

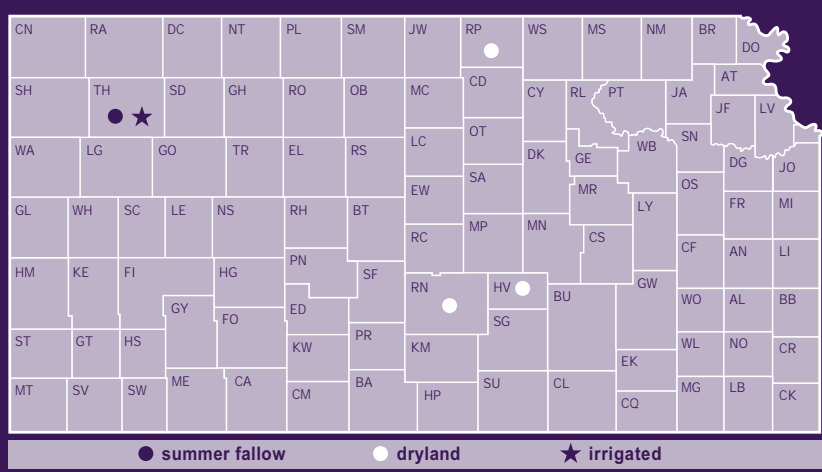
2000

KANSAS PERFORMANCE TESTS WITH

SUNFLOWER HYBRIDS

REPORT OF PROGRESS 871

Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service



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Excerpts from the
UNIVERSITY RESEARCH POLICY AGREEMENT
WITH COOPERATING SEED COMPANIES*

Permission is hereby given to Kansas State University to test our varieties and/or hybrids designated on the attached entry forms in the manner indicated on the test announcement. I understand that all results from Kansas crop performance tests belong to the University and to the public and shall be controlled by the University so as to produce the greatest benefit to the public. It is further agreed that the name of the University shall not be used by the company in any commercial advertising either in regard to this agreement or any other related matter.

*This agreement must be signed by an authorized individual before results involving the company's entries can be published by the Experiment Station. Except for the limitation that the name "KANSAS STATE UNIVERSITY" cannot be used in advertising (you may use something like "official state tests" or "state yield trials"), this does not preclude the use of data for advertising, if done in a fair manner.

Contribution No. 01-282-S from the Kansas Agricultural Experiment Station.

2000 KANSAS PERFORMANCE TESTS WITH SUNFLOWER HYBRIDS

INTRODUCTION

TEST OBJECTIVES AND PROCEDURES

Sunflower performance tests were conducted in 2000 by the Kansas Agricultural Experiment Station to provide farmers, extension workers, and private industry with unbiased agronomic information on many of the sunflower hybrids marketed in the state. Tests were financed in part by entry fees from private companies. Companies known to be developing and marketing sunflowers were invited to participate and enter hybrids on a voluntary fee-entry basis. So, not all hybrids grown in the state were included in tests, and hybrids were not grown uniformly at all locations.

Seven test locations in 2000 included Greeley, Harvey, Reno, Republic, and Sumner Counties—dryland, continuous crop; and Thomas County—irrigated and fallow sites. Because of extremely dry conditions, the test in Greeley County was abandoned. Oilseed entries were grown at all locations. Confectionary entries were included only in tests in Thomas and Greeley counties. Oilseed and confectionary entries were planted separately in all tests. Entries were planted in four-row, replicated plots at all locations. To ensure uniform and adequate stands, all tests were planted at a high seeding rate and hand thinned after emergence to desired stands.

Environmental factors affecting test results and cultural practices are discussed individually for each of the test sites. Test results for 2000, as well as period-of-years average data, are included in Tables 1-10. Entrants and entries in 2000 tests are listed at the end of the report.

DATA INTERPRETATION

Yields are reported as lbs seed/a adjusted to 10% moisture content.

Days to half bloom is number of days from date of planting to date when 50% of plants were in bloom.

Lodging percent is based on counts of lodged and total plants in harvested areas at all locations.

Oil percent was obtained from samples submitted under code numbers to the Kansas Grain Inspection Service for analysis and is reported on a 10% moisture basis. Samples for all tests were derived by compositing replications by entry for each location and subsampling.

Oil yields are reported as net lbs oil/a.

Seed size percent analysis for confectionary-type entries was performed at the Northwest Research-Extension Center on cleaned samples submitted from each of the tests. Separation by seed size was made by screening a weighed sample through a series of six sieves (22/64, 21/64, 20/64, 19/64, 18/64, and 16/64-round holes) secured on a Ro-Tap mechanical shaker.

Statistical analysis Conducting perfect tests is virtually impossible, because soil fertility, moisture, and other environmental factors vary. Therefore, small differences in results may have no real meaning. To help interpret data, we applied a statistical technique, analysis of variance, wherever possible. Such analysis requires repeating whole sets of varieties or treatments several times and placing individual varieties or treatments as they would be placed by

chance alone. Results of the analyses are reported in terms of least significant differences (LSD). If two means differ by more than the LSD (.05), such a difference would be due to chance variation only 5% of the time. So, it's 95% probable that the difference was due to treatment. If means do

not differ by as much as the LSD, then little confidence can be placed in the importance of varietal or treatment differences. The coefficient of variability (CV) represents an estimate of the precision of replicated yield trials. CVs ranging from 10 to 15% are usually acceptable for performance comparisons. CVs greater than 15% provide only a rough guide to hybrid performance.

ACKNOWLEDGEMENTS

Cooperation of Research Center personnel who performed many of the field operations is sincerely appreciated. Vicki Brown, secretary, assisted in preparing this report, and temporary workers Justin Kniep, Cade Moses, and Nadia Fercha helped with seed counting and plot thinning and maintenance. Mary Knapp at the Weather Data Library provided climatological data, and Bob Cochrane, agricultural technician, provided weather charts.

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**NORTHWESTERN KANSAS
FALLOW SUNFLOWER TESTS—
OILSEED AND CONFECTIONARY**

LOCATION: Northwest Research-Extension Center, Thomas County
COOPERATOR: Pat Evans, research technologist
TEST SITE: Keith silt loam
 Grain sorghum 1998, fallow 1999
FERTILIZATION: 100-0-0 spring 2000
PLANTING DATE: June 12, 2000
HEADING DATES: Aug. 11-18, 2000
HARVEST DATES: Oct. 13, 2000
PEST CONTROL: Treflan, April, 24, '00

POPULATIONS: Double-planted and thinned to desired stands:

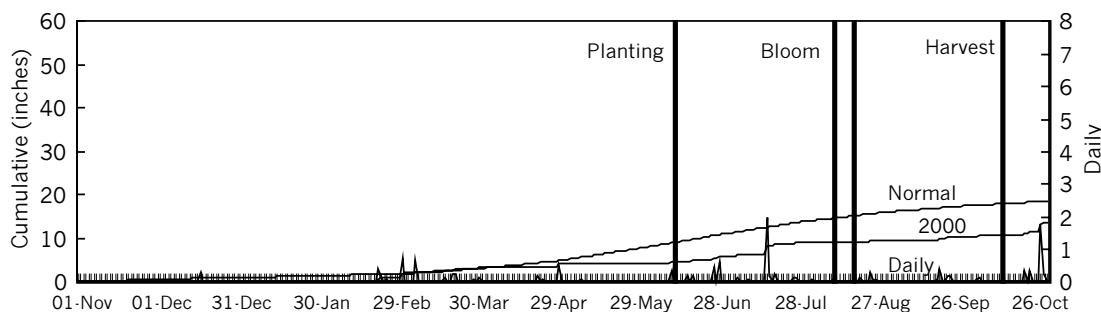
Oil (O) 17,000 plants/a
 Confectionary (C) 14,900 plants/a

TEST YIELDS:

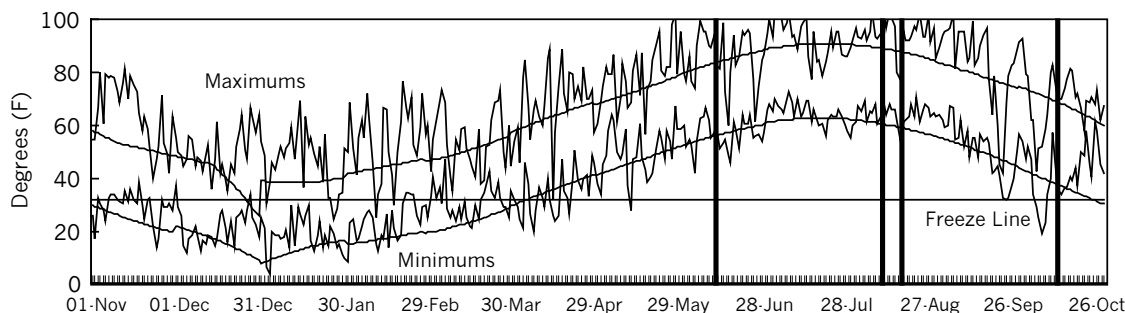
Avg. (lbs/a): (O) 1159, (C) 1605
 Range: (O) 489-1725, (C) 1244-2062
 LSD (lbs/a): (O) 414, (C) 424
 CV (%): (O) 30, (C) 22

GROWING CONDITIONS: Because of dry conditions at planting and afterwards, good stands were not established in many plots. Hot, dry conditions continued throughout the growing season with above-normal temperatures and below-normal precipitation.

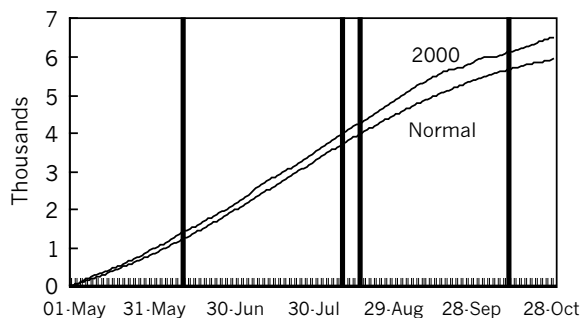
PRECIPITATION



DAILY TEMPERATURES



GROWING DEGREE DAYS



GROWING-SEASON WEATHER SUMMARY

Month	Precipitation		Average Temp.		GDD	
	2000	Normal	2000	Normal	2000	Normal
April	0.5	1.8	51	49	0	0
May	0.6	2.9	64	60	908	781
June	1.8	3.1	71	70	1112	1093
July	2.9	3.0	79	76	1384	1317
August	0.7	2.2	80	74	1414	1241
Sep.	0.8	1.5	68	65	1013	928
Oct.	3.0	1.1	56	53	691	574
Season Totals	10.4	15.6	67	64	6522	5934

Table 1. Thomas County Oilseed Sunflower Performance Test Results—Fallow, 1998-2000

Brand and hybrid	Yield, lbs/a					Yield as % of test average			Oil (%)			Oil yield (lbs/a)		
	2000	1999	1998	2-yr avg	3-yr avg	2000	1999	1998	2000	2-yr avg	3-yr avg	2000	2-yr avg	3-yr avg
Cargill SF125NL	1129	2491	-----	1810	-----	97	94	----	36.0	36.6	-----	406	667	-----
Cargill SF187	1331	2849	2928	2090	2369	115	108	101	35.5	37.8	38.7	472	807	934
Cargill SF260	1422	2627	-----	2024	-----	123	99	----	36.8	38.7	-----	523	795	-----
Cargill SF270	1721	2665	3076	2193	2487	148	101	106	36.1	38.3	39.0	621	850	981
Cargill SF290NL	1019	2796	3091	1908	2302	88	106	107	35.3	36.7	37.4	360	713	874
Croplan Genetics CL345NS	1725	-----	-----	-----	-----	149	-----	-----	36.7	-----	-----	633	-----	-----
Croplan Genetics CL380NS	1390	-----	-----	-----	-----	120	-----	-----	36.5	-----	-----	507	-----	-----
Croplan Genetics CL385NS	1231	-----	-----	-----	-----	106	-----	-----	35.8	-----	-----	441	-----	-----
Interstate Seed HYSUN 450	1156	2167	-----	1661	-----	100	82	----	37.2	38.6	-----	430	647	-----
Interstate Seed IS 4049	1080	2564	2946	1822	2197	93	97	102	37.0	39.0	39.2	400	724	874
Interstate Seed IS 4340	1443	-----	-----	-----	-----	124	-----	-----	36.4	-----	-----	525	-----	-----
Interstate Seed IS 6767	926	2622	3273	1774	2274	80	99	113	37.8	39.4	40.6	350	713	944
Interstate Seed IS 84021	793	-----	-----	-----	-----	68	-----	-----	34.8	-----	-----	276	-----	-----
Interstate Seed X 74066	1035	-----	-----	-----	-----	89	-----	-----	36.6	-----	-----	379	-----	-----
Interstate Seed X 74091	489	-----	-----	-----	-----	42	-----	-----	37.8	-----	-----	185	-----	-----
Kaystar Seed 9404	1154	-----	-----	-----	-----	100	-----	-----	35.3	-----	-----	407	-----	-----
Kaystar Seed 9501	1295	2866	3336	2081	2499	112	109	115	34.6	35.9	35.9	448	757	904
Monsanto DK3872NS	907	2400	-----	1654	-----	78	91	----	37.2	38.3	-----	338	642	-----
Monsanto DK3900	1030	2765	3542	1898	2446	89	105	122	36.2	39.7	40.4	373	782	1017
Mycogen Seeds 8377NS	1128	2550	-----	1839	-----	97	97	----	38.0	39.4	-----	429	734	-----
Mycogen Seeds 8488NS	986	3011	2893	1999	2297	85	114	100	35.7	37.8	37.8	352	775	882
Mycogen Seeds Cavalry	1478	-----	-----	-----	-----	128	-----	-----	39.1	-----	-----	578	-----	-----
Novartis Seeds NK 278	1063	3220	3236	2141	2506	92	122	112	36.0	39.6	40.2	383	887	1037
Novartis Seeds NX T46-R9	1053	-----	-----	-----	-----	91	-----	-----	35.2	-----	-----	371	-----	-----
Pioneer Hi-Bred Int'l. 63A70	1338	-----	-----	-----	-----	115	-----	-----	40.2	-----	-----	538	-----	-----
Pioneer Hi-Bred Int'l. 63M80	871	-----	-----	-----	-----	75	-----	-----	36.5	-----	-----	318	-----	-----
Pioneer Hi-Bred Int'l. 63M91	1107	2693	-----	1900	-----	95	102	----	37.7	39.7	-----	417	770	-----
Pioneer Hi-Bred Int'l. 64M01	1210	-----	-----	-----	-----	104	-----	-----	34.6	-----	-----	419	-----	-----
Seeds 2000 Bronco	1220	2400	-----	1810	-----	105	91	----	37.1	38.5	-----	453	704	-----
Seeds 2000 Maverick	1236	2685	-----	1960	-----	107	102	----	34.5	37.0	-----	426	743	-----
Seeds 2000 Mustang	804	-----	-----	-----	-----	69	-----	-----	33.0	-----	-----	265	-----	-----
Triumph Seed Co. 545A	1112	2494	-----	1803	-----	96	94	----	40.2	41.9	-----	447	767	-----
Triumph Seed Co. 562	1268	3119	3651	2193	2679	109	118	126	36.3	38.3	39.0	460	857	1063
Triumph Seed Co. 652	1380	2834	-----	2107	-----	119	107	----	35.4	37.3	-----	489	800	-----
Triumph Seed Co. TRX0448	1009	-----	-----	-----	-----	87	-----	-----	39.6	-----	-----	400	-----	-----
Triumph Seed Co. TRX9443	1175	-----	-----	-----	-----	101	-----	-----	36.6	-----	-----	430	-----	-----
Average	1159	2641	2895	1900	2231	100	100	100	36.5	38.4	39.1	424	754	858
LSD (.05)	414	400	398	407	404	-----	-----	-----	-----	-----	-----	-----	-----	-----

