

ANNUAL PROGRESS REPORT

NORTHEAST RESEARCH FARMS  
Garden City, Watertown and Twin Brooks, South Dakota

NORTHEAST EXPERIMENTAL FARM COMMITTEE

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Donald Naddy	Marshall	Britton
Elmer Greseth	Roberts	Sisseton
Quentin Kingsley, Project Leader	Northeast Farms	Brookings

BRIEF HISTORY

During the 1971 crop year, rainfall was above normal for the months of June, August and October on all Northeast Research Farms. The rainfall varied from one unit to another, also in the intensity and duration. Subsoil moisture reserves were high at freeze point time.

The three research farm experiments and observation trials were observed by many small groups and individuals this year. As in the past, materials, land preparation and maintenance, equipment and labor were supplied to other SDSU researchers, by this project, to aid in their experimental work.

Field days are tentatively scheduled in 1972 for July 11th at the Whetstone Valley Farm, and July 13th at the Garden City unit. The Watertown unit is not scheduled for a field day, but tours may be conducted on it.

Various demonstrations were set up this year on all three farms. A flax fertility study was started at Garden City and Watertown where fertilizer is applied with the seed and in another area the same amounts are plowed in. Also at Garden City a fertilizer study was started with potatoes. On the Whetstone Valley Farm, a soybean observation was started using 7, 14, 30 and 36 inch row with half of the plots being sprayed with 3 pounds of Amiben. The weed control was effective in the 7 and 14 inch rows, but the 30 and 36 inch rows were drowned out.

NOTE: This is a progress report and therefore the results presented are not necessarily complete nor conclusive. Any interpretation given is strictly tentative because additional data resulting from continuation of these experiments may result in conclusions different than those of any one year.



1971 CROP SEASON

TABLE 1. TOTAL RAINFALL BY MONTHS WITH THEIR DEPARTURE FROM LONG-TIME AVERAGE AT NORTHEAST RESEARCH FARMS

Garden City, Watertown and Whetstone Valley Units

Rainfall	Garden City		Watertown		Whetstone	
	Inches	Depart	Inches	Depart	Inches	Depart
April	1.83	-0.36	1.33	-0.73	0.20	-1.97
May	2.69	-0.16	1.78	-1.19	2.53	-0.45
June	4.95	+0.95	7.61	+3.91	9.30	+5.53
July	1.01	-1.86	1.02	-1.65	2.19	-0.53
August	5.81	+2.85	2.93	+0.15	3.20	+0.33
September	1.41	-0.86	1.46	-0.39	0.81	-1.45
October	4.23	+2.81	5.56	+4.40	5.98	+4.48

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# FERTILITY AND CULTURAL PRACTICE EXPERIMENTS\*

Q. S. Kingsley

TABLE 2. FERTILIZER RATES, PLANTING METHODS AND TILLAGE PRACTICES FOR WINTER WHEAT - GARDEN CITY 1971

Lbs/A Actual N and P	Bushels per Acre			
	Disk Press Drill	Disk Hoe Drill	Stubble Press Drill	Chisel plow Press Drill
0-0-0	36.7	38.7	40.3	43.0
0-15-0	40.4	35.7	44.3	44.6
60-0-0	39.2	42.7	43.9	46.2
30-15-0	36.6	41.8	44.5	42.1
60-15-0	38.6	42.9	47.9	44.6
120-15-0	37.2	45.1	45.2	43.3

Planted: Sept. 11, 1970

Variety: Lancer

Harvested: Aug. 23, 1971

Seeding Rate: 1 1/4 Bu/A

Crop History: 1967, 68, 69 Sorghum. Fertilized 100-40-0 per acre each year.  
1970 Oats, no fertility.

The residual fertility from previous crops increased yields of the 0-0-0 treatment. Yield differences were minimized on the other fertilizer treatments, due to the residual fertility in the soil.

\*For further information concerning these experiments, refer to Plant Science Pamphlet #5, December 1970.

TABLE 3. MULCH TILLAGE AND FERTILIZER RATES FOR CORN - GARDEN CITY, 1971

Lbs/A Actual N-P-K	Percent Moisture	Yield in Bu/A
0-0-0	31.1	36.2
100-0-0	32.5	43.4
50-30-0	32.3	50.1
100-30-0	31.8	55.6
100-60-100	32.5	53.7
100-30-100	32.5	53.3

Planted: June 17, 1971

Row space: 36 inches

Harvested: Oct. 5, 1971

Plant population: 14,000/A

Variety: Pioneer 3872

This experiment was planted May 10, but later had to be reworked because of a heavy weed infestation. It was replanted June 17 using an early maturing corn. The yields are not high, but favorable considering the time required to develop and mature. The 100-30-0 treatment produced 19.4 bushels per acre more than the 0-0-0 treatment and 12.2 bushels more than the 100-0-0 treatment.

TABLE 4. DEPTH PLACEMENT OF FERTILIZER FOR WHEAT. FALL APPLIED IN 1970.

Treatment N-P (4) Lbs/A	Test Wt.	Yield Bu/A	Ave. Yield 68-71
0-0-0 No Rip	60.6	23.8	30.8
0-0-0 Rip	60.1	22.3	29.7
60-0-0 Broadcast (1)	60.8	32.8	39.0
60-0-0 Plow sole (2)	60.2	25.7	35.2
60-0-0 Deep (3)	59.6	27.2	34.5
120-0-0 Broadcast	59.8	27.3	35.7
120-0-0 Plow sole	59.8	29.9	36.0
120-0-0 Deep	60.2	24.3	34.8

Planted: April 6, 1971

Variety: Chris

Harvested: Aug. 18, 1971

- (1) Fertilizer broadcast on surface and plowed in.
- (2) Fertilizer applied at 21 inch spacing 6-7 inches deep.
- (3) Fertilizer applied at 21 inch spacing 14-16 inches deep.
- (4) At planting time, 15# of P is applied with grain drill to the nitrogen treatments.

The differences in yields due to fertilizer placement or rate of fertilizer applied are small for 1971 and for the period of 1968 through 1971. The broadcasting of 60-0-0 on the surface and plow in treatment produced, on an average, 5.9 bushels of wheat more than the other fertilized areas, and 9.7 bushels more than the average 0-0-0 treatments.

#### SOIL AND WATER LOSS (Runoff)

Edward J. Williamson

#### Discussion and Interpretation:

Table 5 presents the 1971 yield and water use efficiency comparisons for the two and four year cropping sequences for up and down slope and across slope (contour) farming systems. The yields range from 79 to 99 bushels per acre for oats, 49 to 72 bushels per acre for corn and around 4.7 tons per acre and 3.8 tons per acre for two cuttings of second year and first year alfalfa respectively. The contour system shows an advantage for soil moisture efficiency by producing 4.2 bushels of corn for each inch of soil moisture compared to 3 bushels per inch of water used for the up and down slope system. There was little difference in soil moisture efficiency for oats this year from either slope system, around 5 bushels of oats were produced for each inch of water used.

Runoff and soil losses during the 1971 season were relatively low for a well-above growing season precipitation of 21.95 inches (3.39 inches above normal). The total loss of runoff and soil for the two cropping sequences and fallow are shown in Table 6. Similar to last year's results, the greatest loss occurred with fallow.

