

ANNUAL PROGRESS REPORT

NORTHEAST RESEARCH STATION  
Watertown, South Dakota

BRIEF HISTORY

The Northeast Research Station Advisory Group met in Watertown in March of 1982 to discuss research being conducted on the Northeast Research Station. At this meeting, Roger Hurlbert of Clark was elected President and Chuck Langner of Clark, Secretary for 1982.

Weather conditions in April slowed planting of spring crops. Farm operations were in full swing in May and continued this way until mid-May. At this time, small showers of rain hindered plantings and tillage operations. The two heavy rains May 28th and 30th caused some erosion and severe crusting of the soil. A soybean experiment was ruined at this time due to washing and crusting. Temperatures and small amounts of rainfall in June were not conducive to rapid small grain growth. Over the complete crop season of April through October, rainfall was 0.56 inches above normal. The subsoil moisture is in good condition for 1983.

There were 2 crop tours on the station this year. One on July 14th in the evening to view the small grain varieties, dry beans, millets, sunflowers and other crops in season at that time. The second tour was conducted September 9th and was set up to observe row crops, such as soybeans, sunflowers, fodder beets, forage sorghums, sunflower insect study and weed control practices. A rain near the end of the day interrupted the tour. Coffee and cookies were served by the Crop Improvement Association. Turn-outs for both tours were very good.

New Research Station advisors for the period 1983-1986 are Doug Toben, Deuel County and Sherman Hustel from Roberts County.

An agreement was reached by the Research Station Advisors and the County Extension Agents concerning the President and Secretary. Each year, the succeeding President and Secretary will be chosen from the county next on the list of counties which are in reverse alphabetical order.

The President for 1983, using this system, is Sherman Hustel of Veblen, representing Roberts County. Joe E. Schuch, County Extension Agent of Roberts County, Secretary.

THE CROP TOURS FOR 1983 ARE SCHEDULED FOR THURSDAY, JULY 14TH AT 6:30 PM AND THE FALL TOUR FOR THURSDAY, SEPTEMBER 8TH AT 2:00 PM.

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 from continuation of these experiments may produce conclusions different than those of any one year. These data reflect the 1982 growing season.



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AGRICULTURAL ADVISORY GROUP  
Northeast Research Station, 1982  
Watertown, South Dakota

Roger Hurlbert	Clark	Clark County	82-85
Harlan Haugen	Wallace	Codington	82-85
John Schwab	Andover	Day	81-83
Charles Meyer	Reville	Deuel	81-82
Lyle Kriesel	Summit	Grant	81-84
Vernon Singrey	Hazel	Hamlin	81-83
Erwin Symeins	Amherst	Marshall	81-84
Gerald Balvin	Claire City	Roberts	81-82
Orrin Korth	Watertown	Codington	Permanent
Maurice Horton	SDSU	Head, Plant Science Department	
Loyal Evjen	South Shore	Ag. Technician	
Quentin Kingsley	SDSU	Station Manager	

THE COOPERATIVE EXTENSION SERVICE  
Hollis D. Hall, Director

Chuck Langner	Clark	Clark County
Robert Schurrer	Watertown	Codington
Jim Wilson	Webster	Day
Dale Witala	Clear Lake	Deuel
Joe R. Schuch	Hilbank	Grant
Donald Guthmiller	Hayti	Hamlin
Patrick Freeberg	Britton	Marshall
Joe E. Schuch	Sisseton	Roberts

1982 CROP YEAR HISTORY  
1982 Crop Season

Total rainfall for growing season by months with this Department from long-term average on Northeast Research Station, S.D.

Rainfall	Inches	Departure*	Greatest Day	Date
April	0.35	-1.71	0.16	20
May	5.50	+2.53	1.60	28
June	1.37	-2.33	0.50	6
July	4.05	+1.38	1.42	13
August	0.64	-2.14	0.31	24
September	2.73	+0.88	1.01	13
October	3.11	+1.95	1.58	11
Total	17.75	+0.56		

Long-Time Average 17.19 inches April through October.

Number of days during month of 90° or above: July 6, August 7.  
Last frost - Spring (April 27).  
First frost - Fall (October 20) Frost free period - 175 days.

SOYBEAN VARIETY AND ROW SPACE STUDY  
Northeast Research Station, 1982  
Q. Kingsley and L. Evjen

**OBJECTIVES:**

To observe several varieties of soybeans for oil percent, test weight, yielding ability and row spacings in this environment.

**DISCUSSION:**

The soybeans were planted June 2nd and harvested October 27th. Row spacings were 7, 14, 21, 28 and 35 inches. The planting rate was 185,000 seeds per acre. Plants per foot of row were for 7 inch row, 2.5, 14 inch 5.0, 21 inch 7.5, 28 inch 10.0 and for 35 inch 12.0. This planting rate is about 62 pounds of soybeans per acre, which varies with seed size.

Chemical weed control on this study was accomplished using 3 quarts of Lasso broadcast preemergent.

There was very little lodging and any that did occur was in the 28 and 35 inch row spacings. This lodging was apparent after the first frost on October 20th. Rainfall during the crop season was 11.8 inches.

Lakota soybeans will replace Corsoy 79 for this study in 1983.

RESULTS:

Table 1. Soybean Variety and Row Spacings, Northeast Research Station, Watertown, S.D. 1982.

Entry	Row Space inches	Maturity Group*	100 Seed Wt. grams	Percent Oil	Test Wt.	Yield Bu/A	All Entry Average Yield Bu/A
Evans	7	0	12.7	13.2	59.6	21.0	
Swift		0	13.5	10.6	59.5	21.7	
Simpson		0	12.7	11.4	58.6	22.1	
Weber		1	12.4	11.7	59.3	22.6	
Hodgson 78		1	13.8	11.7	59.8	21.6	
Corsoy 79		11	12.8	13.6	59.8	22.2	21.9
Evans	14	0	12.1	12.8	59.7	24.9	
Swift		0	14.1	10.8	59.4	28.4	
Simpson		0	13.2	12.3	57.1	27.6	
Weber		1	13.0	14.4	59.1	24.5	
Hodgson 78		1	13.7	10.6	59.4	23.2	
Corsoy 79		11	13.3	14.7	59.4	25.4	25.7
Evans	21	0	12.2	12.3	59.2	20.0	
Swift		0	13.1	11.0	59.2	20.3	
Simpson		0	12.5	11.2	58.1	21.1	
Weber		1	12.0	14.5	58.7	21.6	
Hodgson 78		1	13.0	11.2	59.1	20.9	
Corsoy 79		11	12.5	14.3	59.4	19.3	20.5
Evans	28	0	11.9	11.0	59.6	16.3	
Swift		0	13.6	11.5	58.9	15.7	
Simpson		0	12.4	10.5	58.9	17.8	
Weber		1	12.0	14.1	58.8	16.9	
Hodgson 78		1	12.9	11.0	59.2	16.3	
Corsoy 79		11	12.4	13.9	59.5	17.0	16.6
Evans	35	0	11.8	11.8	58.9	15.8	
Swift		0	11.3	10.6	58.7	15.2	
Simpson		0	11.4	10.2	58.8	19.5	
Weber		1	10.3	12.7	58.8	16.9	
Hodgson 78		1	12.6	11.7	59.5	16.1	
Corsoy 79		11	11.5	14.3	59.3	14.9	16.4

\* Maturity Group from USDA Classification: 0 = early, 1 = early to mid-season, 2 = mid-season to late.

Crop was planted June 2 and harvested October 27th.



DRY BEAN VARIETY TRIALS  
Northeast Research Station, 1982  
Q. Kingsley and L. Evjen

OBJECTIVE:

To observe several varieties of dry beans for adaptability, maintenance and yielding ability.

DISCUSSION:

The beans were planted June 2nd with a four row air planter at a rate of a bean every 2 1/2-4 inches or about 100,000 per acre. The plates for the planter handled everything but the kidney beans. There were no plates large enough to handle this seed properly, but by setting at maximum rate a satisfactory stand was achieved. Normally the beans would be planted in mid-May after any danger of that last frost in the spring. A population of near 80,000 plants per acre were harvested September 20th and the results are shown in Table 2.

All varieties of beans would be adaptable to the area.

Maintenance of the beans is difficult for the vining and prostrate types because they spread out and are driven over when cultivating. Harvesting also presents a problem because the plant must be sheared off below the soil surface. Special equipment is needed for this operation. The bush types may be taken by straight combining them. When combining dry beans, the cylinder speed is down to about 300 RPM and the concave is fairly wide open. There is a high discount on cracked beans. Navy beans were the easiest to combine, with less cracking and dirt in the grain tank.