continued

Table 1. Thomas County Oilseed Sunflower Performance Test Results—Fallow, 1998-2000, continued

Brand and hybrid	Days to ½ bloom			Plant height (in)			Lodging (%)			Test wt (lbs/bu)			200 seed wt (g)		
	2000	2-yr	3-yr	2000	2-yr	3-yr	2000	2-yr	3-yr	2000	2-yr	3-yr	2000	2-yr	3-yr
		avg	avg		avg	avg		avg	avg		avg	avg		avg	avg
Cargill SF125NL	63	63	---	50	61	---	7	5	--	28.5	28.2	----	11.6	10.9	----
Cargill SF187	64	64	63	43	53	55	11	6	5	25.0	25.5	26.3	10.5	9.9	10.5
Cargill SF260	64	64	---	41	51	---	9	5	--	24.5	26.2	----	10.4	9.7	----
Cargill SF270	62	62	60	45	52	55	11	6	5	26.3	27.3	28.0	11.9	10.8	11.6
Cargill SF290NL	64	65	63	41	51	52	13	8	6	24.0	25.6	26.5	11.0	10.7	11.0
Croplan Genetics CL345NS	63	---	---	47	---	---	6	--	--	25.8	----	----	10.5	----	----
Croplan Genetics CL380NS	64	---	---	49	---	---	8	--	--	25.8	----	----	11.0	----	----
Croplan Genetics CL385NS	65	---	---	39	---	---	8	--	--	24.5	----	----	11.0	----	----
Interstate Seed HYSUN 450	65	65	---	38	52	---	7	4	--	25.8	19.7	----	10.9	9.4	----
Interstate Seed IS 4049	63	64	63	47	61	64	13	8	7	26.0	26.9	27.2	11.5	10.2	10.8
Interstate Seed IS 4340	65	---	---	45	---	---	9	--	--	25.5	----	----	10.7	----	----
Interstate Seed IS 6767	63	64	62	44	56	59	13	6	5	26.8	27.2	28.1	12.8	11.3	11.8
Interstate Seed IS 84021	65	---	---	45	---	---	15	--	--	24.3	----	----	10.7	----	----
Interstate Seed X 74066	66	---	---	49	---	---	14	--	--	23.5	----	----	10.8	----	----
Interstate Seed X 74091	65	---	---	48	---	---	17	--	--	22.3	----	----	9.8	----	----
Kaystar Seed 9404	63	---	---	42	---	---	5	--	--	25.3	----	----	11.4	----	----
Kaystar Seed 9501	64	65	64	50	60	63	8	5	4	26.8	27.1	27.9	12.7	11.0	11.8
Monsanto DK3872NS	65	65	---	48	61	---	6	3	--	24.5	25.9	----	12.2	10.6	----
Monsanto DK3900	65	65	64	42	56	58	14	7	5	25.0	27.3	27.8	10.1	10.0	10.7
Mycogen Seeds 8377NS	63	62	---	44	55	---	8	4	--	25.5	26.8	----	9.8	9.4	----
Mycogen Seeds 8488NS	64	64	63	46	56	59	6	4	4	25.8	27.0	27.7	10.2	9.4	10.1
Mycogen Seeds Cavalry	64	---	---	51	---	---	3	--	--	27.5	----	----	11.9	----	----
Novartis Seeds NK 278	64	64	63	45	55	59	11	6	4	23.8	26.1	26.9	11.4	10.7	11.1
Novartis Seeds NX T46-R9	63	---	---	45	---	---	11	--	--	25.2	----	----	12.1	----	----
Pioneer Hi-Bred Int'l. 63A70	62	---	---	44	---	---	9	--	--	24.5	----	----	12.4	----	----
Pioneer Hi-Bred Int'l. 63M80	64	---	---	45	---	---	7	--	--	25.0	----	----	13.3	----	----
Pioneer Hi-Bred Int'l. 63M91	64	64	---	49	61	---	4	2	--	26.5	27.8	----	12.4	11.0	----
Pioneer Hi-Bred Int'l. 64M01	62	---	---	46	---	---	10	--	--	24.5	----	----	11.9	----	----
Seeds 2000 Bronco	65	65	---	40	51	---	6	4	--	25.3	26.0	----	11.5	10.0	----
Seeds 2000 Maverick	64	64	---	43	53	---	12	7	--	23.8	25.9	----	10.6	10.1	----
Seeds 2000 Mustang	63	---	---	46	---	---	9	--	--	24.7	----	----	9.5	----	----
Triumph Seed Co. 545A	64	63	---	41	51	---	13	8	--	25.5	27.0	----	11.4	10.6	----
Triumph Seed Co. 562	64	64	63	49	58	62	7	4	5	25.0	24.9	26.2	13.6	12.3	12.7
Triumph Seed Co. 652	64	65	---	44	56	---	7	4	--	25.8	25.9	----	11.8	11.3	----
Triumph Seed Co. TRX0448	64	---	---	44	---	---	14	--	--	26.0	----	----	11.6	----	----
Triumph Seed Co. TRX9443	64	---	---	45	---	---	8	--	--	25.5	----	----	11.6	----	----
Average	64	64	63	45	55	58	9	6	5	25.3	26.1	27.0	11.3	10.4	11.0
LSD (.05)	1	3	2	3	3	3	9	6	5	1.2	3.0	2.3	----	----	----