There were nine rain storms of sufficient magnitude, during the growing season to cause runoff from the fallow plot. Three of these nine storms were of an intensity to cause runoff from some of the cropping sequence systems as shown



in Table 7. It is interesting to note the effectiveness of corn canopy, particularly of a growth stage nearing maturity, in affording soil surface protection to erosion. Here, in one storm (August 18) two inches of rainfall occurred in a forty-five minute span, and as intensive as one inch falling in fifteen minute period without any runoff from either the 2 or 4 year cropping sequence, only from fallow.

TABLE 5. CROP YIELD AND WATER USE EFFICIENCY RUNOFF DEMONSTRATION.  
GARDEN CITY, SOUTH DAKOTA 1971

Cropping System	Crop	Up and Down Slope		Across Slope (Contour)	
		Yield Bu/A or T/A	Water Use Efficiency Bu/In Water Used	Yield Bu/A or T/A	Water Use Efficiency Bu/In Water Used
Two Yr. Sequence Row Crop- Small Grain	Corn	56.6	3.00	71.5	4.20
	Oats	79.4	5.22	85.9	4.95
Four Yr. Sequence Row Crop- Small Grain	Corn	48.8	3.68	--	--
	Oats	99.4	6.30	--	--
	Alf-2 yr.	4.7	--	--	--
	Alf-1 yr.	3.8	--	--	--

TABLE 6. RAINFALL, RUNOFF AND SOIL LOSS FROM RUNOFF DEMONSTRATION  
GARDEN CITY, SOUTH DAKOTA 1971

Year	Rainfall Apr.-Oct.	Cropping Sequence	Crop	Runoff % Rainfall	Inches	Soil Loss Lb/A
1971	21.95	2 yr. sequence C-0	corn		0.71	22.2
		Up & down slope	oats	0.41	0.09	24
		2 yr. sequence C-0	corn	3.00	0.66	248
		Across slope (contour)	oats	0.10	0.02	10
		4 yr. sequence C-0 Alf-Alf	corn	3.78	0.83	616
		Up & down slope	oats	0.18	0.04	116
			Alf-2 yr.	0.82	0.18	140
			Alf-1 yr.	0.50	0.11	20
		Fallow		6.29	1.38	1786

TABLE 7. EFFECT OF STORM INTENSITY ON RUNOFF AND SOIL LOSS FROM CORN IN 2 YEAR ROTATION AND ON CONTINUOUS FALLOW. GARDEN CITY, 1971

No.	Storms Date	Duration	Slope Direction	Rainfall		Runoff		Soil Loss	
				Amt In.	% Total	Amt In.	% Total	Amt #/A	% Total
1.	June 25	0.37" in 30 min. & 0.57" in 15 min.	Up and Down Slope	1.01	19	0.30	13	168	12
			Across Slope (contour)			0.30	13	188	14
			Fallow*			0.47	21	382	28
2.	June 28	0.55" in 10 min. & 0.7" in 1 1/2 hrs.	Up & Down Slope	1.55	30	0.41	18	54	4
			Across Slope (contour)			0.35	15	160	12
			Fallow*			0.25	11	260	19
3.	Aug 18	1.0" in 15 min. & 1.0" in 30 min. & 0.65" in 3 hrs.	Up & Down Slope	2.65	51	0	0	0	0
			Across slope Contour			0	0	0	0
			Fallow*			0.19	9	154	11

\* Up and Down slope

#### SMALL GRAIN AND FLAX HERBICIDE SCREENING

W. E. Arnold and W. B. O'Neal

The objective of this experiment was to evaluate the performance of several herbicides and herbicide combinations for their control of annual weeds in barley, oats, wheat, and flax. Prilar barley, Kelsey oats, Neepawa wheat, and Nored flax were seeded at the West Prairie Coteau research station on April 15. Preplant Incorporated and preemergence herbicide treatments were also applied on April 15. Postemergence applications were made on May 18 when barley and oats were in the 3-4 leaf stage of growth, wheat was in the 3 leaf stage and flax was 2 inches tall. The growth stages of the weeds at the time of postemergence applications were; wild buckwheat-2 leaf, wild mustard-4 leaf, kochia-2 inches tall, Russian thistle-3 inches tall, and foxtail-2 leaf stage.

Visual observations of percent grassy and broadleaf weed control were taken on July 2. Harvest samples were taken from a 3 x 6 ft. area on the following dates: barley-July 28, oats-July 30, wheat-August 3, and flax-August 17.

The best treatment for both grass and broadleaf weeds was Bay 94337 but severe injury was noted on oats and flax. Herbicide combinations of picloram + 2,4-D, dicamba + MCPA, and dicamba + bromoxynil gave the best broadleaf weed control. The average of four replications of weed control ratings and crop yield are shown in the following table 8.

TABLE 8. WEED CONTROL RATINGS AND CROP YIELDS

Treatment	Rate lb/A	Weed Control		Yields (Bu/A)			
		BLW <sup>a</sup> /	Grasses	Barley	Oats	Wheat	Flax
Preplant Inc.							
Trifluralin	3/4	8	69	54	56	36	1
Preemergence							
Bay 94337	3/8	44	29	60	83	43	5
Oryzalin	2	33	28	56	73	31	6
IMC-3950	6	5	60	50	88	42	3
Postemergence							
BAS-3512 + X-77	1/2 + 1/2%	21	61	55	78	43	8
BAS-3512 + X-77	1 + 1/2%	63	33	49	78	37	3
BAS-3512	2	53	33	57	98	37	9
MCPA ester	1/2	60	33	65	103	47	8
Silvex	1/2	70	0	59	85	40	0
Silvex + MCPA ester	1/4 + 1/4	78	8	60	102	43	0
Silvex + MCPA ester	1/2 + 1/2	75	0	58	78	41	0
Picloram + 2,4-D	3/8* + 3/8	91	23	49	74	38	12
Dicamba + MCPA	1/8 + 1/4	94	5	52	81	40	16
Dicamba + Bromoxynil	1/8 + 1/4	93	21	50	95	44	10
Dicamba	1/8	68	15	55	80	38	12
Bromoxynil	1/4	65	5	57	89	46	14
Bay 94337	3/8	88	94	52	46	37	0
SD-15418 + X-77	3/4 + 1/2%	45	15	58	83	41	0
SD-15418	3/4	38	43	58	86	38	7
SD-15418	1	73	45	60	75	36	10
SD-15418	2	78	78	43	84	39	6
SD-15418 (gran)	1	45	61	50	43	33	6
SD-15418 (gran)	2	49	78	36	40	31	3
SD-16389 + X-77	3/4 + 1/2%	79	0	58	79	45	1
SD-16389	3/4	61	29	55	82	41	4
SD-16389	1	75	75	60	85	44	7
SD-16389	2	88	84	52	78	44	4
DS-5328	1/2	0	41	60	97	35	3
DS-5328	2	38	25	52	94	37	6
TriMore EH-510	(5 + 2.4 + 1.8)*	88	23	53	92	44	11
2,4-D amine (foam)	5.2*	15	31	50	83	41	6
2,4-D amine (foam)	10.4*	63	8	52	77	45	12
No Herbicide	- - -	0	0	52	83	30	2

