

WEST RIVER AGRICULTURAL RESEARCH AND EXTENSION CENTER
CROPS AND SOILS RESEARCH

Rapid City, South Dakota

INTRODUCTION

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

This Research Project serves the entire western part of the state and does not have research plots at one central location. It is unique in that all experimental plots are cooperative with farmers, ranchers and county agents, are initiated at their request, and are conducted at one site for no longer than usually a three year period.

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 only selected research. It does not include results of incomplete work nor work conducted by projects headquartered from the campus at Brookings.

FIELD PLOT COOPERATORS

<u>Name</u>	<u>Address</u>	<u>County</u>
County Crop Impr Ass'n	Martin 57551	Bennett
Ted Cook	Arpan	Butte
Richard Espenscheid	Newell 57760	Butte
Fenton Bros	Nisland 57762	Butte
James A. Mickelson	Nisland 57762	Butte
Harlan Palo	Newell 57760	Butte
Maynard Britton	Oelrichs 57763	Fall River
Don Ferguson	Philip 57567	Haakon
John Niemi	Buffalo 57720	Harding
Bill & Raymond Roghair	Okaton 57562	Jones
Fred Beets	Spearfish 57783	Lawrence
Steve Baker	Whitewood 57793	Lawrence
Robert Grubl	Sturgis 57785	Meade
Joe Komes	Sturgis 57785	Meade
Don Sawvell	Quinn 57775	Pennington
County Crop Impr Ass'n	Bison 57620	Perkins
Dale Nagel	Winner 57580	Tripp
Steve Sharkey	Winner 57580	Tripp

This is an annual report and results published herein are therefore neither complete nor conclusive. 2,000 copies printed at estimated cost of 15¢ each.

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The following County Extension Agents assisted in locating cooperators, and conducting the research: Gary C. Nies-Martin, Ronald L. Stee-Belle Fourche, Floyd F. Wiedmeier-Hot Springs, Ronald T. Thaden-Philip, Roger E. Moul-Buffalo, Robert S. Edwards-Murdo, Ray Rezek-Spearfish, John C. Hansen-Sturgis, Lyndell H. Petersen-Rapid City, Elbert Bentley-Bison, and Keith E. Jennings-Winner.

The results reported in this pamphlet were funded under Plant Science Projects 7110-971, 7110-725, and 7110-5093. Research was conducted by H. A. Geise - Project Leader, J. R. Johnson - Extension Agronomist, and V. K. Mosley - Assistant in Plant Science of Rapid City, and in conjunction with M. D. Rumbaugh, P. L. Carson, A. O. Lunden, J. D. Colburn, W. S. Gardner, J. J. Bonnemann, E. P. Adams, and E. J. Williamson of Brookings.

Table 1. Weather Data - Average Temperature and Total Precipitation by Months, with Departures from Longtime Averages, or Normal, for Period 1931-1960. (Information presented is from nearest U. S. Climatological Reporting Station).

Month & Year	Average Temperature*	Departure from Normal**	Total Precipitation*	Departure from Normal**
Martin (Bennett County Reporting Point)				
August 1974	69.0	-3.3	2.07	-0.01
September 1974	59.8	-1.7	.69	-0.73
October 1974	53.1	2.4	.74	-0.30
November 1974	37.2	1.6	.32	-0.03
December 1974	29.3	2.6	.08	-0.21
January 1975	24.5	2.0	.57	0.28
February 1975	20.5	-6.4	.29	-0.12
March 1975	30.3	-1.8	1.53	0.86
April 1975	42.9	-2.9	3.51	1.86
May 1975	56.7	0.6	.93	-2.02
June 1975	65.0	-0.2	3.88	0
July 1975	77.0	3.7	.99	-1.47
Newell (Butte County Reporting Point)				
March 1975	25.6	-3.2	.84	0.22
April 1975	39.0	-4.9	2.13	0.50
May 1975	53.8	-0.7	2.94	0.25
June 1975	62.7	-0.7	3.61	0.09
July 1975	75.5	3.6	.90	-0.95
August 1975	70.4	-0.6	.47	-0.78
Cottonwood (Haakon County Reporting Point) No record available				
Vale (Lawrence County Reporting Point)				
March 1975	28.9	-2.2	1.75	1.03
April 1975	41.0	-4.8	2.57	0.57
May 1975	55.6	-0.3	2.78	-0.16
June 1975	64.6	0	4.82	1.01
July 1975	75.4	3.0	.48	-1.42
August 1975	70.2	-0.7	.04	-1.24
Murdo (Jones County Reporting Point)				
August 1974	69.8	-4.5	1.48	-0.53
September 1974	59.9	-3.3	.51	-0.84
October 1974	53.2	1.0	.83	-0.25
November 1974	37.6	0.8	.14	-0.50
December 1974	27.0	2.4	.05	-0.36
January 1975	22.7	3.2	1.44	1.07
February 1975	18.5	-6.2	.17	-0.52
March 1975	27.8	-4.1	2.07	1.53
April 1975	45.0	-3.3	1.49	-0.95
May 1975	59.0	1.0	1.28	-1.54
June 1975	66.9	-0.4	5.46	1.62
July 1975	78.2	3.0	2.85	1.06

Table 1. (Continued)

Month & Year	Average Temperature*	Departure from Normal**	Total Precipitation*	Departure from Normal**
Spearfish (Lawrence County Reporting Point)				
August 1974	65.8	-4.5	3.43	1.83
September 1974	56.8	-2.8	.39	-1.52
October 1974	50.9	0.9	.89	-0.32
November 1974	38.2	2.2	.80	-0.52
December 1974	30.0	1.1	.75	-0.02
January 1975	25.8	1.3	1.54	0.81
February 1975	19.9	-7.9	.56	-0.21
March 1975	28.0	-3.8	1.13	-0.33
April 1975	38.0	-6.6	2.41	-0.16
May 1975	52.7	-1.7	2.47	-1.17
June 1975	62.0	-0.7	4.34	-0.26
July 1975	74.1	3.1	1.14	-0.55
Union Center (Meade County Reporting Point)				
August 1974	67.6	-5.4	1.18	-0.50
September 1974	58.1	-3.5	0	-1.29
October 1974	51.4	0.6	.82	-0.09
November 1974	35.2	0.2	.28	-0.17
December 1974	26.3	2.0	.25	-0.17
January 1975	20.5	1.4	1.12	0.67
February 1975	14.7	-8.9	.99	0.50
March 1975	26.0	-4.3	3.33	2.49
April 1975	39.7	-5.7	3.95	2.02
May 1975	55.2	-0.7	2.37	-0.35
June 1975	62.7	-2.1	4.04	0.15
July 1975	75.3	1.7	.18	-2.04
August 1975	69.4	-3.6	.22	-1.46
Bison (Perkins County Reporting Point)				
March 1975	24.1		3.88	3.15
April 1975	37.1		4.82	3.22
May 1975	53.9		2.66	0.13
June 1975	63.7		4.10	0.15
July 1975	73.7		.23	-1.82
August 1975	68.7		.80	
Winner (Tripp County Reporting Point)				
March 1975	41.1	8.1	1.11	-0.01
April 1975	51.1	2.6	3.04	0.68
May 1975	59.2	-0.1	2.99	-0.02
June 1975	69.7	1.2	1.97	-2.27
July 1975	82.0	6.1	1.80	-0.76

* Average temperatures and total precipitation obtained from NOAA climatological data.

** Departures from normal are based on long-time records (1931-1960).

Table 2. Weather Data - Date of Critical Temperatures and Total Usable Precipitation in Counties with Experimental Plots, 1974-75.

Location	Date of Temperature*		Total Usable Moisture**	
	Fall-First	Spring-Last	Aug 74-Jul 75	Mar 75-Jul 75
Bennett County (Martin)	Sep 30, 74	Apr 19, 75	9.06	6.79
Butte County (Newell)	--	Apr 20, 75	--	6.26
Haakon County (Philip)		Apr 20, 75	--	6.26
Jones County (Murdo)	Sep 30, 74	Apr 20, 75	9.45	8.57
Lawrence County (Spearfish)	Sep 30, 74	Apr 20, 75	11.39	7.70
Lawrence County (Vale)	--	Apr 20, 75	--	8.11
Meade County (Union Center)	Sep 28, 74	Apr 18, 75	12.12	10.52
Perkins County (Bison)	--	Apr 20, 75	--	11.75

* First 28° temperature in Fall or last 28° in Spring.

** Sum of all precipitation where amounts were greater than 0.25 inch.

SMALL GRAIN VARIETY TRIALS

Objective: To observe and compare small grain varieties and experimental strains for winterhardiness, grain yield, disease resistance, and other characteristics of area adaptability.

Winter Wheat

Plots were located in Bennett, Lawrence, Meade, Pennington, and Tripp counties. All trials were seeded in non-fertilized fallow with a deep furrow drill. The seeding rate averaged 60 pounds per acre.

None of the five locations were damaged by hail, and normal moisture was received during the growing season. Yields were good to excellent. With the exception of Tripp county, which was hand harvested, the plots were harvested with a Massey-Ferguson Model 35 self-propelled combine. Machine-harvested areas contained a minimum of 200 square feet per sample.

The yield results from the five trials conducted in 1975 are reported in Tables 3 through 7.

