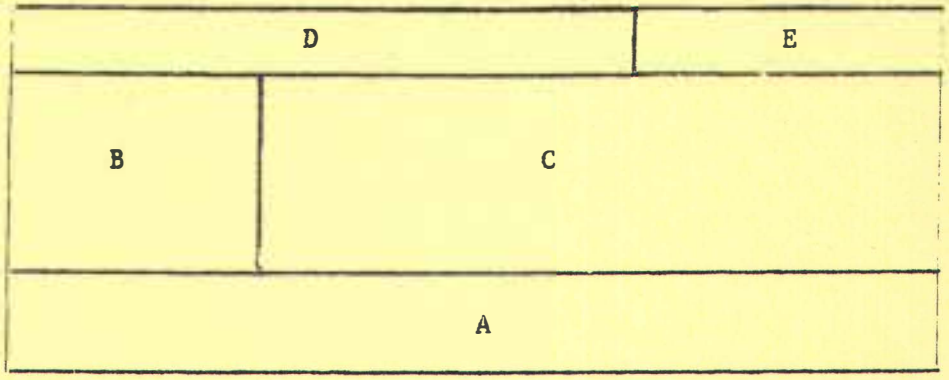
Agronomy Pamphlet #54

DECEMBER 1959

SOUTH CENTRAL RESEARCH FARM

PRESHO, SOUTH DAKOTA

PLOT DIAGRAM



A. - Sorghum, corn, and winter grain testing
B. - Alfalfa and grass seed production
C. - Cultural practices
D. - Legume and grass variety testing
E. - Spring wheat and barley variety testing

NOTE: This pamphlet is a summary of the annual report of the South Central Research Farm. Because of the crop failure and cost of publication only those experiments from which results were obtained are included.

Agronomy and Plant Pathology Departments
South Dakota State College
Agriculture Experiment Station
Brookings, South Dakota

Weather Data Report - South Central Research Farm - 1959*

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.#	Dec.##	Total
Inches of rainfall	.08	.22	.45	.92	4.27	2.75	2.09	.48	3.03	.43	.36	.14	15.22
Departure from longtime mean**	-.44	-.34	-.63	-.77	1.91	-.53	.55	-1.55	1.65	-.61	-.18	-.29	-1.23
Average air temperature-1959	14.2	16.8	37.9	45.5	55.1	72.3	75.7	76.8	60.7	45.8	26.0	29.4	
Departure from longtime avg.**	-4.8	-5.9	5.7	-2.5	-3.9	3.6	-1.6	1.7	-4.1	-5.7			
Avg. soil temperature at 4" depth	20.1	21.0	33.3	42.4	55.5	73.5	71.6	73.3	60.5	44.3	35.6	30.0	

Last frost in Spring - May 22
First frost in Fall - September 28
Growing season - 130 days

Maximum recorded air temperature - 109°F - 11 Aug. 1959
Minimum recorded air temperature - -20°F - 3 Jan. 1959

* Weather data taken and recorded at South Central Research Farm.
** Longtime averages were recorded at Kennebec, S.D.
\# Temperatures for November pertain only to days 1-21 for air, and 1-12 for soil.
Air and soil temperatures for December pertain only to days 12-20 inclusive.

Weather Summary and Growing Season - 1959

The Growing Season of 1959 at the South Central Research Farm can be described as a normal year when compared with longtime averages. The average temperatures were only slightly lower than the longtime record. Total rainfall for the year was only an inch below the longtime average. However, small grain yields were reduced because of hail damage which occurred on May 30 and July 13.

Drought conditions which occurred in August resulted from inadequate rainfall and subsoil moisture, combined with extreme temperatures and wind. The drought conditions were so severe that the corn plants were completely destroyed and sorghum plots delayed in setting seed until September.

The growing season lasted from May 22nd until September 28th, a total of 130 days.