<sup>a</sup>/ General broadleaf weed control

\* Rate in ounces per acre



# SUMMARY OF FIVE YEARS RESULTS FROM INSECT CONTROL USING A SYSTEMIC INSECTICIDE

B. H. Kantack, Q. S. Kingsley and Wayne L. Berndt

Demonstration plots have been set up for five consecutive years at the SDSU research farm at Garden City, South Dakota. Treatments of Thimet (Phorate), a systematic insecticide were applied each year as replicated treatments at planting time. The insecticide was applied as a band treatment at the rate of 2 1/2 pounds actual per acre row (25 pounds 10% granules per acre row). Insect control was excellent in all treated replicates for each of the five years. Light to medium infestations of flea beetles and leafhoppers developed in the untreated plots each year. No foliar sprays were applied to any of the plots during any of the five test years. Yield checks for each of the five years shows the advantage of this treatment.

TABLE 9. INCREASES IN YIELDS OBTAINED USING A SYSTEMIC INSECTICIDE FOR CONTROL OF POTATO INSECTS.

Year	Increase in Yield Treatment Over Check Bu/Acre	*Net Profit for Acre Realized From Treatment Over Check
1971	46.9	\$79.10
1970	30.3	48.60
1969	33.6	40.38
1968	20.1	20.38
1967	11.3	9.52
Five Year Average	28.4	39.59

\* Cost of treatment deducted each year.

The cost of insecticide ranging from \$5.50 to \$6.00 per acre was deducted each year to show the net profit realized from insect control. Research studies have also shown that potato quality increases where systemic insecticides are used. The largest differences in yields were obtained when insect population pressures were the heaviest.

Thimet and Di-Syston are two systemic insecticides currently recommended for use on potatoes in South Dakota.

# FERTILIZER RATES FOR POTATOES - GARDEN CITY

TABLE 10. FERTILIZER RATES FOR POTATO PRODUCTION.

Fertilizer Mixture*	Yield in Cut/A Field Run	Yield in Bu/A Field Run
0-0-0	234.1	390.1
8-32-16	284.1	473.5
25-15-0	326.4	544.0
10-30-20	292.3	487.1
18-46-0	311.0	516.3

\* Each mixture applied at 250# per acre, and Thimet (phorate) at 25# of 10% granular per acre row.

This is the first year for this observation. La Soda potatoes were used in 1971 and all yields are based on "field run."

The 250 pounds of 25-15-0 produced 92.3 hundred weight per acre more than 0-0-0 and 34.1 hundred weight per acre more than 10-30-20.

In 1972, a white potato variety will be used in the experiment in place of the red variety.

Data furnished by Quentin Kingsley

TABLE 11. GRAIN SORGHUM PERFORMANCE TRIAL, GARDEN CITY UNIT, 1971

Brand and Variety	Yield, lb/A	Test Wt. lb/B	Height inches	Percent moisture 9/15/71	Date harvested
RS 506	4620	57	48	35.4 <sup>a</sup>	8/1
Pioneer 894	4235	56	37	31.7	8/1
Western WS 102	4170	55	45	32.2	8/1
Coop SG-20	4165	53	43	35.4	8/8
SD 503	4145	56	51	35.4	8/4
SD 451	3975	55	48	35.4	8/1
DeKalb B-32a	3955	54	42	34.7	8/6
SD 441	3745	56	49	28.4	7/28
DeKalb a-25	3710	53	39	35.4	8/2
P-A-G 354	3690	54	38	35.4	8/8
DeKalb B-36	3465	53	43	35.4	8/6
SD 104	3350	57	38	31.0	7/28
Pioneer 878	2855	54	37	35.4	8/8
RS 610	2555	48	44	35.4	8/10
SD 25702	1845	51	38	35.4	8/9
Coop SG-10	1640	41	41	35.4	8/15
Mean	3505			C.V. = 14.0%	

Trials seeded May 28, 1971; harvested on Sept. 23, 1971

Data reported are means of three replications.

a - + sign indicates that moisture is above 35.0 percent. Moisture determined with electronic moisture meter with upper limit of 35 percent.

Data furnished by J. J. Bonnemann

Planting date: April 9, 1971  
Harvested: August 17, 1971  
Fertility: 60-40-0 per acre plow down  
Varieties listed in order of yield produced, not maturity

Table 12.

[illegible]

Table 18. Standard Variety Spring-seeded Wheat, Barley and Oat Trials, Watertown, 1971

Variety	1969	Yield 1970	1971	3 yr. Av.	1971 T.W. lb/B	Variety	1969	Yield 1970	1971	3 yr. Av.	1971 T.W. lb/B
Standard wheats - B/A						Oats					
Thatcher	17.9	9.1	31.2	19.4	58.5	Dupree	104.3	56.0	78.0	79.4	33.5
Sheridan	31.6	16.9	36.6	28.4	61.2	Burnett	106.8	60.6	85.8	84.4	35.5
Fortuna		18.6	35.2		57.7	Garland	89.9	64.1	78.5	77.5	35.7
Chris	32.3	18.3	36.9	29.2	60.7	Clintford	98.8	57.2	87.5	81.2	39.2
Polk	29.8	21.0	35.4	28.7	64.2	Trio			90.0		37.2
Manitou	33.8	20.5	31.3	28.5	60.7	Lodi	100.4	56.6	79.4	78.8	36.0
Waldron	25.8	19.7	42.9	29.5	61.7	Clintland 64	104.8	46.1	77.4	76.1	36.7
Neepawa	28.9	17.7	37.7	28.1	62.0	Brave	110.6	56.1	79.8	82.2	32.0
Durums - B/A						Pettis	104.0	58.1	80.2	80.8	39.0
Wells	29.7	16.9	40.3	29.0	61.0	Orbit	113.5	69.1	102.6	95.1	33.7
Leeds	25.3	18.1	35.6	26.3	63.0	Jaycee	96.8	56.6	87.7	80.4	35.5
Hercules	30.1	18.5	40.2	29.6	64.7	Holden	96.1	65.3	87.1	82.8	36.5
DT 316		15.5	45.1		59.5	Portal	113.2	62.1	88.1	87.8	36.2
Jari			34.8		54.7	Kelsey	119.4	51.2	83.5	84.7	32.7
Semi-dwarfs - B/A						Sioux	125.9	56.9	75.9	86.2	34.7
WS 1812	30.0	18.2	31.5	26.6	61.0	Cayuse			71.7		30.5
WS 1809		21.0	43.4		57.0	Otter	113.3	59.7	90.2	87.7	35.7
Lark			49.1		57.5	Nodaway 70		59.7	82.2		37.2
Bounty 208			45.6		59.0	Froker	111.5	59.4	88.1	86.3	36.0
Bonanza		18.3	47.4		58.0	SD 955			89.4		37.0
Fletcher		13.1	48.7		58.7	Chief(SD1541)		70.2	97.0		38.2
Era		20.0	52.6		53.5	Ill. 66-2287A			85.8		38.0
Wisc. 271		20.0	38.1		60.2	Random			74.1		30.2
Mean			39.7			Mean			84.0		
LSD-.05			8.4			LSD-.05			14.5		
CV-%			15.1			CV-%			12.1		
Triticales - lb/A						Barley					
Rosner			2659		49.5	Liberty	62.0	27.4	38.7	42.7	48.3
Fas-Gro 203			3155		48.5	Firlbecks III		20.9	50.6		50.3
Fas-Gro 204			2887		48.0	Larker	72.4	23.6	54.0	50.0	47.2
Graze-Grain 70A			2279		49.0	Dickson	68.3	24.2	42.0	44.8	50.7
Mean			2745			Conquest	69.9	26.4	49.9	48.7	44.0
LSD-.05			407			Paragon	75.7	28.8	53.7	52.4	48.8
CV-%			9.8			Primus II	75.9	26.9	53.4	52.1	47.7
						Bonanza		28.4	52.6		45.0
						Nordic			43.8		51.0
						Prilar(SD 640)			48.4		48.2
						M-11			58.1		49.8
						Mean			49.5		
						LSD-.05			7.8		
						CV-.05			12.5		
Seeded April 5, 1971											
Fertilizer: 60 #/A N											
40 #/A P205											
Winter grain trials did not survive the winter. Flax was abandoned to severe disease problem.											