Table 2. Thomas County Confectionary Sunflower Performance Test Results–Fallow, 1998-2000

Brand and hybrid	Acre yield (lbs)					Yield as % of test avg.			Days to 1/2 bloom		
	2000	1999	1998	2-yr avg	3-yr avg	2000	1999	1998	2000	2-yr avg	3-yr avg
Agway, Inc. RH EXP001	1473	-----	-----	-----	-----	92	-----	-----	64	----	----
Interstate Seed IS 8048	2055	2260	-----	2158	-----	128	96	-----	65	61	----
Red River Commodities 2213	1742	2246	3078	1994	2355	109	95	97	64	61	61
Red River Commodities 2413	1435	2041	3501	1738	2326	89	87	110	64	61	61
Red River Commodities 2582	1742	2533	-----	2137	-----	109	108	-----	64	61	----
Seeds 2000 X3247	2062	-----	-----	-----	-----	128	-----	-----	65	----	----
Seeds 2000 X3988	1487	-----	-----	-----	-----	93	-----	-----	64	----	----
Triumph Seed Co. 765C	1244	2569	2715	1907	2176	78	109	85	65	62	61
Triumph Seed Co. 766CRT	1834	2267	-----	2051	-----	114	96	-----	64	61	----
Triumph Seed Co. TRX0451 CRT	1272	-----	-----	-----	-----	79	-----	-----	64	----	----
Triumph Seed Co. TRX0453 CRT	1311	-----	-----	-----	-----	82	-----	-----	64	----	----
Average	1605	2352	3181	1979	2379	100	100	100	64	61	61
LSD (.05)	424	337	488	-----	-----	-----	-----	-----	1	----	----

	Plant height (in)			Lodging (%)			Test weight (lbs/bu)			200 seed weight (g)		
	2000	2-yr avg	3-yr avg	2000	2-yr avg	3-yr avg	2000	2-yr avg	3-yr avg	2000	2-yr avg	3-yr avg
Agway, Inc. RH EXP001	48	----	----	4	---	---	19.1	-----	-----	22.4	-----	-----
Interstate Seed IS 8048	50	57	----	0	0	---	18.8	20.4	-----	25.3	24.6	-----
Red River Commodities 2213	53	60	64	4	4	7	18.7	19.9	19.8	21.0	20.4	-----
Red River Commodities 2413	52	59	63	6	8	5	18.7	20.1	20.4	23.3	21.7	21.7
Red River Commodities 2582	52	60	----	2	1	---	19.8	21.2	-----	23.1	23.0	22.2
Seeds 2000 X3247	50	----	----	2	---	---	19.5	-----	-----	20.7	-----	-----
Seeds 2000 X3988	49	----	----	2	---	---	18.8	-----	-----	21.2	-----	-----
Triumph Seed Co. 765C	49	57	62	0	3	7	18.4	19.5	19.4	22.5	23.1	23.1
Triumph Seed Co. 766CRT	48	59	----	0	2	---	18.4	19.5	-----	24.6	23.6	-----
Triumph Seed Co. TRX0451 CRT	49	----	----	4	---	---	19.0	-----	-----	26.0	-----	-----
Triumph Seed Co. TRX0453 CRT	50	----	----	0	---	---	18.6	-----	-----	23.3	-----	-----
Average	50	58	63	2	2	5	18.9	20.3	20.2	23.0	22.6	22.8
LSD (.05)	3	----	----	3	---	---	4.9	-----	-----	-----	-----	-----

Table 3. Seed Size Distribution for Thomas County Confectionary Sunflower Performance Tests–Fallow, 1998-2000

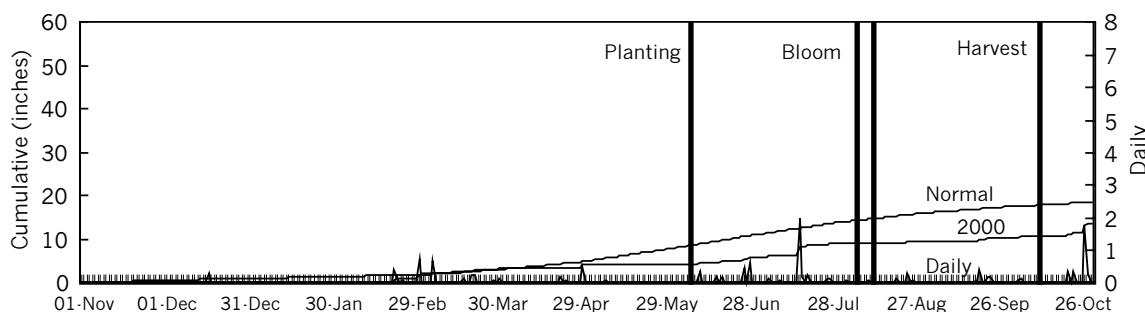
Brand and hybrid	Seed size distribution (%)																				
	2000							2-year average						3-year average							
	Above 21/64	to 20/64	to 19/64	to 18/64	to 16/64	Below 16/64	Above 21/64	to 20/64	to 19/64	to 18/64	to 16/64	Below 16/64	Above 21/64	to 20/64	to 19/64	to 18/64	to 16/64	Below 16/64			
	22/64	22/64	21/64	20/64	19/64	19/64	22/64	22/64	21/64	20/64	19/64	19/64	22/64	22/64	21/64	20/64	19/64	19/64	16/64		
Agway, Inc. RH EXP001	19.1	20.3	17.6	16.6	9.0	11.7	5.4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----		
Interstate Seed ISO8048	22.5	20.4	16.0	14.6	10.1	12.2	4.1	15.7	15.5	15.2	14.8	14.0	13.9	13.0	-----	-----	-----	-----	-----		
Red River Commodities 2213	15.0	16.0	14.2	18.0	11.9	17.5	8.3	13.5	13.0	12.9	13.4	13.0	14.5	13.5	15.1	17.0	15.9	17.9	11.1	16.7	6.5
Red River Commodities 2413	15.3	19.0	18.0	16.4	11.3	15.2	4.8	14.3	14.4	14.1	13.7	13.1	13.8	13.0	16.3	17.7	18.0	16.9	11.3	14.1	5.4
Red River Commodities 2582	8.3	12.8	19.4	24.2	14.4	16.1	5.9	14.3	14.9	15.2	15.5	14.4	14.5	13.1	-----	-----	-----	-----	-----	-----	
Seeds 2000 X3247	19.0	14.4	15.0	19.0	9.7	14.6	9.3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Seeds 2000 X3988	17.8	17.3	14.2	19.7	10.3	13.6	8.3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Triumph Seed Co. 765C	9.9	18.1	21.0	20.8	13.0	11.5	5.6	15.3	16.6	17.2	16.5	14.9	14.2	13.1	18.9	21.3	21.8	17.5	8.3	8.2	3.6
Triumph Seed Co. 766CRT	22.0	22.3	21.2	16.2	8.1	6.6	3.5	14.0	12.8	12.3	12.6	12.3	13.1	12.8	-----	-----	-----	-----	-----	-----	
Triumph Seed Co. TRX0451CRT	14.3	17.9	21.0	26.4	8.2	9.6	3.5	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Triumph Seed Co. TRX0453CRT	13.7	16.3	15.9	18.7	11.5	17.7	7.8	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Average	16.1	17.7	17.6	19.1	10.7	13.3	6.0	14.5	14.5	14.5	14.5	13.6	14.1	13.2	18.0	18.6	18.4	18.2	10.0	11.9	4.7

