAnalyzer

NOTE: Plots were seeded April 16 and harvested August 12, 1985.

TABLE 18. Hard Red Spring Wheat Variety Trial - Meade County (Plainview), 1984-85.

Variety	Height (Inches)	Relative Maturity*	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre	
					1985	(2 yr av)
ND597	28	1	17.5	53.4	32.6	--
Norseman	22	8	17.3	49.8	31.2	29.0
Challenger	24	1	15.6	54.0	31.2	27.2
Centa	28	0	16.9	54.2	30.9	27.4
Oslo	26	0	15.5	51.9	30.8	25.7
Guard	23	1	17.2	54.6	30.7	26.4
Apex 83	25	1	15.3	53.6	30.6	27.4
Butte	29	0	17.0	54.1	30.3	27.8
2369	24	4	17.2	52.7	30.0	25.4
Olaf	23	4	17.1	52.6	29.1	26.9
SD8036	26	0	16.4	54.1	28.6	25.1
Victory 283	26	3	17.4	54.6	28.3	26.0
SD8026	27	-1	16.1	53.7	28.1	26.0
Angus	24	4	17.5	54.0	27.7	27.0
Stoa	27	4	18.0	52.1	27.5	26.0
711	25	3	16.2	52.8	27.5	24.2
Buckshot	24	6	17.5	49.8	27.4	26.4
Len	24	4	17.2	52.2	26.8	24.5
Marshall	23	8	17.1	51.8	26.6	26.9
Leif	24	6	16.9	53.5	26.5	24.2
Wheaton	22	6	16.7	49.4	26.1	23.8
Erik	26	9	18.5	51.0	25.3	24.8
Alex	25	5	17.9	54.4	25.0	24.0
Success	25	8	18.4	50.5	24.3	23.3
A99AR	28	6	18.3	50.1	22.3	22.2
Chris	30	4	18.7	52.2	21.8	21.4
LSD(05 - 3.2 Bu/A		C.V. - 7.0%		Mean - 28.0		

*Indicates relative heading time in days based on earliest heading date.

**Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were seeded April 16 and harvested August 14, 1985.

TABLE 19. Hard Red Spring Wheat Variety Trial - Pennington County (Wall), 1983-85.

Variety	Height (Inches)	Date of Reading	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre	
					1985	(3 yr av)
SD2962	29	June 14	16.9	58.5	44.9	--
906R	23	12	15.8	55.3	43.3	39.9
Norak	26	14	16.4	57.5	42.2	--
Angus	26	15	17.6	56.1	40.8	36.1
Celtic	28	15	14.5	53.9	40.7	--
Olaf	23	June 14	14.5	55.1	40.6	37.5
Leif	26	15	15.8	54.3	40.5	--
Stoa	28	15	17.1	54.3	39.6	35.3
A99AR	31	15	17.8	50.7	39.6	33.9
Norseman	24	15	18.0	52.2	39.3	--
Wheaton	25	June 15	15.3	53.0	39.3	40.4
Guard	23	13	17.2	58.8	38.6	38.7
Oslo	26	13	15.4	57.7	38.6	39.7
Buckshot	28	15	17.1	52.3	38.5	--
ND 597	27	14	17.7	56.8	38.5	--
711	25	June 14	16.2	55.1	38.5	37.2
Len	24	15	16.7	55.3	38.4	35.9
SD 2956	26	14	17.2	54.3	38.2	--
2369	20	14	15.8	56.9	38.0	38.7
Eureka	35	15	18.3	52.6	37.8	34.4
SD 2980	27	June 14	18.1	59.4	37.6	--
SD 2968	28	14	16.7	51.7	37.4	--
SD8026	28	13	17.0	59.2	37.3	35.6
Centa	29	13	17.2	60.7	37.3	36.7
Erik	27	15	18.7	49.6	37.0	36.2
Success	29	June 16	17.3	50.7	37.0	--
Alex	29	15	17.0	53.5	37.0	35.0
Marshall	25	15	16.0	52.0	36.9	38.4
Victory 283	29	15	17.4	56.7	36.8	35.7
A'ND 300X	26	15	18.5	51.8	36.7	--
SD8036	29	14	17.1	59.4	35.8	--
Challenger	25	12	16.1	60.4	34.9	--
Chris	30	15	18.2	55.4	34.6	32.0
Apex 83	27	14	15.9	60.6	32.7	--
Butte	27	14	16.8	59.0	32.4	34.0

LSD(05) - 5.0 Bu/A

C.V. - 9.2%

Mean - 38.2

*Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were seeded April 9 and harvested July 25, 1985.

TABLE 20. Hard Red Spring Wheat Variety Trial - Perkins County (Meadow), 1983-85.

Variety	Height (Inches)	Relative Maturity*	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre	
					1985	(3 yr av)
ND597	31	1	18.1	58.7	40.7	—
Norseman	24	8	19.5	55.5	39.8	—
Guard	26	1	17.3	57.7	39.8	40.6
Oslo	25	0	15.6	58.7	39.3	37.2
SD 2980	30	0	17.7	61.2	38.6	—
SD 2962	32	0	17.4	60.2	38.2	—
Norak	26	3	16.8	57.9	38.1	—
Apex 83	25	1	16.6	59.4	38.0	—
Butte	31	0	17.6	57.7	37.6	36.6
2369	26	4	18.0	57.1	37.1	39.6
Centa	30	0	17.4	58.3	36.9	36.1
Challenger	25	1	16.7	58.2	36.9	—
SD 2956	28	3	17.4	58.0	36.1	—
SD 8036	28	0	17.2	59.6	35.6	—
Leif	27	6	18.4	57.5	35.5	—
711	28	3	17.0	57.4	35.4	35.9
300X	25	8	18.4	56.2	35.3	—
Wheaton	25	6	18.2	55.9	35.1	35.7
Celtic	29	5	18.1	57.4	34.9	—
SD 8026	30	-1	16.9	55.8	34.5	35.9
SD 2968	28	4	17.7	58.0	34.3	—
A99AR	32	6	18.5	54.6	33.0	—
Angus	30	4	18.5	58.4	32.8	35.1
Marshall	26	8	18.3	56.3	32.7	34.7
Stoa	29	4	19.6	56.5	32.6	34.4
Success	28	8	18.8	56.1	32.4	—
Len	28	4	18.4	56.4	32.2	36.0
Buckshot	26	6	19.2	56.1	32.2	—
Olaf	28	4	19.5	57.3	31.8	34.9
Alex	30	5	19.4	58.4	31.8	33.4
Erik	26	9	19.8	55.3	30.8	33.5
Eureka	31	7	19.7	52.9	29.9	32.0
Victory 283	30	3	18.1	57.9	29.8	33.7
206R	23	7	18.0	55.9	28.4	—
Chris	34	4	19.3	56.2	28.2	28.4

LSD(25) = 4.7 Bu/A

C.V. = 9.6%

Mean = 34.8

*Indicates relative heading time in days based on earliest heading date.

**Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were seeded April 11 and harvested August 8, 1985.

Durum Wheat

Durum wheat variety trials were seeded at six locations in 1985. The remarks and discussion pertinent to these trials were included in the Hard Red Spring Wheat section and can be found on pages 22, and 27. The yields and other data are listed in Tables 21 through 26.

TABLE 21. Durum Wheat Variety Trial - Bennett County (Martin), 1982-85.

Variety	Height (Inches)	Relative Maturity*	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre	
					1985	(4 yr av)
Laker	23	1	14.8	56.6	21.2	—
Vic	24	1	16.5	56.1	20.8	21.4
Edmore	24	1	15.7	55.8	20.5	20.5
Rugby	25	1	16.2	55.4	20.3	21.7
Ward	23	0	16.8	56.2	19.9	22.3
Crosby	25	-1	16.4	56.1	19.6	21.8
Lloyd	21	3	15.3	54.9	19.3	22.1
Monroe	22	-2	15.7	55.8	18.8	—
LSD(05) - 2.0 Bu/A		C.V. - 6.9%		Mean - 20.1		

*Indicates relative heading time in days based on earliest heading date.

**Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were seeded April 10 and harvested August 13, 1985.

TABLE 22. Durum Wheat Variety Trial - Corson County (Thunder Hawk), 1985.

Variety	Height (Inches)	Relative Maturity*	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield	
					(Bu/Acre)	
Lloyd	30	3	13.0	59.2	55.8	
Vic	35	1	15.1	59.6	53.3	
Laker	32	1	13.5	57.5	52.9	
Monroe	31	-2	14.7	60.6	52.3	
Edmore	32	1	14.6	60.5	51.4	
Rugby	31	1	14.7	60.1	51.1	
Crosby	36	-1	14.5	61.4	50.8	
Ward	36	0	15.0	60.3	49.8	
Sheba	34	—	14.7	56.5	39.8	
LSD(05) - 3.7 Bu/A		C.V. - 5.1%		Mean - 50.8		

*Indicates relative heading time in days based on earliest heading date.

**Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were seeded April 30 and harvested August 20, 1985.

TABLE 23. Durum Wheat Variety Trial - Harding County (Ralph), 1982-85.

<u>Variety</u>	<u>Height (Inches)</u>	<u>Relative Maturity*</u>	<u>Percent Protein**</u>	<u>Test Wt. (Lbs/Bu)</u>	<u>Grain Yield-Bu/Acre</u>	
					<u>1985</u>	<u>(4 yr av)</u>
Laker	26	1	16.5	49.4	32.7	—
Lloyd	24	3	18.1	51.4	31.4	42.2
Vic	32	1	18.9	55.7	30.6	38.8
Monroe	30	-2	18.9	58.4	30.5	—
Sheba	30	—	16.5	58.1	28.9	—
Edmore	32	1	19.4	55.4	28.9	35.6
Rugby	32	1	20.2	55.7	28.5	39.7
Ward	32	0	19.8	55.3	27.5	39.2
Crosby	32	-1	20.1	56.5	26.7	38.9
LSD(05) - N.S.		C.V. - 9.6%		Mean - 29.5		

*Indicates relative heading time in days based on earliest heading date.

**Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were seeded April 23 and harvested August 19, 1985.

TABLE 24. Durum Wheat Variety Trial - Meade County (Bear Butte Valley), 1982-85.

<u>Variety</u>	<u>Height (Inches)</u>	<u>Relative Maturity*</u>	<u>Percent Protein**</u>	<u>Test Wt. (Lbs/Bu)</u>	<u>Grain Yield-Bu/Acre</u>	
					<u>1985</u>	<u>(4 yr av)</u>
Vic	32	1	16.9	54.7	27.9	34.5
Monroe	29	-2	17.5	51.5	24.3	—
Rugby	30	1	18.1	52.0	23.6	32.6
Crosby	29	-1	18.9	52.0	22.9	32.5
Ward	31	0	18.4	51.0	22.7	31.7
Edmore	29	1	18.1	52.2	22.2	31.9
Lloyd	23	3	18.2	48.8	19.9	28.3
Laker	26	1	16.7	52.6	18.6	—
LSD(05) - 4.5 Bu/A		C.V. - 11.6%		Mean - 22.2		

*Indicates relative heading time in days based on earliest heading date.

**Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were seeded April 16 and harvested August 16, 1985.

TABLE 25. Durum Wheat Variety Trial - Pennington County (Wall), 1982-85.

Variety	Height (Inches)	Relative Maturity*	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre	
					1985	(4 yr av)
Laker	30	1	15.7	47.0	45.2	—
Monroe	32	2	16.5	55.9	41.0	—
Vic	34	1	16.4	55.4	40.3	32.8
Ward	35	0	15.0	58.0	40.0	32.3
Crosby	35	-1	17.1	55.5	35.9	31.0
Edmore	34	1	17.1	55.3	38.2	31.4
Rugby	33	1	18.2	57.0	38.2	31.8
Lloyd	26	3	17.2	50.3	37.3	31.6
<hr/>						
LSD(05) - 4.3 Bu/A		C.V. - 7.4%		Mean - 40.0		

*Indicates relative heading time in days based on earliest heading date.

**Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were seeded April 9 and harvested July 25, 1985.

TABLE 26. Durum Wheat Variety Trial - Perkins County (Meadow), 1981-85.

Variety	Height (Inches)	Relative Maturity*	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre	
					1985	(5 yr av)
Laker	30	1	16.0	60.0	39.6	—
Lloyd	27	3	16.4	58.9	39.2	—
Vic	32	1	17.0	60.0	38.2	29.8
Crosby	31	-1	17.8	60.3	38.2	29.7
Ward	31	0	17.7	58.2	37.1	30.5
Monroe	27	-2	17.3	58.0	36.9	—
Rugby	32	1	18.0	59.6	36.4	29.1
Edmore	32	1	17.5	58.7	35.6	29.6
<hr/>						
LSD(05) - 1.8 Bu/A		C.V. - 3.4%		Mean - 37.6		

*Indicates relative heading time in days based on earliest heading date.

**Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were seeded April 11 and harvested August 8, 1985.

Triticales

Plots were seeded at five locations in 1985. 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 pre-determined by soil test. Harvesting was accomplished with a self-propelled plot combine. Grain yields and other data are reported in Tables 27 through 31.

Triticale varieties seeded at the five locations had yields somewhat higher than adjacent spring 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 27. Spring Triticales Variety Trial - Bennett County (Martin), 1985.

Variety	Height (Inches)	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield (Bu/Acre)
Marval (SD9009)	30	17.02	43.0	21.6
Kramer	31	17.19	44.8	19.5
LSD(05) - N.S. C.V. - 7.4% Mean - 20.6				

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

NOTE: Plots were seeded April 10 and harvested August 13, 1985.

TABLE 28. Spring Triticales Variety Trial-Corson County (Thunder Hawk), 1985.

Variety	Height (Inches)	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield (Bu/Acre)
Marval (SD9009)	39	14.50	49.7	68.2
Kramer	36	15.36	48.7	67.6
LSD(05) - N.S. C.V. - 7.8% Mean - 67.9				

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

NOTE: Plots were seeded April 30 and harvested August 20, 1985

TABLE 29. Spring Triticales Variety Trial - Harding County (Ralph), 1983-85.

Variety	Height (Inches)	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre 1985 (3 yr av)	
Kramer	36	16.44	47.5	50.6	38.4
Marval (SD9009)	38	16.44	47.5	49.6	35.5
LSD(05) - N.S. C.V. - 5.5% Mean - 50.1					

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

NOTE: Plots were seeded April 23 and harvested August 19, 1985.

TABLE 30. Spring Triticales Variety Trial - Pennington County (Wall), 1985.

Variety	Height (Inches)	Date of Heading	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield (Bu/Acre)
Marval (SD9009)	34	June 13	16.04	41.9	48.1
Kramer	38	June 13	15.53	42.5	41.8
LSD(05) - N.S.				Mean - 45.0	

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

NOTE: Plots were seeded April 19 and harvested August 13, 1985.