Table 3. Winter Wheat Variety Performance Trial - Bennett County, Martin - 1975

Variety	Height (Inches)	Rust Reaction**		Wheat Streak Mosaic**	Straw Strength	Test Weight (Lbs/Bu)	Grain Yield (Bu/Acre)
		Leaf	Stem				
Baca	37	S	R	--	Fair	61.5	52.8
Sage	34	MS	R	Tol	Good	60.0	52.5
Hiplains	39	S	R	S	Stiff	57.5	52.5
TAM 101	31	S	S	S	--	60.5	52.0
Centurk	39	MR	R	MR	Stiff	60.0	52.0
Buckskin	43	S	R	MS	Good	60.0	51.8
Cloud	36	MS	R	MR	--	58.0	51.8
Kerwin	38	MR	S	--	--	60.0	50.8
Sentinel	32	S	R	S	Stiff	56.0	50.3
Gent	39	R	R	MR	Fair	60.0	49.8
Trison	39	S	S	--	--	62.0	48.2
Scout	39	S	MR	Tol	Fair	57.0	47.4
Funk's W-335	34	-	-	--	--	58.0	46.5
Lancer	40	S	R	MR	Good	60.0	46.0
Homestead	35	S	R	S	Stiff	58.0	45.2
Gage	38	MR	R	S	Stiff	60.5	45.0
Funk's 7174	32	-	-	--	--	52.0	44.5
Eagle	34	S	R	Tol	Good	61.0	43.6
Winoka	40	S	R	S	Good	59.0	38.5

Note: Yield data presented within the table are non-replicated.

Mean 48.5

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

Table 4. Winter Wheat Variety Performance Trial - Lawrence County, Spearfish - 1975

Variety	Height (Inches)	Rust Reaction**		Wheat Streak Mosaic**	Straw Strength	Test Weight (Lbs/Bu)	Grain Yield (Bu/Acre)
		Leaf	Stem				
Hiplains	38	S	R	S	Stiff	63.0	63.5
Centurk	37	MR	R	MR	Stiff	61.0	62.0
Sage	37	MS	R	Tol	Good	62.0	61.2
Kerwin	38	MR	S	--	--	61.0	61.0
Lancer	41	S	R	MR	Good	62.0	60.0
Baca	39	S	R	--	Fair	62.5	59.8
Buckskin	36	S	R	MS	Good	61.5	58.6
Sentinel	35	S	R	S	Stiff	61.0	57.5
Scout	36	S	R	Tol	Fair	62.5	56.8
Eagle	34	S	R	Tol	Good	62.5	56.1
Gage	43	MR	R	S	Stiff	61.5	54.6
Trison	39	S	S	--	--	62.5	54.2
Homestead	35	S	R	S	Stiff	62.0	54.0
Winoka	44	S	R	S	Good	62.5	53.2
Cloud	42	MS	R	MR	--	62.0	52.9
Bronze	41	MR	R	S	Good	60.5	51.5
TAM 101	28	S	S	S	--	62.0	51.0
Gent	39	R	R	MR	Fair	62.5	50.8

Note: Yield data presented within the table are non-replicated.

Mean 56.6

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

Table 5. Winter Wheat Variety Performance Trial - Meade County, Bear Butte Valley - 1975

Variety	Height (Inches)	Rust Reaction**		Wheat Streak Mosaic**	Straw Strength	Test Weight (Lbs/Bu)	Grain Yield (Bu/Acre)
		Leaf	Stem				
Sage	45	MS	R	Tol	Good	62.0	57.0
Homestead	38	S	R	S	Stiff	61.5	56.8
Hiplains	41	S	R	S	Stiff	62.0	55.4
TAM 101	36	S	S	S	--	60.0	55.4
Lancer	44	S	R	MR	Good	62.5	53.7
Sentinel	42	S	R	S	Stiff	61.5	53.5
Centurk	42	MR	R	MR	Stiff	59.5	53.5
Buckskin	47	S	R	MS	Good	61.0	53.1
Eagle	43	S	R	Tol	Good	61.5	52.9
Baca	44	S	R	--	Fair	61.5	52.5
Gent	44	R	R	MR	Fair	62.0	52.3
Bronze	47	MR	R	S	Good	62.0	51.2
Gage	45	MR	R	S	Stiff	60.0	50.2
Scout 66	45	S	MR	Tol	Fair	61.5	48.1
Trison	44	S	S	--	--	62.5	47.9
Cloud	47	MS	R	MR	--	63.5	47.7
Winoka	45	S	R	S	Good	62.0	47.3
Kerwin	46	MR	S	--	--	62.5	44.8

Note: Yield data presented within the table are non-replicated.

Mean 51.8

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

Table 6. Winter Wheat Variety Performance Total - Pennington County, Quinn - 1975

Variety	Rust Reaction**		Wheat Streak** Mosaic	Straw Strength	Test Weight (Lbs/Bu)	Grain Yield (Bu/Acre)
	Leaf	Stem				
Gent	R	R	MR	Fair	62.0	48.7
Buckskin	S	R	MS	Good	62.0	46.5
TAM 101	S	S	S	--	62.5	44.9
Trison	S	S	--	--	62.0	44.5
Scout 66	S	MR	Tol	Fair	61.0	43.3
Sage	MS	R	Tol	Good	62.5	43.2
Hiplains	S	R	S	Stiff	61.0	43.2
Gage	MR	R	S	Stiff	61.0	42.7
Eagle	S	R	Tol	Good	61.0	41.2

Note: Yield data presented within the table are non-replicated.

Mean 41.2

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

Table 7. Winter Wheat Variety Performance Trial - Tripp County, 1975

Variety	Plant Reaction*		Wheat Streak Mosaic*	Straw Strength	Test Weight (Lbs/Bu)	Grain Yield (Bu/Acre)
	Leaf	Stem				
Cloud	MS	R	MR	--	61.3	74.6
Eagle	H	R	Tol	Good	60.8	73.6
Homestead	S	R	S	Stiff	59.5	70.3
Trison	S	H	--	--	61.5	70.1
Sentinel	S	R	S	Stiff	57.3	69.4
Scout 66	S	MR	Tol	Fair	60.8	67.0
Gent	R	R	MR	Fair	60.8	66.5
Gage	MR	R	S	Stiff	60.0	64.0
Lancer	S	R	MR	Good	60.3	62.8
TAM 101	S	S	S	--	58.0	62.0
Hiplains	S	H	S	Stiff	60.0	58.7
Kerwin	MR	S	--	--	59.3	54.9
Winoka	S	R	S	Good	59.8	50.6
Bronze	MR	R	S	Good	58.3	45.5
						Mean 63.6

Note: Yield was determined by hand harvesting 5 yard square plots and threshing with a portable thresher. Reported data are the average of the samples for each variety.

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

Spring Wheat

Spring wheat varieties were harvested in Bennett and Meade counties in 1975. Both locations were seeded late with Bennett completed on April 25 and Meade on May 13. Temperatures were below normal for all months except July which was above normal. Precipitation was near normal for the year with some months below and some above the longtime averages. The lack of moisture during July when the kernels were filling is quite evident by the low weights per bushel. The yields are shown in Tables 16 and 17. A District Crop Improvement Association variety fertilizer study in Fall River County containing 13 varieties and six fertilizer rates was completely destroyed by hail on June 16.

Table 16. Hard Red Spring Wheat Variety Performance Trial - Bennett County, Martin, SD - 1975.

Variety	Height (Inches)	Test Weight (Lbs/Bu)	Grain Yield (Bu/Acre)
Semidwarf			
MP-25	27	50	16.9
Protor	27	52	16.4
Bounty 309	28	49	15.7
Profit 75	26	50	15.0
Olaf	28	51	14.5
Era	27	51	14.5
Bounty	25	51	14.0
WS 6	27	48	13.6
WS 1809	26	49	13.0
Prodax	26	45	12.8
Bonanza	25	49	11.4
Kitt	26	48	8.5
Standard Height			
Fortuna	34	52	16.2
Chris	33	52	15.2
Tioga	34	51	15.2
Mowesta	32	50	14.5
Waldron	32	50	13.8
Ellar	35	50	12.6
Sheridan	35	52	10.4
Durum			
Rugby	35	51	16.7
Leeds	37	53	15.0
Rolette	34	51	13.8
Ward	37	51	13.1
Crosby	36	52	12.6
Botna	37	49	11.6
LSD(05) - 5.6 Bu/A			Mean - 13.9

Table 17. Hard Red Spring Wheat Variety Performance Trial - Meade County
(Bear Butte Valley) - 1975.

Variety	Percent Moisture	Test Weight (Lbs/Bu)	Grain Yield (Bu/Acre)
Semidwarf			
Era	7.2	51.0	38.6
Protor	7.9	57.0	31.2
Prodax	7.1	48.0	29.5
Bounty 309	7.4	53.5	28.6
Bounty 208	7.9	57.0	28.0
WS 1809	7.0	56.0	27.4
Profit 75	6.6	52.5	27.0
Bonanza	6.8	54.0	24.7
MP-25	6.9	52.5	24.5
Olaf	7.0	52.5	22.6
WS 6	6.4	50.5	22.2
Kitt	6.1	47.0	19.6
Standard Height			
Ellar	6.4	53.0	35.4
Tioga	6.6	52.5	32.0
Waldron	6.4	50.5	30.4
Fortuna	7.2	53.5	28.2
Nowesta	6.3	51.0	24.2

Mean - 27.9

Note: Yield data presented within the table are non-replicated.