Winter and Spring Wheat Testing
by V. A. Dirks and H. A. Geise

Winter Wheat Variety Test at the South Central Station, Presho, 1958-59

Variety	Av. Yield Bu./Acre 1959	Av. Yield Bu./Acre 1958-59	Test Wt. 1959	Survival Percent 1958-59
Northern Types:				
Minter	9.2	20.0	55	53
Minturki	11.7	18.6	54	66
Marmin	8.4	17.8	54	62
Yogo	11.3	16.7	55	48
Kharkof MC22	8.3	14.4	46	47
Central Types:				
Nebred	7.7	16.4	56	58
Cheyenne	12.2	21.7	57	67
Cheyenne 432	11.0	22.0	55	57
Kharkof	11.5	18.0	55	54
Omaha	12.5	18.0	56	51
Warrior	11.1	18.0	56	57
Aztec	13.9	20.9	60	62
C.I. 13279	9.1	18.2	56	60
Southern Types:				
Wichita	8.5	16.8	57	52
Pawnee	12.6	21.2	56	65
Concho	10.2	18.6	56	64
Bison	11.1	17.8	56	53
Ponca	10.2	20.8	56	58

Yields of Winter Wheat Plots at the South Central Station, Presho, 1959

Variety	Winter Survival Percent	Spring Vigor	Date Headed	Stem Rust	Leaf Rust	Wt./Bu. Lbs.	Yield Bu./Acre
Minturki	90	2.0	6-16	25	15	54.5	8.8
Minter	85	2.0	-14	28	18	55.0	9.1
Marmin	95	1.0	-12	22	15	55.0	6.9
Yogo	88	2.5	-15	40	40	54.5	9.4
Kharkof MC22	95	1.5	-18	35	28	50.0	7.4
Nebred	90	2.0	-10	10	5	56.5	10.3
Cheyenne	70	2.0	-11	32	18	57.5	11.4
Wichita	65	2.0	- 7	25	3	58.0	9.0
Pawnee	70	3.0	- 8	25	15	55.5	10.2
Bison	70	2.0	- 8	28	12	56.0	8.3
Concho	50	1.0	- 6	28	10	56.0	7.4
Ponca	75	1.0	- 8	30	8	57.0	9.4

L.S.D. for yield at 5% level = 2.0 bu./acre
Mean yield = 8.97 bu/acre. Seeded on summer fallow, September 5.
Dry fall caused poor growth.

Sorghum Variety Testing

by

C. J. Franzke and H. A. Geise

Sorghum Extension State Variety Test, 1959

Row No.	Variety	Date Headed	Date Pollinated
1	Norghum	7/20	7/24
2	Reliance	7/22	7/27
3	Dual	7/20	7/24
4	Brown Marval	7/20	7/24
5	Prairie Rose	7/20	7/24
6	Martin	8/12	8/14
7	R.S. 501 Nebr. Cert.	7/24	7/29
8	R.S. 610 " "	7/29	7/31
9	Northrup King NK 135	7/27	7/27
10	" " " 145	7/29	7/31
11	" " " 210	8/10	8/14
12	Funk's RS 608	8/10	8/12
13	Jacques J 31	7/20	7/24
14	" J 53	7/27	7/29
15	" J 59	7/27	7/29
16	Steckly's R 99	7/27	7/29
17	" R 103	7/31	8/2
18	Pfister 305-S	7/27	7/29
19	" 405-S	7/31	8/4
20	" 425-S	7/29	7/31
21	Frontier 400	7/31	8/4
22	39-30-S	7/20	7/24
23	Rancher	7/24	7/27
24	Norkan	7/29	7/31
25	Rox Orange	8/19	8/21
26	Waconia	--	--
27	Greenleaf Sudan	8/5	8/7
28	Sweet Sudan	8/2	8/5
29	Piper Sudan	7/27	7/27

Sorghum Commercial Hybrid Test, 1959

Row No.	Variety	Date Headed	Date Pollinated
1	Northrup King NK 135	7/25	7/28
2	" " " 140	7/28	8/2
3	" " " x 3000	7/17	7/20
4	" " " 210	7/28	8/2
5	" " " 230	7/30	8/5
6	" " " Exp. 3026	7/28	7/31
7	" " " " 3005C	7/18	7/23
8	" " " " 3021	7/18	7/24
9	" " " " 3022	7/17	7/20
10	" " " " 3000B	7/20	7/27
11	" " " " 3000C	7/18	7/25
12	" " " 145	7/26	7/26
13	Steckley's R 99	7/25	7/27
14	" R 103	7/27	7/27
15	" R 104A	8/3	8/5
16	" R 106	7/31	8/4
17	" R 108	7/29	8/2
18	Dekalb C-44-a	7/26	7/27
19	" X-30	7/21	7/25
20	" X-49	7/29	7/30
21	Frontier 400B	8/2	8/3
22	" 400C	8/2	8/7
23	" 410B	8/4	8/7
24	" 410C	8/7	8/10
25	" S-210	8/9	8/12
26	Norghum	7/21	7/27
27	Reliance	7/28	7/26
28	Dual	7/21	7/24
29	Frontier 411	8/5	8/8
30	" 410E	8/3	8/6

Corn Variety Performance Testing
South Central Area
by D. B. Shank, D. E. Kratochvil, and H. A. Geise

Objectives: To compare yields of fourteen varieties of corn.