The price on dry beans at harvest time was 15 cents a pound for navy, 11 cents for pinto beans. Current price is 10 cents for navy and 9 cents for pinto. Light red kidney beans are now priced at 17 cents a pound and Great Northerns are 11.5 to 12 cents a pound.

Dry bean seed cost for planting in 1983 for navy beans will be about 30 to 35 cents per pound and for pinto beans about 30 cents a pound or under.

In 1983, four varieties of pinto beans are to be added to those in Table 2. One variety is a pink bean and the other three, Ela, Agate and Pindak are short season 85 day beans. Also, chick peas, commonly known as Garbanzo beans, will be included in this study.

RESULTS:

Table 2. Ory Bean Production, Northeast Research Station, 1982.

Entry	Type	Plant Type	<del>250</del> Seed	Test Wt.	Yield Lbs/A
			Count Grams		
X-Black turtle	Black Beans	Bush	43.3	61.2	1122
Snowbunting	Navy	Bush	44.3	61.8	1212
Fleetwood	Navy	Bush	44.0	63.8	1206
Upland	Navy	Bush	40.3	62.4	1476
Small Whites	Small White	Vining	33.8	61.2	1332
Sac	L.R. Kidney*	Bush	121.8	59.4	1812
Regular	L.R. Kidney	Bush	113.5	58.1	2658
Ouray	Pinto	Bush	81.8	59.2	1242
UI 114	Pinto	Vining	78.3	57.2	1428
UI 111	Pinto	Vining	71.5	57.5	1428
Wyo. 166	Pinto	Vining	72.5	57.3	1506
59S	Gr. North**	Prostrate Vine	73.5	59.0	1482
Valley	Gr. North	Prostrate Vine	68.5	58.8	1602
Star	Gr. North	Prostrate Vine	79.8	59.6	1890

\* Light Red Kidney

\*\* Great Northern



DATE PLANTING OF VARIOUS CROPS  
Northeast Research Station, 1982  
Q. Kingsley and L. Evjen

TITLE: Date planting of small grain and oil crops.

OBJECTIVES:

1. Do dates of planting have any effect on yielding ability, percent protein and test weight?
2. Do weeds become a problem?

DISCUSSION:

The Date Planting study was started May 3rd in 1982. This is about 30 days later than in 1981. Soil conditions and the weather were not right to initiate this study sooner.

Weed control and the planting of sunflowers on sunflower ground were the biggest problems in 1982.

The first plantings of small grain May 3rd, Table 3, emerged about the same time as the second planting May 10th. Yield differences in 1982 favored the second planting, when compared to all dates. From this date on through the June 16th planting, the yields decreased as did test weights.

Tillage was performed prior to each planting date, but grassy weeds and wild oats would take over the crops. Three plantings of flax, two of durum and one of spring wheat were lost to the weed problem.

Sunflowers, Table 4, were definitely affected by being planted on 1981 sunflower ground. Downy mildew and sunflower stem bores raised havoc with the plantings through June 2nd. The plantings from then on were on ground not previously in sunflowers.

Percent oil, percent moisture, test weight and yield varied with planting date and row spacing. In this year, the 7 inch row space produced slightly better yields. Percent moisture increased with later plantings on both row spacings.

The 7 inch row space will be discontinued in 1983 and possibly 3 varieties added, with one being a dwarf variety.

RESULTS:

Table 3. Date Planting of Spring Crops, Yield in Bushels per Acre. Northeast Research Station, 1982.

Variety	Date Planted	Date Harvested	% Protein	Test Weight	Yield Bu/A
Morex Barley	5/3	8/3	12.9	49.0	44.6
	5/10	8/6	13.1	48.5	58.2
	5/18	8/16	13.7	49.2	42.4
	6/2	8/20	14.7	45.0	37.8
	6/10	8/20	15.6	38.4	29.0
	6/16	8/23	18.3	34.0	11.8
Lancer Oats	5/3	8/3	16.4	39.5	48.1
	5/10	8/6	18.6	40.2	53.1
	5/18	8/16	18.9	37.8	46.3
	6/2	8/20	16.5	33.8	43.0
	6/10	8/20	14.6	29.5	38.5
	6/16	8/23	14.6	24.5	21.2
James Wheat	5/3	8/4	--	58.8	29.4
	5/10	8/6	14.9	56.1	41.6
	5/18	8/16	15.5	55.5	33.4
	6/2	8/20	15.9	55.3	27.3
	6/10	8/23	16.4	51.9	11.7
Vic Durum	5/3	8/6	14.8	60.2	20.5
	5/10	8/6	13.2	57.2	40.4
	5/18	8/20	14.8	59.5	22.8
	6/2	8/23	15.9	55.0	16.3
Culbert 79 Flax	5/3	8/16	--	49.0	7.7
	5/10	8/23	--	50.0	4.1
	5/18	8/23	--	50.5	5.4

NOTE: Centa hard red spring wheat and Flor flax will replace the varieties shown in Table 3 in 1983.

RESULTS:

Table 4. Date Planting and Row Spacing of Sunflowers for Grain Yield, Oil Percent and Other Observations.

Entry	Planting Date	Row Space inches	% Oil 10% Moisture	% Moisture	Test Wt. lbs/bu	Yield lbs/A
IS 3100	5/3	7	40.8	6	31.2	370
		35	40.2	6	32.1	307
IS 3100	5/10	7	41.1	4	31.3	225
		35	38.1	3	30.6	211
PAG 101	5/18	7	40.6	5	33.0	289
		35	38.8	3	30.9	270
PAG 102		7	40.7	3	32.2	168
		35	42.4	4	33.3	145
PAG 101	6/2	7	41.1	3	33.5	556
		35	39.9	5	32.4	575
PAG 102		7	42.8	5	33.1	532
		35	41.5	7	33.1	479
PAG 101	6/10	7	39.6	5	29.2	965
		35	40.7	6	29.6	762
PAG 102		7	41.1	11	30.0	1015
		35	39.5	9	29.6	903
PAG 101	6/16	7	40.0	16	24.7	1190
		35	39.4	16	27.6	1037
PAG 102		7	38.5	10	29.2	1169
		35	38.5	18	26.9	1002
PAG 101	6/23	7	39.2	17	29.2	1853
		35	36.7	24	25.2	1494
PAG 102		7	36.9	18	27.2	1360
		35	38.8	23	26.5	1072
PAG 101	6/30	7	37.7	36	22.2	969
		35	32.1	37	21.4	823
PAG 102		7	34.4	37	21.4	1028
		35	33.8	35	21.6	924
PAG 101	7/7	7	36.7	57	-	669
		35	32.5	56	-	591
PAG 102		7	33.2	62	-	444
		35	33.2	59	-	402

## 1982 South Dakota Hybrid Sunflower Trial

Charles Lay and Kathleen Grady  
Plant Science Department  
South Dakota State University

Growing conditions were excellent throughout the season at all test sites as indicated by the rather high seed yields. Moisture at planting was good, resulting in good stands for all hybrids except Sigco 488. Stands of Sigco 488 were less than the other hybrids. However, they were uniform, so the data were included in the results. Rabbits caused some stand reductions at Redfield, therefore data are reported for only those hybrids having uniform stands. Ipswich was not planted and Miller was hailed out on June 21. A new test site south of Wessington was selected as a replacement to Miller.

Plots at all locations were 50 ft. long and consisted of 4 rows spaced 30 inches apart. Experimental design was a Randomized Complete Block with 3 replications. The area harvested for yield was approximately 100 ft.<sup>2</sup> from the two center rows of each plot. All seed yields are expressed at moisture levels below 10%. Plant height was determined at harvest by measuring from ground level to center of the head. Flowering at Brookings was recorded when the outer ring of florets were in anthesis on 50% of the heads in a plot. Lodging was not a factor at any location. Oil content was determined using a Newport NMR. Oil determinations were made on oven-dry samples and converted to 10% moisture.

Rust was observed at Redfield and Wessington. Data on rust were taken at Redfield. Seed weevils were controlled at all locations except Wessington where control was not necessary.