Oats

Oat variety drill strips were harvested only in Meade county. Results are listed in Table 19. Plots were seeded on fallow. The fertilizer applied and seeding rate are listed in plot information section. The trials which were planted late, benefited by the cool temperature of May by producing numerous tillers. This resulted in yields ranging from 130 to 58 bushels per acre. The trials were hand harvested and threshed with a plot thresher. A District Crop Improvement Association variety fertilizer study in Fall River County containing ten varieties and six fertilizer rates were completely destroyed by hail on June 16.

Table 18. Oat Variety Performance Trial - Meade County (Bear Butte Valley), 1975.

Variety	Test Weight (Lbs/Bu)	Grain Yield (Bu/Acre)
Chief	38	129.9
Nodaway 70	42	129.2
Diana	39	118.6
Wright	36	116.0
Noble	37	113.1
Burnett	38	108.2
Froker	36	105.1
Stout	37	104.4
Portal	40	94.7
Cayuse	32	90.8
Dal	36	84.1
Spear	38	83.8
Grundy	40	75.2
Otee	40	71.8
Trio	37	71.5
M-73	38	70.0
Astro	28	68.1
E-76	39	63.5
E-74	40	58.6

Mean 92.4

Note: Yield data presented within the table are non-replicated.

Spring Barley

The variety plots in Meade county (Table 19) were seeded in fallow in mid-May. The average yield of the trial was 24 bushels above the county average and about 2 times the 1965-70 average yield for the county. Weight per bushel for all varieties in the trial was low because of the lack of moisture and resultant unfilled kernels. A District Crop Improvement Association variety fertilizer study in Fall River County containing five varieties and six fertilizer rates was completely destroyed by hail on June 16.

Table 19. Spring Barley Variety Performance Trial - Meade County, (Bear Butte Valley) - 1975.

Variety	Test Weight (Lbs/Bu)	Grain Yield (Bu/Acre)
Primus II	44	63.8
M-18	41	59.6
Prilar	43	56.9

Mean 60.1

Note: Yield data presented within the table are non-replicated.

SPECIALITY CROPS TESTING

Soybean Variety Trials

Objectives: To observe and compare soybean varieties for grain yield, disease resistance, and management practices under irrigated conditions in the Belle Fourche Irrigation District, and dryland conditions in central Perkins county.

Ten varieties of soybeans were selected from maturity groups 0, I, & II. They were planted in replicated plots in Perkins county on May 15, and Butte county on May 30, 1975. Seeding rate was 60 pounds per acre. Row spacing was 36 inches.

The Butte county trials were irrigated with additional water applied as the cooperators saw a need. The Perkins county trial was dryland. Excellent growing conditions and good management practices resulted in plants which were vigorous and healthy. An unusually late killing frost permitted the long-seasoned varieties to yield high quality seed with normal test weights. The yields are reported in Tables 20 and 21.

Table 20. Irrigated Soybean Variety Trial - Butte County (Nisland) - 1975.

Variety	Maturity Group	Test Weight (Lbs/Bu)	Grain Yield (Bu/Acre)
Hodgson	I	56.7	37.6
Evans	0	55.0	37.4
Steele	I	56.0	35.3
Clay	0	56.0	34.8
Chippewa	I	56.0	32.5
Corsoy	II	56.3	31.7
Swift	0-I	56.5	30.7
Wilkins	0	55.7	29.6
Harlon	I	56.3	29.2
Ada	00	56.3	26.8

LSD(05) - N.S.

C.V. - 14.6%

Mean - 32.6

Table 21. Dryland Soybean Variety Trial - Perkins County (Bison) - 1975.

Variety	Maturity Group	Height (Inches)	Test Weight (Lbs/Bu)	Grain Yield (Bu/Acre)
Wilkins	0	18	55.5	17.6
Evans	0	23	56.0	16.9
Clay	0	19	55.0	15.1
Swift	0-I	25	54.0	14.2
Harlon	I	26	56.2	13.8
Corsoy	II	23	55.7	13.5
Hodgson	I	23	56.0	12.8
Steele	I	24	56.0	12.2
Chippewa	I	22	54.0	11.5
Ada	00	22	56.7	10.8

LSD(05) - 4.9 Bu/A

C.V. - 15.8%

Mean - 13.8

Sunflower Variety Trials

Objectives: To compare varieties of the various types of domestic sunflowers for adaptation to the Northwestern area of South Dakota. Evaluation of varieties is based on characters such as: seed yield, seed quality, plant height, damage by birds, disease tolerance, and insect susceptibility.

Two trials were conducted in Western South Dakota in 1975. They involved thirteen oilseed varieties and three confectionary varieties. Information regarding the trials can be found in the last section of this report.

The dryland trial located in Perkins county was seeded into fallow soil on May 15. Soil moisture was adequate through June with little rain during July. On August 14, severe hail damage was sustained. Early September inspections indicated yields of 500 pounds per acre could still be expected. However, before the plots were ready to harvest they were destroyed by sparrows. Table 22 lists the agronomic data obtained from the trial.

An irrigated trial was seeded in Butte county at Newell on May 28, 1975. Stands were good and growth was excellent. However, in August, the plants were infested by Sunflower Head Moth. Fair to good yields were still anticipated in early September, but before the plots could be harvested they were destroyed by flocks of blackbirds, as were adjacent farmer fields.

Table 22. Sunflower Variety Performance Trial - Perkins County, Bison - 1975.

Seed Source & Variety	Plant Height (Inches)	Percent Lodging
Oilseed Type		
Cargill Hybrid 201	68	11
Cargill Hybrid 204	66	11
Grower's Seed Ass'n SunHi 372	62	12
Grower's Seed Ass'n SunHi 380	69	10
Interstate Seeds Hybrid 8941	67	10
Interstate Seeds Hybrid 8944	67	10
Northrup King Sunbred 212	68	4
Northrup King Romsun HS 52	67	12
Pacific Oilseeds SunHi 301	69	4
Pacific Oilseeds SunHi 304	66	8
Cargill Peredovik 66	72	8
Cargill Sputnik	68	26
Interstate Seeds Hybrid 896	66	10
Confectionary Type		
Commander	71	3
Arrowhead	69	4
Mingren	66	5

SORGHUM VARIETY TESTING

Grain Sorghum

Objective: To compare the performance of grain sorghum hybrid varieties as to yield and other agronomic characteristics.

A small trial of short-season grain sorghum varieties was seeded in Perkins county in 1975. The varieties were evaluated for plant height, maturity, and grain yield. The soil had been fallowed the previous year. Excellent stands were obtained but because of moisture stress and hail damage the plants did not head until September. The results of the trial are reported in Table 23.

Table 23. Grain Sorghum Variety Performance Trial - Perkins County, Bison - 1975.

Brand & Variety	Height (Inches)	Maturity (1-5)*	Grain Yield (Bu/Acre)
Acco R920	39	1.4	10.6
Pioneer 894	33	1.4	9.3
Northrup King 121	34	1.2	7.6
Pride P500A	38	2.0	7.4
SD 104	34	1.2	6.7
RS 506	40	1.8	6.6
Northrup King MM52	32	1.0	6.0
SD 106	32	1.8	5.6

Mean - 7.5

* Maturity Scale used is as follows: 1-Mature hard seed, 2-Hard dough stage, 3-Milk stage, 4-Pollinating stage, 5-Not headed. Notes taken September 12.

Sorghum Forage Trials

Objective: To compare the various forage sorghums, and sudangrasses, or their hybrids, as to their adaptability, their forage production, and their forage quality.

Replicated single row plots of forage sorghum, sorghum-sudans, and sudangrasses were seeded in Haakon and Perkins counties on June 13 and June 24, respectively. The plots in Haakon county were in winter wheat stubble. The soil there was dry and cloddy resulting in a very poor seedbed. Germination and emergence was slow and uneven, resulting in poor stands. Forage yields at that location (Tables 24-26) were small because of moisture stress throughout the summer.

The trial in Perkins county was seeded in fallow soil. At that location the seedbed was excellent as were resulting stands. However, hail damage in mid-August greatly influenced forage yield levels reported in Table 27.

Table 24. Forage Sorghum Variety Trial - Haakon County - 1975

Brand & Variety	Height (Inches)	Percent Dry Matter	Forage Yield, Tons/Acre (Oven Dry)*
Pioneer 931	41	42	1.65
Rancher	48	38	1.41
Acco FS403R	23	53	1.36
Rudy-Patrick 55F	36	34	1.25
Frontier S211	32	37	1.22
Funk's 93F	30	39	1.21
Acco X7804	24	40	1.21
Warner W-600	30	44	1.20
Acco FS4014	24	45	1.19
Warner W-601	29	43	1.13
Asgrow Dairy D	34	38	1.04
SD 275F	34	34	1.04
DeKalb FS1b	30	39	1.03
Warner W-55	29	39	1.02
DeKalb FS4	32	40	1.00
Rudy-Patrick 22F	34	37	.98
Rudy-Patrick Sumax	34	35	.97
Taylor-Evans Hay-Grazer	34	42	.96
Dekalb FS1a	26	40	.94
Warner W-561	36	39	.88
SD XR873	36	34	.88
Asgrow Beefbuilder T	35	43	.87
Frontier S212a	32	39	.82
Northrup King 325	28	39	.82
Frontier S209	40	35	.81
Acco FS531	26	44	.76
Northrup King 367	34	34	.67
Frontier Hi-Kane	30	41	.59
Waconia	42	33	.54
Excel Silofill 33	30	38	.50
Advance 1071F	25	38	.34

LSD(05) - N.S.

Mean - .98

*Results reported are an average of 2 replications, and are not statistically significant because of irregularities between the replications.