TABLE 31. Spring Triticales Variety Trial - Perkins County (Meadow), 1983-85.

Variety	Height (Inches)	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre 1985 (3 yr av)	
Marval (SD9009)	37	17.53	46.5	49.6	41.3
Kramer	35	17.87	45.9	46.5	38.7
LSD(05) - N.S.		C.V. - 9.8%	Mean - 48.1		

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

NOTE: Plots were seeded April 11 and harvested August 8, 1985.

Oat Variety Trials

Oat variety trials were conducted on a cooperative basis at six locations in 1985. Seeding dates ranged from April 9 to April 30. 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 32 through 37.

Bennett County

Oat variety plots at Martin were seeded on April 10 into fallowed soil. Soil moisture at seeding time was present to a depth of 36 inches. The good supply of moisture was the result of heavy wet snow received in early March. Precipitation during the spring and summer was far below normal with topsoil moisture being classed as critically short from April through July. Air temperatures were nearly 6 degrees above normal during March, April, and May. The high temperatures resulted in very few tillers being produced, short plants, and low yields. The data are listed in Table 32.

TABLE 32. Oat Variety Trial - Bennett County (Martin), 1982-85.

Variety	Height (Inches)	Relative Maturity*	Percent Oil**	Percent Protein**	Test Wt. (lbs/Bu)	Grain Yield-Bu/Acre	
						1985	(4 yr av)
Ogle	20	4	7.2	12.2	31.2	28.4	66.4
Porter	22	11	8.9	15.5	31.2	25.4	62.2
Lang	20	0	9.3	17.5	29.5	25.3	66.3
A'HD345M	22	4	6.9	14.5	31.5	25.2	—
Webster	20	1	8.4	12.9	29.8	24.4	—
Moore	26	8	10.9	15.6	32.6	24.0	61.9
Bates	19	2	10.2	15.5	32.4	23.2	60.4
Otee	20	4	8.7	17.4	33.9	22.5	60.8
Hazel***	19	4	8.9	14.5	32.4	21.8	—
SD810109	26	6	8.6	14.9	34.8	21.6	—
Lancer	22	4	7.7	16.1	33.1	21.3	60.0
Don***	20	3	8.9	13.0	32.8	21.3	—
SD790400	25	7	7.3	15.3	31.0	21.1	—
Haylander II	26	7	7.0	15.0	30.4	20.6	—
SD 800043	25	9	7.7	15.5	32.7	20.4	—
Hytest***	26	4	8.0	14.3	34.0	20.4	—
Proat	22	7	9.1	17.3	30.0	19.8	—
Steele	24	8	8.1	16.6	32.4	19.2	—
SD 790054	23	5	7.5	16.3	31.4	19.0	—
Preston	20	1	11.0	19.1	32.4	18.9	55.0
Lyon	27	7	9.3	17.5	30.1	18.3	56.0
Benson	25	6	7.6	15.3	31.4	17.7	59.6
Sandy***	26	8	8.1	13.7	33.0	17.4	—
Pierce	21	10	8.7	17.2	29.4	17.1	—
Noble	22	4	8.1	14.8	33.5	17.1	56.3
Starter***	22	2	8.1	15.6	34.0	16.7	—
A'HD X145E	21	3	7.2	16.2	33.0	16.6	—
Wright	26	7	9.7	16.7	34.8	16.5	57.4
SD 740065	22	0	7.4	14.7	35.2	16.0	—
Burnett	24	4	7.0	14.5	33.1	15.1	56.7
Nodaway 70	21	2	7.1	14.1	33.4	15.0	55.5
Centennial	25	7	7.2	13.5	31.2	14.3	—
Kelly	22	1	8.1	17.0	32.7	11.8	52.5

LSD(05) - 5.6 Bu/A

C.V. - 12.9%

Mean - 19.8

*Indicates relative heading time in days based on earliest heading date.

**Percent oil and protein determined on groats only with a Technicon 300 InfraAnalyzer.

***New releases for 1986.

NOTE: Plots were seeded April 10 and harvested August 13, 1985.

Corson County

Oat variety plots near Thunder Hawk in Corson county were seeded on April 30. The soil was mellow and friable with adequate moisture. Rainfall was above normal through the month of May, as were air temperatures. The effect of high temperatures during tillering had little effect at this location and the normal quantity of tillers developed. Plants were vigorous and high yields of grain of excellent quality were produced. The trial results are given in Table 33.

Harding County

Varietal plots of oats were seeded near Ralph on April 23. Soil moisture was stored to a depth of 36 inches. Rainfall during the growing season was subnormal resulting in plant stress during the latter part of the growing season. Air temperatures were above normal during April, May, and July, but were below normal during June. Grain yields were comparable to those of 1984 but test weights were six pounds per bushel less in 1985. Trial data are listed in Table 34.

Meade County

The Meade county trial at Plainview was seeded into fallow soil on April 16. Soil moisture was adequate for germination but was present only to 21 inches. Rainfall was below normal during the entire growing season. Consequently, topsoil moisture was short to critically short. Spring air temperatures were above normal resulting in few tillers, short plants, and reduced yields. Weights per bushel ranged from 33.4 pounds down to 27.2 pounds. Protein content of groats were exceptionally high and measured up to 23.0%. Trial data are reported in Table 35.

Pennington County

On April 9, 1985 the oat variety trial near Wall was seeded into fallow soil. Soil moisture was adequate for germination and emergence, but precipitation was subnormal during the entire growing season. With above normal temperatures and below normal moisture during April and May, the grain yields were reduced with low test weights and high protein levels. The results of the trial are given in Table 36.

Perkins County

Oat varieties in Perkins county were seeded near Meadow on April 11. The soil had been fallowed in 1984 and had adequate surface moisture with subsurface moisture to a depth of 30 inches. Spring and summer precipitation was below normal. Average air temperatures during the spring were over 8 degrees above normal. At maturity the plants were drought stressed but produced good quality grain. Mean yield was above the 1984 mean but below the 1983 mean. Trial data are listed in Table 37.

TABLE 33. Oat Variety Trial - Corson County (Thunder Hawk), 1985.

Variety	Height (Inches)	Relative Maturity*	Percent Oil**	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield (Bu/Acre)
Burnett	33	4	6.2	13.9	38.6	119.4
SD 790054	32	5	8.1	16.7	37.9	116.4
SD 790400	34	7	7.5	14.8	37.9	111.4
SD 800043	34	9	7.5	15.6	38.6	111.3
Sandy***	37	8	8.1	14.0	38.3	108.5
Don***	27	3	8.8	11.9	37.6	108.1
Lancer	30	4	6.9	15.0	36.7	107.9
Haylander II	38	7	7.9	14.2	36.4	107.7
Lyon	36	7	9.2	16.6	35.5	107.2
Wright	34	7	10.3	17.1	39.3	106.8
Benson	32	6	7.5	15.1	37.0	106.4
A'HD 345M	30	4	7.1	15.4	36.1	106.3
Centennial	34	7	6.7	14.9	36.9	105.6
SD 810109	32	6	8.3	14.2	41.0	104.1
SD 740065	31	0	7.4	14.7	39.3	101.8
Ogle	27	4	7.3	12.3	34.7	101.1
Steele	34	8	8.4	16.8	38.2	100.7
Moore	35	8	10.7	15.4	36.7	100.4
Bates	26	2	9.3	14.5	35.7	100.4
Starter***	29	2	8.1	16.9	38.1	100.2
Hytest***	34	4	7.8	15.9	40.5	100.2
Proat	33	7	8.4	18.7	38.5	98.4
Hazel***	27	4	9.5	14.5	37.2	96.7
Pierce	31	10	8.8	17.3	39.7	95.1
Porter	32	11	8.6	15.0	38.4	94.9
A'HDX145E	30	3	7.4	15.2	38.7	93.9
Noble	28	4	7.1	15.0	37.9	92.5
Lang	27	0	8.2	13.4	34.1	92.4
Kelly	31	1	7.5	17.4	37.9	91.3
Webster	28	1	8.3	14.5	35.2	91.2
Preston	30	1	9.9	20.2	36.8	87.7
Otee	28	4	8.6	19.0	37.6	86.7
Nodaway 70	32	2	6.6	14.7	37.4	85.2

LSB(05) - 11.1 Bu/A

C.V. - 7.2

Mean - 101.2

*Indicates relative heading time in days based on earliest heading date.

**Percent oil and protein determined on oat groats with a Technicon 300 InfraAnalyzer.

***New releases for 1986.

NOTE: Plots were seeded April 30 and harvested August 6, 1985.

TABLE 34. Oat Variety Trial - Harding County (Ralph), 1983-85.

Variety	Height (Inches)	Relative Maturity*	Percent Oil**	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre	
						1985	(3 yr av)
Porter	27	11	7.8	16.6	33.4	60.4	59.3
Hazel***	26	4	8.4	16.4	31.9	58.5	—
Moore	31	8	9.4	16.5	33.1	58.0	56.9
Ogle	25	4	6.9	14.4	31.4	55.5	60.4
Sandy***	33	8	7.1	14.9	32.4	55.3	—
SD810109	28	6	7.8	15.4	34.8	53.8	—
A'HD 345M	28	4	6.9	17.7	31.5	53.1	—
Webster	28	1	7.6	15.0	35.2	53.0	—
Haylander II	30	7	7.3	15.1	30.9	52.7	—
Hyttest***	30	4	7.1	17.0	35.6	51.4	—
SD790054	28	5	7.5	17.7	30.8	51.1	—
Pierce	30	10	8.3	17.5	32.7	50.5	52.2
Lang	27	0	7.7	14.6	35.5	50.4	56.7
Burnett	27	4	6.0	14.6	34.6	49.2	55.3
Noble	28	4	7.0	17.1	35.0	49.1	50.8
Bates	26	2	9.1	16.5	35.0	47.9	58.2
Lancer	28	4	6.6	16.3	34.0	47.7	52.6
Lyon	33	7	8.0	18.4	29.8	47.4	53.5
SD790400	30	7	7.1	16.8	31.6	47.4	51.3
SD800043	28	9	7.1	16.3	32.0	47.3	—
Steele	30	8	7.1	17.0	32.9	46.9	—
Otee	28	4	8.0	19.8	35.5	45.4	48.8
Starter***	28	2	7.7	18.0	37.2	45.0	—
Proat	28	7	7.7	19.5	30.1	44.9	48.1
Don***	27	3	8.2	13.9	35.2	43.0	—
Wright	31	7	8.6	19.5	33.8	42.2	49.7
Centennial	28	7	6.1	15.4	31.1	42.1	44.8
SD740065	30	0	6.9	15.8	37.8	41.4	—
Benson	30	6	7.0	17.1	30.8	41.3	46.2
Preston	30	1	9.3	21.0	35.7	39.2	48.0
A'HD X145E	28	3	7.2	17.3	36.7	38.9	—
Kelly	28	1	7.5	17.3	35.9	38.6	45.0
Nodaway 70	30	2	6.6	16.6	36.9	35.8	45.7

LSD(05) - 8.1 Bu/A

C.V. - 12.0%

Mean - 48.0

*Indicates relative heading time in days based on earliest heading date.

**Percent oil and protein determined on oat groats with a Technicon 300 InfraAnalyzer.

***New releases for 1986.

NOTE: Plots were seeded April 23 and harvested August 19, 1985.

TABLE 35. Oat Variety Trial - Meade County (Plainview) 1983-85.

Variety	Height (Inches)	Relative Maturity*	Percent Oil**	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre	
						1985	(3 yr av)
Lang	21	0	7.8	16.2	30.4	44.3	56.6
Webster	21	1	8.4	17.5	31.6	42.5	--
Preston	24	1	10.4	19.9	30.8	42.0	50.7
Kelly	22	1	7.3	18.0	32.3	40.6	--
Nodaway 70	22	2	6.6	16.9	33.1	40.0	48.4
Bates	19	2	8.5	19.6	33.4	38.9	55.9
Starter***	23	2	7.5	18.9	32.5	38.2	--
Noble	22	4	6.7	18.6	30.3	38.0	51.9
Moore	24	8	--	--	29.8	38.0	53.8
Don***	22	3	9.1	16.1	32.2	37.1	--
Porter	21	11	7.4	19.4	29.9	35.6	55.9
Otee	21	4	8.1	19.8	31.4	35.4	51.6
Steele	25	8	7.4	19.0	31.2	35.2	--
Burnett	22	4	6.1	16.4	33.2	35.1	50.7
Ogle	22	4	6.8	16.2	27.9	34.8	54.8
Lancer	22	4	7.4	17.9	31.1	34.0	50.8
Hazel***	21	4	8.5	18.5	31.0	33.6	--
Benson	23	6	7.2	18.0	29.1	32.0	48.4
SD800043	23	9	7.5	18.4	30.7	31.2	--
Hytest***	24	4	6.8	18.3	33.0	29.8	--
Centennial	24	7	5.9	17.3	31.0	26.7	41.0
Pierce	21	10	8.1	20.6	29.7	25.1	46.7
SD790400	23	7	6.7	18.6	29.3	23.3	--
Wright	23	7	9.4	17.0	31.1	23.0	47.7
Proat	21	7	7.6	23.0	27.4	22.4	--
Lyon	23	7	8.1	20.1	27.2	21.3	43.2
LSD(05) - 10.3 Bu/A		C.V. - 18.8%			Mean - 33.8		

*Indicates relative heading time in days based on earliest heading date.

**Percent oil & protein determined on oat groats with a Technicon 300 InfraAnalyzer.

***New releases for 1986.

NOTE: Plots were seeded April 16 and harvested August 14, 1985.

TABLE 36. Oat Variety Trial - Pennington County (Wall), 1982-85.