**NORTHWESTERN KANSAS
IRRIGATED SUNFLOWER TESTS—
OILSEED AND CONFECTIONARY**

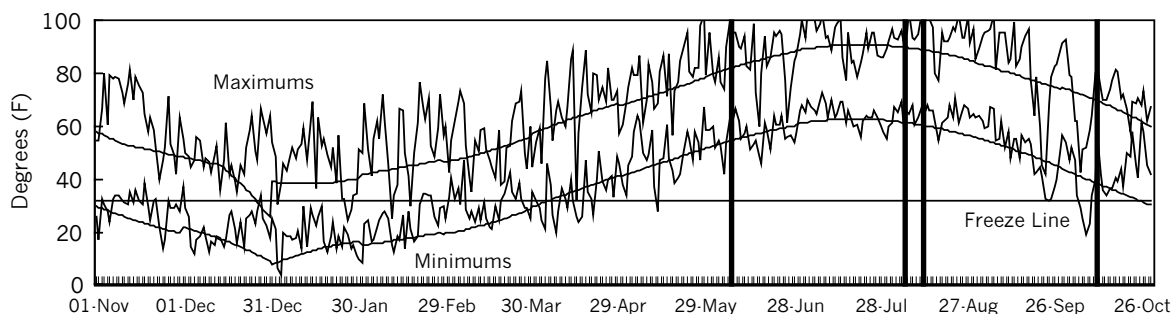
LOCATION: Northwest Research-Extension Center, Thomas County
COOPERATOR: Pat Evans, research technologist
TEST SITE: Keith silt loam
 Soybean 1998, corn 1999
FERTILIZATION: 120-10-0 spring
PLANTING DATE: June 7, 2000
HEADING DATES: Aug. 6-12, 2000
HARVEST DATES: Oct. 11, 2000
PEST CONTROL: Treflan, May 6; Warrior, Aug. 11

IRRIGATIONS: (3") June 8, July 28, Aug. 11, Aug. 24, Sept.6, 2000
POPULATIONS: Double-planted and thinned to desired stands:
 Oil (O) 23,000 plants/a
 Confectionary (C) 17,000 plants/a
TEST YIELDS:
 Avg. (lbs/a): (O) 2238, (C) 2080
 Range: (O) 1336-2813, (C) 1616-2377
 LSD (lbs/a): (O) 372, (C) 384
 CV (%): (O) 14.2, (C) 15.4
GROWING CONDITIONS: Very good stands were established, but higher-than-normal temperatures occurred throughout the growing season. Head clippers did more damage than normal.

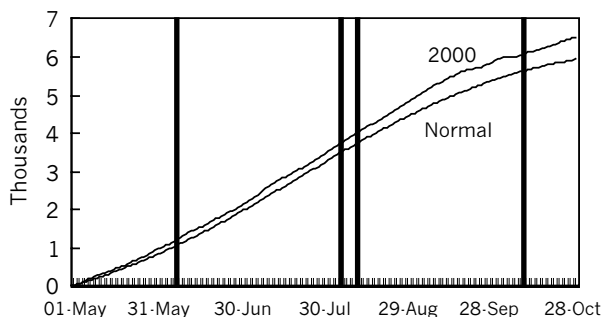
PRECIPITATION



DAILY TEMPERATURES



GROWING DEGREE DAYS



GROWING-SEASON WEATHER SUMMARY

Month	Precipitation		Average Temp.		GDD	
	2000	Normal	2000	Normal	2000	Normal
April	0.5	1.8	51	49	0	0
May	0.6	2.9	64	60	908	781
June	1.8	3.1	71	70	1112	1093
July	2.9	3.0	79	76	1384	1317
August	0.7	2.2	80	74	1414	1241
Sep.	0.8	1.5	68	65	1013	928
Oct.	3.0	1.1	56	53	691	574
Season Totals	10.4	15.6	67	64	6522	5934

Table 4. Thomas County Oilseed Sunflower Performance Test Results--Irrigated, 1998-2000