Table 25. Sorghum-Sudan Variety Performance Trial - Haakon County, 1975.

Brand & Variety	Height (Inches)	Percent Dry Matter	Forage Yield, Tons/Acre (Oven Dry)*
Frontier Hidan 35	48	40	1.64
Northrup King Sordan 70	48	34	1.54
Acco Sweet Sioux III	43	34	1.44
Acco Sweet Sioux	39	35	1.28
DeKalb SX-4	52	39	1.21
Frontier Hidan 39	47	34	1.18
Acco S-99	38	39	1.14
Frontier Hidan 37	46	37	1.14
Acco Sweet Sioux II	48	37	1.10
Pioneer 988	43	36	1.02
Doreman Suregraze	36	35	1.02
Rudy-Patrick Su-4	48	40	.90
LSD(05) - .16 Tons/Acre			C.V. - 5.8%
			Mean - 1.21

*Results are an average of 2 replications.

Table 26. Sudangrass Variety Performance Trial - Haakon County - 1975.

Brand & Variety	Height (Inches)	Percent Dry Matter	Forage Yield, Tons/Acre (Oven Dry)*
Cal/West Monarch	54	40	1.18
Acco HS-33	57	42	1.13
Northrup King Trudan 5	53	40	1.06
Rudy-Patrick Trudy	56	43	.91
Piper	57	42	.76
LSD(05) - N.S.			Mean - 1.01

Table 27. Sorghum Forage Variety Performance Trial - Perkins County, Bison - 1975.

Brand & Variety	Maturity (1-5)*	Height Inches	Plant Type**	% Dry Matter	Forage Yield Tons/Acre**
FORAGE SORGHUM					
Northrup-King 367	5	67	4	23	2.9
Pioneer 931	5	72	1	27	2.3
Rudy-Patrick 55F	3	52	8	23	2.3
Acco FS401R	4	50	8	26	1.8
Asgrow Beefbuilder T	5	54	8	25	1.7
SD 275F	3	46	8	29	1.7
Dekalb FS1b	4	38	8	24	1.6
Frontier S209	4	70	4	27	1.4
Taylor-Evans Hay Grazer	4	63	4	27	1.3
Waconia	3	62	4	25	1.3
Rudy-Patrick Sumax	3	58	3	25	1.2
Northrup-King 325	4	50	8	24	1.2
Rancher	1	53	5	24	.8
LSD(05) - .9 T/A					Mean - 1.7
SORGHUM-SUDAN					
Northrup-King Sordan 70	3	71	3	24	2.5
Acco Sweet Sioux	3	72	3	28	2.0
DeKalb SX-4	3	65	3	23	1.8
Dorman Suregraze	3	63	3	25	1.7
Rudy-Patrick SU4	3	68	4	25	1.7
Frontier Hidan 37	3	63	3	25	1.5
LSD(05) - .4 T/A					Mean - 1.9
SUDANGRASS					
Rudy-Patrick Trudy	3	52	3	27	1.2
Northrup-King Trudan 5	3	53	3	26	1.1
Acco HS-33	3	50	3	29	.8
Cal/West Monarch	3	48	3	29	.7
Piper	3	53	3	28	.7
LSD(05) - N.S.					Mean - 1.2

* Maturity Scale: 1-Mature Grain; 2-Hard Dough Stage; 3-Milk Stage; 4-Pollination Stage; 5-Not Headed. Notes taken September 12.

** Plant Type:

- | | |
|------------------------------|-------------------------------|
| 1 Tall-Extra Leafy-No Grain | 6 Short-Extra Leafy-No Grain |
| 2 Tall-Leafy-Some Grain | 7 Short-Leafy-Some Grain |
| 3 Tall-Leafy-Grain (50-50) | 8 Short-Leafy-Grain (50-50) |
| 4 Tall-Few Leaves-Some Grain | 9 Short-Few Leaves-Some Grain |
| 5 Tall-Few Leaves-No Grain | 10 Short-Few Leaves-No Grain |

***Forage Yields are reported on an oven-dry basis, and are an average of 3 replications.

ALFALFA DEMONSTRATION PROJECT

Objective and Approach: Irrigated alfalfa in western South Dakota is a neglected crop by comparison to other irrigated crops. However, there is interest among many of the producers in making their alfalfa acreage more productive. The evidence of this is their request for assistance, subsequent financial support, and continuing interest in the trials.

For the trials themselves, there are indications of production and stand establishment differences among varieties. Over the next few years we may not only change our varietal recommendations, but we should also be able to encourage producers to try new varieties. We should be able to demonstrate the value of careful water management when shooting for top production. Further, we will be more knowledgeable about the role and need for commercial fertilizer on the three types of soil that constitute the bulk of the irrigated alfalfa land on the District.

The project was initiated to demonstrate the level of alfalfa production obtainable under irrigation by the application of current technology. The replicated trials are located on the major soil types as listed below.

- (1) Variety trial - At one location, Fenton Farms, on a deep silt loam with 1/2% slope. Established spring 1974 for a minimum of three years.
- (2) Water management trial - At one location, Pittman Farm, on a sandy loam soil with 1/2% slope. Established spring 1974 for one season only. Results are not included in this report.
- (3) Fertilizer and water management trial - At one location, Fenton Farms, on a deep silt loam soil with 1% slope. Established spring 1975 for three years.
- (4) Variety, fertilizer and water management trials - At two locations on heavy clay soil. One location, Ted Cook Farm, has 1/2% slope; the other, Espenscheid Farm, has 2% slope. Both were established in spring 1975 for three years.

Variety Trial

The variety trial was established with 20 entries in April 1974 on an excellent deep silt loam soil south of Nisland. A herbicide was incorporated in the soil before planting. Plots were not fertilized until May 1975, and then 60 pounds of P_2O_5 and 60 pounds of K_2O were broadcast. Water has been applied to maintain optimum moisture levels, based on tensiometer readings at one and two foot levels.

Yields during the first year, 1974, are shown on Table 28. Two cuttings were obtained. There was no statistical difference ($P < 0.05$) in yields among varieties for either cutting or for the total yield. This was attributed to high plot-to-plot variation which appeared to be a result of differential weed control. An average of nearly 3 tons of hay was harvested during the first year.

Table 28. Alfalfa Variety Trial - (Irrigated) - Butte County, 1974.

Source	Variety	Tons per Acre (12% moisture)		
		1st cut	2nd cut	total
USDA-Minn AES	Agate	1.57	.96	2.53
Teweles	Americana	2.28	1.44	3.72
USDA	Cossack	1.76	1.19	2.95
USDA-Neb AES	Dawson	2.50	1.33	3.83
Barzan	Flandria	2.37	1.09	3.46
Minn-AES	Grimm	1.21	1.13	2.34
NY-AES	Iroquois	1.31	1.55	2.86
Jacques	JX-80	1.03	1.42	2.45
Mont-AES	Ladak 65	1.50	1.28	2.78
Dekalb	131	1.80	2.31	2.91
USDA-Neb AES	Ranger	1.09	1.34	2.43
NY-AES	Saranac	1.53	1.27	2.80
King's Western	17AA	1.60	1.39	2.99
Foster's	Siberian	1.60	1.32	2.92
Teweles	Superstan	1.11	1.28	2.39
USDA	Team	1.69	1.41	3.10
Northrup King	Thor	1.68	1.41	3.09
Wis-AES	Vernal	1.27	1.11	2.38
Northrup King	Warrior	1.53	1.56	3.09
Farmer's ForRes	Weevlc hek	1.94	1.50	2.44
Mean		1.61	1.31	2.92
LSD(05)		N.S.	N.S.	N.S.
C.V. (%)		54	19	34

Statistical analysis by M.D. Rumbaugh, Alfalfa Breeder, SDSU, Brookings

Yields for 1975 are shown in Table 29. The first cutting, taken June 11 was light due to cool spring temperatures and also late. The second and third cuttings, taken July 14 and August 25 produced very well. The fourth cutting, taken October 22 was somewhat light due to the late date. Normally, recommendation would not be given to harvest on such a date, but very little regrowth occurred after the fourth cutting and consequently we would anticipate normal amounts of winter injury. For four cuttings, 6 1/2 tons were produced from the better varieties.

Only one Flemish variety is among the lowest producers. This can be attributed to quick regrowth for excellent second, third, and fourth harvests. However, winter hardiness in the Flemish varieties is questionable. Because of this and other testing to be done, we cannot recommend any Flemish varieties, at least until after the 1976 growing season. Seven of the top eight varieties in the fourth cutting were Flemish varieties. This suggests that these varieties are potentially valuable for late fall harvest or for fall grazing.

After two growing seasons, there seems to be at least a couple varieties that are thinning. These are Foster's Yellow Blossom (Siberian) and Ladak 65. This explains the low yields from the 1975 harvest and in the fourth cutting in particular.

Table 29. Alfalfa Variety Trial Yields - 1975.