Variety	Height (Inches)	Relative Maturity*	Percent Oil**	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre	
						1985	(4 yr av)
Lancer	25	4	7.2	16.2	33.8	103.2	71.8
Kelly	25	1	7.1	15.6	34.1	102.9	75.5
Lang	23	0	7.9	15.5	30.2	102.5	79.1
Hazel***	19	4	8.4	15.5	33.0	101.3	--
Burnett	26	4	6.3	15.1	32.8	100.7	72.0
Don***	20	3	9.0	15.3	34.2	100.4	--
Preston	27	1	10.3	18.3	31.4	99.7	72.8
A'HD 345M	23	4	7.4	15.6	31.6	99.6	--
Starter***	25	2	7.8	15.6	35.1	99.2	--
Hytest***	31	4	7.2	16.0	37.0	97.6	--
SD 40065	25	0	7.7	16.2	36.7	96.6	--
Nodaway 70	28	2	6.6	14.2	32.4	96.4	76.9
Bates	25	2	8.9	16.0	34.4	95.2	80.6
Noble	26	4	7.2	15.9	29.8	94.7	72.1
A'HD X145E	24	3	6.5	15.3	33.7	94.4	--
Benson	27	6	6.6	17.2	32.5	93.7	71.3
SD 790054	25	5	7.1	16.7	29.5	93.6	--
Webster	24	1	8.1	14.9	31.6	93.4	--
Ogle	23	4	7.2	13.5	31.0	92.7	83.7
Steele	30	8	7.2	17.4	32.4	92.2	--
Otee	24	4	8.4	17.8	33.7	92.1	74.1
Moore	27	8	9.6	16.1	30.0	90.7	75.6
SD 810109	28	6	8.3	16.2	34.4	90.6	--
Sandy***	27	8	6.9	15.0	32.7	90.5	--
SD 800043	25	9	7.0	16.1	30.2	89.7	--
Porter	27	11	--	--	30.8	89.5	85.8
Wright	33	7	9.1	18.8	33.3	89.2	74.2
Haylander II	32	7	7.1	18.4	29.9	87.4	--
Lyon	34	7	7.9	18.5	29.9	86.6	69.7
Proat	28	7	8.3	19.5	30.0	85.2	--
Centennial	25	7	6.2	15.7	30.4	83.0	--
Pierce	26	10	7.7	20.2	30.8	82.4	--
SD 790400	28	7	5.8	17.3	30.4	82.2	--

LSD(05) = 8.4 Bu/A

C.V. = 0.4%

Mean = 93.6

*Indicates relative heading time in days based on earliest heading date.

**Percent oil and protein determined on groats only with a Technicon 300 InfraAnalyzer.

***New releases for 1986.

NOTE: Plots were seeded April 9 and harvested July 24, 1985.

TABLE 37. Oat Variety Trial - Perkins County (Meadow), 1983-85.

Variety	Height (Inches)	Relative Maturity*	Percent Oil**	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre	
						1985	(3 yr av)
Lang	28	0	8.7	22.6	35.0	77.4	80.3
A'HD 345M	30	4	7.4	19.9	33.8	72.6	—
Webster	32	1	6.6	18.6	35.3	72.4	—
Ogle	29	4	6.5	17.3	34.1	71.7	74.7
Don***	30	3	8.0	19.5	36.4	70.4	—
Bates	27	2	6.5	18.0	36.2	70.4	72.0
Starter***	32	2	6.5	19.2	37.9	70.1	—
SD740065	33	0	8.6	17.6	38.4	69.9	—
Burnett	32	4	7.3	16.9	36.7	69.1	63.1
Wright	36	7	7.0	18.3	36.3	69.1	63.9
Hazel***	25	4	6.6	18.4	34.9	68.4	—
Hytest***	36	4	8.3	19.7	39.2	68.0	—
Lancer	32	4	6.3	16.1	36.6	66.3	65.1
Benson	34	6	6.8	18.9	35.2	65.8	63.4
Preston	32	1	7.0	18.0	36.3	65.0	61.3
SD790400	36	7	6.7	19.2	33.7	64.5	67.5
SD800043	34	9	6.6	17.2	32.7	64.1	—
SD810109	32	6	6.9	17.7	38.1	63.9	—
Moore	34	8	7.6	19.6	33.7	62.8	65.0
Haylander II	36	7	7.1	20.9	35.0	61.9	—
SD790054	33	5	6.0	17.7	34.3	61.9	—
Noble	30	4	7.3	19.3	36.7	61.6	59.0
Sandy***	36	8	7.4	22.2	35.7	61.1	—
Steele	34	8	5.9	17.2	35.0	61.0	—
Nodaway 70	32	2	7.3	17.8	37.2	60.9	66.1
Proat	35	7	6.8	18.7	32.6	60.2	58.7
Porter	31	11	8.6	17.5	32.9	59.6	66.0
Otee	29	4	8.2	17.3	37.4	59.5	63.7
Kelly	31	1	6.0	17.0	38.2	58.6	61.1
A'HDX145E	31	3	7.1	19.1	36.7	58.0	—
Lyon	36	7	7.5	16.3	32.2	56.9	60.7
Pierce	31	10	8.6	15.6	33.0	56.0	54.1
Centennial	30	7	6.6	18.7	33.2	55.8	51.5

LSD(05 - 7.1 Bu/A

C.V. - 7.9%

Mean - 64.7

*Indicates relative heading time in days based on earliest heading date.

**Percent oil & protein determined on oat groats with a Technicon 300 InfraAnalyzer.

***New releases for 1986.

NOTE: Plots were seeded April 11 and harvested August 7, 1985.

Spring Barley Trials

Spring barley variety trials were conducted on a cooperative basis at six locations in 1985. 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 9 to April 30. Harvesting was completed with a self-propelled plot combine between July 15 and August 7. Trial data are reported in Tables 38 through 43.

Bennett County

The spring barley variety trial at Martin was seeded on April 10 into fallowed soil. Soil moisture was good at seeding time with moisture stored to a depth of 36 inches. Precipitation during the growing season was far below normal and was classed as critically short through July. Air temperatures averaged six degrees above normal during March, April, and May. Plants were short, tillers few, and grain quality inferior. Grain yields averaged only about a third of the 1984 yields. Trial data are presented in Table 38.

TABLE 38. Spring Barley Variety Trial - Bennett County (Martin), 1982-85

Variety	Height (Inches)	Relative Maturity*	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre	
					1985	(4 yr av)
Bowman	17	1	13.2	51.0	32.6	--
Morex	19	1	13.5	43.9	24.7	43.6
Glenn	16	0	13.6	42.4	23.9	42.6
Primus II	16	0	12.6	45.5	23.7	39.1
Hazen	18	2	13.3	42.9	23.6	--
Larker	20	2	14.4	43.4	22.8	39.9
Azure	20	3	13.6	41.1	21.2	45.6
Bumper	18	5	14.3	38.4	20.7	39.8
Robust	18	3	14.2	42.3	19.4	41.8
LSD(05) - 3.4 Bu/A		C.V. - 10.1%		Mean - 23.6		

*Indicates relative heading time in days based on earliest heading date.

**Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were seeded April 10 and harvested July 19, 1985.

Corson County

Spring barley variety trials were seeded on April 30 near Thunder Hawk. Soil moisture was good and soil conditions excellent. Precipitation during May was above normal and near normal the remainder of the growing season. Air temperatures were above normal in May but below normal in June. Grain yields were good. Trial data are presented in Table 39.

TABLE 39. Spring Barley Variety Trial - Corson County (Thunderhawk), 1985

Variety	Height (Inches)	Relative Maturity*	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield (Bu/Acre)
Bowman	31	1	13.1	51.8	71.7
Azure	33	3	11.4	47.7	71.2
Hazen	34	2	12.3	47.1	70.0
Morex	35	1	11.4	47.4	69.5
Robust	34	3	11.7	47.9	67.9
Glenn	32	0	12.8	46.7	62.4
Bumper	33	5	12.2	45.6	62.1
Larker	32	2	12.3	49.4	59.1
Primus II	31	0	11.4	48.6	57.0
LSD(05) - 3.7 Bu/A C.V. - 4.0% Mean - 65.7					

*Indicates heading time in days based on earliest heading date.

**Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were seeded April 30 and harvested August 6, 1985.

Harding County

Experimental plots containing 8 varieties were seeded near Ralph on April 23. Soil moisture was excellent and favored immediate germination. Rainfall was below normal during most of the growing season. Air temperatures were above normal during the spring. Grain yield and quality was lower for the later maturing varieties. Yield data are reported in Table 40.

TABLE 40. Spring Barley Variety Trial - Harding County (Ralph), 1983-85.

Variety	Height (Inches)	Relative Maturity*	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre	
					1985	(3 yr av)
Bowman	24	1	14.4	52.9	52.5	—
Primus II	29	0	13.0	47.0	46.5	46.2
Hazen	29	2	14.9	45.5	42.9	—
Morex	30	1	16.5	43.9	42.5	45.9
Larker	30	2	17.1	46.0	39.9	45.2
Bumper	28	5	18.1	40.8	39.5	47.8
Glenn	27	0	15.2	44.5	39.4	43.8
Azure	29	3	15.4	43.4	39.3	46.9
Robust	29	3	16.7	42.2	35.4	44.6
LSD(05) - 84 Bu/A C.V. - 14.0% Mean - 42.0						

*Indicates heading time in days based on earliest heading date.

**Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were seeded April 23 and harvested August 5, 1985.

Meade County

Spring barley varieties were seeded in Meade County on April 16. The soil had been fallowed but had limited subsoil moisture. Precipitation during the growing season was very limited. During the spring season air temperatures were above normal resulting in few tillers. The plant stress resulted in low test weights and poor quality grain. The average yield in 1985 was 50% of the 1984 yield. The yields were further reduced by a high population of grasshoppers. Trial data are reported in Table 41.

TABLE 1. Spring Barley Variety Trial - Meade County (Bear Butte Valley), 1983-85

Variety	Height (Inches)	Relative Maturity*	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre	
					1985	(3 yr av)
Bowman	30	1	—	48.6	50.9	—
Primus II	26	0	—	43.3	46.2	57.3
Morex	26	1	13.2	40.9	40.3	59.2
Hazen	28	2	13.7	40.8	39.3	—
Robust	28	3	12.7	43.3	35.5	56.8
Larker	26	2	13.8	41.6	32.6	52.7
Bumper	28	5	—	36.4	31.9	50.2
Azure	29	3	12.9	40.5	31.0	50.4

LSD(05) - 4.4 Bu/A

C.V. - 5.3%

Mean - 38.4

*Indicates relative heading time in days based on earliest heading date.

**Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were seeded April 16 and harvested July 15, 1985.

Pennington County

Spring barley was seeded near Wall on April 9 into fallow soil. Surface soil moisture was good. Germination and emergence was normal. Precipitation was subnormal during the growing season but came at a critical time resulting in very high yields. Grain quality was down because of extreme moisture stress during final growth stages. The yield data are presented in Table 42.

Perkins County

Spring barley plots in Perkins county were seeded on April 11. The soil had been fallowed on 1984 and contained moisture to a depth of 30 inches. Spring moisture was slightly below normal. Air temperatures were above normal during March, April, and May. High temperatures during the tillering stage resulted in few tillers, short plants, and small heads. Weights per bushel were very low while grain yields were several bushels below 1984 yields. Experimental data are reported in Table 43.

TABLE 42. Spring Barley Variety Trial - Pennington County (Wall), 1982-85

Variety	Height (Inches)	Date of Heading	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre	
					1985	(4 yr av)
Bowman	27	June 13	12.5	48.3	103.8	--
Azure	31	14	11.8	44.8	91.3	65.6
Robust	30	15	11.4	46.9	90.5	64.9
Morex	32	14	11.6	44.7	84.8	60.0
Hazen	31	June 14	14.7	42.2	81.5	--
Glenn	31	13	13.7	43.0	79.2	61.2
Primus II	30	11	12.4	47.5	77.5	61.2
Bumper	30	15	10.8	42.2	73.6	57.2
Larker	30	15	12.8	44.1	69.5	53.4
LSD(05) - 10.0 Bu/A C.V. - 5.3% Mean - 83.5						

*Percent protein determined with a Technicon 300 InfraAnalyzer

NOTE: Plots were seeded April 9 and harvested July 16, 1985

TABLE 43. Spring Barley Variety Trial - Perkins County (Meadow), 1981-85

Variety	Height (Inches)	Relative Maturity*	Percent Protein**	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre	
					1985	(5 yr av)
Bowman	26	1	13.5	43.4	55.6	--
Glenn	27	0	13.5	41.4	53.6	53.1
Azure	30	3	13.6	40.4	50.9	43.4
Larker	30	2	15.6	39.8	45.2	43.7
Primus II	27	0	14.0	41.4	44.5	51.8
Hazen	30	2	13.6	40.4	44.3	--
Morex	31	1	14.8	37.6	43.2	49.0
Bumper	31	5	13.9	36.4	40.4	46.6
Robust	30	3	15.2	37.6	37.9	46.9
LSD(05) - N.S. C.V. - 17.6% Mean - 46.2						

*Indicates heading time in days based on earliest heading date.

**Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were seeded April 11 and harvested August 7, 1985.

Winter Barley

Objective: To observe and compare growth characteristics, grain quality, and grain yield of varieties and composites of winter barley.

Twelve entries of winter barley were seeded in fallow on September 13, 1984. The entries consisted of four varieties from Nebraska and eight composites from South Dakota. Each composite was composed of plants which were selected for deep setting crowns. Crown depth is associated with winter survival because those genotypes with naturally buried crowns most frequently survive winter conditions.

At seeding time the surface soil was loose and dry, and contained a large amount of stubble from the previous year. Subsurface moisture was adequate for germination and emergence. Air temperatures were below normal in September and October, and far below normal in December. There were two inches of snow cover during the extreme cold of December, but in January and February there was only an inch or less. During March, April, and May, air temperatures were 8 degrees above longtime averages resulting in plants with few tillers. Precipitation during the spring and summer was below normal causing soil moisture to be critically short. The yield data are presented in Table 44.

TABLE 44. Winter Barley Variety Trial - Pennington County (Wall), 1983-85

Variety	% Stand May 1985	Height (Inches)	Date of Heading	Percent Protein*	Test Wt. (Lbs/Bu)	Grain Yield-Bu/A	
						1985	(3 yr av)
Composite 142	82	29	June 1	13.1	48.9	52.9	56.5
Nebar	80	28	2	13.6	52.4	52.2	44.7
Composite 129	79	26	1	13.2	50.5	51.6	48.8
Dundy	76	23	May 30	14.2	50.4	49.4	31.2
Kearney	81	28	June 1	13.6	51.8	49.1	50.1
Composite 10	78	28	May 31	13.9	50.6	48.6	50.2
Herb	80	28	June 2	13.3	53.4	45.5	—
Composite 295	46	27	May 31	13.4	51.9	44.0	—
Composite 223	29	28	June 1	13.0	50.3	39.3	—
Composite 307	26	30	1	14.3	50.0	30.8	—
Composite 308	11	28	1	13.2	48.4	26.4	—
Composite 250	9	29	3	14.2	42.7	7.7	—

Mean = 41.4

*Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were seeded September 13, 1984 and harvested July 17, 1985.

Flax Trials

Flax variety trials were conducted at four locations in 1985. 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 was predetermined by soil test. Harvesting was completed with a self-propelled plot combine. Trial data are reported in Tables 45 through 48.