**Table 5. General soil-types of the test sites.**

<u>Location</u>	<u>Soil Type</u>
Brookings	Vienna loam, gently sloping
South Shore (9 mi. west)	Brookings, Kranzburg, Vienna Association
Redfield	Beotia
Wessington	Stickney-Jerauld silt loams

**Table 6. Seeding and harvest dates for the 1982 South Dakota hybrid sunflower trial.**

<u>Location</u>	<u>Seeded</u>	<u>Harvest</u>	<u>Plant population at harvest (x 1000)</u>
Brookings	June 3	Sept. 24	17 - 18.5
South Shore (9 mi. west)	June 10	Oct. 1	17 - 18.5
Redfield	June 11	Oct. 6	15 - 16.5
Wessington	June 23	Oct. 5	17 - 18.5



Table 7. Hybrid identification and test sites for 1982 South Dakota Hybrid Sunflower trial.

Hybrid Identification	Location			
	Brookings	South Shore	Redfield	Wessington
Hybrid 894 ck	x	x	x	x
Hybrid 903 ck	x	x		x
89-A x 124-B x RHA 274	x	x	x	x
224-A x 290-8 x RHA 296	x	x		x
Agway Royal Hybrid 2121	x			
Agway Royal Hybrid 2141	x			
Arrowhead 747	x	x	x	x
Cal West 54k	x	x	x	x
Cal West 64P	x	x		x
Cal West 67P	x	x	x	x
Cargill 205	x	x	x	x
Cargill 206	x	x		x
Cargill 207	x	x	x	x
Dahlgren DO 705	x	x	x	x
Dekalb DKS-37	x	x	x	x
Dekalb 2049	x	x	x	x
Dekalb 2011	x	x		x
Dekalb 2013	x	x		x
Dekalb 2214	x	x	x	x
Gro Agri Exp. 93	x	x		x
Gro Agri 378	x	x		x
Gro Agri 380-A	x	x	x	x
Gro Agri 382	x	x	x	x
Imperial 673	x	x		x
Imperial EXSD-1	x	x		x
Interstate 897		x	x	x
Interstate 7775-S	x	x	x	x
Interstate 7111			x	x
Interstate 7116	x	x		x
Interstate 3107	x			
Jacques J 311	x	x	x	x
Jacques J 503	x	x		x
Keltgen DO 704 XL	x	x	x	x
Keltgen Exp 151	x	x		x
Northrup King 246	x	x	x	x
Northrup King 254	x	x	x	x
Northrup King 265	x	x	x	x
Northrup King 275	x	x	x	x
O's Gold 614	x	x	x	x
PAG SF 101	x	x		x
PAG SF 102	x	x		x
Pride 2011			x	
Seedtec 307		x	x	
Seedtec 315	x	x	x	x
Seedtec 316	x	x	x	x
Sexauer S-304A	x	x		x
Sexauer S-305A	x	x	x	x
Sexauer 811	x	x	x	x

Miscellaneous Crops  
Northeast Research Station 1982

Q. Kingsley and L. Evjen

FODDER BEETS

A fodder beet is a cross between sugar beets and mangels. The purpose of this crop was for livestock feed originally. It is fairly high in sugar content and is hoped to fit into the alcohol production because of the high tonnage produced per acre. The tops are used for forage and the pulp of the root is fed wet to cattle.

The beets were planted May 18 and dug October 27th. Yields of tops oven dried were 3.9 tons per acre and the roots yielded 26.3 tons per acre wet. Alcohol production from a ton of wet fodder beets was 18-20 gallon. Variety used was a monogerm named Monrosa.

POTATOES

This was to be a fertilizer variable study, but a previous weed control study had Tordon treatments in it. These treatments confounded the potato yield results and are not reported by fertility variables. An overall average yield was taken which figured out to be 16,930 pounds acre. Norchip was the variety used and it was planted May 11th at 1200 pounds per acre.

SWEET SORGHUM

This study was set up to find out how much alcohol could be produced from a ton of green chopped or dry material.

For a ton of sweet sorghum at 70% moisture, 11.6 gallons of alcohol was produced. When the material was dried, 38.6 gallons of alcohol was produced. The drying of the sorghum had little effect on the sugar content.

This study was conducted on both Research Stations at Watertown and Highmore and the results refer to both places.

Table 23. Forage Study, Cut for Silage 1982, Northeast Research Station, Watertown, SD.

Entry	Type	Dry Yield ton/A	Water Grouping**	Percent Protein	Plant Height inches
Pioneer 931	GxS	14.6	A	8.8	92
NK Silo Milo 2	OP	11.5	B	9.6	67
NK NK367	FL	10.5	C B	8.5	84
NK 326	F	10.3	C B D	8.6	79
Western WS 58	F	10.0	C B D	10.0	65
Cargill 250S	F	9.7	C E B D	8.8	75
Pioneer 988	GxS	9.6	F C E B D	7.9	83
Pioneer 947	GxF	8.7	F C E G D	9.2	72
Cenex H1 Green 2	FxS	8.6	F C E G D	9.1	70
Funks G-1990	FL	8.5	F C E G D H	6.8	63
Cenex Sweet Suso	SxS	8.4	F I E G O H	7.1	82
Western WS 15	FxS	8.3	F I E G J D H	8.3	86
NK Sordan 79	GxS	7.7	F I E G J K H	7.6	85
Disco 3530	FxS	7.7	F I E G J K H	9.0	76
Pioneer 956	GxF	7.6	F I L G J K H	8.3	72
NK NK300	OP	7.4	M I L G J K H	9.1	62
Dekalb FS-4	GxF	7.4	M I L G J K H	7.8	76
Cenex 700T	GxF	7.3	M I L G J K H	9.1	66
Dekalb ST-6+	GxS	7.2	M I L G J K H	9.8	83
Dekalb FS-1a+	DP	7.1	M I L G J K H	8.8	63
Dekalb FS-25a+	FL	7.0	M I L G J K H	9.9	60
Western WS 60	F	7.0	M I L G J K H	8.1	80
Funks G-98	FL	6.9	M I L G J K H	8.6	75
Cargill 200F	F	6.8	M I L G J K H	9.6	73
NK SucroSorgo	GxF	6.7	M I L G J K H	6.1	85
Cenex Hiland Sweet	F	6.5	M I L N J K H	8.9	80
Cargill SS 100	GxS	6.4	M I L N J K	8.9	83
Disco Wintergraze	SuxSo	6.3	M L N J K	8.6	79
Funks 83F	GxS	6.3	M L N J K	8.1	78
Texas Triumph	GxF	6.2	M L N K	9.8	64
Bet-R-Sile					
Texas Triumph	FxS	5.6	M L N	7.4	79
Sooner Sweet					
Western WS 20	FxS	5.4	M NO	8.8	72
Texas Triumph	GxS	5.3	NO	8.9	77
Sweet D Two					
Funks HW 5111	GxS	3.5	P O	8.3	73
Cenex 74A	S	2.8	P Q	8.4	78
NK Trudan 8	S	1.3	Q	7.6	77

\* Type: S - Sudan; DP - Dual Purpose; FL - Forage Leafy; F - Forage; FxS - Forage x Sudan; GxF - Grain x forage; GxS - Grain x Sudan; SxS - Sorgho x Sorgho; SuxSo - Sumac x Sorgho.

\*\* Means with the same letter are not significantly different.

#### DISCUSSION:

The sudan and forage type sorghums were planted June 3 and cut September 16th. Rainfall during the crop growing season was 8.7 inches. All yields are reported on an oven dry basis in Table 22.

To determine tons of hay, haylage or silage, use the formula from Table 20.

Table 22. Dry Matter Production of Millets, Tons of Dry Matter\* (DM) Per Acre, Foxtail and Proso Types.

Entry	Plant Height inches	Dry Yield tons/A*	% Protein	Grain Yield lbs/A
Manta Foxtail	32	3.2	11.4	2320
Sno Fox Foxtail	32	3.2	10.6	1865
WS-Mil Hy 100 Foxtail	54	3.2	13.3	
RMP Foxtail	52	1.6	12.8	
Serere 3A Foxtail	50	3.5	12.1	
German Strain Foxtail	48	3.6	14.0	
Cerise Proso	36	2.2	12.9	
Minsum Proso	37	2.5	11.6	
Average	42.6	2.9	12.3	

\* All yields are reported on an oven-dry basis.

#### DISCUSSION:

This study was planted June 2 but due to poor emergence was replanted July 1. The Manta and Sno Fox had satisfactory stands and were left standing. These foxtail millets were harvested for forage and seed yield August 5th.

The proso varieties, Cerise and Minsum were not harvested for grain yields due to a wind storm which twisted and downed these crops. Forage yields were taken from them and all other varieties August 30th. Yields and other data are presented in Table 22.