Brand and hybrid	Yield (lbs/a)					Yield as % of test average			Oil (%)			Oil yields (lbs/a)		
	2000	1999	1998	2-yr avg	3-yr avg	2000	1999	1998	2000	2-yr avg	3-yr avg	2000	2-yr avg	3-yr avg
Adrian Associates DN1156	2329	-----	-----	-----	-----	104	---	---	42.6	-----	-----	992	-----	-----
Adrian Associates DN1183 (ns)	2423	-----	-----	-----	-----	108	---	---	38.9	-----	-----	942	-----	-----
Adrian Associates DN1691	2143	-----	-----	-----	-----	96	---	---	43.2	-----	-----	926	-----	-----
Adrian Associates DN1704	1878	-----	-----	-----	-----	84	---	---	42.6	-----	-----	800	-----	-----
Adrian Associates DN2015	1856	-----	-----	-----	-----	83	---	---	43.3	-----	-----	804	-----	-----
Cargill SF 125NL	1676	1986	-----	1831	-----	75	78	---	39.2	38.1	-----	657	695	-----
Cargill SF 187	2327	2957	2484	2642	2589	104	116	111	41.1	41.6	41.2	956	1099	1067
Cargill SF 260	2687	2495	-----	2591	-----	120	98	---	44.3	44.2	-----	1190	1144	-----
Cargill SF270	1903	2537	2372	2220	2271	85	100	106	42.1	42.3	41.9	801	938	951
Cargill SF290NL	2314	2730	2285	2522	2443	103	108	102	41.6	41.1	40.5	962	1035	990
Interstate Seed Hysun 450	2546	2289	-----	2418	-----	114	90	---	41.9	40.1	-----	1067	971	-----
Interstate Seed 4049	2540	2768	2410	2654	2573	113	109	107	42.6	42.2	41.6	1082	1120	1072
Interstate Seed 4340	2331	-----	-----	-----	-----	104	---	---	43.9	-----	-----	1023	-----	-----
Interstate Seed IS 6767	2142	2552	2608	2347	2434	96	101	116	42.8	43.5	43.2	917	1021	1051
Interstate Seed IS 84021	2203	-----	-----	-----	-----	98	---	---	40.6	-----	-----	895	-----	-----
Interstate Seed IS 971136NS	2293	2589	-----	2441	-----	102	102	---	43.1	42.1	-----	988	1025	-----
Interstate Seed IS X33204	2814	-----	-----	-----	-----	126	---	---	42.2	-----	-----	1187	-----	-----
Interstate Seed K 41978	2686	2821	-----	2754	-----	120	111	---	40.6	40.1	-----	1091	1102	-----
Interstate Seed X 74066	2504	-----	-----	-----	-----	112	---	---	43.8	-----	-----	1097	-----	-----
Interstate Seed X 74091	2115	-----	-----	-----	-----	95	---	---	44.1	-----	-----	933	-----	-----
Kaystar Seed 9501	2731	3078	1960	2905	2950	122	121	87	37.6	37.5	36.9	1027	1088	959
Monsanto DK 3872NS	1903	2561	-----	2232	-----	85	101	---	43.2	43.2	-----	822	963	-----
Monsanto DK 3875	2673	2482	2471	2578	2542	119	98	110	41.7	41.1	40.9	1115	1059	1040
Monsanto DK 3881	2238	2853	2251	2546	2447	100	112	100	43.4	43.4	42.8	971	1103	1048
Monsanto DK 3900	2362	2720	2205	2541	2429	106	107	98	44.8	44.0	43.7	1058	1115	1062
Monsanto DKF29-90	1671	-----	-----	-----	-----	75	---	---	45.9	-----	-----	767	-----	-----
Monsanto DKF31-01NS	1336	-----	-----	-----	-----	60	---	---	39.2	-----	-----	524	-----	-----
Monsanto DKF36-40NS	1458	-----	-----	-----	-----	65	---	---	38.5	-----	-----	561	-----	-----
Monsanto EX9915NS	1981	-----	-----	-----	-----	89	---	---	41.5	-----	-----	822	-----	-----
Mycogen Seeds 8468	2644	2700	-----	2672	-----	118	106	---	45.6	46.4	-----	1206	1240	-----
Mycogen Seeds 8488NS	2338	2527	2358	2432	2408	104	100	105	40.5	40.7	39.7	947	989	956
Pioneer Hi-Bred Int'l. 63A70	2127	-----	-----	-----	-----	95	---	---	45.4	-----	-----	966	-----	-----
Pioneer Hi-Bred Int'l. 63A81	2239	2530	-----	2384	-----	100	100	---	43.0	43.1	-----	963	1027	-----
Pioneer Hi-Bred Int'l. 63M80	2010	-----	-----	-----	-----	90	---	---	43.0	-----	-----	864	-----	-----
Pioneer Hi-Bred Int'l. 63M91	2747	2573	-----	2660	-----	123	101	---	42.0	42.9	-----	1154	1139	-----
Pioneer Hi-Bred Int'l. 64M01	2196	2765	-----	2481	-----	98	109	---	41.3	41.6	-----	907	1033	-----
Seeds 2000 Bronco	2326	2353	-----	2339	-----	104	93	---	41.8	40.6	-----	972	950	-----
Seeds 2000 Maverick	2103	1973	-----	2038	-----	94	78	---	39.4	39.1	-----	828	796	-----
Seeds 2000 Mustang	2016	-----	-----	-----	-----	90	---	---	40.7	-----	-----	821	-----	-----
Triumph Seed Co. 545A	2419	2781	-----	2600	-----	108	110	---	46.5	46.3	-----	1125	1203	-----
Triumph Seed Co. 540	2004	2270	1655	2137	1976	90	89	74	43.6	43.4	42.8	874	926	848
Triumph Seed Co. 562	2679	2855	2906	2767	2813	120	112	129	40.1	40.8	40.5	1074	1128	1140
Triumph Seed Co. 652	2621	3130	-----	2875	-----	117	123	---	39.5	39.7	-----	1035	1142	-----
Triumph Seed Co. TRX0448	1796	-----	-----	-----	-----	80	---	---	45.1	-----	-----	810	-----	-----
Triumph Seed Co. TRX9443	2387	-----	-----	-----	-----	107	---	---	44.6	-----	-----	1064	-----	-----
Average	2238	2539	2246	2389	2341	100	103	104	42.3	42.0	41.4	946	1018	983
LSD (.05)	372	396	436	384	401	17	---	---	-----	-----	-----	-----	-----	-----

continued

Table 4. Thomas County Oilseed Sunflower Performance Test Results—Irrigated, 1998-2000, continued