Variety	Tons per Acre (12% moisture)				Total
	Cut 1	Cut 2	Cut 3	Cut 4	
Agate	2.56	1.30	1.70	.80	6.36
Americana*	2.44	1.38	1.75	1.02	6.59
Cossack	2.31	1.29	1.47	.63	5.69
Dawson	2.35	1.23	1.42	.52	5.52
Flandria*	2.33	1.31	1.61	.97	6.23
Grimm	2.25	1.24	1.48	.59	5.57
Iroquois	2.36	1.20	1.27	.45	5.28
JX-80*	2.28	1.53	1.58	1.06	6.46
Ladak 65	2.15	1.18	1.46	.30	5.08
131*	2.54	1.29	1.44	.90	6.17
Ranger	2.51	1.47	1.67	.86	6.51
Saranac*	2.59	1.52	1.77	.91	6.79
17 AA*	2.69	1.25	1.48	.52	5.94
Siberian	2.12	.97	1.06	.10	4.26
Superstar*	2.60	1.43	1.77	1.01	6.81
Team	2.60	1.40	1.77	.94	6.71
Thor	2.67	1.43	1.57	.93	6.60
Vernal	2.26	1.27	1.39	.48	5.40
Warrior	2.60	1.36	1.61	.84	6.41
Weevlchek	2.43	1.34	1.59	.48	5.85
Mean	2.43	1.32	1.54	.72	6.01
LSD(05)	0.21	0.24	N.S.	0.29	0.67
C.V. (%)	6	13	16	28	7

Statistical analysis by M. D. Rumbaugh, alfalfa breeder, SDSU Brookings.

*Flemish varieties.

Table 30 is a composite of the 1974 and 1975 yield data. This table suggests considerable yield variation, most of which is attributed to varietal differences. However, for the two year average, there is no statistical ($P < 0.05$) difference among varieties.

The variety plots are being managed to give maximum yields with four harvests per year in most cases. One could speculate that in western South Dakota, with irrigation, the problems of poor winter hardiness that are often associated with rapid growth recovery types may be minimized. This may especially be true where alfalfa is used in short term rotations as contrasted to nearly permanent alfalfa fields. Early evidence also suggests that some of the varieties which have been top performers in the region may not now be the best.

Table 30. Alfalfa Variety Trial Yields

Variety	Tons per Acre @ 12% moisture		
	1974	1975	Average
	2 Cuts	4 Cuts	
Agate	2.53	6.26	4.45
Americana**	3.72	6.59	5.16
Cossack	2.95	6.69	4.32
Dawson	3.83	5.52	4.68
Flandria**	3.46	6.23	4.85
Grimm	2.34	5.57	3.96
Iroquois	2.86	5.28	4.07
JX-80**	2.45	6.46	4.46
Ladok 65	2.78	5.08	3.93
131**	2.91	6.17	4.54
Ranger	2.43	6.51	4.47
Saranac**	2.80	6.79	4.80
17 AG**	2.99	5.94	4.47
Siberian	2.92	4.26	3.59
Superstan**	2.39	6.81	4.60
Team	3.10	6.71	4.91
Thor	3.09	6.60	4.85
Vernal	2.38	5.40	3.89
Warrior	3.09	6.41	4.75
Weevlchek	3.44	5.85	4.65
Mean	2.92	6.01	4.47
LSD(05)	N.S.	67	N.S.
C.V. (%)	34	7	20

Statistical analysis by M. D. Rumbaugh, Alfalfa Breeder, SDSU, Brookings.

* 1974 was the first growing season.

**Flemish varieties.

Fertilizer and Water Management Trial

This trial was initiated in the spring of 1974. Yields under the optimum water management exceeded 7.5 tons per acre. However, the trial was re-located for 1975 because of a perched water table which nullified the effects of the less intensive water management. The trial was reestablished and expanded in the spring of 1975 on a loam soil site southeast of Nisland at the Fenton Farm. The variety in the trial is DeKalb 131, ~~selected~~ by Fentons in 1974. It was our intent to find a field on a ~~loam~~ site that could have several varieties included in the trial. None were available. The trial scheme with only one variety takes on the following appearance.

	Yield Projection	
	No Fertilizer	Recommended Fertilizer
Casual Water Management	Up to 5 Tons	Up to 5 Tons
Intensive Water Management	Up to 7 Tons	Up to 7 Tons

Irrigation intensity on the "casual" portion is one irrigation after each of the first cuttings, but none after the last. This is the usual practice on the District. The "intensive" portion will be irrigated about twice between cuttings, and once after the final (4th) harvest. Several fertilizer treatments are included in the trial (Table 31). Two fertilizer treatments were based on soil tests and yield goals for the plots. These are the "Casual" portion at 30 pounds P_2O_5 and 30 pounds of K_2O per acre and the "Intensive" portion at 60 pounds P_2O_5 and 60 pounds of K_2O per acre. Fertilizer treatments were applied in April 1975. To date, after four cuttings in 1975, we have not seen any meaningful production differences due to treatment. We are in the process of examining the reasons for this. On the more promising side, yields did approach 7 tons per acre in a season that was not particularly desirable for alfalfa production. Some of the points that should be made are: (1) Neither the "W₁" nor the "W₂" set of plots was irrigated prior to the first cutting. However, the greater first cutting production came from the "W₁" half which is being managed for 5 ton yield projection. (2) The recommended fertilizer treatments (phosphate and potash) are showing trends for increased production over all other fertilizer treatments. Protein determinations for each treatment and each cutting are in final stages of processing. Plots will be refertilized in February of 1976.

Table 31. Forage Yield from Fertilizer and Water Management - Nisland, 1975.

Water	Fertilizer	Tons per acre at 12% moisture				Total
		Cut 1	Cut 2	Cut 3	Cut 4	
W ₁	0-0-0	2.88	1.64	1.21	1.10	6.83
	0-30-0	2.89	1.50	1.25	1.14	6.78
	0-30-30*	2.94	1.60	1.26	1.16	6.96
	60-30-30	2.89	1.64	1.19	1.11	6.83
W ₂	0-0-0	2.49	1.44	1.29	.88	6.10
	0-60-0	2.70	1.68	1.28	.93	6.59
	0-60-60**	2.74	1.79	1.37	.93	6.83
	60-60-60	2.72	1.37	1.26	.85	6.20

W₁ - Indicates plots receiving 1 irrigation between harvests and none in fall

W₂ - Indicates plots receiving 2 irrigations between harvests plus 1 in fall

* The recommended fertilizer treatment for 5 ton yield projection.

**The recommended fertilizer treatment for 7 ton yield projection.

Variety, Fertilizer, and Water Management Trial - Arpan

The spring of 1975 was extremely cool, wet, and late. As a result, seeding of spring crops was unusually late. This was especially so on clay soils which became saturated and did not drain well. At the Arpan trial site, these moisture conditions were complicated further by early spring snow which drifted and accumulated on the field. Slope on the field is about 1/2 %, thus runoff was also delayed.

Plots were seeded with a double disc grass drill to four alfalfa entries on June 5, 1975. Varieties are Agate, which is Phytophthora root rot resistant; Vernal, which is a good performing variety recommended by the South Dakota Agricultural Experiment Station; Cossack, which is the most commonly grown variety in the area; and Jacques JX-80, which is a popular proprietary selection. The plots that are to receive fertilizer in subsequent seasons received a starter application at the rate of 12-60-0 applied with the seed, down the spout. The soil surface was somewhat cloddy, but below one inch the profile was saturated. Immediately after seeding, an empty Brillion alfalfa seeder was pulled over the plots to break clods and firm up the seed bed. The Brillion packer left the surface in a smooth and mellow condition. By June 11, much of the seed had germinated, and by late June good stands appeared in all plots. On June 25 there was a driving rain that damaged many plants by breaking them or lodging them in a saturated soil. Plot damage appeared severe. On August 1 field estimates of plot damage were made to determine which plots had to be overseeded. A striking difference was noted in seedling survival of the varieties as witnessed by the number of plots which had to be overseeded.

Variety	No. of plots to overseed compared to number in trial
Agate	3 of 12
Cossack	12 of 12
Jacques 80	5 of 12
Vernal	12 of 12
Total 32 of 48	

Furthermore, on August 1 there was an apparent difference due to the starter fertilizer. Those plots without fertilizer appeared to have more seedlings than those with fertilizer. Therefore, it was decided to make alfalfa seedling counts in all plots to see if (1) overseeding was justifiable, and (2) there was some differential seedling establishment success due to the varieties and fertilizer treatments.

For all 48 plots, counts were made on four, 10 foot row sections, located in the same relative position in each plot. In every case, the fertilized half of the split plot had fewer plants than did the unfertilized half. This is dramatically shown in Table 32 as averaged by variety and fertilizer treatments.

At this point we can only speculate as to what caused the differential success in plant establishment. There was obviously some salt burning as a result of the fertilizer. Established procedure was followed and it is not

known whether these results could be duplicated. There is apparently considerable difference in "seedling vigor" among varieties in the test or at least among the particular lots of varieties which were used. Agate and Jacques JX-80 fared considerably better than did Cossack or Vernal. We will not know whether the plots will be salvagable until the Spring of 1976.

Table 32. Alfalfa Establishment at the Arpan Fertilizer and Water Management Trial - August 4, 1975.

Treatment	Number of plants per square foot			
	Agate	Cossack	Jacques	Vernal
No starter fertilizer	18.4	8.7	21.1	8.9
12# N and 60# P ₂ O ₅ per acre	11.7	2.7	8.6	2.2

Variety, Fertilizer, and Water Management Trial - Newell

The trial at Newell is on a heavy clay soil like Arpan, with the primary difference being slope. The Newell site has about 2% slope and also considerable side slope. The field is typical of many alfalfa fields on this portion of the District.

Plots were established on June 6, 1975 in the same manner as at Arpan. The primary difference was that at Newell, irrigation borders were necessary to give uniform water distribution. Varieties entered include Agate, because of its root rot resistance. Thor, because it is a common proprietary variety in the area; and Vernal, because it is a recommended standard that is commonly grown.