RESULTS:

Table 21. Small Grain Haylage, Tons of Dry Matter\* (DM) Per Acre at Stages of Maturity. Second Planting May 19, 1982.

Variety and Maturity	Yield in tons per acre							
	11/1k	% Protein	Dough	% Protein	Late Dough	% Protein	Ripe	% Protein
Nodaway 70 Early	7/16** 1.51	12.1	7/25 1.82	11.6	7/27 1.82	13.1	8/3 2.12	12.8
Burnett Medium	7/16** 1.27	12.5	7/29 1.69	12.2	7/29 1.82	14.1	8/9 2.90	13.5
Lancer Medium	7/16** 1.33	11.4	7/27 1.88	11.3	7/29 1.69	11.3	8/9 2.42	12.6
Benson Medium L.	7/19** 1.57	12.6	7/27 2.12	12.7	7/29 2.36	12.8	8/9 2.78	12.3
Average	1.42		1.88		1.92		2.56	

Triticales, cut in late dough stage 7/29, tons/A 2.64, protein 11.9%.

\* Refer to Table 20 to determine yield at various stages.

\*\* Harvest date: Listed above under column heading.

DISCUSSION:

Four oats varieties of various degrees of maturity were used for this study. Triticales was added in 1982 to study the time to harvest the crop for forage yield. When the plant is in the dough or late dough stage, most of the leaves have dropped off leaving but stems and a few leaves plus the head to harvest. It is the opinion of this observer that the crop be harvested when the plant is covered with leaves. The stage of seed maturity is not the proper criteria for triticales.

Haylage production and percent protein for the four oat varieties varied with maturity as may be noted in Tables 20 and 21. There were two dates of planting, May 4 and May 19.



HAY HAYLAGE AND SILAGE PRODUCTION  
Northeast Research Station 1982

Q. Kingsley and L. Evjen

**TITLE:** Dry Matter Production for Small Grains, Millet and Forage Sorghum.

**OBJECTIVES OF EXPERIMENT:**

1. Compare various crops for dry matter production.
2. Obtain regrowth data after first harvest for green chop or haylage when possible.

**RESULTS:**

**Table 20. Small Grain Haylage, Tons of Dry Matter\* (DM) Per Acre at Stages of Maturity. First Planting May 4, 1982.**

Variety and Maturity	Yield in tons per acre							
	Milk	1 Protein	Dough	2 Protein	Late Dough	3 Protein	Ripe	4 Protein
Nodaway 70 Early	7/9** 1.88	12.8	7/16 1.88	12.8	7/20 2.00	10.4	7/27 1.75	9.6
Burnett Medium	7/12** 1.39	12.7	7/19 1.88	11.8	7/27 2.30	11.2	7/29 2.11	13.3
Lancer Medium	7/12** 1.39	11.0	7/19 1.75	10.9	7/27 2.30	10.6	7/29 2.18	12.0
Benson Medium L.	7/12** 1.39	11.7	7/20 2.00	11.1	7/27 2.24	11.3	7/29 2.12	12.2
Average	1.51		1.88		2.21		2.04	

Triticale, cut in dough stage 7/27, tons/A 1.94, protein 11.9%.

Hay (88% DM); Haylage (50% DM); Silage (33% DM)

\* To determine yields of hay, haylage or silage: Divide tons of DM by percent DM in hay, haylage or silage. Example: (DM average for dough of 1.88 if divided by 0.88 equals 2.13 tons of 12% moisture hay, etc.).

\*\* Harvest date: Listed above under column heading.

Sunflower Seed Weevil Date of Planting Study  
Northeast Research Station 1982

D. D. Walgenbach, J. V. Gednalske and T. J. Heilman

Sunflower seed weevils are the number one pest of cultivated sunflowers in South Dakota. 1981 studies indicated that early planted sunflowers may escape major infestations. This is due to the bloom period occurring before the majority of adult seed weevils emerged from the soil.

To test this theory, a date of planting study was initiated at the N. E. Station and other locations in 1982.

Two hybrids were planted on three dates. The hybrids, Sigco 432 and 894 were planted in four row plots, 100 ft. long and replicated six times. Plots were planted on April 28, May 15 and June 1.

Effectiveness of each planting was determined by calculating the percent of seed infested by seed weevils from seed samples taken from the combine at harvest and from head samples taken prior to harvest. Yield and oil content data was also obtained. No other insects had a significant effect on plantings in 1982.

The following Table 19 summarizes the results. It indicates that by planting an early maturing hybrid or by planting around May 1 weevil infestations can be limited.

Table 19. Date of Planting Study, Watertown, S.D. 1982.

Hybrid	Planted	Yield lbs/acre	Mean % of Seed Infested*		% Oil
			Combine	Head	
Sigco 432	April 28	1254	0.7 e	3.4	34.5
	May 15	993	13.8 c	19.8	32.8
	June 1	1056	18.0 b	28.6	34.6
Sigco 894	April 28	1084	5.0 d	7.5	37.5
	May 15	1018	16.9 bc	21.3	37.2
	June 1	1244	37.4 a	40.9	38.8

Area fields at peak infestations 20-25 seed weevils per head.

\* Values within the same columns followed by the same letter are not significantly different at the .05 level by Waller-Duncan K-Ratio T Test.

Table 18. Insecticide Treatment Effects at Watertown....

Variety: Sigco 894A      Planted: 5/21/82      Replications: 5 Plot Size: 2 Rows x 80 Feet								
Treatment	Rate	Placement	Yield (lbs/A)	Stalk-Rot Rating	% of Stalks Infested by Species			
					Apion	Cylindrocopterus	Dectes	Hordelliscena
Furadan 15G	1.5 lb	Cultivation	1036 a	0.88*	84*	32*	16	18
Counter 15G	1.0 lb	Furrow	1033 a	1.40	94	58	26	26
Counter 15G	1.5 lb	Subseed	1031 a	1.60	98	72	14*	18
Furadan 15G	2.0 lb	Subseed	1022 a	0.98*	84*	48*	24	18
Counter 15G	1.0 lb	Cultivation	1015 a	1.30	96	58	16	28
Counter 15G	2.0 lb	Band	1015 a	1.40	94	68	14*	16
Counter 15G	1.5 lb	Furrow	1013 a	1.30	100	58	8*	18
Furadan 15G	1.5 lb	Furrow	996 a	1.44	92	62	30	22
Furadan 15G	2.0 lb	Furrow	995 a	0.98*	94	48*	18	22
Counter 15G	2.0 lb	Cultivation	991 a	0.98*	94	50	10*	6*
Furadan 15G	1.0 lb	Furrow	991 a	1.14	92	62	16	32
Counter 15G	2.0 lb	Subseed	964 ab	1.12	96	58	18	12*
Counter 15G	2.0 lb	Furrow	957 ab	1.00*	86	46*	2*	6*
Furadan 15G	1.5 lb	Subseed	946 ab	0.96*	92	48*	22	28
Furadan 15G	1.0 lb	Cultivation	929 ab	1.16	86	60	26	20
Untreated			922 ab	1.54	98	72	32	30
Furadan 15G	2.0 lb	Cultivation	918 ab	0.90*	84*	34*	18	8*
Counter 15G	1.0 lb	Subseed	909 ab	1.20	96	62	14*	38
Furadan 15G	1.0 lb	Subseed	908 ab	1.42	90	66	34	24
Counter 15G	1.5 lb	Cultivation	770 b	1.46	94	72	26	20

\*Means followed by an asterisk were significantly different from the untreated mean in the same column of the table at the .10 probability level.

Means in a column superscribed by the same letter are not significantly different at the .10 probability level using Duncan's Multiple Range Test.



## Chemical Control of Stalk-Boring Insects in Sunflowers

Dr. David Walgenbach, Terril Heilman, and Joe Gednalske

During the 1982 growing season, field surveys indicated that stalk-boring insects and associated stalk-rot diseases caused significant lodging of sunflowers after ray-petal drop. Affected areas appeared to be concentrated in the traditional growing areas between Highway 14 and the North Dakota border and west of a line from DeSmet to Britton, South Dakota. All of the following species were found: two stem weevils, Apion occidentale and Cylindrocopterus adspersus; one long-horned beetle, Dectes texanus; and one tumbling flower beetle, Mordellistena sp.

In 1981 field test plots, applications of Furadan 10G and Counter 15G at planting time and at first cultivation significantly reduced the percent of stems infested by C. adspersus and D. texanus. The same treatments also significantly reduced the severity of stalk-rots. However, no evidence of yield differences were found at the one location where yield data was taken.