Bennett County

The flax variety trial at Martin was seeded April 10. The fallowed soil had good moisture content to a depth of 30 inches. Precipitation was far below normal throughout the growing season. Temperatures, however, were above normal. The stress on the plants due to temperatures and moisture resulted in low seed yields of poor quality.

TABLE 45. Flax Variety Trial - Bennett County (Martin), 1985.

Variety	Height (Inches)	Relative Maturity*	Test Wt. (Lbs/Bu)	Grain Yield (Bu/Acre)
Flor	16	3	50.4	9.6
Culbert 79	16	0	51.2	9.5
Clark	17	1	51.2	9.4
Wishek	16	0	51.4	9.3
Rehab	15	4	50.4	9.2
LSD(05) - N.S.		C.V. - 6.7%		Mean - 9.4

*Indicates relative heading time in days based on earliest heading date.

NOTE: Plots were seeded April 10 and harvested August 13, 1985.

Corson County

Flax trials near Thunder Hawk in Corson county were seeded on April 30. Soil moisture was good and soil conditions excellent. Precipitation was above or near normal throughout the growing season. Air temperatures were normal except during June when they were below longtime levels. Yields averaged over 21 bushels per acre, and seed quality was good. The experimental data are reported in Table 46.

Harding County

Flax varieties at Ralph were seeded on April 23. Soil moisture was excellent and germination immediate. Rainfall during the spring was only 2/3 of normal with above normal temperatures. Weights per bushel were slightly below normal and yields similar to 1984. The experimental results are listed in Table 47.

TABLE 46. Flax Variety Trial - Corson County (Thunder Hawk), 1985.

Variety	Height (Inches)	Relative Maturity*	Test Wt. (Lbs/Bu)	Grain Yield (Bu/Acre)
Rahab	21	4	54.7	22.2
Clark	23	1	55.9	21.9
Culbert 79	23	0	55.3	21.7
Flor	21	3	55.1	21.1
Wishek	22	0	55.7	20.0
LSD(05) - N.S.		C.V. - 6.3%	Mean - 21.4	

*Indicates relative heading time in days based on earliest heading date.

NOTE: Plots were seeded April 30 and harvested August 20, 1985.

TABLE 47. Flax Variety Trial - Harding County (Ralph), 1984-85.

Variety	Height (Inches)	Relative Maturity*	Test Wt. (Lbs/Bu)	Grain Yield-Bu/Acre	
				1985	(2 yr av)
Flor	20	3	55.5	15.3	14.6
Rahab	18	4	54.5	14.4	--
Clark	21	1	55.9	13.8	14.2
Wishek	20	0	55.6	13.3	13.4
Culbert 79	20	0	55.3	13.0	13.0
LSD(05) - N.S.		C.V. - 7.5%	Mean - 14.0		

*Indicates relative heading time in days based on earliest heading date.

NOTE: Plots were seeded April 23 and harvested August 19, 1985.

Perkins County

The plots were seeded in fallow soil on April 11. Soil moisture was present to a depth of 30 inches. Precipitation was only slightly below normal but air temperatures in April and May were over 8 degrees above normal.

TABLE 48. Flax Variety Trial - Perkins County (Meadow), 1985.

Variety	Height (Inches)	Relative Maturity*	Test Wt. (Lbs/Bu)	Grain Yield (Bu/Acre)
Flor	20	3	52.4	12.3
Clark	21	1	52.0	12.2
Rahab	20	4	51.2	11.9
Wishek	22	0	52.2	10.4
Culbert 79	21	0	51.5	7.7
LSD(05) - N.S.		C.V. - 32.1%	Mean - 10.9	

*Indicates relative heading time in days based on earliest heading date.

NOTE: Plots were seeded April 11 and harvested August 20, 1985. Heavy infestation with Russian-thistle is reflected in high Coefficient of Variability.

Soybeans

Thirty varieties of soybeans from 3 maturity groups were planted near Wall in eastern Pennington county on May 22 and harvested October 17. Plant populations were established at 2.6 plants per square foot. Stands were good and plants were healthy but under moisture stress during most of the growing season. Group I and Group II varieties produced good quality mature beans, but Group III varieties were very immature at first killing frost (23°F) on September 24, 1985.

TABLE 49. Soybean Variety Trial - Pennington County (Wall), 1985.

Brand & Variety	Height (Inches)	Test Weight (Lbs/Bu)	Seed Yield (Bu/Acre)
GROUP I			
Simpson	13	54.6	8.8
Arrowhead 8450	12	55.2	5.4
Sigco 80	10	56.0	4.6
Domestic M1000	14	56.5	4.1
Swift	14	54.1	3.9
Evans	12	54.5	3.8
Group Mean -			5.1
GROUP II			
Cenex 7461	16	56.1	10.6
NK S14-60	15	54.8	9.6
Hardin	14	55.9	9.0
Asgrow A1937	13	55.0	9.0
Dekalb CX155	14	54.5	8.9
Lincoln LS7119	13	54.8	8.4
Hodgson 78	14	56.2	8.0
Weber	15	55.6	8.0
Cenex 8410	12	54.0	7.8
Lakota	15	57.0	7.7
Asgrow A1214	14	55.4	7.4
Arrowhead 2188	13	55.9	6.9
Seedtec 610	13	54.8	6.6
Domestic M1120A	14	54.5	6.4
Dekalb CX174	14	54.0	6.4
NK S15-60	15	56.4	6.3
Group Mean -			7.9
GROUP III			
Domestic M1225	14	54.9	10.4
Pride B216	16	56.1	10.0
Corsoy 79	16	55.2	9.1
Elgin	14	54.0	8.3
Sexauer SX29	16	54.9	8.0
Wells II	16	55.0	7.9
Century	16	55.5	7.2
Nebsoy	14	55.0	7.0
Group Mean -			8.5
(Not statistically Analyzed)			Trial Mean - 7.5

NOTE: Plots were seeded in 30 inch row on May 22 and harvested October 17.

Chickpea
(Garbanzo Bean)

Chickpea (*Cicer arietinum* L.) is an annual legume, widely grown for its edible seed. It is the third most important pulse (grain legume) crop in the world. Most of the production in the United States is used for the salad bar market.

Chickpeas are a summer crop adapted to low rainfall areas, but can be grown under irrigation on well drained soils. The plants are frost tolerant and can be planted when soil temperatures reach 43°F at seeding depth. Seeding depth can vary from 3 to 6 inches depending on available moisture. Seed treatment is required to prevent damping off of seedlings caused by soil-borne fungi.

The crop can be windrowed or direct-combined when the seeds contain less than 12% moisture. Cylinder speed and concave settings must be watched closely to prevent seed damage. Grain handling equipment also need to be monitored because of the fragility of the beans.

TABLE 50. South Dakota Chickpea Yield Trial, Wall - 1985.

Succession Number	Entry Name	Origin/Source	Seed Yield	
			(kg/ha)	(lbs/A)
1	ILC-76	Spain	1680	1500
2	ILC-83	Spain	2158	1927
3	ILC-132	Spain	1591	1420
4	ILC-134	Spain	1431	1278
5	ILC-135	Spain	1877	1676
6	ICC-4918	India	299	267
7	ICC-4948	India	1393	1244
8	ICC-5003	ICRISAT	1393	1244
9	ICC-11529	ICRISAT	819	731
10	X81TH-85	ICARDA	1728	1543
11	X81TH-101	ICARDA	1033	922
12	X81TH-105	ICARDA	1285	1147
13	X81TH-111	ICARDA	1348	1204
14	X81TH-112	ICARDA	1800	1607
15	X81TH-126	ICARDA	1481	1322
16	UC-5	USA	--	--
17	SDGI-6	Turkey	2023	1806
Location Mean			1459	1303
CV (%)			19.6	17.5
Range			284-2540	254-2268

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 1985. Included were commercial varieties which varied in maturity from short-season to medium-season.

Precipitation was extremely short during the growing season. Rainfall from April through July provided only 1.5 inches of usable moisture. Topsoil moisture was classed as short to critically short from May through September. The plots were seeded with a Buffalo planter in 30 inch rows. Germination and emergence were good but growth was very slow. Plant heights never exceeded 24 inches. The grain sorghum plots were dormant from mid-July to early September. A few plants eventually produced heads but did not pollinate until shortly before the first killing frost.

Sorghum Forage Trials

Objective: To compare the various Forage Sorghums, Sorghum-Sudangrass crosses, and Sudangrass as to their adaptability, their forage production, and their forage quality. Yield data are presented in Tables 51 through 53.

TABLE 51. Forage Sorghum Variety Trial - Pennington County (Wall), 1985.

Brand & Variety	Percent Protein*	Percent Dry Matter	Forage Yield Tons/Acre**
Pioneer 931	11.75	47.3	2.8
Funk's 102F	12.06	75.8	2.6
Pioneer 947	14.87	65.6	2.3
Keltgen KFS-2	10.44	72.3	2.1
Sokota Exp 315	12.50	47.2	2.0
Funk's G1990	13.19	74.4	1.8
Funk's 83F	12.06	69.2	1.8
Northrup King 326	11.06	55.1	1.7
Sokota 320	11.19	44.0	1.6
Sokota Sweet Cut 340	10.87	51.6	1.6
Keltgen KFS-1	11.81	61.6	1.6
Payco DFS-16	10.81	60.9	1.5
Growers GSA1586F	7.94	52.4	1.4
Asgrow Titan R	14.06	65.9	1.2
Triumph Super Sile 20	11.50	51.4	1.1
Asgrow Suregraze	12.31	74.8	.8

LSD(05) - 1.2 T/A C.V. - 46.6% Mean - 1.9

*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: Replicated plots were seeded in 30-inch rows on June 18.

TABLE 52. Sorghum-Sudangrass Variety Trial - Pennington County (Wall), 1985.

<u>Brand & Variety</u>	<u>Percent Protein*</u>	<u>Percent Dry Matter</u>	<u>Forage yield Tons/Acre**</u>
Triumph Sooner Sweet	10.13	60.1	2.7
Kings Western WS-20	9.87	48.8	2.7
Grower GSA 11A	10.69	55.6	2.5
Sokota 290	9.37	59.1	2.1
Triumph Super Sweet 10	11.06	61.8	2.1
Payco DSS15	9.75	51.7	2.1
Pioneer 877F	10.00	54.9	2.0
NK Sordan 79	10.94	53.1	2.0
Asgrow Grazer N2	11.63	54.2	1.9
Sokota 310F	10.00	45.1	1.8
Grower GSA1757	12.25	60.6	1.8
Johnson Sweet Chow	12.59	57.2	1.3
<hr/>			
LSN(05) - 1.2 T/A	C.V. - 38.8%	Mean - 2.1	

*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: Replicated plots were seeded in 30" rows on June 13.

TABLE 53. Sudangrass Variety Trial - Pennington County (Wall), 1985.

<u>Brand & Variety</u>	<u>Percent Protein*</u>	<u>Percent Dry Matter</u>	<u>Forage yield Tons/Acre**</u>
NK Trudan 8	9.00	51.0	1.9
Piper	12.87	76.6	1.3
<hr/>			
Mean - 1.6			

*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: Replicated plots were seeded in 30-inch rows on June 12.

Small Grain Forage Trials

Objective: To compare the various cereal crops for forage production, forage quality, and the relationship of forage and grain production.

Twenty four varieties of small grains composed of spring wheat, durum wheat, triticales, oats, and spring barley were seeded at Wall on April 9. Spring moisture was adequate for germination and emergence but was in short supply during the remainder of the growing season. Air temperatures during April and May were above normal limiting the number of tillers produced per plant.

TABLE 54. Small Grain Forage Trial - Pennington County (Wall), 1985.

Crop & Variety	Percent Dry Matter	Percent Protein*	Tons/Acre @ 12% H2O	Percent Protein**	Test Wt (Lbs/Bu)	Grain Yield (Bu/Acre)
OATS						
Burnett	48.7	9.1	4.06	15.1	32.8	101.0
Haylander II	46.4	9.8	3.51	18.4	29.9	87.6
Lancer	46.3	10.4	3.56	16.2	33.8	103.5
Kelly	44.5	10.3	3.48	15.6	34.1	103.2
Marathon	42.2	10.1	3.48	—	—	—
Moore	45.6	9.2	3.52	16.1	30.0	90.0
Lang	51.1	10.2	3.68	15.5	30.2	102.8
Bates	54.7	9.7	3.63	16.0	34.4	95.4
			Mean-3.62			
SPRING BARLEY						
Morex	57.4	9.9	4.18	11.6	44.7	84.8
Bumper	51.0	11.6	3.64	10.8	42.6	73.6
Larker	50.2	8.8	3.52	12.8	44.1	69.4
SD 71-672	50.6	11.2	3.82	13.8	49.4	85.5
			Mean-3.79			
DURUM WHEAT						
Vic	43.8	11.4	3.13	16.4	55.4	40.3
Crosby	47.7	10.5	3.28	17.1	55.5	39.5
			Mean-3.20			
SPRING WHEAT						
Alex	46.3	10.3	3.16	17.0	53.5	37.0
Olaf	49.7	10.6	3.54	14.5	55.1	40.6
Marshall	50.4	10.6	3.01	16.0	52.0	36.8
Centa	56.3	11.4	3.47	17.2	60.7	37.2
James	56.3	9.3	3.68	—	—	—
Butte	52.8	11.8	3.25	16.8	59.0	24.8
Pio 2369	51.5	11.1	3.30	15.8	56.9	38.0
Eureka	50.0	7.8	3.37	18.3	52.6	37.8
			Mean-3.35			
TRITICALES						
Marval(SD9009)	46.8	8.6	3.48	16.0	41.9	48.1
Kramer	51.2	8.9	3.31	15.5	42.5	41.8
			Mean-3.40			

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

**Percent protein in grain determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were seeded in fallow soil on April 9 and harvested July 8, 1985. Harvested area was 4 feet x 25 feet. Grain yields were obtained from adjacent variety trials seeded on same date.

MANAGEMENT, TILLAGE, AND CULTURAL PRACTICES

Winter Wheat Fertilizer Demonstration

(Lyman County, Halverson Farm)

OBJECTIVE: To demonstrate the use of 10-34-0 as a starter fertilizer.

FIELD DATA: A starter fertilizer, 10-34-0 was placed with the seed at seeding time. It was applied at the following rates: 0 gal/A, 6 gal/A, and 12 gal/A. There were 3 replication. Plots were harvested on July 12, 1985. Harvested area was 6 feet x 30 feet.

TABLE 55. Winter Wheat Fertility Demonstration-Lyman County(Kennebec),1984-85.