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Data reported are means of four replications  
Data furnished by J. J. Bonnemann



WHETSTONE VALLEY RESEARCH FARM  
TWIN BROOKS, SOUTH DAKOTA

BRIEF HISTORY

During the 1971 season, rainfall was above normal for the months of June, August, and October. The month of June was 5.53 inches above normal and October, 4.48 inches above normal. Subsoil moisture reserves are high to the 5-foot depth sampled.

A small grain crop tour was conducted on this farm during the year. Attendance was very good with active participation and interest shown. As in the past, materials, land preparation and maintenance, equipment and labor were supplied to other SDSU researchers to aid in their experimental work.

The various corn varieties used in the experiments are provided by local dealers. Variety selection is a function of the "farm directors" of the Whetstone Valley Research Farm.

WHETSTONE VALLEY RESEARCH FARM ADVISORS

<u>Member</u>	<u>County</u>	<u>Address</u>
Harlyn Bartz	Roberts	Browns Valley
Gordon Bracht	Grant	Milbank
Winston Christensen	Roberts	Wilmot
Clayton Palmquist	Roberts	Wilmot
Robert Quade	Roberts	Wilmot
Elwood Konstant	Grant	Milbank
Don Grimsrud	Roberts	Sisseton
LeRoy Larson	Grant	Milbank
Frank Roberts	Grant	LaBolt
Jim Voeltz	Grant	Big Stone City
John Anderson	Roberts	Wilmot
Wilford Anderson	Grant	LaBolt
Roy Carlson	Grant	Milbank
Ray Mueller	Grant	Big Stone City
Gerald Oehler	Grant	Milbank
Arvid Stengel	Grant	Milbank

Quentin Kingsley, Project Leader	Northeast Research Farms	Brookings
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NOTE: This is a progress report and therefore, the results presented are not necessarily complete nor conclusive. Any interpretation given is strictly tentative because additional data resulting from continuation of these experiments may result in conclusions different than those of any one year.



**WHETSTONE VALLEY RESEARCH FARM  
Rainfall 1971**

<u>Rainfall</u>	<u>Inches per Month</u>	<u>Departure</u>
April	0.20	-1.97
May	2.53	-0.35
June	9.30	+5.53
July	2.19	-1.53
August	3.20	+0.33
September	0.81	-1.45
October	5.98	+4.48

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**TWIN BROOKS**

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FERTILITY AND CULTURAL PRACTICE EXPERIMENTS  
Whetstone Valley Research Farm

Quentin Kingsley

For experimental objectives, cropping sequence, and other details, see Plant Science Pamphlet 5, 1970.

TABLE 14. FERTILIZER RATES - NITROGEN FOR CORN 1971

N-P-K Treatment*	Percent Moisture	Yield in Bu/A	Ave. Yield 1969-71
0-0-0	15.4	45.8	43.5
0-25-0	15.6	48.3	58.1
100-0-0	16.5	62.9	67.5
50-25-0	17.0	61.3	67.3
100-25-0	15.9	70.4	72.1
150-25-0	17.2	62.7	69.6
200-25-0	16.2	60.3	70.2
150-25-50	18.4	60.0	63.8

Date planted: May 5, 1971      \*N-P-K: Actual element #/A  
Harvested: Oct. 14, 1971      Fertilizer: Broadcast & plowed in  
Variety: DeKalb      Variable: Nitrogen  
Row Space: 30"      Population: 14,000/A

Insecticide: Thimet, 1# active per acre  
Weed Control: 2# atrazine + 1 gallon crop oil per acre  
Cultivations: One

N-Study

In this year, the 100-25-0 rate increased corn yields 24.6 bushels per acre more than 0-0-0. No appreciable lodging, insect or disease damage was noted in the field. The overall percent moisture in the corn grain was low. The addition 50 pounds of potassium to the 100-20-0 treatment did not help yields.

TABLE 15. FERTILIZER - PHOSPHORUS FOR CORN 1971

N-P-K Treatment*	Percent Moisture	Yield in 1971 Bu/A	Ave. Yield 1970-71
0-0-0	15.2	45.5	47.9
100-0-0	17.2	65.3	61.0
100-15-0	16.2	69.1	61.9
100-20-0	15.5	71.8	61.8
100-25-0	15.8	70.8	60.5
100-30-0	16.8	66.3	62.4
100-35-0	16.1	74.2	64.2
100-35-30	16.2	72.5	60.5

Date planted: May 5, 1971      \*N-P-K: Actual element #/A  
Harvested: Oct. 14, 1971      Fertilizer: Broadcast and plowed in  
Variety: Northrup King      Variable: Phosphorous  
Row space: 30"      Population: 14,000/A

Insecticide: Thimet, 1# active per acre  
Weed Control: 2# Atrazine + 1 gallon crop oil per acre  
Cultivations: One

## P-Study

The 35-pound rate of phosphorous increased yields 28.7 bushels per acre more than the 0-0-0 treatment. The addition of 30 pounds of potassium helped increase yields in 1971, but over a period of two crop years in not better than the other fertilizer treatments.