All plots were successfully established at Newell, even though weed populations were high. No plots were in need of overseeding, probably because the Newell site did not have the heavy driving rain in late June, nor was the soil saturated as long as it was at Arpan. However, because of differential seedling establishment success at Arpan, plant counts were made at Newell in August to detect possible variety and fertilizer effect differences. Results are shown in Table 33. Again the pattern of fertilizer damage was repeated. In this case the rate of application had been 12-90-0. As with the Arpan trial, at no time was there evidence of salt burning. Similarly, there was differential establishment due to fertilizer treatment. Further, the pattern was so consistent, that for every varietal plot that was split with regard to fertilizer, the fertilized half had fewer plants than the unfertilized. Thor, had the best survival when no fertilizer was applied, followed by Agate and then Vernal. By contrast, Agate did best with the fertilizer followed by the other two varieties.

A point of interest is that at both Arpan and Newell, under fertilization Agate clearly had the best seedling establishment. Its resistance to Phytophthora root rot may be a factor. Agate was not necessarily the best performer when the varieties were not fertilized. This pattern lends support to the thought that there are varietal differences to salt tolerance at the

seedling stage. Soils at both Arpan and Newell are relatively high in native salts, and the addition of fertilizer with the seed may simply have been too toxic for some of the entries. Results from these trials are preliminary, and must be considered in that light. Additional examination of the nature of the problem will continue in 1976.

Table 33. Alfalfa Establishment at the Newell Fertilizer and Water Management Trial - August 5, 1975.

Treatment	Number of plants per square foot		
	Agate	Thor	Vernal
No starter fertilizer	34.0	42.4	29.3
12# N and 90# P ₂ O ₅	21.1	16.5	16.8

MANAGEMENT, TILLAGE, AND CULTURAL PRACTICES

Rate of Seeding of Spring Wheat

Objective: To determine the optimum rate of seeding required for spring wheat in order to produce the highest yield of quality grain.

Table 34. Rate of Hard Red Spring Wheat - Lawrence County - 1975

Variety	Rate of Seeding Pounds/Acre	Percent Stand of 120 Lbs/A	Test Weight Lbs/Bu	Grain Yield Bu/Acre
Bounty 208	15	9.7	50.5	6.5
	30	21.7	51.0	9.1
	45	47.4	51.8	11.8
	60	52.5	53.8	12.7
	75	71.8	53.8	13.1
	90	88.4	53.5	15.6
	105	97.4	55.5	20.3
	120	100.0	55.2	19.0
			Mean -	13.5
WS 1809	15	9.1	50.0	5.3
	30	20.8	50.2	5.3
	45	36.4	51.2	8.3
	60	58.4	52.8	10.7
	75	67.4	52.8	10.7
	90	85.8	52.8	11.1
	105	97.5	53.2	14.7
	120	100.0	52.2	14.3
			Mean -	10.0

LSD(05) - 1.3 Bu/A

C.V. - 15.1%

Average - 11.8

Yield differences were significant at 1% level for treatments, and varieties x replications.

An experiment was conducted in Lawrence county in 1975 in which two semi-dwarf varieties of Hard Red Spring Wheat were seeded at eight rates ranging from one to eight pecks per acre. Stands were spotted because of heavy rain following seeding. The soil crust which formed prevented many seedlings from emerging. Estimates of stand were made using the highest rate of seeding as 100% level. The yield and test weights reported in Table 34, indicate that under the conditions of 1975 when seeding was delayed until early-May spring wheat plants will not tiller, consequently, heavier rates of seeding produced the greatest yield. In other research (Agronomy Pamphlet #89, December 67) where dates of seeding were investigated the results indicated that every day seeding is delayed after April 7 the grain yield will be reduced by one-half bushel per acre.

Row Spacing and Fertilizer Effects on Sorghum Forage Yields

Objective: To study effects of row spacing and the application of nitrogen fertilizer on forage yields of forage sorghum, sorghum-sudan crosses, and sudangrasses.

A study was conducted in Haakon county in 1975 involving eleven forage sorghum varieties, nine sorghum-sudan crosses, and two sudangrasses. All entries in the replicated trial were seeded in twelve inch rows as well as 24 inch rows. The plots were further divided to include fertilized and unfertilized treatments. The plots were seeded in soil which had been in winter wheat the previous year. Lack of adequate precipitation and dry soil placed the plants under moisture stress during the entire growing season.

The yields reported in Table 35 indicates that forage sorghum responded more to row spacing than to fertilizer. This probably was due to competition for moisture because of the more leafy characteristics of forage sorghum. Increases in yield were also noted where fertilizer was applied both to 12 inch rows and to 24 inch rows but again was dependent upon the variety characteristics.

Sudangrasses and sorghum-sudan crosses produced higher yields than the forage sorghums. However these types reacted more to row spacing, and showed little response to fertilizer.

Further information concerning these plots is listed in the Plot information section.

Table 35. Sorghum Forage Variety Row Space and Fertilizer Study, Haakon County - 1975.

Brand & Variety	Forage Yields - Tons/Acre				Average
	No Fertilizer		30# of Nitrogen/Acre		
	12" Rows	24" Rows	12" Rows	24" Rows	
FORAGE SORGHUM					
Pioneer 931	.86	1.16	1.79	2.44	1.56
Sokota 320	.82	1.16	1.40	1.56	1.24
Rancher	1.32	1.08	.55	1.78	1.18
Weathermaster 500B	.98	.94	1.22	1.20	1.08
DeKalb B35	.74	1.48	.61	1.34	1.04
Waconia	.74	.72	1.34	1.08	.97
Sokota 262F	.70	1.26	.66	1.02	.91
DeKalb A25	.58	1.03	.96	.96	.88
Northrup King 367	.80	1.13	.58	.98	.87
Weathermaster FS445	.58	1.18	.96	.74	.86
Sokota 252F	.67	.92	1.03	.80	.86
				Mean -	1.04
SORGHUM-SUDAN					
DeKalb FS4	1.28	2.46	1.58	2.50	1.96
DeKalb ST6	1.28	2.38	.98	2.22	1.72
Su-Queen	.97	2.46	.94	2.08	1.61
Pioneer 988	1.45	2.08	.87	2.01	1.60
Northrup King Sordan 70A	.99	2.23	1.37	1.81	1.60
DeKalb SX-17	1.12	1.88	.94	1.98	1.48
Sexauer 500A	1.04	1.26	1.08	1.76	1.28
Hay-R-Graze	.88	1.96	.65	1.37	1.22
W'master superdan 550	.82	1.65	.94	1.35	1.19
				Mean -	1.52
SUDANGRASS					
Piper	.92	2.58	.92	2.24	1.66
Northrup King Trudan 6	1.24	2.50	.74	2.08	1.64
				Mean -	1.65

LSD(05) - 12" rows .31 T/A; 24" rows - 1.10 T/A

Note: Differences between varieties and replications were significant at 1% level.

Influence of Fertilizer on Yield of Hard Red Winter Wheat

Objective: To study winter wheat responses to various rates and ratios of fertilizer in a continuous cropping system.

A study was initiated in Jones county in September 1974 in which sixteen fertilizer ratios under continuous cropping were studied. The treatments consisted of four rates of nitrogen and four rates of phosphorus fertilizers.

The fertilizer was applied as a broadcast application and was incorporated into the soil during tillage operations. Stands were reduced by a heavy infestation of armyworms but were controlled by an application of insecticide. The yields reported in Table 36 are the first year results of this particular study. It should also be noted there was severe drought stress during the growing season.

Table 36. Influence of Fertilizer on Grain Yield of Winter Wheat - Jones County, Okaton - 1975.

Applied	Percent Moisture	Test Weight Lbs/Bu	Grain Yield Bu/Acre
0-0-0	9.3	60.0	13.6
0-30-0	9.1	61.0	12.4
0-60-0	-	61.0	12.5
0-90-0	9.2	62.0	12.7
30-0-0	-	60.0	13.6
30-30-0	9.1	60.5	14.5
30-60-0	9.1	61.5	14.0
30-90-0	9.2	61.0	15.5
60-0-0	8.4	58.0	13.5
60-30-0	-	61.0	14.9
60-60-0	8.7	60.5	14.5
60-90-0	8.8	61.0	13.7
90-0-0	8.7	58.5	14.4
90-30-0	9.0	59.5	14.6
90-60-0	8.9	60.0	15.0
90-90-0	9.3	60.0	15.0

Note: Data is an average of 4 replications

Mean - 14.1

CROP DISEASE CONTROL

Response of Hard Red Winter Wheat to Bacillus uniflagellatus Applied as a Seed Treatment

Twelve standard hard red winter wheat varieties were planted in five replications at Martin (Bennett county) on September 27, 1974. Excess rain and standing water in part of the experimental plot caused complete loss of 2 cultivars and replications 1 and 2 of ten other cultivars. The results presented in Table 37 indicate differential reactions by the varieties to such characters as plant height, maturity, test weight, and yield. However, at present there has been no consistent response to the Bacillus seed treatment.