Brand and hybrid	Days to 1/2 bloom			Plant height (in)			Lodging (%)			Test weight (lbs/bu)			200 seed weight (g)		
	2000	2-yr	3-yr	2000	2-yr	3-yr	2000	2-yr	3-yr	2000	2-yr	3-yr	2000	2-yr	3-yr
		avg	avg		avg	avg		avg	avg		avg	avg		avg	avg
Adrian Associates DN1156	64	---	---	67	---	---	8	---	---	26.3	----	----	10.0	----	----
Adrian Associates DN1183 (ns)	66	---	---	75	---	---	9	---	---	25.3	----	----	9.8	----	----
Adrian Associates DN1691	65	---	---	69	---	---	15	---	---	27.8	----	----	9.9	----	----
Adrian Associates DN1704	66	---	---	78	---	---	9	---	---	24.8	----	----	9.2	----	----
Adrian Associates DN2015	63	---	---	72	---	---	8	---	---	26.3	----	----	10.9	----	----
Cargill SF 125NL	61	60	---	70	75	---	7	6	---	27.3	27.9	----	15.0	13.2	----
Cargill SF 187	63	62	62	63	64	65	7	4	4	26.3	27.3	27.8	10.2	9.3	10.0
Cargill SF 260	63	62	---	63	65	---	3	3	---	26.8	27.5	----	10.4	9.6	----
Cargill SF270	60	60	58	59	62	64	5	4	4	25.7	27.2	28.1	12.4	11.7	12.0
Cargill SF290NL	62	61	61	58	61	61	11	7	7	26.8	27.3	27.7	11.3	10.9	11.2
Interstate Seed Hysun 450	64	63	---	60	65	---	5	5	---	27.3	27.5	----	9.0	8.4	----
Interstate Seed 4049	63	63	63	70	75	77	4	4	4	28.0	27.6	28.0	10.3	10.0	10.8
Interstate Seed 4340	65	---	---	66	---	---	6	---	---	28.0	----	----	9.9	----	----
Interstate Seed IS 6767	62	61	60	65	69	69	10	7	7	28.0	28.4	29.2	12.4	11.6	12.2
Interstate Seed IS 84021	64	---	---	66	---	---	9	---	---	24.5	----	----	9.9	----	----
Interstate Seed IS 971136NS	62	61	---	70	73	---	8	6	---	26.8	26.9	----	10.9	10.4	----
Interstate Seed IS X33204	63	---	---	73	---	---	6	---	---	25.5	----	----	10.9	----	----
Interstate Seed K 41978	63	62	---	65	70	---	5	3	---	24.0	24.4	----	11.6	11.2	----
Interstate Seed X 74066	66	---	---	66	---	---	13	---	---	27.3	----	----	9.4	----	----
Interstate Seed X 74091	64	---	---	64	---	---	18	---	---	26.3	----	----	9.8	----	----
Kaystar Seed 9501	64	64	63	71	75	77	8	5	5	28.8	28.0	28.5	11.7	11.3	11.9
Monsanto DK 3872NS	64	63	---	71	74	---	10	6	---	24.5	26.5	----	11.2	10.5	----
Monsanto DK 3875	63	62	62	66	69	70	5	4	4	27.6	27.8	28.2	11.9	10.1	10.8
Monsanto DK 3881	63	62	62	62	66	64	10	7	7	27.5	27.8	28.2	11.6	10.5	11.5
Monsanto DK 3900	64	63	63	64	69	67	13	6	6	27.5	27.9	28.6	11.8	10.2	10.9
Monsanto DKF29-90	61	---	---	66	---	---	5	---	---	27.8	----	----	10.3	----	----
Monsanto DKF31-01NS	61	---	---	72	---	---	9	---	---	27.0	----	----	11.4	----	----
Monsanto DKF36-40NS	60	---	---	67	---	---	10	---	---	26.3	----	----	11.6	----	----
Monsanto EX9915NS	63	---	---	65	---	---	12	---	---	26.3	----	----	10.8	----	----
Mycogen Seeds 8468	63	62	---	62	64	---	4	2	---	26.3	26.6	----	13.6	12.4	----
Mycogen Seeds 8488NS	62	61	61	68	71	71	6	4	4	27.5	27.7	28.5	10.2	9.5	10.5
Pioneer Hi-Bred Int'l. 63A70	61	---	---	61	---	---	1	---	---	25.0	----	----	11.2	----	----
Pioneer Hi-Bred Int'l. 63A81	64	63	---	65	68	---	5	5	---	24.8	25.0	----	11.1	10.5	----
Pioneer Hi-Bred Int'l. 63M80	62	---	---	65	---	---	6	---	---	26.8	----	----	13.1	----	----
Pioneer Hi-Bred Int'l. 63M91	62	61	---	70	75	---	6	6	---	27.5	28.2	----	12.5	10.8	----
Pioneer Hi-Bred Int'l. 64M01	60	60	---	63	67	---	8	5	---	26.3	27.2	----	12.5	11.7	----
Seeds 2000 Bronco	64	63	---	60	64	---	10	7	---	28.5	28.1	----	9.9	9.1	----
Seeds 2000 Maverick	62	61	---	58	64	---	11	13	---	26.5	26.5	----	9.7	9.1	----
Seeds 2000 Mustang	61	---	---	61	---	---	13	---	---	26.7	----	----	9.4	----	----
Triumph Seed Co. 545A	62	61	---	62	66	---	7	7	---	26.8	27.6	----	11.9	10.9	----
Triumph Seed Co. 540	60	60	59	62	65	66	9	8	8	25.5	27.2	28.1	11.9	11.2	12.0
Triumph Seed Co. 562	62	61	61	64	70	73	4	4	4	28.0	28.5	28.9	14.9	13.7	13.8
Triumph Seed Co. 652	63	63	---	67	72	---	3	3	---	26.0	27.5	----	12.9	12.0	----
Triumph Seed Co. TRX0448	63	---	---	64	---	---	15	---	---	26.0	----	----	13.2	----	----
Triumph Seed Co. TRX9443	64	---	---	67	---	---	6	---	---	29.8	----	----	11.5	----	----
Average	63	62	61	65	69	69	8	6	6	26.7	27.3	28.1	11.2	10.5	11.2
LSD (.05)	1	1	3	3	3	3	5	5	5	1.7	1.6	1.4	----	----	----

Table 5. Thomas County Confectionary Sunflower Performance Test Results—Irrigated, 1998-2000

Brand and hybrid	Acre yield (lbs)					Yield as % of test avg.			Days to 1/2 bloom		
	2000	1999	1998	2-yr avg	3-yr avg	2000	1999	1998	2000	2-yr avg	3-yr avg
Agway, Inc. RH EXP001	2351	-----	-----	-----	-----	113	-----	-----	64	-----	-----
Interstate Seed IS 8048	1933	2193	-----	2063	-----	93	91	-----	61	60	-----
Red River Commodities 2213	2174	2535	3169	2355	2926	105	105	112	62	61	60
Red River Commodities 2413	2377	1971	2887	2174	2411	114	82	102	63	62	61
Red River Commodities 2582	2329	2338	-----	2333	-----	112	97	-----	62	61	-----
Seeds 2000 X3247	2328	-----	-----	-----	-----	112	-----	-----	62	-----	-----
Seeds 2000 X3988	1890	-----	-----	-----	-----	91	-----	-----	65	-----	-----
Triumph Seed Co. 765C	1932	2735	3263	2333	2643	93	113	115	63	62	61
Triumph Seed Co. 766CRT	1616	2730	-----	2173	-----	78	113	-----	64	62	-----
Triumph Seed Co. TRX0451 CRT	2144	-----	-----	-----	-----	103	-----	-----	64	-----	-----
Triumph Seed Co. TRX0453 CRT	1802	-----	-----	-----	-----	87	-----	-----	64	-----	-----
Average	2080	2415	2836	2248	2444	100	100	100	63	62	60
LSD (.05)	-----	484	579	532	483	-----	-----	-----	1	1	1

	Plant height (in)			Lodging (%)			Test weight (lbs/bu)			200 seed weight (g)		
	2000	2-yr avg	3-yr avg	2000	2-yr avg	3-yr avg	2000	2-yr avg	3-yr avg	2000	2-yr avg	3-yr avg
Agway, Inc. RH EXP001	64	-----	-----	9	---	---	18.9	-----	-----	24.7	-----	-----
Interstate Seed IS 8048	59	64	-----	3	4	---	19.9	21.0	-----	26.0	26.2	-----
Red River Commodities 2213	63	69	72	9	8	7	19.9	21.7	21.7	23.8	22.5	-----
Red River Commodities 2413	63	67	70	8	9	8	17.8	20.3	21.0	24.8	23.9	23.7
Red River Commodities 2582	60	65	-----	7	5	---	17.6	21.0	-----	25.5	23.7	24.1
Seeds 2000 X3247	59	-----	-----	5	---	---	19.2	-----	-----	24.7	-----	-----
Seeds 2000 X3988	65	-----	-----	4	---	---	19.0	20.9	21.1	24.8	-----	-----
Triumph Seed Co. 765C	60	67	70	7	6	8	19.5	19.6	-----	25.9	25.4	25.6
Triumph Seed Co. 766CRT	63	70	-----	7	6	---	18.4	-----	-----	26.0	25.9	-----
Triumph Seed Co. TRX0451 CRT	64	-----	-----	4	---	---	18.5	-----	-----	25.8	-----	-----
Triumph Seed Co. TRX0453 CRT	65	-----	-----	6	---	---	20.1	-----	-----	25.4	-----	-----
Average	62	68	70	6	5	6	19.0	20.8	21.1	25.2	24.5	24.3
LSD (.05)	2	2	2	6	5	5	1.7	2.9	2.1	-----	-----	-----

Table 6. Seed Size Distribution for Thomas County Confectionary Sunflower Performance Tests—Irrigated, 1998-2000