TABLE 16. CORN ROW SPACING AND PLANT POPULATIONS, 1971

Row Spacing	Population in Thousands	Percent Moisture	Yield in Bu/A	Ave. Yield 1969-71
30'	9	26.3	62.1	55.7
	12	28.6	64.7	60.3
	15	24.7	73.6	68.0
	18	27.8	78.9	71.3
	21	23.9	76.1	69.9
35'	9	28.5	58.2	58.5
	12	26.2	66.7	65.6
	15	25.0	77.0	72.1
	18	27.2	83.6	68.9
	21	28.8	76.0	67.2
40'	9	24.3	58.8	62.0
	12	30.7	62.1	67.8
	15	26.6	70.7	69.9
	18	22.6	69.4	59.7
	21	29.4	62.2	61.2

Date planted: May 5, 1971

Harvested: Oct. 14, 1971

Corn Variety: Pioneer

Overall Fertilizer Application: 150-25-50 actual element #/A plowed in

Insecticide: Thimet, 1# active per acre

Weed Control: 2# atrazine + 1 gallon crop oil per acre

Cultivations: One

## Row space-population Study

In the row spacing-plant population study, the plant population in this year seemed to be the most important factor. Top yields in the 30-inch rows were produced at 18,000 plants per acre, which is consistent with the three-year average. In the 35-inch rows, the highest yields this year were produced at 18,000 plants per acre; but over the years, the bushels of corn produced are higher at 15,000 plants per acre. The 15,000 plants per acre in 40-inch rows were the highest yielding combinations this year.

TABLE 17. TILLAGE METHODS FOR CORN, 1971

N-P-K Treatment*	Percent Moisture	Yield in Bu/A	Ave. Yield 1970-71
Plow Down			
0 - 0 - 0	28.2	65.7	66.9
150-25-30	26.3	77.6	73.1
Till Plant			
0 - 0 - 0	22.3	73.1	70.3
150-25-30	24.7	87.9	78.1
Chisel Plow			
0 - 0 - 0	26.5	64.2	65.1
150-25-30	22.7	78.6	74.9
Date planted:	May 6, 1971	N-P-K:	Actual element #/A
Harvested:	Oct. 14, 1971	Population:	14,000/A
Variety:	Sokota	Row space:	36"
Insecticide:	Thimet, 1# active per acre		
Weed Control:	2# atrazine + 1 gallon crop oil per acre		
Cultivations:	One		

## Tillage Methods Study

The fertilizer was broadcast for plowing and chisel plow, and side dressed for the till plant method of soil preparation.

The application of 150-25-30 pounds of fertilizer to all soil preparation methods increased the bushels per acre of corn produced when compared to the 0-0-0 treatments. The yields on all 0-0-0 treatments are high, but the differences between the treated and untreated yields are consistent with the other experiments on the farm.

In this year, the bushels per acre produced were highest where the till plant method was used. Similar yields were produced using the plow down versus chisel plow method.

TABLE 18. METHODS OF FERTILIZER APPLICATION FOR CORN

<u>N-P-K</u> <u>Treatment**</u>	<u>Percent</u> <u>Moisture</u>	<u>Yield in</u> <u>1971 Bu/A</u>	<u>Ave. Yield</u> <u>1970-71</u>
<u>Plow Down</u> 0 - 0 - 0	18.5	50.2	57.2
<u>Plow Down</u> 100-25-0	23.8	61.0	59.6
<u>Plow Down</u> 96-21-0 pop up 4 - 4 - 0	21.8	67.5	67.0
<u>Starter</u> 10-25-0 Side-Dress 90-0-0	20.8	73.4	67.1
<u>Starter</u> 10-25-0 + zinc* Side-Dress 90-0-0	19.9	67.9	66.4
<u>Starter</u> 10-25-0 Plow down 90-0-0	22.2	69.6	67.1

\* 38# of zinc in the form of zinc sulfate to get 10.8# of zinc

Date planted:	May 6, 1971	**N-P-K:	Actual element #/A.
Harvested:	Oct. 14, 1971	Population:	14,000/A
Variety:	Trojan	Row space:	36"

Insecticide: Thimet, 1# active per acre  
 Weed Control: 2# atrazine + 1 gallon crop oil per acre  
 Cultivations: One

The total amount of fertilizer used for each method or combinations of application methods is 100-25-0, except where 10.8 pounds of zinc is added to one of the starter ratios.

The application of 10-25-0 starter and 90-0-0 side-dressed increased corn yields 23.2 bushels per acre when compared to 0-0-0 and 12.4 bushels more than 100-25-0 plowed down. The use of 10-25-0 plus 90-0-0 plow down increased yields 8.6 bushels over 100-25-0 plowed down. The other two treatments using pop-up and zinc produced similar yields but approximately 17.5 bushels more than 0-0-0.



## HIGH NITROGEN STUDY

Garden City and Milbank Experimental Farms

Paul Carson, Quentin Kingsley and Raymond Ward

## OBJECTIVES:

1. Determine the effect of very high rates of nitrogen on the yield of corn.
2. Determine if very high rates of nitrogen causes an accumulation of nitrate nitrogen in the plant.
3. Determine what happens to the nitrogen not utilized in plant growth.
4. Determine if large amounts of nitrogen fertilizer has any effect on the solonetz soils present in the soil.

## MATERIALS AND METHODS:

Fertilizer Application.

The fertilizer was applied in the spring of 1969, except on replications 3 and 4 at Garden City where it was applied in the spring of 1970. The fertilizer was broadcast on the surface before planting the crop. No fertilizer has been applied since. Ammonium nitrate was used as a source of nitrogen.

Rates of Fertilization.

<u>Treatment</u>	<u>Rates of Nitrogen in Lbs. Per Acre.</u>
1	0
2	32
3	100
4	320
5	1000

1971 Cropping.

1. Corn was planted in 36" rows.
2. Land preparation, planting, and cultivation was carried out by the station personnel.
3. Pioneer 3956 was planted May 12 at Garden City. Sokota TS 49 was planted May 5 at Milbank.
4. Corn was harvested at the Milbank station September 23, and at the Garden City station September 22.
5. Sixty feet of row from each plot was harvested at each site for the grain yield.
6. Twenty feet of row from each plot was harvested for a silage yield.
7. Five plants were selected at random and split into upper and lower stalks, leaves, and ears for nitrate analysis.

1971 Soil Sampling.

1. Core samples were taken to a depth of four feet at Milbank in the spring on all plots and on certain plots in the fall.
2. Core samples were taken to a depth of four feet at the Garden City station in the fall.

**RESULTS:**

The grain yield results, moisture content of the ears at harvest, and the percent of plants having ears are reported for both stations in Table 19. The only treatment showing a yield increase at the Milbank station was the 320-pound per acre rate of nitrogen. Moisture content of the ears at both sites was slightly higher in the corn from the 1000-pound rate of nitrogen than from the other treatments. Nitrogen rates had no effect on the percentage of stalks with ears. Yields at the Garden City site were quite variable. The high rate of nitrogen application (1000 lbs. N) produced the lowest yield.

Nitrate nitrogen levels in the soil profiles at the end of the 1971 growing season are shown in Table 20 (Milbank farm) and Table 21 (Garden City farm). These results are the average of the soil samples collected from 4 replications. It should be kept in mind that at the Garden City location replications 3 and 4 were fertilized in the spring of 1970 instead of 1969. These replications will be treated collectively with replications 1 and 2 and separately in a final report. The data from both sites indicate that the nitrates have moved from the surface to a depth of 24 inches or greater. At the Garden City site, the major concentration of nitrates is still above 48 inches, but some accumulation is noted in the 48-60 inch depth. At the Milbank site, an accumulation is noted in the 48-60 inch depth at the 1000-pound per acre rate of nitrogen. It was impossible to secure the samples from the Milbank site in the fall of 1970, so samples were taken in the spring of 1971. These are reported in Table 22. It should be noted that considerable movement of nitrates took place during the 1971 growing season.