Fertilizer			XProtein in grain*	Grain Yield-Bushel per Acre			
Gal/Acre	Lbs/Acre			I	II	III	Average
10-34-0	N	P ₂ O ₅					
0	0	0	11.8	34.6	34.7	35.8	35.0
6	6.8	20.5	12.5	34.3	34.4	42.2	37.0
12	13.6	41.0	12.5	33.1	40.7	36.2	36.7

*Percent protein determined with a Technicon 300 Infra analyzer.

Winter Wheat Variety-Fertilizer Demonstration

(Lyman County, Halverson Farm)

OBJECTIVE: To demonstrate Winter Wheat Varietal differences in relation to fertilizer rate and location within a trial.

FIELD DATA: Seeded September 12, 1984; Thimet applied with seed; Starter fertilizer applied with seed at following rates: LF - No Fertilizer; RF - 6 gal/A of 10-34-0; HF - 12 gal/A of 10-34-0. Harvest Date: July 12, 1985. Harvest Area: 6 feet x 30 feet. There were three replications.

RESULTS: See Table 56.

TABLE 56. Winter Wheat Variety Demonstration - Lyman County (Maine), 1984-1985.

Variety* (Field order)	Percent Protein**	Test Weight Lbs/Bu	Yield Bu/A	Variety* (Field order)	Percent Protein**	Test Weight Lbs/Bu	Yield Bu/A
Sage RF1	14.2	65.9	69.7	WM 9106	13.1	64.8	68.0
Sage RF2	14.5	65.1	69.1	WM 8400A	12.6	64.4	74.3
Sage A	14.7	64.7	65.1	Sage G	15.0	64.7	63.5
Sage RF3	14.9	64.9	69.2	WM 101	14.1	63.7	60.1
Sage RF4	14.6	64.8	70.1	Newton	13.6	65.1	63.5
Sage NF1	14.9	65.1	68.7	MT 5221	15.4	61.5	53.7
Sage NF2	14.4	64.8	68.6	WM 9110	13.7	65.1	64.1
Sage B	14.7	65.1	66.1	Sage H	14.1	64.0	64.3
Sage HF1	14.7	63.9	73.5	BWW 149	17.4	61.5	44.4
Sage HF2	14.9	63.4	71.8	Citation	15.5	63.1	54.8
Ram	12.9	62.4	74.7	Lancota	16.5	63.8	57.1
Dawn	13.1	65.3	75.4	SDSU Sage	14.8	64.3	65.1
Sage C	14.0	65.1	63.9	Sage I	14.7	64.4	61.5
Centura	14.0	64.9	67.6	Hawk	13.2	64.1	66.1
Buckskin	13.5	64.5	71.5	Scout 66	14.5	64.4	65.8
Bennett	14.9	64.8	66.3	Rita	14.0	63.0	65.9
Rocky	13.2	64.9	74.7	Agate	12.5	61.9	59.0
Sage D	15.2	63.6	63.7	Sage J	13.4	64.4	61.5
Brule	11.5	63.8	73.8	Hail	12.6	62.2	67.6
Colt	13.3	63.6	73.9	Centurk 78	12.5	63.8	63.7
Big Horn 1	13.7	63.4	68.5	Agassiz	13.9	62.7	54.9
Q555	12.8	64.0	76.1	Norstar	12.9	61.9	61.5
Sage E	14.1	64.5	63.5	Sage K	14.7	63.6	59.0
Q554	13.6	64.9	72.7	Roughrider	12.6	63.6	61.2
Q568	12.7	64.4	75.6	WM 104	13.2	63.4	56.3
Siouxland	13.2	64.2	70.4	Big Horn 2	14.0	62.2	65.3
Lancer	13.3	64.9	63.5	WM 140-A	11.9	64.0	68.7
Sage F	14.0	64.9	65.0	Sage L	14.7	63.9	59.4
Nell	13.2	64.1	64.4	Sage c-oil 1	14.2	64.0	62.1
Rose	13.4	64.4	70.7	Sage c-oil 2	14.1	63.2	58.6
Mean	13.9	64.0	65.6		13.9	64.0	65.6
LSD(05)		0.98	4.52			0.98	4.52
CV %		0.95	4.26			0.95	4.26

*RF - Regular fertilizer rate 6 gal of 10-24-0/A; HF - High fertilizer rate - 12 gal of 10-34-0/A;

NF - No fertilizer applied.

**Percent protein determined with a Technicon 300 InfraAnalyzer.

No-Till Demonstration of Soybeans, Field Beans, and Grain Sorghum

Jones County (Draper), 1985

Paul Patterson, Cooperator

OBJECTIVE: To demonstrate use of a No-Till planter in seeding sorghum and beans into stubble.

EQUIPMENT: Buffalo No-Till plate planter with 2-30 inch rows, mounted on a Ford 4000 series tractor.

SOIL TEST DATA: pH-7.7, O.M.-1.9%, Nitrogen-15#/A, Phosphorus-15#/A, Potassium-990#/A, Salt-1.0 mmho/cm, Zinc-0.28 ppm, Texture-fine, Depth tested. 0-6".

FIELD DATA: Beans and grain sorghum were planted May 15, 1985 and a late planted grain sorghum on June 17, 1985. A starter fertilizer of 38 lbs of Nitrogen and 21 lbs of Phosphorus was applied at late planting date. Seeding rate was 2.5 Lbs/A for sorghum and 54 Lbs/A for beans. All plots were cultivated on July 2 and sorghum received a second cultivation on August 15. Damaging hailstorm occurred on August 15, 1985.

TABLE 57. No-Till Demonstration - Jones County (Draper), 1985.

<u>Crop & Variety</u>	<u>Test Weight (Lbs/Bu)</u>	<u>Grain Yield (Bu/Acre)</u>
GRAIN SORGHUM		
Funks 251H (Early Planting)	50.8	22.1
Funks 146OGS (Late Planting)	46.2	7.5
SOYBEANS		
Hardin	55.3	9.2
Funks G3213	55.3	7.4
Dawson	53.3	7.4
NKS0512	51.9	6.2
Funks G3145	53.0	4.2
FIELD BEANS		
Seafarer Navy	55.3	1.5
Dark Red Kidney	42.0	1.0
Black Turtle Soup	56.4	4.0

NOTE: Plots were harvested on October 22, 1985. Harvested area: 2-30 inch rows x 25 feet. One replication only harvested.

No-Till Demonstration of Soybeans, Field Beans, and Grain Sorghum

Pennington County (Wicksville), 1985
Jim Trevillyan, Cooperator

OBJECTIVE: To demonstrate use of a No-Till planter in seeding sorghum and beans into stubble.

EQUIPMENT: Buffalo No-Till plate planter with 2-30 inch rows, mounted on a Ford 4000 series tractor.

SOIL TEST DATA: pH-7.1, O.M.-1.8%, Nitrogen-19#/A, Phosphorus-54#/A, Potassium-990#/A, Salts-1.0 mmho/cm, Zinc-0.54 ppm, Texture-fine, Depth Tested 0-6".

FIELD DATA: Plots were seeded on May 13, 1985. Sorghum was seeded at 2.5#/A and beans at 54#/A. Lasso Microtech at 2-1/2#/A and Roundup at 12 oz/A were applied post plant.

TABLE 58. No-Till Demonstration - Pennington County (Wicksville), 1985

<u>Crop Planted</u>	<u>Plant Height (Inches)</u>	<u>Test Weight (Lbs/Bu)</u>	<u>Seed Yield (Bu/A)</u>
GRAIN SORGHUM			
Funks 251-H	26	56.8	9.3
Funks 1460-H	34	46.0	5.7
SOYBEANS			
Dawson	14	55.3	5.1
Hardin	14	53.3	7.1
Northrup-King S0512	14	55.3	6.1
Funks G3213	12	55.3	5.9
Funks G3145	16	55.3	4.2
FIELD BEANS			
Black Turtle Soup	17	50.8	1.6
Dark Red Kidney	11	42.0	0.9
Seafarer Navy	12	56.4	2.5

NOTE: Plots were harvested on October 15, 1985. Harvested area: 2-30 inch rows x 75 feet. One replication only.

No-Till Demonstration of Soybeans, Field Beans, and Grain Sorghum

Stanley County (Hayes), 1985
Bonnie Sivage, Cooperator

OBJECTIVE: To demonstrate use of a No-Till planter in seeding sorghum and beans into stubble.

EQUIPMENT: Buffalo No-Till plate planter with 2-30 inch rows and liquid fertilizer attachment, mounted on a Ford 4000 series tractor.

SOIL TEST DATA: pH-7.6, O.M.-2.2%, Nitrogen-34#/A, Phosphorus-28#/A, Potassium-990#/A, Zinc-0.35 ppm, Salts-0.8 mmho/cm, Texture-fine, 0-6 inch test.

FIELD DATA: Sorghums were seeded at 2.5#/A, Soybeans and Field Beans were seeded at 100,000 plants/acre. Early seeding of sorghum, soybeans and Field beans: May 16, 1985. Late seeding of sorghum: June 18, 1985. Late seeding had 40#/A Nitrogen and 22#/A Phosphorus applied as liquid fertilizer. 2-1/2#/Acre of Lasso Micro-Tech was applied to all plots. Fields were cultivated on August 15, 1985 with a Buffalo 2 row cultivator.

TABLE 59. No-Till Demonstration - Stanley County (Hayes), 1985.

Variety	Plant Height (Inches)	Test Weight (Lbs/Bu)	Grain Yield (Bu/Acre)
<u>Early Planting</u>			
GRAIN SORGHUM			
Funks 251-H	30	55.3	19.9
Funks 1460-H	31	44.0	9.6
SOYBEANS			
Dawson	16	53.0	11.7
Hardin	21	55.3	15.4
NK SO 512	20	55.3	15.2
Funks G3213	19	55.3	13.9
Funks G3145	20	56.4	10.8
FIELD BEANS			
Black Turtle Soup	17	53.3	11.7
Dark Red Kidney	13	47.7	7.3
Seafarer Navy	12	57.5	8.7
<u>Late Planting</u>			
GRAIN SORGHUM			
Funks 251-H	30	48.5	13.0
Funks 1460-H	35	42.9	1.3

NOTE: Plots were harvested on October 16, 1985. Harvested area: 250 square feet. One replication only.

WEED CONTROL RESEARCH

Effects of Selective Herbicides on Winter Wheat Varieties

Jones County (Okaton), 1984-85.

Eltor Buxcel, Cooperator

OBJECTIVE: To evaluate herbicide injury to 26 winter wheat varieties.

WEEDS: Downy brome in 1-leaf stage of growth.

CROP: Winter wheat at approximately the 3-leaf stage and the crown was just starting to develop.

APPLICATION DATA: Herbicide applied on October 11, 1984 with a 3-wheel sprayer. Nozzles-flat fan #8002, Spacing-30", Pressure-25 psi, Speed-3.1 mph, Mixture applied at 10 gal/A, Wind-South and gusty, Time 6:00 - 8:00 pm.

SOIL TEST DATA: pH-6.7, O.M.-2.3%, Nitrogen-59#/A, Phosphorus-75#/A, Potassium-990#/A, Salts-0.8-mmho/cm, Texture-medium, Soil moist to 40", 0-6" soil test.

PLOT SIZE: 5 feet x 25 feet, 1 Replication. Harvested area 5 feet x 20 feet.

TABLE 60. Effect of 6 Herbicide Combinations on 26 Varieties of Winter Wheat - Jones County (Okaton), 1984-1985.

Treatment Number	Herbicide	Rate-Oz/A (A.I.)		Herbicide	Rate-Oz/A (A.I.)	Grain Yield* (Bu/Acre)
01	SMY1500	12	Plus	Metribuzin	2	33.2
02	SMY1500	12	Plus	Metribuzin	0	28.2
03	SMY1500	0	Plus	Metribuzin	2	24.7
04	Control			Control		29.6
05	SMY1500	16	Plus	Metribuzin	2	33.7
06	SMY1500	16	Plus	Metribuzin	0	39.1
07	Glean	0.5	Plus	Metribuzin	0	37.3

Mean - 32.3

*Yield is an average of 26 winter wheat varieties.

NOTE: Plots were harvested on July 18, 1985.

TABLE 61. Effect of 6 Herbicide and Herbicide Combinations on 26 Varieties of Hard Red Winter Wheat - Jones County (Okaton), 1984-1985.

Variety	Treatment* Bushel/Acre)							Percent Protein**	Ave. Yield (Bu/Acre)
	01	02	03	04	05	06	07		
Agassiz	24.1	22.2	Lost	29.7	32.8	33.9	35.6	15.7	29.7
Agate	26.8	21.5	22.5	27.9	33.9	36.4	40.7	14.8	30.0
Bennett	23.1	19.7	23.7	29.8	33.7	36.3	38.4	15.6	29.2
Brule	27.6	23.8	22.5	27.9	33.2	38.1	36.4	14.2	29.9
Buckskin	44.0	38.1	20.8	29.9	40.8	39.8	37.1	11.6	35.8
Centura	41.9	33.3	25.6	23.7	34.3	37.6	38.2	11.8	33.5
Centurk 78	45.3	32.8	28.5	34.5	41.7	47.0	39.0	14.1	38.4
Colt	36.1	28.3	23.9	33.4	39.0	50.1	37.4	14.6	35.5
Dawn	29.7	25.2	25.6	26.1	41.4	44.4	39.5	14.1	33.1
Hail	36.7	31.2	13.3	26.9	32.2	30.1	36.7	11.7	29.6
Hawk	35.9	24.5	24.2	33.4	37.6	46.9	39.4	13.9	34.6
Lancer	32.3	32.9	21.4	28.0	34.5	34.0	35.3	11.1	31.2
Larned	30.2	25.7	23.5	31.9	36.3	40.5	37.5	14.7	32.2
Nell	24.9	22.7	23.1	27.5	34.3	34.9	38.1	14.5	25.1
Norstar	25.1	23.3	26.8	27.7	31.3	35.8	39.8	13.4	30.0
Roughrider	20.5	17.9	19.8	26.9	30.1	32.9	36.3	15.3	26.3
Ram	42.8	31.4	30.0	32.7	39.4	41.4	34.3	13.5	36.0
Rita	23.4	19.9	21.8	26.5	35.6	37.0	36.4	15.5	28.7
Rocky	40.6	35.2	24.6	31.7	40.3	51.8	42.1	14.4	38.0
Rose	28.4	27.6	22.5	27.2	33.3	45.7	36.1	15.4	31.5
Sage	28.6	23.6	26.6	27.3	39.8	43.0	39.7	15.9	32.7
Scout 66	26.0	18.8	21.5	28.4	34.7	35.4	35.7	15.6	28.6
Stoutland	37.8	41.4	33.6	37.9	44.7	47.2	35.8	12.4	36.9
Quantum 554	41.6	33.8	28.8	29.7	40.3	40.9	38.6	12.4	36.2
Quantum 555	46.4	38.1	31.4	39.0	40.4	44.1	35.6	12.6	39.2
Quantum 568	42.7	39.2	30.8	30.7	39.4	42.5	42.7	12.5	38.3
Mean - 13.9									32.4

*See table number 60.