Experimental Results: The corn plants were completely killed by drought in early August 1959.

Alfalfa Seed and Forage Production and Testing

By M. D. Rumbaugh and H. A. Geise

Forage yields in tons/acre taken from solid seeded alfalfa plots, July, 1959.

Variety	Fertility	Average Tons/acre
Teton	0-0-0	.31
	0-30-0	.48
Vernal	0-0-0	.28
	0-30-0	.36

Alfalfa seed yield from 42" spaced row plots, 1959

Variety	Cutting	Fertility	Average lbs/acre
Teton	1	0-0-0	3.55
		0-30-0	2.37
	2	0-0-0	.92
		0-30-0	.92
Vernal	1	0-0-0	3.16
		0-30-0	4.08
	2	0-0-0	1.58
		0-30-0	1.18

Forage yield of six varieties of alfalfa when treated as hay and pasture types, 1959.

Variety	Treatment			
	1st pasture yield lbs./acre	2nd pasture yield lbs./acre	Total pasture lbs./acre	1st hay yield lbs./acre
Cossack	709.7	730.3	1440.0	1790.7
Ranger	786.8	920.2	1707.0	1790.7
DuPuit	648.0	525.8	1173.8	1571.8
Teton	601.7	701.1	1302.8	1770.8
Semipalatinsk	555.4	496.6	1052.0	1651.4
Carlson CK	432.0	452.8	884.8	1611.6

Annual Sweet Clover Test

by M. D. Rumbaugh and H. A. Geise

Yield of forage in tons per acre of annual sweet clover at South Central Research Farm, 1959.

Variety	Tons/acre dry matter
Hubam	1.43
Golden	1.05
Israel	.27
Floranna	.97

Grass Fertilizer and Spacing Study

by J. G. Ross and H. A. Geise

Average seed yields of two species of Introduced Grasses seeded in two row spacings and four fertility levels, 1959.

Row Spacing*	Fertility level	Ree wheatgrass Avg. lbs./acre	Smooth brome Avg. lbs./acre
6"	0-0-0	27.2	.052
	20-0-0	29.3	.015
	40-0-0	21.8	.002
	40-20-0	17.5	0
42"	0-0-0	7.1	.008
	20-0-0	7.2	.002
	40-0-0	7.2	.032
	40-20-0	5.3	0

* Significant difference in seed production between the spacings of Ree wheatgrass.

Comparisons of Different Techniques in Growing Winter Wheat

by B. L. Brage and H. A. Geise

Objectives: This experiment was designed to determine if continuous wheat with or without commercial nitrogen could produce as well as that of a wheat-fallow system. Also, if sweet clover fallow will produce as well or better than conventional fallow, and to investigate the possibility of substituting wide-spaced corn or wide-spaced sorghum for fallow as a moisture conserving technique.

Yield of winter wheat on plots having six different management practices, 1959

Treatment	Avg. Yield Bu./Acre
Continuous winter wheat	.19
Cont. winter wheat + 30 lbs./ acre nit.	.26
Winter wheat-summer fallow rotation	3.21
Winter wheat-sweet clover fallow rotation	2.67
Winter wheat-wide spaced corn (84" rows)	1.60
Winter wheat-wide spaced sorghum (84" rows)	3.30

L.S.D. at 5% confidence level .99

Yield of grain obtained from wide spaced corn and wide spaced sorghum, 1958-1959

Crop	Yield in bu./acre 1958	1959
Corn	41.25	0
Grain sorghum	26.14	.62

Methods of Summer Fallow

by
B. L. Brage and H. A. Geise

Objectives: This experiment was designed to compare the physical and chemcial properties of the soil as it is affected by various fallow practices. To determine how these various practices affect soil moisture, which, if any, can be omitted or replaced, and how this combination of factors affect the following wheat yields.

Summer fallow operations in which six different treatments were compared, 1959.

Treatment	Fall Operation	Summer Operations
(1)	One way	Four one-way operations
(2)	One way	Four Noble-blade operations
(3)	One way	Two Noble-blade + 2 applications of 2,4-D*
(4)	One way	Two Noble-blade operations
(5)	Chisel	Four Noble-blade operations
(6)	One way	Two Dalapon and 2,4-D + two 2,4-D applications*

* Dalapon applied at 5 lbs./acre, 2,4-D applied at 1/2 lb./acre.