In 1982, field test plots were treated with Furadan 15G and Counter 15G at planting and at first cultivation. Field tests were planted at Watertown, Hayti, Redfield, and Ipswich. All tests included treatments of Furadan and Counter at rates of 1, 1½, and 2 lbs. per acre in each of three placements: (1) seed furrow, (2) subseed, and (3) cultivation. A band placement of Counter at 2 lbs. was also included. Weed control at each location included 1½ pints of Treflan and 3 quarts of amiben pre-plant incorporated (except Ipswich where Roundup had been applied in late fall and again one month before planting). Cultivations were made at the time plants averaged 9 inches and again at 18 inches.

The effect of treatments was determined by hand-splitting of ten stems randomly selected from each replication at a location or test. The species of insects and severity of stalk-rots present were recorded for each stem. Ratings of stalk-rot severity were as follows: 0 for stems with no infection, 1 for stems with a light infection in the pith only, 2 for stems with a complete infection throughout the pith in at least one area of the stem, and 3 for stems with a complete destruction of the pith and partial destruction of the vascular tissue in one or more areas. All stems were split after ray-petal drop and before the heads and stems turned brown.

Field plots were harvested for yield data at Watertown and Redfield, where sufficient insect populations and stalk-rots were believed to cause yield reductions.

Yields were poor due to a combination of factors, including drought stress and lodging. Although significant differences were found between chemical treatments in yield, it was impossible to determine if insects and/or stalkrot control was associated with these differences. However, it is worth noting that some control of stalkrots and insects was obtained, particularly with subseed and cultivation placements of both Counter and Furadan. More research is needed to determine what rates and chemicals will improve yield.

The following Table 18 summarizes the results from 1982 chemical treatment tests.

Rainfall Studies in Sunflowers  
Northeast Research Station, Watertown, SD 1982

M. Anderson and W. E. Arnold

OBJECTIVE:

Rainfall studies from 1981 were duplicated in 1982 with potential postemergence herbicides in sunflowers. The purpose of these studies was to evaluate the amount and timing of rainfall and its effect on weed control.

EXPERIMENTAL PLAN:

1. A washoff experiment looking at the amount of immediate rainfall necessary to reduce weed control.
2. An experiment consisting of various time intervals between chemical application and simulated rainfall.

METHODS:

Sokota 4000 sunflowers were planted in 36" rows with 4 replications. A commercial mixture containing half Betanal and half Betanex was the postemergent herbicide tested for broadleaf weed control. Weeds present were redroot pigweed and wild mustard. For the amount study, various amounts (0, 0.01, 0.10, 0.20, 0.50 inch) of rainfall were applied immediately after the herbicides were applied. For the time study, a simulated rainfall of 0.5 inch was applied to plots sprayed with herbicide 0, 1/2, 1, 4, 8, 16, and 32 hours prior to the rain.

DISCUSSION:

In the amount of rainfall study, 0.10 inch or more of immediate rainfall washed the herbicide off the weeds and reduced weed control to minimum levels. The 0.01 inch of rain had little effect on weed control performance as did the 0 amount of rainfall treatment. These results agreed with those obtained in 1981.

In the time of rainfall after herbicide application experiment, weed control increased with the increasing time intervals. The maximum control was attained with the 16 hour period between chemical application and rainfall, indicating a time period of 8 to 16 hours needed for optimum weed control. Results from 1981 concluded that a no rainfall period of more than 8 hours was needed. This year's data was comparable with a no rainfall period of more than 8 hours and less than 16 hours exhibiting the maximum control.

In general, the rates tested in these experiments gave excellent control of wild mustard but poor control of redroot pigweed. With the use of these experimental herbicides for postemergence broadleaf weed control in sunflowers, time of early rainfall and amount of rainfall received had definite effects on weed control performance.



Northeast Research Station  
Small Grain Variety Characteristics - 1982  
Q. Kingsley and L. Evjen

Table 17. Small Grain Characteristics and Protein Tests.

Variety	Maturity	General Height	Protein
<b>Barley</b>			
Primus II	VE	M	12.94
Glenn	M	M	14.31
Larker	M	M	14.38
Morex	M	M	14.31
Azure	ML	M	12.94
Bumper	ML	M	12.69
<b>Oats</b>			
Lang	E	S	14.81
Nodaway 70	E	M	14.38
Preston	E	M	15.50
Otee	ME	S	15.88
Chief	ME	M	15.50
Noble	ME	S	14.81
Ogle	ME	S	13.94
Burnett	M	M	14.50
Lanser	M	M	15.94
Benson	ML	M	15.50
Wright	ML	M	15.25
Dal	L	S	13.75
Marathon	L	T	13.69
Moore	L	M	14.06
Portal	L	S	12.44
<b>Spring Wheat</b>			
Butte	E	M	16.38
Centa	E	M	14.88
James	ME	M	16.63
Pondera	ME	MS	16.30
906R	ME	S	16.36
Oslo	ME	S	15.39
711	ME	S	16.07
Eureka	M	MT	16.01
Aim	ML	S	15.62
Alex	ML	T	15.56
Len	ML	MS	16.87
Lew	ML	MT	16.87
Olaf	ML	MS	16.87
Era	L	S	14.93
715	L	M	16.25
Marshall	L	MS	15.05
Solar	L	MS	13.79
<b>Durum</b>			
Edmore	M	T	16.36
Rugby	M	T	13.91
Vic	M	T	15.96

Table 16. 1982 Small Grain Variety Trials, Northeast Research Farm, Watertown, SD.

Entry	Yields, B/A				Test Wt. lb/8u	Height, inches
	1980	1981	1982	3-yr		
SPRING WHEAT						
Angus	54.3	34.8	41.4	43.5	61	30
Alex	53.4	35.0	36.8	41.7	60	34
Pioneer Brand PR 2369			36.7		59	29
Centa	55.0	36.9	35.7	42.5	61	36
Len	47.7	36.4	35.5	39.9	58	31
906R	48.3	32.9	35.4	38.9	57	29
Oslo	51.4	36.3	35.4	41.0	55	30
Aim	54.5	34.2	35.3	41.3	58	29
Walera		38.4	34.0		55	27
Coteau	53.1	24.4	33.9	37.1	60	33
Probrand 715		38.0	33.3		55	28
Era	52.8	39.1	33.2	41.7	56	28
Olaf	51.2	35.8	33.1	40.0	58	32
Solar	52.3	39.4	32.9	41.5	55	26
Butte	56.9	39.6	32.9	43.1	61	35
Pioneer Brand PR 2360			32.1		58	28
Eureka	50.8	34.8	31.9	39.2	57	37
Lew	45.9	37.2	31.1	38.1	58	33
Marshall	57.2	32.4	30.8	40.1	54	27
Pondera	51.3	40.0	30.8	40.7	59	30
James	53.6	35.8	30.6	40.0	57	33
Probrand 711	46.0	31.6	28.8	35.5	56	30
Chris	43.6	32.8	28.7	35.0	59	36
Means			34.1		58	31
LSD (.05)			3.2		CV - % = 6.8	
DURUM						
0771			39.6		59	26
Ward	64.1	30.4	39.2	44.6	62	36
Vic	62.0	34.2	39.1	45.1	61	34
Edmore	64.0	29.6	38.3	44.0	61	36
Crosby	64.6	29.9	37.8	44.1	61	36
Rugby	57.1	29.7	37.5	41.4	61	35
Cando	54.8	35.0	36.6	42.1	60	24
Means			38.3		61	32
LSD (.05)			3.3		CV - % = 6.1	

Small Grain Variety Trials 1982  
J. Bonnemann

Table 15. 1982 Small Grain Variety Trials, Northeast Research Farm, Watertown, SD.