TABLE 19. THE EFFECT OF HIGH RATES OF NITROGEN ON THE YIELD AND THE MOISTURE CONTENT OF EAR CORN AT TWO SITES. 1971.

Treatments N + P + K lbs/A	N. E. Experimental Farm Milbank			N. E. Experimental Farm Garden City		
	Yield* bu/A	Moisture %	Plants with ears, %	Yield* bu/A	Moisture %	Plants with ears, %
0 + 0 + 0	79	33.8	99.7	77	40.9	98.2
32 + 0 + 0	76	35.0	98.2	85	40.1	98.9
100 + 0 + 0	76	33.7	101.2	79	40.1	99.2
320 + 0 + 0	86	32.5	99.7	74	40.5	97.6
1000 + 0 + 0	74	35.5	98.4	63	42.8	91.2

\* Yield calculated on a 15% moisture basis.

TABLE 20. NITRATE NITROGEN LEVELS FOUND IN SOIL PROFILES OF THE HIGH NITROGEN STUDY AT THE MILBANK\* EXPERIMENTAL FARM 1971.

Depth In Soil Profile Inches	Nitrate Nitrogen** In Lbs Per Acre		
	Fertilizer Treatments***		
	0 + 0 + 0	320 + 0 + 0	1000 + 0 + 0
0-6	12.1	15.5	28.6
6-12	6.8	10.3	37.3
12-24	10.4	70.6	284.7
24-36	11.5	107.6	416.2
36-48	15.5	54.7	207.0
48-60	not taken	not taken	109.8
Total	56.3	258.7	1078.6

\* Field was sampled in November, 1971

\*\* 3.6 x ppm of NO<sub>3</sub> in 12 inches.

\*\*\* Fertilizer was applied in the spring of 1969.

TABLE 21. NITRATE NITROGEN LEVELS FOUND IN SOIL PROFILES OF THE HIGH NITROGEN STUDY AT THE GARDEN CITY\* EXPERIMENTAL FARM, 1971.

Depth In Soil Profile Inches	Nitrate Nitrogen** In Lbs Per Acre				
	Fertilizer Treatments***				
	0 + 0 + 0	32 + 0 + 0	100 + 0 + 0	320 + 0 + 0	1000 + 0 + 0
0-6	9.7	3.4	2.2	6.5	10.3
6-12	9.2	3.8	1.8	12.1	18.5
12-24	13.7	5.8	1.7	81.7	186.5
24-36	29.9	36.4	26.3	252.7	828.4
36-48	51.8	37.8	29.0	104.8	251.6
48-60	not taken	not taken	not taken	not taken	68.4
Total	114.3	87.2	215.4	457.8	1363.7

\* Field was sampled in November, 1971.

\*\* 3.6 x ppm of NO<sub>3</sub> in 12 inches.

\*\*\* Fertilizer was applied in the spring of 1969.

TABLE 22. NITRATE NITROGEN LEVELS FOUND IN SOIL PROFILES OF THE HIGH NITROGEN STUDY AT THE MILBANK<sup>\*</sup> EXPERIMENTAL FARM. APRIL, 1971.

Depth In Soil Profile Inches	Nitrate Nitrogen** In Lbs Per Acre				
	Fertilizer Treatments***				
	0 + 0 + 0	32 + 0 + 0	100 + 0 + 0	320 + 0 + 0	1000 + 0 + 0
0-6	15.5	14.4	17.6	24.8	45.5
6-12	11.7	12.8	17.5	20.3	88.7
12-24	14.0	14.0	37.8	65.2	253.4
24-36	13.3	13.7	30.2	61.9	194.4
36-48	12.6	8.3	20.2	42.8	91.4
Total	67.1	63.2	123.3	215.0	673.4

\* Field sampled in April, 1971.

\*\* 3.6 x ppm of NO<sub>3</sub> in 12 inches.

\*\*\* Fertilizer was applied in the spring of 1969.

#### STARTER FERTILIZER EXPERIMENT WITH CORN AT THE N. E. EXPERIMENTAL FARMS (MILBANK AND WATERTOWN) 1971

Paul Carson, Fred Shubeck, Ray Ward, and Quentin Kingsley

#### OBJECTIVES:

1. To establish the value of starter fertilizers on the growth and yield of corn.
2. To determine what effects rates of P and/or K applied as a starter have on the yield of corn.

#### METHODS:

1. Experimental Design - completely randomized factorial. Plot size was 10' x 60'. Each plot contained four rows of corn.
2. Fertilization - Milbank site. Nitrogen at the rate of 150 pounds of nitrogen per acre was applied by broadcasting by hand shortly after the corn had emerged.

Watertown site. The presence of large amounts of nitrate nitrogen in the soil profile made it unnecessary to apply additional nitrogen.

3. Varieties - Milbank site. Sokota TS 49.

Watertown site. Northrup King Px476MR.

4. Weed Control - Milbank site. 1.6 pounds of actual atrazine after planting.



TABLE 20. NITRATE NITROGEN LEVELS FOUND IN SOIL PROFILES OF THE HIGH NITROGEN STUDY AT THE MILBANK\* EXPERIMENTAL FARM 1971.

Depth In Soil Profile Inches	Nitrate Nitrogen** In Lbs Per Acre Fertilizer Treatments***		
	0 + 0 + 0	320 + 0 + 0	1000 + 0 + 0
0-6	12.1	15.5	28.6
6-12	6.8	10.3	37.3
12-24	10.4	70.6	284.7
24-36	11.5	107.6	416.2
36-48	15.5	54.7	207.0
48-60	not taken	not taken	109.8
Total	56.3	258.7	1078.6

\* Field was sampled in November, 1971

\*\* 3.6 x ppm of NO<sub>3</sub> in 12 inches.

\*\*\* Fertilizer was applied in the spring of 1969.

TABLE 21. NITRATE NITROGEN LEVELS FOUND IN SOIL PROFILES OF THE HIGH NITROGEN STUDY AT THE GARDEN CITY\* EXPERIMENTAL FARM, 1971.

Depth In Soil Profile Inches	Nitrate Nitrogen** In Lbs Per Acre Fertilizer Treatments***				
	0 + 0 + 0	32 + 0 + 0	100 + 0 + 0	320 + 0 + 0	1000 + 0 + 0
0-6	9.7	3.4	2.2	6.5	10.3
6-12	9.2	3.8	1.8	12.1	18.5
12-24	13.7	5.8	1.7	81.7	186.5
24-36	29.9	36.4	26.3	251.7	828.4
36-48	51.8	37.8	29.0	104.8	251.6
48-60	not taken	not taken	not taken	not taken	68.4
Total	114.3	87.2	215.4	457.8	1363.7

\* Field was sampled in November, 1971.

\*\* 3.6 x ppm of NO<sub>3</sub> in 12 inches.

\*\*\* Fertilizer was applied in the spring of 1969.



TABLE 22. NITRATE NITROGEN LEVELS FOUND IN SOIL PROFILES OF THE HIGH NITROGEN STUDY AT THE MILBANK\* EXPERIMENTAL FARM. APRIL, 1971.