Moisture conditions and grain yield of plots where six different fallow treatments were compared, 1959.

Treatment		Total inches of water in profile to a depth of 4'*				Bu/acre of wheat	H_2O in profile of plots fallowed during 1959**
Fall '57	Summer '58	Aug. 1958	May 1959	June 1959	Oct. 1959		
One way	One way	14.38	16.88	11.21	9.58	3.76	11.45
One way	Noble blade	15.06	17.84	11.91	9.65	3.57	11.49
One way	Alternate Noble + 2,4-D	14.56	17.59	11.43	9.86	3.40	11.42
One way	Alternate Noble + no treatment	13.99	16.93	11.92	9.89	4.61	10.97
Chisel	Noble blade	14.69	17.82	11.53	9.63	3.58	12.35
One way	Complete chemical	13.86	16.70	12.23	10.50	3.02	10.59

* Plots fallowed in summer of 1958 produced wheat in 1959.
** Plots fallowed in summer of 1959 seeded to wheat in September, 1959.

Sorghum Spacing and Date of Planting Study

by B. L. Brage and H. A. Geise

Objectives: This experiment was designed to determine the optimum time of seeding, row spacings, and to compare seeding implements in the production of grain sorghum. These management techniques in turn were to be compared by measuring the yield of spring wheat during the following year.

Yield of Spring wheat from plots subjected to three dates, two fertilizer levels and three methods of planting of sorghum in previous year, 1959

Previous Sorghum Date of Planting	Method	Fertilizer	Avg. Yield bu./acre
21 May	Lister	0-0-0	1.42
		30-0-0	1.46
	Corn planter	0-0-0	.84
		30-0-0	.99
	Deep furrow drill	0-0-0	.86
		30-0-0	.37
2 June	Lister	0-0-0	2.03
		30-0-0	1.57
	Corn planter	0-0-0	.71
		30-0-0	.80
	Deep furrow drill	0-0-0	1.08
		30-0-0	.68
14 June	Lister	0-0-0	1.42
		30-0-0	1.60
	Corn planter	0-0-0	1.00
		30-0-0	1.19
	Deep furrow drill	0-0-0	1.12
		30-0-0	.98

Average yield of sorghum seeded on three different dates by three different methods, 1959

Date	Method	Fertilizer rate	Bu./acre
21 May	Corn planter	0-0-0	1.85
		30-0-0	1.75
	Deep furrow drill	0-0-0	.38
		30-0-0	.56
	Lister	0-0-0	0
		30-0-0	0
2 June	Corn planter	0-0-0	0
		30-0-0	0
	Deep furrow drill	0-0-0	.85
		30-0-0	.98
	Lister	0-0-0	0
		30-0-0	0
14 June	Corn planter	0-0-0	0
		30-0-0	0
	Deep furrow drill	0-0-0	0
		30-0-0	0
	Lister	0-0-0	.09
		30-0-0	.11

Winter Wheat Diseases

by C. M. Nagel and H. A. Geise

Objective: Control of yellow streak mosaic of winter wheat.

Effect of seeding date on yellow streak mosaic virus disease on Nebred winter wheat, 1959.

Seeding dates	Aug. 15	Aug. 25	Sept. 4	Sept. 14	Sept. 24	Oct. 4
Stand on Oct. 10, 1958	Exc.	Exc.	Exc.	Exc.	Good	Fair
Percent stand on May 15, 1959	13	32	68	83	72	63
Percent mosaic infected plants on May 15, 1959	97	95	65	8	6	1
Yield, Bu./A.*	.4	1.4	3.8	7.0	7.0	5.0

* Damaging hail occurred on July 13; estimated loss in plot yield, 50 percent.

Discussion:

The Plant Pathology Department has recommended that planting winter wheat about the 10th of September gives the best control of this disease. In other words, proper date of planting is very important in the control of this destructive disease in years when mosaic is present. However, the grower will want to base his decisions on when to plant, not only with regard to the disease problem on his particular farm, but also in consideration of soil moisture and erosion problems.

In addition to selecting a practical time to plant, it is recommended the land be worked about a week to 10 days before planting to destroy all volunteer wheat and pigeon grass for the reason that both are highly susceptible to wheat mosaic and can serve to initiate and spread the disease under field conditions if not killed in advance of planting the wheat seed.