Table 37. HRW Wheat Variety Seed Treatment Study - Bennett County, Martin 1975.+

Variety	Seed Treatment	Height (Inches)	Percent Moisture	Test Weight (lbs/Bu)	Grain Yield (Bu/Acre)
Eagle	Check Treated	--- ---	--- ---	--- ---	--- ---
Gage	Check Treated	--- ---	--- ---	--- ---	--- ---
Baca	Check Treated	35.2 33.6	15.7 17.4	55.6 53.8	45.0 38.4
Sage	Check Treated	33.4 32.6	15.7 15.4	57.1 57.4	39.8 37.6
Cloud	Check Treated	40.0 40.7	22.3 20.5	53.8 51.3	53.4 49.0
Scout 66	Check Treated	35.0 35.7	19.3 18.4	54.3 55.0	39.5 40.9
Gent	Check Treated	34.6 34.6	18.4 17.3	56.4 55.9	45.5 42.3
Trison	Check Treated	34.4 36.2	13.8 13.3	58.1 58.9	39.5 42.2
Hiplains	Check Treated	37.6 37.2	13.3 12.1	56.3 56.8	44.1 47.0
Kerwin	Check Treated	39.8 39.4	12.9 12.7	57.4 58.7	49.5 47.9
Sentinel	Check Treated	34.0 34.4	11.9 11.6	57.3 55.9	45.7 47.0
Lancer	Check Treated	40.0 39.6	12.1 11.2	58.5 57.0	42.8 41.1

Average - 43.9

Note: Data reported is an average of 5 replications.

Twelve standard hard red winter wheat cultivars were planted in four replications at Alkali (Meade county) on September 27, 1974. Good soil moisture conditions at seeding time resulted in excellent stands and at harvest time with good yields of grain. The results in Table 38 indicate differential reactions by the varieties to such characters as plant height, maturity, test weight, and yield. At the present time there has been no consistent response to the Bacillus seed treatment.

Table 38. HRW Wheat Variety Seed Treatment Study - Meade County
Alkali - 1975.

Variety	Seed Treatment	Height (Inches)	Percent Moisture	Test Weight (Lbs/Bu)	Grain Yield (Bu/Acre)
Eagle	Check	34.0	7.40	61.4	49.6
	Treated	34.5	7.42	61.2	50.1
Gage	Check	37.5	7.15	61.5	49.6
	Treated	38.2	7.15	61.9	50.3
Baca	Check	36.0	7.75	61.4	52.7
	Treated	35.5	7.67	61.5	50.0
Sage	Check	36.2	7.88	62.6	52.5
	Treated	35.2	7.85	62.8	52.8
Cloud	Check	40.0	7.80	63.2	55.6
	Treated	38.8	7.78	63.2	51.5
Scout 66	Check	38.2	7.75	61.8	46.0
	Treated	37.0	7.68	62.1	43.0
Gent	Check	39.2	7.58	63.1	53.9
	Treated	43.8	7.50	63.0	55.2
Trison	Check	36.8	7.60	63.0	46.3
	Treated	35.0	7.78	63.1	44.3
Hiplains	Check	37.2	7.35	62.0	50.8
	Treated	37.0	7.42	62.2	51.2
Kerwin	Check	35.8	7.65	62.2	46.6
	Treated	36.0	7.60	62.1	44.1
Sentinel	Check	31.0	7.22	61.1	45.9
	Treated	31.8	7.22	60.9	42.5
Lancer	Check	42.5	7.42	62.4	52.6
	Treated	42.0	7.32	62.5	52.3

LSD(05) - 2.9 Bu/Acre between varieties
C.V. - 5.8%

Mean - 49.6

Date of Planting of Hard Red Winter Wheat

Bronze and Winoka winter wheat were planted at two dates in an effort to provide exposure to wheat streak mosaic (WSMV) on the early date and to compare with a later date of planting which should remain virus free. The expected WSMV did not develop in the early planting. The data are summarized and shown in Tables 39 and 40. There were no apparent consistent differences between Bacillus treatments and their controls. However, there are real differences between date of planting of the varieties as well as between the varieties at different dates.

Table 39. Date of Planting of HRW Wheat with Seed Treatment - Bennett County, Martin - 1975

Variety	Date of Planting	Seed Treatment	Height (Inches)	Percent Moisture	Test Wt (Lbs/Bu)	Yield (Bu/A)
Bronze	Sept 5	Check	34	9.2	61.5	37.5
		Treated	34	9.5	61.0	35.0
	Sept 27	Check	37	8.8	58.0	30.6
		Treated	36	9.2	60.0	30.4
Winoka	Sept 5	Check	37	9.3	62.0	40.9
		Treated	36	9.5	62.5	39.6
	Sept 27	Check	39	9.5	59.5	38.7
		Treated	38	9.9	58.0	37.1

LSD(05) - 5.1 Bu/A between dates for a variety
C.V. - 9.5%

Mean - 36.2

Table 40. Date of Planting of HRW Wheat with Seed Treatment - Meade County, Alkali - 1975

Variety	Date of Planting	Seed Treatment	Height (Inches)	Percent Moisture	Test Wt (Lbs/Bu)	Yield (Bu/A)
Bronze	Sept 6	Check	40	7.0	61.8	46.6
		Treated	39	7.2	61.8	45.2
	Sept 25	Check	38	7.2	61.2	40.9
		Treated	38	7.2	61.1	41.4
Winoka	Sept 6	Check	42	7.4	62.5	44.0
		Treated	45	7.2	61.9	42.6
	Sept 25	Check	37	7.6	62.2	42.5
		Treated	38	7.6	61.9	39.6

LSD(05) - 2.8 Bu/A between dates for a variety.
C.V. - 4.5%

Mean - 42.8

Effects of Rate of Seeding and Seed Treatment on Hard Red Spring Wheat

Four varieties of semidwarf HRS wheat were seeded in Bennett and Meade counties in spring of 1975. The treatments included in the study consisted of two rates of seeding and a *Bacillus* seed treatment. The results (Tables 41 and 42) show differential responses in test weight and grain yield. There is a consistent increase in yield for the higher rate of seeding over the lower rate. The difference in yield between varieties at both locations is statistically significant. Further information regarding seeding date and soil condition can be found in the plot information section.

Table 41. HRS Wheat Variety Seed Treatment and Rate of Seeding Study - Bennett County, Martin - 1975

Variety	Rate of Seeding	Seed Treatment	Height (Inches)	Test Wt (Lbs/Bu)	Grain Yield (Bu/Acre)
WS 1809	1 bu/A	Check	27	52.1	18.5
		Treated	26	55.2	17.9
	2 Bu/A	Check	26	54.4	23.2
		Treated	27	56.1	23.0
Bounty 208	1 Bu/A	Check	25	54.6	15.6
		Treated	25	54.0	15.1
	2 Bu/A	Check	25	54.9	19.3
		Treated	26	54.9	16.7
Protor	1 Bu/A	Check	27	54.2	19.0
		Treated	27	53.7	18.0
	2 Bu/A	Check	27	53.8	22.5
		Treated	28	53.8	21.7
Olaf	1 Bu/A	Check	27	53.3	22.2
		Treated	26	55.1	20.6
	2 Bu/A	Check	28	53.9	22.6
		Treated	27	54.7	25.2
LSD(05) - 2.9 Bu/A			C.V. - 10.4%		Mean - 20.1

Table 42. HRS Wheat Variety Seed Treatment and Rate of Seeding Study - Lawrence County - 1975

Variety	Rate of Seeding	Seed Treatment	Height (Inches)	Test Wt (Lbs/Bu)	Grain Yield (Bu/Acre)
WS 1809	1 Bu/A	Check	24.0	57.6	20.1
		Treated	23.8	57.2	17.1
	2 Bu/A	Check	25.3	57.8	23.7
		Treated	24.8	58.3	24.8
Bounty 208	1 Bu/A	Check	24.3	58.2	23.6
		Treated	24.7	58.7	20.7
	2 Bu/A	Check	24.3	59.4	28.5
		Treated	24.2	59.8	30.1
Protor	1 Bu/A	Check	25.0	58.4	26.6
		Treated	25.0	58.5	26.7
	2 Bu/A	Check	25.5	59.8	31.9
		Treated	25.7	60.0	31.2
Olaf	1 Bu/A	Check	26.2	59.3	24.2
		Treated	22.6	60.2	22.9
	2 Bu/A	Check	23.7	60.5	30.7
		Treated	24.3	59.6	29.4
LSD(05) - 2.75 Bu/A		C.V. - 8.6%		Mean - 25.9	

PLOT INFORMATION

Winter Grain Variety TrialsMartin Airport - Bennett county

Date of Seeding: September 6, 1974
 Rate of Seeding: 60 pounds per acre
 Plot Size: 6' x 50'
 Row Space: 14 inches
 Number of Replications: One
 Fertilizer Applied: None
 Soil Condition: Fallow, with good rain in August
 Date of Harvest: July 24, 1975.
 Other Factors: Severe soil moisture shortage through February 1975, seeded with a deep furrow drill

Fred Beets Farm - Lawrence county

Date of Seeding: September 16, 1974
 Rate of Seeding: 60 pounds per acre
 Plot Size: 5' x 200'
 Row Space: 12 inches
 Number of Replications: One
 Fertilizer Applied: None
 Soil Condition: Fallow, soil moisture fair
 Date of Harvest: July 28, 1975
 Other Factors: Seeded with deep furrow drill

Joe Komes Farm - Bear Butte Valley, Meade county

Date of Seeding: September 15, 1974
 Rate of Seeding: 60 pounds per acre
 Plot Size: 5' x 92'
 Row Space: 8 inches
 Number of Replications: One
 Fertilizer Applied: None
 Soil Condition: Fallow, soil moisture short
 Date of Harvest: July 29, 1975
 Other Factors: Seeded with single disc drill