**Percent protein determined with a Technicon 300 InfraAnalyzer

NOTE: Harvested on July 18, 1985.

Effects of Selective Herbicides on Winter Wheat Varieties

Lyman County (Presho), 1984-85
Steve Lien, Cooperator

OBJECTIVE: To determine the effect of two herbicides at different rates on 35 different varieties of winter wheat.

WEEDS: Buckwheat, mustard - small

CROP: Winter wheat - 35 varieties, 1983 oats, 1984 fallow. Wheat had 7-13 tillers and 4-5 leaves.

APPLICATION DATA: Herbicides applied on April 3, 1985 with a 3 wheel sprayer. Nozzle-flat fan #8002 with 30" spacing, Pressure-30 psi, Speed-3.5 mph, Mixture-10 gal/A, Air Temperature 50-60°F, Wind East at 10-15 mph, cloudy, Time 4:00 - 5:30 pm.

SOIL TEST DATA: pH-7.8, Salts 0.7 mmho/cm, Texture - fine. Top soil was moist down to 4" on April 3, 1985, 0-6" soil test.

PLOT SIZE: 25 feet x 5 feet, 1 Replication. Harvested area 5 feet x 20 feet.

TABLE 62. Effect of 5 Herbicide and Herbicide Combinations on 35 Varieties of Winter Wheat - Lyman County (Presho), 1984-1985.

Treatment Number	Herbicide	Rate-Oz/A (A.I.)	Herbicide	Rate-Oz/A (A.I.)	Yield* Bu/A	Test Wt. Lbs/Bu
1	SMY1500	16 Plus	Sencor	2	27.8	57.4
2	SMY1500	16 Plus	Sencor	0	27.5	57.4
3	SMY1500	24 Plus	Sencor	0	26.1	56.8
4	Control		Control		24.7	56.9
5	SMY1500	0 Plus	Sencor	6	24.4	57.0
6	SMY1500	0 Plus	Sencor	8	25.2	56.8
Mean -					26.1	57.1

*Yield is an average of 35 wheat varieties.

TABLE 63. Effect of 5 Herbicide and Herbicide Combinations on 35 Varieties of Hard Red Winter Wheat ~ Lyman County (Presho), 1984-1985.

Variety	Treatment* - Yield, Bu/A						Percent Protein**	Test Wt. (Lbs/Bu)	Yield (Bu/A)
	1	2	3	4	5	6			
Agassiz	18.0	16.8	14.4	13.8	15.2	16.1	16.6	53.8	15.7
Agate	28.5	24.6	13.0	22.5	20.5	18.6	15.4	57.3	21.3
Bennett	34.2	30.3	29.8	31.7	28.3	27.5	16.9	57.0	30.3
Big Horn	22.9	24.6	23.4	19.5	19.8	24.1	16.4	54.9	22.4
Brawny	19.4	20.9	21.0	21.5	17.3	19.1	17.6	57.8	19.9
Brule	24.4	27.6	25.6	22.5	26.2	24.8	14.8	57.3	25.2
Buckskin	32.7	32.1	32.7	32.7	31.1	30.7	16.3	59.7	32.0
Centurk-78	27.7	26.4	24.9	22.7	24.4	24.9	16.4	56.4	25.2
Citation	23.9	22.8	21.4	20.8	19.6	23.1	15.2	57.4	21.9
Colt	32.4	31.6	30.7	24.9	28.5	26.1	16.2	56.9	29.0
Dawn	36.5	31.1	30.9	27.1	27.5	28.1	15.6	58.0	30.2
Hail (Avg)	26.1	25.9	23.4	22.9	21.8	22.1	16.1	55.6	23.7
Lancer	22.6	23.6	23.4	23.0	21.4	24.2	16.4	57.5	23.0
Lancota	24.1	25.1	24.2	21.4	21.4	23.3	17.1	58.4	23.3
Nell	27.8	29.9	26.7	26.4	25.4	26.8	15.8	57.0	27.2
Newton	31.0	32.7	29.5	28.8	28.0	25.0	14.6	58.4	29.2
Norstar	25.8	28.7	27.2	26.4	23.9	24.5	16.1	58.0	26.1
Ram	24.7	27.0	22.1	22.1	25.4	25.5	16.2	55.5	24.5
Rita	30.3	29.1	28.2	23.9	26.3	23.7	16.4	54.9	26.9
Rocky	28.1	29.2	29.8	28.3	27.1	31.1	16.4	57.4	28.9
Roughrider	25.5	24.0	22.7	20.4	23.6	22.5	16.3	57.5	23.1
Rose	33.9	26.4	30.4	24.3	25.0	28.8	15.9	57.8	28.1
Sage	28.2	28.9	28.4	27.8	28.5	27.3	—	57.5	27.7
Scout	35.8	34.3	30.7	26.9	25.2	28.1	—	59.2	30.2
Siouxland	29.2	28.5	29.3	27.0	24.7	26.9	15.7	56.3	27.6
Scout-66	27.1	28.8	25.8	27.2	29.0	28.8	16.0	59.3	27.8
Quantum 554	29.2	27.6	27.0	22.8	19.4	25.2	16.1	55.7	25.2
Quantum 555	28.2	26.4	27.9	24.5	26.4	26.8	15.2	55.0	26.7
Quantum 568	31.7	31.1	33.5	32.0	27.4	29.1	15.9	59.5	30.8
RH-110	27.1	27.4	28.4	27.3	29.6	30.7	15.9	58.3	28.4
RH-5221	21.6	18.8	20.1	18.5	20.4	19.0	16.5	55.1	19.7
Wthr. Mstr. 101	23.4	23.9	21.9	17.5	21.3	19.3	—	55.0	21.2
Wthr. Mstr. 106	26.8	29.1	27.8	27.6	27.5	30.7	15.5	58.7	28.3
Wthr. Mstr. 110	32.4	31.9	30.5	25.2	27.4	26.1	—	58.7	28.9
Wthr. Mstr. 140A	37.2	40.4	35.6	40.0	30.2	31.5	14.5	58.4	35.8

LSD(05) ~ 3.3 Bu/A

C.V. ~ 11.3%

Mean ~ 16.0

57.1

26.1

* See table number 62.

** Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Harvest started July 17, 1985, rain interrupted then finished July 18, 1985.

Control Of Downy Bromegrass In Winter Wheat
(Early Fall)

Jones County (Okaton), 1984-85
Norman Buxcel, Cooperator

OBJECTIVE: To evaluate several herbicides for control of downy bromegrass in Larned winter wheat.

WEEDS: Downy bromegrass at the 1-leaf stage of growth.

CROP: Winter wheat (Larned) with 2-3 leaves and just developing brace roots. Seeded September 12, 1984 in 10" rows.

APPLICATION DATA: Sprayed on October 12, 1984, 3 wheeled sprayer, Nozzle-flat fan #8002, 30" spacing, Pressure-25 psi, Speed-3.1 mph, Mixture-10 gal/A, wind - South, gusty. Time 9:00 am - 12:00 pm.

SOIL TEST DATA: pH-7.5, O.M.-2.2%, Nitrogen-65#/A, Phosphorus-44#/A, Potassium-990#/A, Salts-0.9 mmho/cm, Texture-fine, soil moist to 40", top soil was dry, 0-6" soil test.

PLOT SIZE: 12.5 feet x 75 feet. 4 Replications. Harvested area 5 feet x 30 feet.

RESULTS: See Table 64.

Control Of Downy Bromegrass In Winter Wheat
(Late Fall)

Jones County (Okaton), 1984-85
Norman Buxcel, Cooperator

OBJECTIVE: To determine the effect of SMY1500 and metribuzin at different rates and combinations on downy bromegrass, under a late fall application.

WEEDS: Downy bromegrass 1-leaf stage of growth.

CROP: Larned Winter Wheat that had started to tiller, 10" row. Planted September 12, 1984.

APPLICATION DATA: Herbicide applied November 21, 1984 with a 3 wheel sprayer, Nozzle-flat fan #8002, 20" spacing, Pressure-25 psi, Speed-3.1 mph, Mixture applied-10 gal/A, No wind, Time 3:00-6:00 pm.

SOIL TEST DATA: pH-7.5, O.M.-2.2%, Nitrogen-66#/A, Phosphorus-44#/A, Potassium-990#/A, Salts-0.9 mmho/cm, Texture-fine, soil moist to 40", top soil dry, 0-6" soil test.

PLOT SIZE: 12.5 feet x 75 feet, 4 replications, harvested area 5 feet x 30 feet.

RESULTS: See Table 65.

TABLE 64. Effect of Five Herbicides and Herbicide Combination on Downy Bromegrass Control, and Grain Yield of Hard Red Winter Wheat. Jones County (Okaton), 1984-85. (Early Fall Application).

Herbicide	Rate-Oz/A (A.I.)	Herbicide	Rate-Oz/A (A.I.)	Percent Crop*		Percent** Protein	Test Wt. (Lbs/Bu)	Yield (Bu/A)
				Control	Injury			
R7910	12	Metribuzin	2	75		15.7	63.1	23
R7910	12	Metribuzin	4	83	++	14.9	61.5	29
R7910	12	Metribuzin	6	67	+++	15.3	56.2	23
Control	—	Control	—	00		13.8	62.4	23
R7910	16	Metribuzin	2	69	+	15.6	61.6	26
R7910	16	Metribuzin	4	79	++	14.9	58.8	24
R7910	16	Metribuzin	6	82	+++	14.8	57.6	25
R7910	12	Metribuzin	0	25		15.6	62.8	26
R7910	16	Metribuzin	0	61	+	16.7	61.8	22
Metribuzin	4	—	—	10		16.0	61.5	15
Metribuzin	6	—	—	44	+	16.2	61.3	18
Racer	6	Metribuzin	4	20		16.2	58.9	15
SMY1500	12	Metribuzin	1	31		16.2	61.1	17
SMY1500	12	Metribuzin	2	40		15.2	60.2	21
SMY1500	12	Metribuzin	3	45	+	15.5	59.7	16
SMY1500	12	Metribuzin	0	25		13.4	63.2	20
SMY1500	16	Metribuzin	1	30		15.4	61.9	17
SMY1500	16	Metribuzin	2	67	+	14.6	60.2	23
SMY1500	16	Metribuzin	3	76	++	15.3	60.0	22
SMY1500	16	Metribuzin	0	46		16.2	61.3	22
Hoelon	12	—	—	00		14.8	63.5	20
Hoelon	16	—	—	00		15.5	62.7	19
Mean						15.3	61.0	21.2
LSD(05)				33.7			1.1	8.0
CV(%)				53			3.7	27.3

* Injury ratings noted in 4 replications on May 29, 1985. Injury consisted of stunted plants and delayed maturity. (+ = 1 replication with injury).

** Percent Protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were harvested on July 11, 1985.

TABLE 65. Effect of 2 Herbicide and Herbicide Combinations on Downy Brome grass Control, and Grain Yield of Larned Hard Red Winter Wheat - Jones County (Okaton), 1984-1985. (Late Fall Application)

Herbicide	Rate-Oz/A (A.I.)	Herbicide	Rate-Oz/A (A.I.)	I Control				Ave.	Percent* Protein	Test Wt. lbs/Bu	Yield Bu/A
				I	II	III	IV				
SMY1500	12	Metribuzin	0	75	85	40	70	67.5	--	62.6	23
SMY1500	16	Metribuzin	0	60	90	80	60	72.5	--	62.4	25
SMY1500	12	Metribuzin	2	85	60	80	50	68.8	14.2	62.3	27
SMY1500	12	Metribuzin	4	90	80	75	95	85.0	14.1	62.8	29
SMY1500	16	Metribuzin	2	85	90	85	75	83.8	14.5	63.1	29
Control		Control		00	00	00	00	00.0	14.1	63.2	20
SMY1500	16	Metribuzin	4	90	85	75	85	83.8	15.1	62.5	23
SMY1500	0	Metribuzin	2	60	30	30	40	40.0	14.6	63.0	23
SMY1500	0	Metribuzin	4	90	85	50	50	68.3	14.4	63.2	27
LSD(05) - 6.3 Bu/A				C.V. - 17.4%				Mean - 63.0	14.4	62.8	25.0

*Percent protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were harvested on July 11, 1985.

Control Of Downy Bromegrass In Winter Wheat (Early Spring)

Jones County (Okaton), 1984-85
Norman Buxcel, Cooperator

OBJECTIVE: To determine the effect of SMY1500 and Metribuzin at different rates and combinations on downy bromegrass, under an early spring application.

WEEDS: Downy bromegrass with 2-3 tillers, 1" high. Tansy mustard and Pennycress were also present.

CROP: Larned winter wheat with 2-3 tillers, 2-3" high, and well developed braceroots. Planted September 12, 1984.

APPLICATION DATA: Herbicide applied April 3, 1985 with a 3 wheel sprayer, Nozzle-flat fan #8002, 30" spacing, Pressure-30 psi, Speed-3.5 mph, Mixture applied-10 gal/A, Wind S.E. 0-10 mph, No clouds, Time 10:00 am - 12:30 pm.

SOIL TEST DATA: pH-7.5, O.M.-2.2%, Nitrogen-66#/A, Phosphorus 44#/A, Potassium 990#/A, Salts-0.9 mmho/cm, Texture-fine, soil moist to 48", 0-6" soil test.

PLOT SIZE: 12.5 feet x 75 feet, 3 Replications.

TABLE 66. Effect of 2 Herbicide and Herbicide Combinations on Downy Bromegrass Control - Jones County (Okaton), 1985. (Early Spring Application).

Herbicide	Rate-Oz/A (A.I.)		Herbicide	Rate-Oz/A (A.I.)		Control			Ave.
						I	II	III	
SMY1500	12	Plus	Metribuzin	0		85	80	40	68
SMY1500	16	Plus	Metribuzin	0		90	80	80	83
SMY1500	12	Plus	Metribuzin	2		60	75	00	45
SMY1500	12	Plus	Metribuzin	4		75	60	75	70
Control			Control			00	00	00	00
SMY1500	16	Plus	Metribuzin	2		80	90	90	87
SMY1500	16	Plus	Metribuzin	4		80	90	85	85
SMY1500	0	Plus	Metribuzin	2		90	60	60	70
SMY1500	0	Plus	Metribuzin	4		60	60	75	65

LSD(05) - 29.5

C.V. - 26.7%

NOTE: Plots were not harvested for yield due to custom combiner errors.