Entry	Yields, B/A				Test Wt. lb/bu	Height, inches
	1980	1981	1982	3-yr		
OATS						
Otana	113.4	--	96.5		37	34
Lang	105.2	56.2	90.1	83.8	35	32
Ogle	107.8	55.3	89.8	84.3	35	32
Burnett	105.5	56.3	89.8	83.9	39	36
Marathon	119.9	--	86.6		35	38
Lancer	114.0	62.8	86.2	87.7	37	33
Larry	104.8	54.0	85.4	81.4	36	31
Porter			82.4		36	30
Moore	120.7	62.4	81.6	88.2	38	34
Arrowhead 335M Blend			81.2		39	34
Lyon	108.9	--	80.3		36	36
Chief	110.5	52.6	79.9	81.0	37	35
Arrowhead 135E Blend			79.8		39	36
Wright	103.5	54.1	79.3	79.0	39	36
Bates	102.3	51.0	79.2	77.5	37	34
Nodaway 70	97.9	52.3	79.1	76.4	40	37
Benson	117.2	62.0	78.8	86.0	38	34
Preston			71.6		38	35
Dal	104.3	60.0	69.6	78.0	38	33
Noble	107.9	53.6	69.1	76.9	38	32
Otee	89.2	45.5	66.4	67.0	37	32
Means			80.7		37	34
LSD (.05)			8.8		CV - % = 6.7	
BARLEY						
Azure			61.5		49	33
M-36			57.2		48	32
Clark		46.1	56.9		49	28
Bumper		45.7	56.7		47	32
Larker	74.8	46.5	52.6	58.0	47	34
Klages	76.4	38.3	47.8	54.2	50	29
Firlbecks III	77.0	39.9	46.6	54.5	50	30
Primus II	76.3	38.6	45.3	53.4	47	33
Glenn	94.4	43.6	45.0	61.0	44	32
Morex	80.2	52.0	43.1	58.4	45	34
Means			51.3		48	32
LSD (.05)			5.3		CV - % = 7.2	

Table 14: Spring Wheat Advanced Yield Trial. 1982. Watertown.

Entry No.	Variety	Pedigree	Grain Yield	Test Weight	Maturity	Height inches
			Bu/A 1982	lbs/bu	Days to Heading	
1	Butte		47.3	60	59	30
2	Eureka		38.5	55	61	32
3	Olaf		36.8		61	26
4	Len		42.2	56	62	26
5	Era		38.5	58	63	23
6	Centa		44.2	58	59	30
7	James		43.5	57	59	29
8	Alex		46.2		61	30
9	Oslo		44.2		60	27
10	Marshall		40.3		63	23
11	Pro 711		39.9		62	27
12	Pro 715		33.9		63	26
13	Pondera		41.0		60	26
14	Verry-4		32.4			20
15	SD 2854	James/SD 2049	46.2	57	59	29
16	SD 2861	Eureka/Prodax	44.6	58	59	25
17	SD 2881	Protor/RL 6010	43.9	60	59	30
18	SD 2903	SXW Composite	46.4		59	30
19	SD 2911	Prt/RL 6010//Marshall	41.4	60	62	26
20	SD 2912	Prt/RL 6010//Marshall	48.5	59	59	29
21	SD 2922	Mn 69124/3/LV//Era/Tob	37.3		63	25
22	SD 2925	Butte/James	46.0	56	59	26
23	SD 2926	ND 528/1117/IAS 20/3/Butte	40.4		60	30
24	SD 2935	Agt/3/ND 411/Wld/88	41.3		62	25
25	SD 2937	Hand/2*1809//On/Tob//Tpr	47.0	61	59	31
26	SD 8025	Coteau/Dawn	48.6	59	59	30
27	SD 8021	James/Dawn	43.9		59	31
28	SD 8015	Eureka/Dawn	45.2	59	60	27
29	SD 8036	Butte*2/Arthur 71	51.6	60	59	31
30	SD 8038	Pro 711//EE/Parker	41.1		63	31
31	SD 8039	Pro 711/Butte/Art	44.5	59	62	26
32	SD 2940	SD 2854-42 James/2049	47.4	60	59	30
33	SD 2941	SD 2861-4 EE/PRD	41.9		60	25
34	SD 2942	SD 2835-6 Butte/EE	48.8	60	59	32
35	SD 2943	SD 2837-2 Butte/EE	46.7	59	59	30
36	SD 2944	WS 25/Butte	37.1		62	26
37	SD 2945	WS 28/James	42.3	59	59	28
38	SD 2946	Butte/SD 2271//Mn 70181	44.7	58	59	27
39	SD 2947	Glenlee/Butte	41.8		59	31
40	SD 2948	Prt/RL6010//James	44.8	61	61	29
41	SD 2949	PTM 70/SD 75409//Marshall	43.5	58	62	25
42	SD 2950	WS 1809//Butte/SD 74219	41.5		59	29
43	SD 2951	SD 2837/5/Bgs*2/. . .	45.9	60	59	29
44	SD 2952	Prt/RL 6010//Marshall	43.9	61	62	26
45	SD 2953	SD 2911-Selection	42.4	59	62	28
46	SD 2954	SD 2863/Olaf	43.1		62	31
47	SD 2955	SD 21671/Mn 70181//SD 2853	45.2	56	59	29
48	SD 2956	Butte/Co 53427//WS 1809	47.2	60	60	26
49	Mn 73168	Crim/Era 2*//Bai-Gallo	41.6		62	23
Mean			43.2			
CV			5.0			
LSD .05			3.7			



Spring Wheat Breeding Program  
Northeast Research Station

F. Cholick and K. Sellers

The performance of the spring wheat advanced yield trial is presented in Table 1. This trial consists of several check varieties and the best experimental lines in the breeding program. The mean grain yield was 43.2 bu/A, which was similar to the mean yield obtained over the past four years. The LSD of 3.7 bu/A indicates that any two varieties that differ by more than 3.7 bu/A were statistically different. Named varieties with a good grain yield in 1982 were Butte, Alex, Centa, Oslo and Len. Several experimental lines also look promising; however, they will have to continue to have a good performance through time to be considered as candidates for varietal release. The experimental line SD 8015 has been tested for the past three years and has been recommended for varietal release with the proposed name Guard. This line has had a good performance record and it is resistant to Hessian fly.

In 1982 several additional trials were grown including regional nurseries (Hard Red Spring and Durum), triticale trial and seed multiplication and purification plots. The regional nurseries are made up of experimental lines which the breeders in the region consider their most promising lines.

Experiments were seeded on May 4, 1982 in adequate soil moisture resulting in good germination and stand establishment. Soil tests were taken and all experiments were fertilized for a 50 bu/A yield goal. There was little or no disease observed in the plots and harvest was completed on August 18, 1982.



**Glean Recropping Study  
Northeast Research Station, Watertown, SD 1982**

M. A. Peterson and W. E. Arnold

Split plot experiments were established at the Northeast Research Station, Watertown and the James Valley Research Farm, Redfield to examine the effects of Glean™ carryover on flax, sunflowers, corn, soybeans, and grain sorghum. In the spring of 1982, four rates of Glean (0.0, 0.015, 0.03, and 0.06 lb. active ingredient per acre) were applied postemergence to oats at the Watertown location and wheat at the Redfield location. The test crops were planted in these treated areas in 1982 and crop injury measurements taken.

Differences in the amount of carryover and consequent crop injury between the two locations appeared to be related to soil pH and organic matter, with the Watertown location having a pH of 6.4 and organic matter content of 4%, and the Redfield location having a pH of 7.5 and organic matter content of 3%.

Injury ratings for the two locations are given in the following table:

Crop (1982)	Glean Rate (1981)	Percent Crop Injury	
		Watertown	Redfield
Flax	0.0 1b/A	0	0
	0.015	0	38
	0.03	0	54
	0.06	5	72
Sunflowers	0.0	0	0
	0.015	0	21
	0.03	0	38
	0.06	8	77
Corn	0.0	0	0
	0.015	0	34
	0.03	5	59
	0.06	8	77
Soybeans	0.0	0	0
	0.015	0	37
	0.03	0	62
	0.06	0	89
Sorghum	0.0	0	0
	0.015	0	44
	0.03	0	78
	0.06	5	93

Table 13. Summary of seed yield, plant height, and oil content of 35 sunflower hybrids grown at Brookings, SD, South Shore, SD, Redfield, SD, and Wessington, SD in 1982.