Depth In Soil Profile Inches	Nitrate Nitrogen** In Lbs Per Acre				
	Fertilizer Treatments***				
	0 + 0 + 0	32 + 0 + 0	100 + 0 + 0	320 + 0 + 0	1000 + 0 + 0
0-6	15.5	14.4	17.6	24.8	45.5
6-12	11.7	12.8	17.5	20.3	88.7
12-24	14.0	14.0	37.8	65.2	253.4
24-36	13.3	13.7	30.2	61.9	194.4
36-48	12.6	8.3	20.2	42.8	91.4
Total	67.1	63.2	123.3	215.0	673.4

\* Field sampled in April, 1971.

\*\* 3.6 x ppm of NO<sub>3</sub> in 12 inches.

\*\*\* Fertilizer was applied in the spring of 1969.

STARTER FERTILIZER EXPERIMENT WITH CORN AT THE  
N. E. EXPERIMENTAL FARMS (MILBANK AND WATERTOWN) 1971

Paul Carson, Fred Shubeck, Ray Ward, and Quentin Kingsley

OBJECTIVES:

1. To establish the value of starter fertilizers on the growth and yield of corn.
2. To determine what effects rates of P and/or K applied as a starter have on the yield of corn.

METHODS:

1. Experimental Design - completely randomized factorial. Plot size was 10' x 60'. Each plot contained four rows of corn.
2. Fertilization - Milbank site. Nitrogen at the rate of 150 pounds of nitrogen per acre was applied by broadcasting by hand shortly after the corn had emerged.

Watertown site. The presence of large amounts of nitrate nitrogen in the soil profile made it unnecessary to apply additional nitrogen.

3. Varieties - Milbank site. Sokota TS 49.

Watertown site. Northrup King Px476MR.

4. Weed Control - Milbank site. 1.6 pounds of actual atrazine after planting.

The fertilizer treatments did not have a consistent effect on the moisture content of the ears at harvest or the number of ears per stalk. The number of ears per stalk was greater at the Watertown station even though the yield was lower.

The soil tests for available phosphorous and potassium were considered high at both sites.

TABLE 24. THE RATES OF PHOSPHOROUS AND POTASSIUM IN A STARTER FERTILIZER ON THE YIELD,<sup>1/</sup> MOISTURE CONTENT <sup>2/</sup> AT HARVEST AND THE NUMBER OF EARS PER STALK. N. E. EXPERIMENT STATIONS MILBANK AND WATERTOWN, 1971.

No.	Treatment N + P + K lbs/A	N. E. Farm Watertown			N. E. Farm Milbank		
		Yield bu/A	Moisture %	No. Ears Per Stalk	Yield bu/A	Moisture %	No. Ears Per Stalk
1.	12 + 0 + 0	77	23.3	1.13	81	22.3	.95
2.	12 + 0 + 9	68	22.4	1.04	80	26.4	.98
3.	12 + 0 +17	68	21.9	1.06	77	23.7	.99
4.	12 + 6 + 0	78	22.2	1.17	87	23.2	.99
5.	12 + 6 + 9	70	23.5	1.05	84	23.9	.98
6.	12 + 6 +17	67	24.7	1.05	79	23.9	.98
7.	12 +12 + 0	66	24.3	1.02	83	25.7	.99
8.	12 +12 + 9	65	25.2	1.04	73	26.5	1.01
9.	12 +12 +17	69	26.8	1.09	70	20.2	.95
10.	12 +23 + 0	68	23.9	1.11	75	16.4	.99
11.	12 +23 + 9	71	25.1	1.11	85	20.8	.99
12.	12 +23 +17	64	27.1	1.10	80	24.5	.95
13.	12 + 0 + 0	77	23.3	1.13	81	22.3	.95
14.	12 + 6 + 0	78	22.2	1.17	87	23.2	.99
15.	12 +12 + 0	66	24.3	1.02	83	25.7	.99
16.	12 +23 + 0	68	23.9	1.11	75	16.4	.99
17.	12 + 0 + 9	68	22.4	1.04	80	26.4	.98
18.	12 + 6 + 9	70	23.5	1.05	84	23.9	.98
19.	12 +12 + 9	65	25.2	1.04	73	26.5	1.01
20.	12 +23 + 9	71	25.1	1.11	85	20.8	.99
21.	12 + 0 +17	68	21.9	1.06	77	23.7	.99
22.	12 + 6 +17	67	24.7	1.05	79	23.9	.98
23.	12 +12 +17	69	26.8	1.09	70	20.2	.95
24.	12 +23 +17	64	27.1	1.10	81	24.5	.95

<sup>1/</sup> Calculated at 15% moisture.

<sup>2/</sup> The moisture sample was taken by cutting a section out of the center of eight ears of corn. This includes a section on the cob.

## INFLUENCE OF MCPA AND 2,4-D ON OATS

Arnold, W. E. and O'Neal, W. B.

Seven oat varieties were used to compare the effect of ester and amine formulations of 2,4-D and MCPA in a test conducted near Milbank, South Dakota. Burnett, Froker, Garland, Holden, Kelsey, Kota, and Lodi oats were planted on April 15, 1971. Each variety was treated with 1/4, 1/2, and 3/4 lb/A of alkanolamine salt of 2,4-D, propylene glycol butyl ether ester of 2,4-D, dimethyl amine salt of MCPA, and isooctyl ester of MCPA. An untreated check of each variety was included for comparison with each treatment. Oat seedlings were in the 3-4 leaf stage of growth when treated on May 19, 1971. The number of panicles/1.5 ft.<sup>2</sup>, number of spikelets per panicle, number of kernels per spikelet, and the test weight were measured to determine the component of yield most affected by the herbicides. Harvest samples of oats were taken in August.

Yield data over all varieties showed 2,4-D to be more injurious to oats than MCPA. 2,4-D ester appeared to reduce yields when compared to 2,4-D amine; however, MCPA ester did not appear to reduce oat yields when compared with MCPA amine.

TABLE 25. OAT YIELDS PRESENTED AS PERCENT OF CHECK.

Treatment	Rate lb/A	Lodi	Garland	Holden	Burnett	Kelsey	Froker	Kota
MCPA amine	1/4	112	109	110	99	105	93	94
MCPA amine	1/2	99	116	109	104	105	99	98
MCPA amine	3/4	109	118	115	103	104	105	94
MCPA ester	1/4	106	110	103	103	96	109	98
MCPA ester	1/2	105	104	108	102	107	106	91
MCPA ester	3/4	119	107	108	98	105	105	105
2,4-D amine	1/4	103	99	101	104	101	105	91
2,4-D amine	1/2	107	102	98	98	95	93	93
2,4-D amine	3/4	105	100	95	90	91	88	82
2,4-D ester	1/4	105	92	103	89	86	89	92
2,4-D ester	1/2	93	79	84	78	81	73	81
2,4-D ester	3/4	90	83	83	70	78	75	74
No Herbicide	—	100	100	100	100	100	100	100

Yield component analysis showed that a reduction in the number of spikelets per panicle was the largest contributing component to yield reduction. Other components showing a reduction with corresponding yield reductions were the number of kernels per spikelet and the test weight. All treatments appeared to give an increase in the number of panicles per unit area; however, 3/4 lb/A of 2,4-D ester significantly increased the number of panicles when compared to the untreated check. The variety Burnett showed the largest increase in panicles/1.5 ft.<sup>2</sup>.