Don Sawvell Farm - Quinn, Pennington county

Date of Seeding: September 26, 1974
 Rate of Seeding: 60 pounds per acre
 Plot Size: 7' x 100'
 Row Space: 14 inches
 Number of Replications: One
 Fertilizer Applied: 50 pounds of 18-46-0 per acre
 Soil Condition: Fallow, soil moist
 Date of Harvest: July 22, 1975
 Other Factors: Seeded with a deep furrow drill, weed controlled
 W/1/2#A of 2,4-D ester

Robert Grubl Farm - Alkali, Meade county

Date of Seeding: September 25, 1974
 Rate of Seeding: 60 pounds per acre
 Plot Size: 6' x 100'
 Row Space: 12 inches
 Number of Replications: Four
 Fertilizer Applied: None
 Soil Condition: Fallow
 Date of Harvest: July 29, 1975
 Other Factors: Rate of seed treatment - four ounces per bushel of seed

Steve Sharkey Farm - Winner, Tripp county

Date of Seeding: September 10, 1974
 Rate of Seeding: 75 pounds per acre
 Plot Size: Area harvested, 5 square yards
 Row Space: 7 inches
 Number of Replications: One
 Fertilizer Applied: 150 pounds per acre of 29-14-0 analysis
 Soil Condition: Fallow
 Other Factors: Seeded with single disc drill, Thimet applied to control worms and greenbugs
 Previous crop was grain sorghum

Spring Grain Variety TrialsMartin airport - Bennett county

Date of Seeding: April 25, 1975
 Rate of Seeding: Wheat-60#, Barley-72#, Oats-64#
 Plot Size: 4' x 25'
 Row Space: 8 inches

Number of Replications: Three
 Fertilizer Applied: None
 Soil Condition: Fallow

Joe Komes Farm - Bear Butte Valley, Meade county

Date of Seeding: May 13, 1975
 Rate of Seeding: 60 pounds per acre
 Plot Size: 5' x 92'
 Row Space: 8 inches
 Number of Replications: One
 Fertilizer Applied: None
 Herbicides Applied: None
 Soil Condition: Fallow
 Other Factors: Good soil moisture for spring grain

Soybean Variety Trials

~~James~~ Mickelson Farm - Nisland, Butte county

Date of Seeding: May 30, 1975
 Rate of Seeding: 3' x 25'
 Row Space: 30 inches
 Number of Replications: Four
 Soil Condition: Irrigated
 Herbicide Applied: Lasso at 3# a.i. per acre
 Date of Harvest: October 7, 1975
 Other Factors: Harvested 10 square feet

Perkins county Crop Improvement acreage - Bison

Date of Seeding: May 15, 1975
 Rate of Seeding: Three pecks per acre
 Plot Size: 3' x 25'
 Row Space: 36 inches
 Number of Replications: Four
 Soil Condition: Fallow
 Herbicide Applied: Lasso at 2 pounds per acre
 Date of Harvest: September 30, 1975
 Other Factors: Harvested 30 square feet

Sunflower Variety Trials

~~Harlan Palo~~ Farm - Newell, Butte county

Date of Seeding: May 28, 1975
 Rate of Seeding: Four pounds per acre
 Plot Size: 76" x 25'
 Row Space: 38 inches
 Number of Replications: Four
 Soil Condition: Irrigated
 Herbicide Applied: Lasso at 3 pounds a.i. per acre
 Other Factors: Plots destroyed by blackbirds

Perkins County Crop Improvement acreage

Date of Seeding: May 15, 1975
 Rate of Seeding: Four pounds per acre
 Plot Size: 6' x 25'
 Row Space: 36 inches

Number of Replications: Four
 Soil Condition: Fallow
 Herbicide Applied: Lasso at 2 pounds a.i. per acre
 Other Factors: Destroyed by sparrows

Sorghum Variety Trials

Perkins County Crop Improvement acreage - Bison
 Date of Seeding: May 15, 1975
 Rate of Seeding: Four pounds per acre
 Plot Size: 9' x 25'
 Row Space: 36 inches
 Number of Replications: Five
 Soil Condition: Fallow
 Date of Harvest: September 30, 1975
 Other Factors:

Don Ferguson Farm - Haakon county
 Date of Seeding: June 13, 1975
 Rate of Seeding: Four pounds per acre
 Plot Size: 6' x 25'
 Row Space: 12, 24, and 36 inches
 Number of Replications: Four
 Fertilizer Applied: None and 30 pounds of nitrogen per acre
 Soil Condition: Wheat stubble
 Date of Harvest: September 25, 1975
 Other Factors: Very dry

Irrigated Alfalfa Trials

Penton Brothers Farm - Nisland, Butte county (Variety trial)
 Date of Seeding: April 25, 1974
 Rate of Seeding: 12 pounds per acre
 Plot Size: 4' x 20'
 Row Space: 6 inches
 Number of Replications: Three
 Fertilizer Applied: 60 pounds per acre of phosphate and potash
 Soil Condition: Irrigated silt loam
 Herbicide Applied: Eptam preplant at 2 pounds a.i. per acre
 Harvests: Twice in 1974 and four times in 1975
 Other Factors:

Richard Espenscheid Farm - Newell, Butte county (Var, Fert, & Water Mgt)
 Date of Seeding: June 9, 1975
 Rate of Seeding: 14 pounds per acre
 Plot Size: 21' x 100'
 Row Space: Six inches
 Number of Replications: Three
 Fertilizer Applied: 15 pounds of nitrogen and 90 pounds of phosphate per acre
 Soil Condition: Irrigated, clay soil
 Harvests: None - clipped once for weed control
 Other Factors: Fertilizer was applied to 1/2 of plots only at seeding

Fenton Brothers Farm - Nisland, Butte county (Fert & Water Mgt)

Plot Size: 24' x 100'
 Number of Replications: Three
 Fertilizer Applied: According to plot design
 Soil Condition: Irrigated, fine sandy loam
 Harvests: Four times in 1975
 Other Factors: Alfalfa field was seeded in spring of 1974 with companion crop of oats

Ted Cook Farm - Arpan, Butte county (Variety, Fert, & Water Mgt)

Date of Seeding: June 5, 1975
 Rate of Seeding: 14 pounds per acre
 Plot Size: 28' x 138'
 Row Space: Six inches
 Number of Replications: Three
 Fertilizer Applied: 15-60-0 per acre with seed
 Soil Condition: Irrigated, clay soil
 Harvests: None
 Other Factors: One-half of the plots were fertilized. Plots were overseeded on August 5 and irrigated on August 12, 1975

Fertilizer Studies on Winter WheatBill Roghair Farm - Okaton, Jones county

Date of Seeding: September 19, 1974
 Rate of Seeding: 60 pounds per acre
 Plot Size: 10' x 43'
 Row Space: 14 inches
 Number of Replications: Four
 Fertilizer Applied: 0, 30, 60, & 90 pounds increments of Nitrogen and phosphorus per acre
 Soil Condition: Continuous wheat cropping
 Herbicide Applied: 1/2# of 2,4-D ester per acre
 Insecticide Applied: Endrin for armyworms
 Date of Harvest: July 23, 1975
 Other Factors: Severe damage by armyworms

Seed Treatment StudiesRobert Grubel Farm - Alkali, Meade county (Winter wheat-Bacillus)

Date of Seeding: September 6, 1974 and September 25, 1974
 Rate of Seeding: 60 pounds per acre
 Plot Size: 6' x 100'
 Row Space: 12 inches
 Number of Replications: Six
 Fertilizer Applied: None
 Soil Condition: Fallow
 Herbicide Applied: None
 Date of Harvest: July 29, 1975
 Other Factors: Rate of seed treatment-four ounces per bushel of seed

Martin Airport - Bennett county (Winter wheat-Bacillus)

Date of Seeding: September 5, 1974 and September 27, 1974
 Rate of Seeding: 60 pounds per acre
 Plot Size: 6' x 35'
 Row Space: 12 inches
 Number of Replications: Four
 Fertilizer Applied: None
 Soil Condition: Fallow
 Herbicide Applied: None
 Date of Harvest: July 24, 1975
 Other Factors: Rate of seed treatment - four ounces per bushel of seed

Seed Treatment and Rate of Seeding on Hard Red Spring Wheat

Martin Airport - Bennett county

Date of Seeding: April 25, 1975
 Rate of Seeding: One and two bushels per acre
 Plot Size: 4' x 25'
 Row Space: Eight inches
 Number of Replications: Five
 Fertilizer Applied: None
 Soil Condition: Fallow
 Herbicide Applied: None
 Date of Harvest: August 28, 1975
 Other Factors: Rate of seed treatment - four ounces per bushel of seed

Steve Baker Farm - Whitewood, Lawrence county

Date of Seeding: May 5, 1975
 Rate of Seeding: One and two bushels per acre
 Plot Size: 4' x 25'
 Row Space: Eight inches
 Number of Replications: Six
 Fertilizer Applied: None
 Soil Condition: Fallow
 Herbicide Applied: None
 Date of Harvest: August 27, 1975
 Other Factors: Rate of seed treatment - four ounces per bushel of seed

Rate of Seeding Spring Wheat

Steve Baker Farm - Whitewood, Lawrence county

Date of Seeding: May 5, 1975
 Rate of Seeding: 1 to 8 pecks per acre
 Plot Size: 4' x 25'
 Row Space: 8 inches
 Number of Replications: Four
 Fertilizer Applied: None
 Soil Condition: Fallow
 Herbicide Applied: None
 Harvest Date: August 27, 1975
 Other Factors: Heavy driving rain immediately after seeding