Hybrid Identification	Seed Yield (Tbs/A)	Plant Height (Inches)	Oil Content (10% moisture)
Cargill 207	2644	73	37.6
Northrup King 246	2534	62	41.2
Stauffer S 3101	2439	60	34.4
Gro Agrl 382	2425	64	41.0
Hybrid 894 ck	2402	63	38.7
Northrup King 265	2374	58	40.5
Sigco 448	2332	64	41.9
Sokota 4000	2326	64	39.5
Northrup King 254	2305	66	39.2
Stauffer S 303	2297	66	39.4
Cal West 67P	2296	66	38.3
Keltgen DO 704 XL	2279	68	38.8
Arrowhead 747	2278	64	42.0
Cargill 205	226	62	40.6
Seedtec 316	2263	67	39.4
Sexauer 811	2259	66	39.0
Sokota 81-307	2249	60	37.5
Dahlgren DO 705	2242	68	39.9
Sokota 81-950	2241	65	37.7
O's Gold 614	2239	65	39.3
Dekalb 2214	2238	64	38.7
TNT 534	2223	63	41.1
Gro Agrl 380-A	2205	66	41.9
Stauffer S 1888	2196	60	39.5
Dekalb DKS-37	2195	64	39.6
Dekalb 2049	2182	64	37.7
Seedtec 315	2170	72	37.0
Northrup King 275	2168	68	37.4
Sheyenne Golden Glo	2157	68	37.4
Jacques J 311	2151	66	38.6
89-A x 124-8 x RHA 274 ck	2131	71	37.9
Sexauer S-305A	2126	62	39.1
Cal West 54k	2103	63	38.3
Interstate 7775-S	2083	68	38.1
Sokota 2057	2045	66	38.2
Test Average	2259	65	39.0
LSD .05	281	5	1.6
Coefficient of Variation (%)	11	5	3

Table 12. Cont.

Hybrid Identification	Seed Yield (lbs/A)	Plant Height (inches)	Oil Content (10% moisture)
Dekalb DKS-37	1890	63	39.9
Interstate 7775-S	1887	68	38.7
Jacques J 503	1887	66	38.2
Sokota 5000	1879	63	39.5
Dekalb 2213	1878	62	42.8
Cal West 54k	1844	63	38.5
Gro Agri 380-A	1841	66	42.8
89-A x 124-B x RHA 274 ck	1837	70	38.3
Hybrid 903 ck	1802	64	38.1
Interstate 7116	1783	63	40.0
Sokota 2057	1739	66	38.3
Sigco 488	1632	74	36.8
224A x 2908 x RHA 296 ck	1555	67	37.8
Test average	1966	65	39.5
LSD .05	334	5	1.9
Coefficient of Variation	13	5	3

Table 12. Summary of seed yield, plant height and oil content of 55 sunflower hybrids grown at Brookings, SD, South Shore, SD, and Wessington, SD in 1982.

Hybrid Identification	Seed Yield (Tb./A)	Plant Height (Inches)	Oil Content (10% moisture)
Cargill 207	2370	72	38.1
Stauffer S 3101	2250	61	34.9
Northrup King 246	2228	62	40.9
PAG SF 102	2215	63	39.6
Gro Agri 382	2136	63	41.6
Hybrid 894 ck	2131	63	39.1
Northrup King 254	2094	65	39.7
Cal West 67P	2065	66	38.6
Sheyenne Sundance	2061	67	38.0
Gro Agri 378	2058	64	42.2
Sokota 81-307	2054	61	37.9
Keltgen Exp 151	2046	68	38.8
Keltgen DO 704 XL	2044	69	39.1
Northrup King 265	2031	58	40.6
Sexauer S 304A	2028	64	39.3
Dekalb 2214	2024	64	38.5
Sokota 81-950	2021	65	38.0
Sigco 448	2019	64	42.3
Sokota 4000	2003	64	39.9
PAG SF 101	1997	59	41.1
Stauffer S 303	1990	66	39.8
Sokota 6000	1988	68	41.8
Seedtec 315	1982	72	37.5
Stauffer S 1888	1977	61	39.6
Sheyenne Golden Glo	1973	67	37.9
Imperial Exp SO-1	1972	55	41.2
Seedtec 316	1968	66	39.4
Sexauer 811	1966	66	39.5
O's Gold 614	1949	65	39.7
Dekalb 2049	1944	63	38.6
Cargill 205	1941	61	40.8
Arrowhead 747	1940	63	42.1
TNT 534	1933	63	41.6
Imperial 673	1930	63	41.8
Dekalb 2211	1930	64	41.9
Jacques J 311	1919	65	38.9
Northrup King 275	1919	67	38.2
Oahlgren DO 705	1918	68	39.7
Cargill 206	1915	65	40.2
Gro Agri Exp 93	1914	66	39.5
Cal West 64P	1909	67	38.3
Sexauer S-305A	1899	63	39.6



Table 11. Cont.

Hybrid Identification	Seed Yield (lbs/A)	Plant Height (inches)	Oil Content (10% moisture)
Cargill 206	1924	59	38.9
Hybrid 903 ck	1917	64	37.5
Gro Agri Exp 93	1887	62	39.1
Northrup King 275	1874	63	38.5
Gro Agri 380-A	1865	60	42.4
89-A x 124-B x RHA 274 ck	1821	70	38.8
Interstate 7116	1817	59	40.3
Sheyenne Golden Glo	1791	69	37.5
Dahlgren DO 705	1781	63	38.7
Cal West 54k	1767	60	38.4
Sokota 2057	1742	63	37.2
Sigco 488	1610	69	38.4
224A x 290B x RHA 296 ck	1314	64	35.5
Test Average	2079	62	39.5
LSD .05	488	6	2.4
Coefficient of Variation	14	6	4

Table 11. Results of the 1982 Hybrid Sunflower Trial at Wessington, SD.

Hybrid Identification	Seed Yield (lbs/A)	Plant Height (inches)	Oil Content (10% moisture)
Northrup King 246	2805	60	42.0
Gro Agri 378	2567	64	41.6
Cargill 207	2549	67	37.8
Keltgen DO 704 XL	2431	71	39.8
Northrup King 265	2388	53	40.2
Dekalb 2213	2371	58	43.1
Stauffer S 3101	2338	61	34.9
Gro Agri 382	2321	64	41.6
Hybrid 894 ck	2301	58	38.9
Sexauer S 304-A	2294	63	39.0
Dekalb 2211	2293	59	42.0
Sokota 6000	2278	67	42.1
PAG SF 101	2277	53	40.8
Sheyenne Sundance	2215	65	37.7
Interstate 897	2213	62	39.0
Stauffer S 303	2171	65	40.5
Imperial 673	2167	63	42.1
Sokota 81-307	2166	57	39.2
Seedtec 316	2133	64	38.8
Sokota 81-950	2108	61	37.4
TNT 534	2107	58	42.1
Jacques J 311	2097	64	39.5
Dekalb DXS-37	2095	63	40.7
Cal West 67P	2094	61	39.2
Sexauer S-305A	2092	58	39.3
Interstate 7111	2091	64	41.5
Dekalb 2049	2087	60	39.5
Sigco 448	2079	58	41.4
Jacques J 503	2075	66	38.7
Northrup King 254	2063	62	39.1
Cal West 64P	2054	66	38.5
Imperial Ex SD-1	2052	53	41.5
Dekalb 2214	2051	59	34.5
Seedtec 315	2050	70	37.8
Sexauer 811	2044	61	39.1
PAG SF 102	2023	62	38.5
Arrowhead 747	2016	57	41.8
Sokota 4000	2014	63	40.1
Keltgen Exp 151	2003	64	39.8
Interstate 775-S	1990	67	39.7
Sokota 5000	1977	63	39.8
O's Gold 614	1960	62	39.9
Cargill 205	1943	60	39.6
Stauffer S 1888	1933	56	40.4

Table 10. Results of the 1982 Hybrid Sunflower Trial at Redfield, SD.