WHETSTONE VALLEY RESEARCH FARM  
SMALL GRAIN YIELDS 1971

Planting Date: April 6, 1971  
Harvested: August 10, 1971  
Fertility: 60-40-0 plowdown per acre  
Varieties listed in order of yield produced, not maturity

TABLE 26.

Barley	Test Wt.	Yield Bu/A	Ave. Yield 69-71	Spring Wheat	Test Wt.	Yield Bu/A	Ave. Yield 69-71
Primus II	45.0	81.2	54.5	Cargill 208	57.5	59.0*	
Dickson	45.0	79.2	54.0	Neepawa	58.5	55.1**	44.0
M-11	43.5	68.4*		DeKalb Bonanza	56.0	54.5**	43.7
Nordic	45.0	63.0*		Fletcher	58.5	52.9**	40.2
Prilar	42.5	58.9*		Era	56.0	49.3**	41.5
Conquest	44.5	57.4	47.9	Manitou	57.0	47.7	38.4
Larker	43.0	46.6	47.5	Chris	58.0	46.1	36.9
				Waldron	55.0	44.3	33.1
	<u>Flax</u>			Polk	59.0	41.2	35.7
Summit	51.0	21.8	17.1	World Seeds 1803	57.0	41.1**	29.5
B5128	52.0	19.5	14.9	Sheridan	58.0	38.5	31.6
Bolley	52.0	18.6	15.2	Fortuna	54.0	35.1**	34.3
Nored	51.0	18.4	14.7				
Foster	53.0	16.7**	16.9		<u>Durum</u>		
Norstar	53.0	16.4	15.2	Hercules	55.0	54.2	43.2
Linott	54.0	15.9	18.5	Leeds	56.5	45.2	38.7
Windom	53.0	14.2	16.1	Wells	51.0	37.9	35.2
	<u>Triticales</u>				<u>Speltz</u>		
		<u>lbs/A</u>		Speltz	34.0	43.6	
Graze Grain 70A	41.5	2366.6					
Rosner	44.5	2333.3					
Fas Gro 203	43.5	2269.2					
Fas Gro 204	43.5	2235.5					
	<u>Oats</u>						
Cayuse	34.5	122.7**	86.8				
SD1541 (Chief)	34.0	115.7*					
Lodi	37.0	112.7	83.0				
Mammoth	37.5	110.9*					
Kelsey	36.5	106.9	81.4				
Froker	36.5	106.7**	79.2				
Garland	35.5	105.9	79.1				
Holden	36.0	102.6	87.1				
Portal	37.5	96.2	76.2				
Otter	37.0	93.9**	74.0				
Kota	37.0	91.0	68.2				
Burnett	38.0	80.5	62.0				

\* one year average  
\*\* two year average



TABLE 27. CORN PERFORMANCE TRIAL, WHETSTONE VALLEY FARM, MILBANK, 1971

Brand and Variety	Type	Cross	Performance Score	Stalk Lodged, percent	Percent Moisture	Mean Yield, B/A
Pioneer 3579	N	M2X	1	2.7	27.2	108.9
Pioneer 3773	N	2X	2	1.5	27.2	107.5
Western KX-55	T	2X	4	1.4	29.2	101.4
SDAES SD Ex 72	N	M3X	3	4.1	23.2	99.0
Pride R-290	T	2X	8	2.6	28.2	98.7
ACCO UC 2900	T	2X	9	2.8	28.1	98.7
SDAES SD Ex 70	N	3X	7	6.5	26.6	98.7
ACCO U 333	T	3X	6	2.1	27.5	98.5
ACCO UC 1900	T	2X	5	4.2	23.8	96.4
SDAES PP151	N	4X	11	6.7	24.5	95.8
Pioneer 3784	N	2X	12	0.3	26.6	95.5
Pioneer 3956A	N	2X	10	3.3	23.2	94.5
ACCO UC 3300	T	2X	18	2.7	30.5	94.4
Pride R-369	T	3X	13	2.0	27.9	94.2
SDAES SD Ex 82	N	3X	17	3.5	23.5	89.0
SDAES SD 200 (X59)	N	2X	15	10.0	20.7	89.0
SDAES SD Ex 48A	N	4X	14	2.7	22.0	88.2
Sokota TS-67	T	2X	22	1.4	29.2	88.0
Sokota MX-59	T	M2X	20	1.7	26.4	87.8
Western KX-45	T	2X	16	2.7	21.9	87.5
SDAES SD Ex 81	N	3X	19	5.7	21.2	86.6
ACCO UC 2300	T	2X	21	0.7	25.4	84.9
Pride 200A	N	3X	25	7.1	22.8	83.5
SDAES PP145	N	4X	29	4.8	23.3	82.9
Renk R 95	T	3X	26	3.0	23.1	82.5
SDAES PP127	N	4X	23	2.9	21.2	81.8
Western K-1175	T	4X	29	6.0	24.4	81.6
Sokota 403	T	4X	30	2.4	27.2	81.5
SDAES PP147	N	4X	24	4.1	20.5	81.3
ACCO DC 230	T	4X	31	4.5	25.2	80.2
Pioneer 3814	T	4X	28	4.8	22.5	79.9
SDAES SD 270	T	4X	33	10.3	24.9	76.4
SDAES SD 250	T	4X	32	7.6	23.0	75.6
SDAES PP112	N	M3X	34	2.3	23.4	65.7
Mean						89.2

The trial was seeded on May 14 and harvested on October 14, 1971. It was seeded at two populations, 12,- and 16,000 plants per acre. The variability of the soil contributed in part to wide variations in yield and no significance was found for one population over the other. Yields reported are the mean of eight replications.

Data furnished by J. J. Bonnemann



TABLE 28. SUNFLOWER VARIETY TRIAL - NORTHEAST SOUTH DAKOTA, 1971

Cultivar	Height* Inches	Test Wt* Lbs/Bu	Seed Yield-Lbs/Acre**		
			Garden City	Twin Brooks	Revilla
OILSEED TYPE					
Record	61	28	1552	1307	1427
Peredovik 66	51	28	1453	1630	1099
VNIIMK 8931 66	51	28	1197	1672	904
Krasnodarets	43	29	824	1113	878
EDIBLE OR BIRDFEED TYPE					
P-21 VR2 x Menn. RR-18-1	47	28	1054	1497	1733
Arrowhead	48	28	1140	1437	1485
Commander	51	23	1258	1684	1070
Mingren	50	22	1092	1596	1122

\* Data taken from yield trial at West Prairie Coteau Research Farm

\*\* Yields are reported from West Prairie Coteau Research Farm, - Garden City, Whetstone Valley Research Farm, - Twin Brooks, and Jim Street Farm, - Revilla. Data provided by H. A. Glese and Q. S. Mingsley