Downy Bromegrass Control

Pennington County (Rapid City), 1985
Rapid City Airport Farm, Cooperator

OBJECTIVE: To evaluate several herbicides and herbicide combinations in both preplant incorporated and post plant incorporated treatments for downy brome control in winter wheat.

WEEDS: Downy bromegrass starting to spike through the ground, at the time of the spraying October 10, 1984.

CROP: Recropped winter wheat was seeded on October 10, 1984 with a Noble drill behind a field cultivator and Big Bud tractor. The field cultivator was withdrawn from the ground before the plots were entered.

APPLICATION DATA: Sprayed on September 14, 1984 with a 3 wheel All Terrain Vehicle mounted sprayer. Herbicide solution was mixed in 1 gallon lots, Nozzles were flat fan #8002. Solution applied at a pressure of 40# psi at a velocity of 4 mph. Plots were harrowed within 1 hour after spraying with a Melroe Spring tined harrow. Post plant treatment applied October 11, 1984.

SOIL TEST DATA: pH-6.0, O.M.-3.6%, Nitrogen-33#/A, Phosphorus-88#/A, Potassium-1510#/A, Salt-0.5 mmho/cm, Zinc-1.9 ppm, Sulfur-0.0 ppm, Texture-fine.

PLOT SIZE: 25 feet x 75 feet, 4 Replications.

TABLE 67. Effect of Several Herbicides and Herbicide Combinations on Downy Bromegrass in Winter Wheat using Pre- and Post-Plant Applications. Pennington County (Rapid City Airport Farm), 1984-85.

Herbicide	Rate-Lbs/A (a.i.)	Percent Weed Control				Average
		I	II	III	IV	
<u>PREPLANT INC (September 14)</u>						
Far-Go	1-1/4	40	50	20	50	40.0
Far-Go	1-1/2	40	50	40	30	40.0
Hoelon	3/4	40	40	20	50	37.5
Hoelon	1	50	30	40	50	42.5
Hoelon	1-1/4	60	70	00	40	42.5
Control	--	00	00	00	00	00.0
Racer + Far-Go	3/8 + 1-1/4	30	50	00	40	30.0
Racer + Treflan	3/8 + 3/4	30	30	20	40	30.0
Treflan	3/4	30	40	50	30	37.5
<u>POST-PLANT, INC. (October 11)</u>						
Racer + Far-Go	3/8 + 1-1/4	20	50	30	50	37.5
Racer + Treflan	3/8 + 3/4	40	60	30	30	40.0
Far-Go	1-1/4	30	40	30	40	35.0
Far-Go	1-1/2	30	50	30	40	37.5
LSD(05) - 17.3		C.V. - 35.3		Mean - 34.6		

*Percent weed control in individual replications and a treatment average.

NOTE: Plots were not harvested due to downy brome infestation.

BROADLEAF WEED CONTROL IN SPRING WHEAT

Jones County (Murdo), 1985.

Richard Nicks, Cooperator

OBJECTIVE: To evaluate several broadleaf herbicides on Guard spring wheat at three stages of growth: 1: 2-leaf, 2: tillering, 3: jointing.

WEEDS: Wild buckwheat 3-6" tall, Green Foxtail 3-4 leaves June 6, 1985.

CROP: Guard spring wheat, planted April 7, 1985.

First spraying: 1-1/2 - 2 leaf stage

Second spraying: 4-5 leaves and tillering

Third spraying boot to heading: 12"-14" tall.

APPLICATION DATA: First Application: April 24, 1985, 3 wheeled sprayer, Nozzle-flat fan #8001, 30" spacing, Pressure-40 psi, Speed-4 mph, Mixture applied-5 gal/A, Wind-0-7 mph from NW, clear sky, Soil Temperature-60°F, Air Temperature-60°F, Time 3:00-6:00 pm, soil moist to 40 plus inches.

Second Application: May 8, 1985. Wind 0-3 mph, SE, clear, air temp. 80°F, time 3:30-5:00 pm.

Third Application: June 6, 1985. Wind 0-3 mph, NW, clear, air temp. 80°F, top 1/2" dry, time 2:30-3:30 pm.

SOIL TEST DATA: pH-7.9, O.M.-1.6%, Nitrogen-26#/A, Phosphorus-8#/A, Potassium-990#/A, Zinc-0.47 ppm, Salts-0.8 mmho/cm, Texture-fine, 0-6" soil test.

PLOT SIZE: 12.5 feet x 75 feet, 3 Replications, Harvested area: 5 feet x 30 feet.

RESULTS: See table 68.

TABLE 68. Effect of Several Broadleaf Herbicides and Date of Application on Spring Wheat Yields - Jones County (Murdo), 1985.

Herbicide	Rate-Oz/A (A.I.)	Surfactant Percent	Maturity* Rating	Injury** Rating	Test Wt. (Lbs/Bu)	Yield (Bu/A)
<u>2 Leaf</u>						
Harmony	3/8	3/4	1.0	1.0	62.6	35.9
Harmony	1	3/4	1.0	1.0	61.6	36.1
L5300	1/4	3/4	1.7	1.0	62.0	36.4
L5300	1	3/4	1.7	1.0	62.1	35.8
Ally	1/8	3/4	1.7	1.7	61.1	38.2
2,4-D Amine	8	0	3.0	2.3	60.7	33.3
Banvel	2	0	1.7	1.0	62.6	39.2
Control	0	0	1.3	1.0	62.0	37.4
<u>Tillering</u>						
Harmony	3/8	3/4	1.3	1.0	62.1	40.2
Harmony	1	3/4	1.7	1.3	61.8	38.6
L5300	1/4	3/4	1.7	1.7	61.9	37.9
L5300	1	3/4	2.0	1.0	60.9	37.8
Ally	1/8	3/4	1.7	1.7	60.8	36.8
2,4-D Amine	8	0	1.0	1.0	61.6	33.7
Banvel	2	0	1.3	1.0	61.8	38.6
<u>Jointing</u>						
Harmony	3/8	3/4	2.3	1.3	62.5	33.8
Harmony	1	3/4	2.3	1.3	61.8	34.7
Control	0	0	1.0	1.0	62.7	36.7
Control	0	0	1.0	1.0	62.2	35.0
Ally	1/8	3/4	2.3	1.7	61.6	32.6
2,4-D Amine	8	0	1.7	1.7	62.1	35.0
Banvel	4	0	2.7	3.0	61.3	28.0
Mean -			1.7	1.3	61.8	36.1
LSD(05)			1.3	0.9	1.4	6.3
CV (%)			48.0	40.5	1.4	10.7

NOTE: Protein-15.4% (Average of Replication number 2), protein was analyzed with a Technicon 300 InfraAnalyzer. Plots were harvested on July 23, 1985

*Maturity Rating: 1 = no green heads, 2 = some green heads, 3 = many green heads, on July 17, 1985.

**Injury Rating: 1 = no injury, 2 = 3" stunting, 3 = 5" stunting, on July 17, 1985.

Broadleaf Weed Control In Spring Wheat

Pennington County (Wicksville), 1985
Jim Trevillyan, Cooperator

OBJECTIVE: To determine the Effect on Spring Wheat of Several Herbicides and Herbicide Rates.

WEEDS: Tansy Mustard, Wild Buckwheat, Lambsquarters, Wild Sunflower. All weeds were small: 1-3" tall.

CROP: 1985-Spring Wheat 3-4 leaf stage, 1984-Fallow, 1983-Sod.

APPLICATION DATA: Herbicides applied May 1, 1985 with a 3 wheel sprayer. Nozzles-Flat fan #8001 with 30 inch spacing, Pressure-40 psi and a ground speed of 4 mph, Solution applied-3 gallon per acre. Air temperature-75°F, Soil temperature-67°F, Wind-SSE at 5-10 mph, Clear air, Time of application-5:00-7:30 PM.

SOIL TEST DATA: None.

PLOT SIZE: 12.5 feet x 75 feet, 4 Replications. Harvested area: 7 feet x 30 feet.

TABLE 69. Effect of Several Broadleaf Herbicides on Weed Control and Grain Yield of Spring Wheat. Pennington County (Wicksville), 1985.

Herbicide	Rate-Oz/A (A.I.)	Percent Control Wild Sunflower	Grain Yield (Bu/Acre)
Racer + Surfactant	2 + 1/2 %	75	5.0
Racer + Surfactant	4 + 1/2 %	82	5.1
Racer + Banvel + S*	1 + 1-1/2 + 1/2 %	85	3.7
Racer + Banvel + S*	2 + 2 + 1/2 %	94	4.0
Control	—	00	5.2
Racer + Banvel + S*	1 + 2 + 1/2 %	94	3.2
Racer + Bromoxynil + S*	1 + 2 + 1/2 %	76	5.9
Racer + Bromoxynil + S*	2 + 2 + 1/2 %	70	6.0
Bromoxynil + S*	2 + 1/2 %	70	6.3
Banvel + S*	2 + 1/2 %	90	6.4
2,4-D Amine + S*	2 + 1/2 %	91	4.0
	Mean	75	4.9
	LSD (05)	15	3.0
	CV (%)	13.4	42.0

*S = Surfactant (X-77).

NOTE: Plots were harvested August 7, 1985.

**Date & Rate of Application for Control & Broadleaf
Weeds in Winter Wheat**

Pennington County (Wall), 1984-1985
Bill Bielmaier, Cooperator

OBJECTIVE: To evaluate fall and spring applications of Glean and Racer on Rita winter wheat.

WEEDS: April 30, 1985, Buckwheat 1-2 leaves, a few Lambsquarters 2 leaves.

CROP: November 2, 1984, Rita winter wheat in the 2 leaf stage, crowns starting to develop. April 30, 1985 wheat was fully tillered, 6-8" tall.

APPLICATION DATA: Herbicides applied-November 1984 with a 3 wheeled sprayer, 1 gal. mixes, Solution rate-10 gal/A, Nozzles-flat fan #8002, Pressure-25 psi, Speed-3.1 mph, Wind-5-15 mph from Southwest, Time 2:00-4:30 pm.
Spring Application-April 30, 1985 with a 3 wheeled sprayer, 1 gal. mixes, Solution rate-10 gal/A, Nozzles-flat fan #8002, Pressure-25 psi, Speed-3.1 mph, Air Temperature-80°F, Soil Temperature-63°F.

SOIL TEST DATA: pH-6.0, O.M.-1.9%, Nitrogen-67#/A, Phosphorus-58#/A, Potassium-1100#/A, Salts-0.6 mmho/cm, Zinc-0.67 ppm, Sulfer-10.0 ppm, Texture-fine, 0-6" soil test.

PLOT SIZE: 12.5 feet x 75 feet, 4 Replications.

TABLE 70. Effects of Glean and Racer Applied Fall and Spring on Broadleaf Weeds in Rita Winter Wheat - Pennington County (Wall), 1984-1985.

Herbicide	Rate-Oz/A (A.I.)	Percent Control of Wild Buckwheat					Percent Control of Lambsquarters				
		I	II	III	IV	Ave	I	II	III	IV	Ave
November 1984											
Glean	0.083	90	75	90	85	85	99	99	80	99	94
Glean	0.125	75	80	90	75	80	99	99	90	90	94
Racer	4	70	00	50	70	47	50	00	00	00	13
Racer	6	00	50	00	00	13	60	00	00	00	15
Racer	8	60	00	00	00	15	00	60	00	00	15
April 1985											
Glean	0.083	90	90	90	90	90	99	99	99	99	99
Glean	0.025	80	90	80	85	84	99	99	99	99	99
Racer	4	40	00	70	40	37	00	99	80	50	57
Racer	6	60	60	80	60	65	85	99	99	80	91
Racer	8	85	60	75	80	75	90	99	99	99	97
Control	---	00	00	00	00	00	00	00	00	00	00
Mean						54	61				
LSD(05)						26.7	29.6				
CV (%)						34.4	33.5				

NOTE: Due to drought, plots were not harvested.

**Broadleaf Weed Control In Winter Wheat
(Spring Application)**

Jones County (Murdo), 1985.
Gene Thomas, Cooperator

OBJECTIVE: To evaluate several broadleaf herbicides and date of application on the yield of Dawn winter wheat.

WEEDS: Tansy mustard just starting to 3" tall. Pennycress small to large rosette. Wild buckwheat 1 true leaf.

CROP: Dawn winter wheat 7-12 tillers, 4-6" tall at first spray application, wheat was just about to boot stage at second application.

APPLICATION DATA: First Application: April 25, 1985 with a 3 wheeled sprayer, Nozzle-flat fan #8001, 30" spacing, Pressure-40 psi, Speed-4 mph, Mixture applied-5 gal/A, Wind-SE 2 mph, cloudy, Soil Temperature-48°F, Time-6:00 - 9:00 AM.

Second Application: May 8, 1985 same as above except clear, No wind, Time-6:00 - 8:00 pm, Soil Temperature-65°F.

SOIL TEST DATA: pH-8.0, O.M.-1.9%, Nitrogen-23#/A, Phosphorus-17#/A, Potassium-790#/A, Zinc-0.76 ppm, Salts-0.9 mhos/cm. Texture-fine, 0-6" soil test.

PLOT SIZE: 12.5 feet x 75 feet, 4 Replications. Harvested area: 5 feet x 30 feet (12 inch rows).

RESULTS: See table 71.

TABLE 71. Effect of Several Broadleaf Herbicides and Date of Application on Winter Wheat Yields - Jones County (Murdo), 1985.

Herbicide	Rate-Oz/A (A.I.)	Test Wt. (Lbs/Bu)	Yield (Bu/A)
<u>Early*</u>			
Harmony	3/8	64.6	48
Harmony	1	65.4	48
L5300	1/4	64.7	46
Ally	1	64.8	46
L5300	1	64.7	44
2,4-D Amine	8	64.7	48
Banvel	2	65.3	47
Control	—	65.5	42
<u>Late*</u>			
Harmony	3/8	65.1	43
Harmony	1	65.3	45
Glean	1/10	63.9	44
Glean	1/3	65.1	43
2,4-D Amine	8	65.7	37
Banvel	2	65.8	35
Ally	1/8	65.4	46
<hr/>			
	Mean	65.1	44.2
	LSD(05)	1.8	10.5
	CV (%)	2.0	6.6

*Early application April 25, 1985, Late May 8, 1985. Protein 12.7% (Average of Replication number 2.)

NOTE: Protein was analyzed with a Technicon 300 InfraAnalyzer. Plots were harvested on July 17, 1984.