Hybrid Identification	Seed Yield (lbs/A)	Plant Height (inches)	Percent Oil (10% moisture)	Rust <sup>1</sup>
Cargill 207	3464	81	36.4	S-tr
Northrup King 246	3452	61	42.0	S-20
Northrup King 265	3402	53	39.9	S-10
Gro Agr 380-A	3296	65	39.2	S-20
Sokota 4000	3294	62	38.2	S-10
Gro Agr 382	3294	67	39.3	S-5
Arrowhead 747	3291	67	41.8	S-5
Sigco 448	3272	65	40.8	S-20
Cargill 205	3240	67	40.0	S-20
Hybrid 894 ck	3215	62	37.6	S-30
Stauffer S 303	3215	70	38.2	S-5
Dahlgren DO 705	3213	69	40.6	S-5
Seedtec 316	3149	77	39.6	S-10
Seedtec 307	3146	70	37.3	S-30
Sexauer 811	3135	72	37.3	S-20
Dekalb DKS-37	3110	72	38.5	S-20
O's Gold 614	3110	62	38.0	S-30
TNT 534	3092	64	39.6	S-5
Interstate 897	3089	73	37.7	S-30
Pride 2011	3065	67	37.0	S-20
Interstate 7111	3021	68	39.5	S-5
89-A x 124-B x RHA 274 ck	3011	79	36.7	S-20
Stauffer S 3101	3004	57	33.0	S-10
Cal West 67P	2987	67	37.6	S-20
Keltgen DO 704 XL	2984	64	37.9	S-10
Sokota 2057	2963	65	37.9	S-20
Northrup King 254	2938	77	37.8	S-10
Northrup King 275	2915	71	35.0	S-10
Sokota 81-930	2902	64	36.8	S-20
Dekalb 2049	2897	71	35.0	S-30
Dekalb 2214	2879	65	39.2	S-30
Cal West 54k	2879	64	37.8	S-20
Stauffer S 1888	2851	60	39.1	S-20
Jacques J 311	2846	70	37.5	S-30
Sokota 81-307	2834	60	36.4	S-30
Sexauer S-305A	2805	61	37.5	S-20
Seedtec 315	2737	75	35.7	S-30
Sheyenne Golden Glo	2706	71	36.1	S-20
Interstate 775-S	2672	69	36.3	S-40
Test Average	3061	67	38.0	
LSD .05	431	--	1.9	
Coefficient of Variation	9	--	3	

<sup>1</sup> S = susceptible reaction  
 10 = percent of leaf covered  
 tr = less than 1% of leaf covered

Table 9. Cont.

Hybrid Identification	Seed Yield (lbs/A)	Plant Height (Inches)	Percent Oil (10% moisture)
Sokota 6000	1689	62	40.4
Dekalb 2211	1686	58	40.1
Sexauer S 304-A	1677	55	37.4
Northrup King 265	1676	51	40.1
89-A x 124-B x RHA 274 ck	1664	64	36.5
Cal West 64P	1651	58	37.3
Jacques J 503	1648	61	37.3
Hybrid 903	1641	57	36.3
Sokota 2057	1640	63	37.3
224-A x 290-B x RHA 296 ck	1610	59	38.3
Dekalb 2213	1588	57	39.8
Sigco 488	1531	69	34.2
Seedtec 316	1517	55	37.7
Test Average	1794	58	38.3
LSD .05	294	5	1.8
Coefficient of Variation (%)	10	5	3



Table 9. Results of the 1982 Hybrid Sunflower Trial 9 miles west of South Shore, SD.

Hybrid Identification	Seed Yield (lbs/A)	Plant Height (inches)	Percent Oil (10% moisture)
Cargill 207	2277	65	36.6
PAG SF 102	2264	59	38.1
Stauffer S 3101	2181	54	33.9
Northrup King 254	2062	58	38.6
Sokota 4000	2006	60	39.1
Gro Agrí 382	1991	55	40.2
Seedtec 315	1970	66	36.8
Cargill 205	1933	55	39.8
Cargill 206	1913	60	38.8
Dekalb 2214	1912	58	40.0
Northrup King 246	1893	55	40.1
Cal West 54k	1873	60	37.5
Sheyenne Sundance	1855	60	37.6
Sokota 81-950	1854	61	37.6
Jacques J 311	1840	59	36.8
TNT 534	1836	56	39.8
Dahlgren CO 705	1835	63	39.0
Hybrid 894 ck	1832	56	38.1
Cal West 67P	1831	62	36.8
Keltgen Exp 151	1828	62	37.5
Imperial Ex SD-1	1820	49	39.9
Seedtec 307	1820	56	38.0
Sigco 448	1805	57	41.6
O's Gold 614	1805	59	38.0
Stauffer S 303	1792	61	39.2
Stauffer S 1888	1791	53	38.4
Imperial 673	1781	58	39.2
Sheyenne Golden Glo	1780	59	37.3
Gro Agrí 380-A	1779	58	41.7
Sexauer S-305A	1761	56	38.6
Arrowhead 747	1756	57	40.8
Gro Agrí 378	1747	58	41.0
Sokota 81-307	1744	53	37.2
Dekalb 2049	1741	56	36.0
Dekalb DKS-37	1741	56	38.1
PAG SF 101	1739	53	40.3
Gro Agrí Exp 93	1726	59	39.1
Interstate 7116	1723	58	38.7
Interstate 897	1720	55	39.0
Sexauer 811	1718	59	38.5
Keltgen NO 704 XL	1703	63	37.9
Interstate 7775-S	1698	63	36.1
Sokota 5000	1696	57	38.9
Northrup King 275	1691	62	36.7

Table 8. Cont.

Hybrid Identification	Yield (lbs/A)	Days to Flower	Plant Height (inches)	Percent Oil (10% moisture)
Gro Agrif 380-A	1879	72	76	44.3
Gro Agrif 378	1861	71	67	43.8
TNT 534	1856	70	70	42.7
Hybrid 903 ck	1848	70	69	40.5
Sexauer 305-A	1845	71	69	40.9
Imperial 673	1841	70	67	44.2
Sokota 2057	1835	67	70	40.2
Dekalb DKS-37	1833	73	66	41.0
Jacques J 311	1821	69	69	40.5
Dekalb 2011	1809	70	71	43.5
Interstate 7116	1808	72	68	41.0
Sigco 488	1756	77	80	37.8
224A x 290-8 x RHA 296 ck	1742	66	75	39.7
Dekalb 2013	1675	711	67	45.4
Test Average	2024	70	71	40.5
LSD .05	424	1	6	1.8
Coefficient of Variation (%)	13	1	5	3

Table 8. Results of the 1982 Hybrid Sunflower Trial at Brookings, SD.

Hybrid Identification	Yield (lbs/A)	Days to Flower	Plant Height (inches)	Percent Oil (10% moisture)
PAG SF 102	2358	70	67	42.1
Sheyenne Golden Glo	2350	71	72	39.0
Keltgen Exp 151	2306	69	74	39.3
Cargill 207	2286	69	79	39.7
Cal West 67P	2272	71	73	39.8
Hybrid 894 ck	2259	69	71	40.3
Seedtec 316	2252	70	74	41.6
Sokota 81-307	2252	69	68	37.1
Stauffer 3101	2232	69	65	35.8
Stauffer 1888	2208	70	69	40.1
Northrup King 275	2192	72	74	39.5
Sigco 448	2174	70	72	43.8
Northrup King 254	2155	71	71	41.4
Dahlgren DO 705	2138	69	74	41.3
Sexauer 811	2137	70	73	41.0
Gro Agri Ex 93	2127	70	72	40.3
Sexauer 304-A	2118	71	72	41.4
Sheyenne Sundance	2112	70	73	38.7
Dekalb 2214	2108	71	71	41.0
Interstate 3107	2106	70	73	43.1
Sokota 81-950	2101	69	69	39.9
Gro Agri 382	2096	70	68	43.1
O's Gold 614	2083	71	72	41.2
Arrowhead 747	2050	69	72	43.7
Imperial EXSD-1	2043	70	59	42.1
Northrup King 265	2029	68	67	41.6
89-A x 124-8 x RHA 274 ck	2027	70	73	39.4
Cal West 64P	2023	71	75	39.1
Stauffer 303	2009	70	70	39.6
Dekalb 2049	2004	74	68	40.4
Keltgen DO 704 XL	1999	69	72	39.5
Sokota 6000	1996	71	72	42.8
Sokota 4000	1991	70	67	40.5
Northrup King 246	1985	68	67	40.6
PAG SF 101	1975	70	67	42.2
Interstate 7775-S	1973	71	73	40.2
Agway Royal Hybrid 2121	1967	67	74	28.9
Sokota 5000	1963	70	66	39.7
Cargill 205	1948	70	66	43.0
Jacques J 503	1938	70	70	38.8
Seedtec 315	1924	73	78	37.9
Cargill 206	1909	70	72	42.8
Agway Royal Hybrid 2141	1905	68	75	30.1
Cal West 54k	1893	70	68	39.6

Table 7. Cont.

Hybrid Identification	Location			
	Brookings	South Shore	Redfield	Dessington
Sheyenne Sundance	x	x		x
Sheyenne Golden Glo	x	x	x	x
Sigco 448	x	x	x	x
Sigco 488	x	x		x
Sokota 2057	x	x	x	x
Sokota 4000	x	x	x	x
Sokota 5000	x	x		x
Sokota 6000	x	x		x
Sokota 81-307	x	x	x	x
Sokota 81-950	x	x	x	x
Stauffer S 303	x	x	x	x
Stauffer S 1888	x	x	x	x
Stauffer S 3101	x	x	x	x
TNT 534	x	x	x	x
No. of hybrids tested	58	57	39	57