Broadleaf Weed Control In Winter Wheat

Pennington County (Wall), 1985

Bill Bielmaier, Cooperator

OBJECTIVE: Evaluation of broadleaf weed control and yields of winter wheat when sprayed with several herbicides and herbicide combinations.

WEEDS: Wild buckwheat 1-2 leaf stage, Pennycress 1-3" rosette, Tansy mustard 1-5", Lambsquarters 1-2", Kochia present.

CROP: Winter wheat 8" tall, fully tillered.

APPLICATION DATA: May 2, 1985. Solutions applied with a 3 wheeled sprayer in 1 gallon mixes at 5 gallon per acre, Nozzle-Flat fan #8001, Pressure-40 psi, Ground speed-4 mph, Air Temperature-92°F, Soil Temperature-79°F, Wind velocity 7-10 mph from South, Air clear except for a few high clouds, Soil surface was dry and hard, Soil moisture to 30 inch depth.

SOIL DATA: pH-6.0, O.M.-1.9%, Nitrogen-67#/A, Phosphorus-58#/A, Potassium-1100#/A, Salts-0.6 mmho/cm, Zinc-0.6 ppm, Sulfur-10.0 ppm, Textured-fine.

PLOT SIZE: 12.5 feet x 75 feet, 4 Replications. Harvested area 6 feet x 30 feet.

TABLE 72. Effects of Several Broadleaf Herbicides and Herbicide Combinations on Weed Control and Yields of Winter Wheat. Pennington County (Wall), 1985.

Herbicide	Rate-Oz/A (a.i.)	Percent Control**		Test Wt. (Lbs/Bu)	Grain Yield Bu/Acre
		WB	LQ & Kochia		
Racer					
+ Surfactant*	6 + 1/4 %	59	76	63	29.8
Racer + Tordon					
+ Surfactant*	4 + 1/4 + 1/4 %	79	79	63	34.1
Racer + Tordon					
+ Surfactant*	2 + 1/4 + 1/4 %	86	75	64	30.8
Control	—	00	00	62	30.9
Racer + Banvel					
+ Surfactant*	2 + 2 + 1/4 %	81	77	62	31.3
Racer + Banvel					
+ Surfactant*	2 + 1.5 + 1/4 %	71	79	63	33.9
2,4-D Amine					
+ Surfactant*	8 + 1/4 %	92	96	63	29.9
Mean		67	69	62.0	31.5
LSD(05)		19	25	1.5	7.3
CV (%)		19.1	23.0	1.6	15.6

*Surfactant used was X-77.

**WB=Wild Buckwheat, LQ=Lambsquarter.

NOTE: Control notes were taken on June 7 and plots were harvested August 7, 1985. Percent Protein 14.5 was determined with Technicon 300 InfraAnalyzer on a composite sample from the second replication.

Tank Mixtures In Winter Wheat

Pennington County (Wall), 1985

Bill Bielmaier, Cooperator

OBJECTIVE: Evaluation of broadleaf weed control and yields of winter wheat when sprayed with herbicides applied as tank mixtures.

WEEDS: Wild buckwheat 1-2 leaf stage, Pennycress 1-3" rosette, Tansy mustard 1-5", Lambquarters 1-2", Kochia present.

CROP: Winter wheat 8" tall, fully tillered.

APPLICATION DATA: Herbicide applied-May 2, 1985 with a 3 wheeled sprayer, 1 gal. mixes, Solution applied-5 gal/A, Nozzle-Flat fan #8001, Pressure-40 psi, Speed-4 mph, Air Temperature-92°F, Soil Temperature-79°F, Wind-7-10 mph from South, a few high clouds, Time-4:00-6:00 pm, Soil surface-dry and hard, Sub-soil moisture to 30 inches.

SOIL TEST DATA: pH-6.0, O.M.-1.9%, Nitrogen-67#/A, Phosphorus-58#/A, Potassium-1100#/A, Salts-0.6 mmho/cm, Zinc-0.67 ppm, Sulfer-10.0 ppm, Texture-fine, 0-6" test.

PLOT SIZE: 12.5 feet x 75 feet, 4 Replications. Harvested size 6 feet x 30 feet.

TABLE 73. Effects of Tank Mixtures on Broadleaf Weeds and Winter Wheat Yields - Pennington County (Wall), 1985.

Herbicide	Rate-Oz/A (A.I.)	Percent Control		Test Wt. (Lbs/Bu)	Yield (Bu/A)
		WB	LQ & Kochia		
Harmony + S*	1/8 + 1/4 %	70	70	63.7	28.5
Harmony + S*	1/4 + 1/4 %	76	76	63.7	31.5
L5300 + S*	1/8 + 1/4 %	51	44	63.9	28.4
L5300 + S*	1/4 + 1/4 %	34	30	63.7	27.1
Control	—	00	00	63.4	26.4
R-9674 + S*	1/10 + 1/4 %	82	90	64.1	30.2
R-9674 + S*	2/10 + 1/4 %	89	97	63.6	25.6
E8698 + S*	1/4 + 1/4 %	92	96	64.0	26.6
E-8698 + S*	1/2 + 1/4 %	89	93	63.7	27.6
R-9521 + S*	.14 + 1/4 %	83	85	64.5	22.4
R-9521 + S*	.21 + 1/4 %	92	92	64.1	27.6
R-9521 + S*	.28 + 1/4 %	92	93	63.5	25.5
Ally + S*	1/16 + 1/4 %	80	91	63.2	32.6
Banvel	2	76	70	63.7	29.5
2,4-D Amine	8	85	95	63.9	23.8
Mean		72.7	74.8	63.8	27.5
LSD(05)		24.6	23.0	1.8	9.3
CV (%)		23.9	21.7	2.0	23.8

*S = Surfactant (X-77).

NOTE: Percent Protein (11.6) determined with a Technicon 300 InfraAnalyzer. Plots harvested on July 24, 1985.

WEED CONTROL IN FALLOW
(FALL AND SPRING APPLICATION)

Pennington County (Wall), 1983-1985
Rapid City Airport Farm, Cooperator

OBJECTIVE: To evaluate Glean and DPX-T 6376 (Ally) for weed control in fallow.

WEEDS: Fall application: No weeds. Spring Application: Wild buckwheat 2"-3", some Barnyard grass.

CROP: Rose winter wheat, planted September 18, 1984.

APPLICATION DATA: Fall Application: October 13, 1983, notes on July 13, 1984, Herbicide applied with a 3 wheeled sprayer, 20 gal/A, Nozzles-Tk 4, Pressure-10 psi, Speed-3 mph. Spring Application: June 21, 1984, notes on July 21, 1984, 20 gal/A, Nozzles-Tk 4, Pressure-10 psi, Speed-3 mph, applied with a 3 wheeled sprayer, Wind-0-5 mph, Time-9:00-11:00 am.

SOIL TEST DATA: pH-6.6, O.M.-3.4%, Phosphorus-24#, Potassium-1110#, Texture-loam, 0-6" soil test.

PLOT SIZE: 20 feet x 60 feet, 3 Replications. Harvested area: 7 feet x 40 feet.

TABLE 74. Effects of Glean and Ally on Fallow Weed Control and the Yield of Rose Winter Wheat - Pennington County (Rapid City), 1983, 1984, 1985.

Herbicide	Rate-Gal/A	Average Control 1984			Percent*	Test Wt.	Yield
	(A.I.)	W.B.	B.G.	D.B.	Protein	(Lbs/Bu)	(Bu/A)
October 1983							
Ally	0.125	96	23	99	16.1	62.9	19
Ally	0.250	86	82	99	16.1	61.7	22
Ally	0.375	99	93	99	16.1	61.1	19
Glean	0.250	96	83	94	16.0	61.7	20
Glean	0.375	98	99	99	15.9	61.9	11
Control	--	00	00	00	16.1	62.0	19
June 1984							
Ally	0.125	43	20	00	16.1	62.9	8
Ally	0.250	52	67	00	16.5	62.1	8
Ally	0.375	67	30	00	16.1	62.8	14
Glean	0.250	40	57	00	16.6	62.1	8
Glean	0.375	67	30	00	--	62.2	11
Mean		67.6	53.1	44.5	16.2	62.1	14.5
LSD(05)		27	36	4.2	--	1.2	6.4
CV (%)		23.4	39.9	5.5	--	1.1	25.3

*% Protein determined with a Technicon 300 InfraAnalyzer.

NOTE: Plots were harvested on July 26, 1985.

Weed Control in Fallow

Pennington County, 1984-1985.
Rapid City Airport Farm, Cooperator

OBJECTIVE: To determine herbicide rates necessary to control weeds during the fallow period.

WEEDS: Downy brome grass jointing to early heading. Tansy mustard 12" and flowering. Wild Lettuce and Wild Buckwheat present. Spring oats 3-leaf stage.

CROP: Rose winter wheat-seeded at 60#/A on September 18, 1984.

APPLICATION DATA: Herbicides applied on May 29, 1984. Notes taken on July 1, 1984. Chemicals applied with 3 wheel mounted sprayer in 2 gallon mixes at 10 gallons per acre. Nozzles-Flat fan #8002. Pressure-25 psi, Speed-3.1 mph, Air temperature maximum 74°F and minimum 38°F. Top soil was moist at spraying. Time of application 10:00 AM - 12:00 PM.

SOIL TEST DATA: pH-6.7, O.M.-3.2%, Phosphorus-30#/A, Potassium-990#/A, Texture-Loam,, Soil test on 0-6" depth.

PLOT SIZE: 25 feet x 75 feet, 4 Replications. Harvested Area: 7 feet x 40 feet, 3 reps.

DATA: Presented in Table 75.

Weed Control in Fallow

Pennington County (Wicksville), 1985
Jim Trevillyan, Cooperator

OBJECTIVE: To test herbicide rates and effect on weeds during fallow period.

WEEDS: Volunteer wheat 6-8" tall, fully tillered, Tansy mustard 3-5" tall, Lambsquarters 1 - 1-1/2" tall, Pennycress 3" wide rosette.

APPLICATION DATA: Initial treatments applied on May 2, 1985. Four treatments containing Roundup were applied on May 8, 1985. Treatments were applied with a 3 wheeled sprayer. Nozzles-Flat fan #8001, Pressure-40 psi, Speed-4 mph, Air Temperature-72°F, Soil Temperature-55°F, Wind-5-7 mph from SE, Time-7:00 AM - 10:00 AM.

SOIL TEST DATA: pH-7.1, O.M.-1.8%, Nitrogen-19#/A, Phosphorus-54#/A, Potassium-990#/A, Zinc-0.54 ppm, Soluable Salts-1.0 mmho/cm, Test depth-0-6".

PLOT SIZE: 12-1/2 feet x 75 feet, 4 Replications.

DATA: Presented in Table 76.

TABLE 75. Effect of Several Broadleaf Herbicides on Weed Control in Fallow and Following Year Winter Wheat Yields - Pennington County (Rapid City), 1984-1985.

Herbicide	Rate - Oz/A (A.I.)	% Weed Control July 1, 1984				Test Wt. (Lbs/Bu)	Yield (Bu/A)
		DB	O	TM	WL		
Ally + Surfactant	0.125 + 4%	0	35	99	99	59.0	12.8
Ally + Surfactant	0.250 + 4%	0	30	99	99	58.0	10.6
Ally + Surfactant	0.375 + 4%	15	13	99	99	58.9	13.0
Control	--	0	0	0	0	58.0	10.8
Ally + Roundup + Surfactant	0.250 + 4.0 + 4%	89	90	99	99	58.7	24.8
Ally + Roundup + Surfactant	0.375 + 4.0 + 4%	97	99	99	99	57.9	26.0
Landmaster + Surfactant	(6.0 R. + 8.0 2,4-D) + 4%	99	25	99	99	57.1	23.7
Glean + Roundup + Surfactant	0.250 + 4.0 + 4%	99	60	99	99	57.9	27.5
Glean + Roundup + Surfactant	0.375 + 4.0 + 4%	84	75	99	99	58.7	24.3
Bladex + Paraquat	20.0 + 4.0	99	97	99	99	58.3	26.3
Roundup + Surfactant	6.0 + 4%	98	20	99	99	57.7	25.4
Tilled Comparison Plot	--	97	97	99	99	58.4	25.7
Ally + Roundup + Ammonium Sulfate + Surfactant	0.250 + 4.0 + 4% + 4%	92	77	99	99	58.0	23.5
Glean + Roundup + Ammonium Sulfate + Surfactant	0.250 + 4.0 + 4% + 4%	99	63	99	99	57.6	25.2
Mean		69.1	55.8	--	--	58.2	21.4
LSD(05)		16.8	30.7			1.9	7.9
CV (%)		17.0	38.5			2.0	22.1

NOTE: Harvested August 6, 1985. Surfactant used was X-77.

Protein 15.3% (Ave. 2nd replication), determined in the Technicon 300 InfraAnalyzer.

TABLE 76. Effect of Several Herbicides and Herbicide Combinations on Weed Growth in Fallow - Pennington County (Wicksville), 1985.

Herbicide	Rate - Oz/A (A-I.)	Percent Control			
		Volunteer Wheat			LA & TM
		May 7	May 12	May 22	May 22
Ally + Landmaster	0.06 + (3.0 R + 4.0 2,4-D)	65	86	85	98
Ally + Landmaster + Ammonium Sulfate	0.06 + (3.0 R + 4.0 2,4-D) + 2%	92	95	91	99
Ally + Landmaster + Ammonium Sulfate	0.125 + (3.0 R + 4.0 2,4-D) + 2%	95	96	97	99
Landmaster + Ammonium Sulfate	(3.0 R + 4.0 2,4-D) + 2%	97	96	97	99
Control	—	00	00	00	00
Glean + Landmaster + Ammonium Sulfate	0.25 + (3.0 R + 4.0 2,4-D) + 2%	97	95	99	99
Glean + Ammonium Sulfate	0.06 + 2%	00	00	00	97
Glean + Ammonium Sulfate	0.125 + 2%	00	00	00	95
Glean	0.06	00	00	00	98
Glean	0.125	00	00	00	97
Glean + Conc. Crop Oil	0.06 + 5.0%	00	00	00	99
Glean + Roundup	0.06 + 3	*	13	71	81
Glean + Roundup + Ammonium Sulfate	0.06 + 3 + 2%	*	23	79	97
Banvel + Roundup + Ammonium Sulfate	2 + 3 + 2%	*	25	74	69**
Roundup + Loveland Crop Oil	3 + 0.06%	*	33	66	60.
Paraquat + Ortho X-77	4 + 0.75%	92	73	68	55**
Paraquat	4	92	63	65	46***
LSD (05)		5.0	13.1	5.0	11.1
CV (%)		9.7	22.5	7.4	9.1

*Applied May 8, 1985.

**3Replications,

***2 Replications.