Brand and hybrid	Seed size distribution (%)																				
	2000							2-year average						3-year average							
	Above 21/64	to 20/64	to 19/64	to 18/64	to 16/64	Below 16/64	Above 21/64	to 20/64	to 19/64	to 18/64	to 16/64	Below 16/64	Above 21/64	to 20/64	to 19/64	to 18/64	to 16/64	Below 16/64			
	22/64	22/64	21/64	20/64	19/64	19/64	22/64	22/64	21/64	20/64	19/64	19/64	22/64	22/64	21/64	20/64	19/64	19/64	16/64		
Agway, Inc. RH EXP001	34.8	16.3	14.1	14.3	7.8	9.4	3.3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----		
Interstate Seed ISO8048	36.1	17.8	15.5	13.4	7.3	6.2	3.8	35.4	19.4	15.8	11.9	6.5	6.2	4.6	-----	-----	-----	-----	-----		
Red River Commodities 2213	33.9	16.6	15.9	13.1	7.7	7.7	5.2	21.8	14.9	15.8	16.0	9.6	14.1	7.7	23.6	17.9	16.5	16.0	8.6	11.2	6.0
Red River Commodities 2413	29.3	20.4	14.6	14.8	9.4	8.1	3.3	21.7	16.5	16.5	15.4	9.6	12.4	7.6	22.6	18.2	16.1	15.1	9.8	11.6	8.3
Red River Commodities 2582	25.1	18.4	15.1	16.8	8.8	11.6	4.2	20.4	14.2	14.0	18.3	11.4	14.4	7.1	-----	-----	-----	-----	-----	-----	-----
Seeds 2000 X3247	30.0	20.9	14.5	14.0	8.6	8.0	4.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Seeds 2000 X3988	28.2	19.9	15.5	13.6	8.6	8.3	5.7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Triumph Seed Co. 765C	26.2	22.6	16.7	14.8	8.3	8.9	2.4	23.0	23.5	16.9	15.7	8.8	8.8	2.9	24.1	22.5	18.5	16.0	7.8	7.8	3.0
Triumph Seed Co. 766CRT	40.1	21.0	13.6	11.4	6.2	4.9	2.7	26.2	18.6	17.2	15.1	9.0	10.6	3.1	-----	-----	-----	-----	-----	-----	-----
Triumph Seed Co. TRX0451CRT	25.7	18.3	17.6	16.1	8.0	10.9	3.4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Triumph Seed Co. TRX0453CRT	17.2	13.5	16.5	19.2	11.3	15.8	6.5	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Average	29.7	18.7	15.4	14.7	8.4	9.1	4.0	23.7	17.5	16.1	15.7	9.3	11.7	5.7	24.5	19.0	16.8	15.7	8.7	10.1	4.8

**NORTH CENTRAL KANSAS
 DRYLAND, CONTINUOUS CROP
 SUNFLOWER TEST-OILSEED**

HARVEST DATE: Sept.13, 2000
PEST CONTROL: Prowl, May 10, 2000;
 Warrior, July 28
POPULATION: 22,000 plants/a
TEST YIELDS:

LOCATION: North Central Kansas
 Experiment Field, west of Belleville in
 Republic County

Avg. (lbs/a): 1649
Range (lbs/a): 1239-2301
CV (%): 11

COOPERATOR: Barney Gordon,
 agronomist

GROWING CONDITIONS: Uniform stands
 were established in all plots. Spring was
 very dry with above-normal temperatures.
 Summer rainfall was much below normal,
 and temperatures were above normal. No
 significant disease outbreaks occurred.

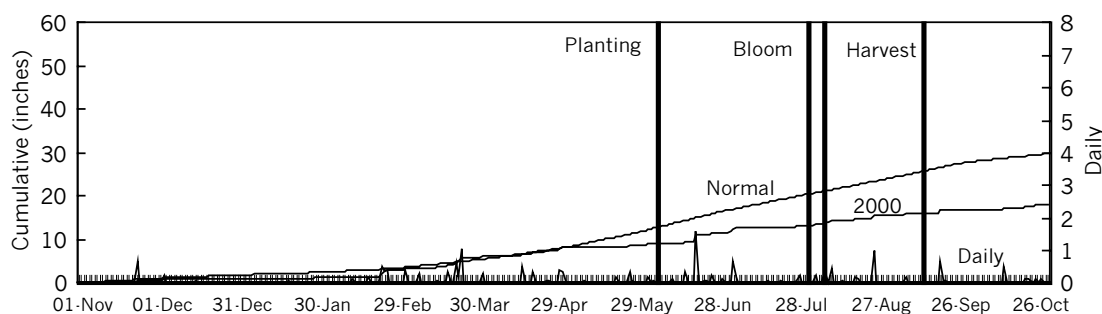
TEST SITE: Crete silt loam
 Soybeans1998, corn 1999

FERTILIZATION: 70-30-0 spring

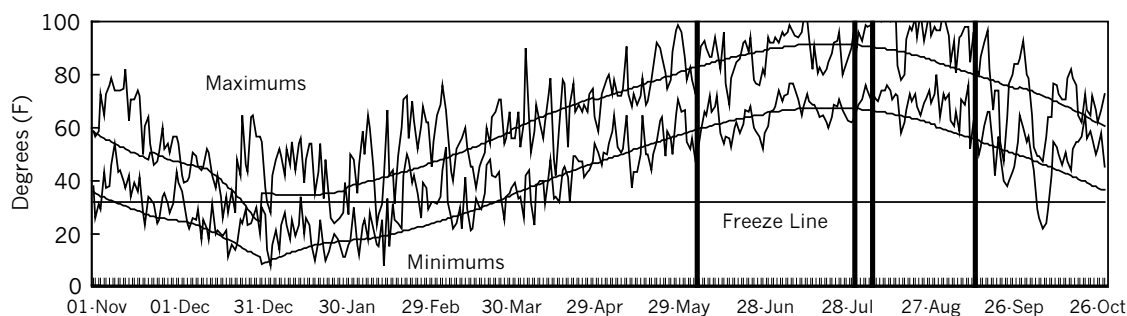
PLANTING DATE: June 5, 2000

HEADING DATES: Aug. 1-7, 2000

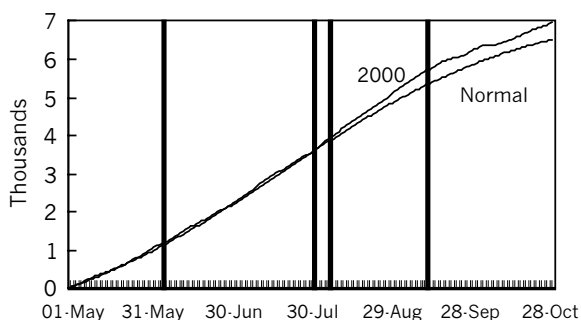
PRECIPITATION



DAILY TEMPERATURES



GROWING DEGREE DAYS



GROWING-SEASON WEATHER SUMMARY

Month	Precipitation		Average Temp.		GDD	
	2000	Normal	2000	Normal	2000	Normal
April	1.4	2.5	52	53	0	0
May	1.5	4.0	66	64	962	902
June	2.8	4.6	73	74	1156	1188
July	1.6	3.8	79	79	1404	1398
August	2.6	3.7	83	77	1529	1335
Sep.	1.1	3.9	72	67	1134	1004
Oct.	1.2	2.0	59	56	771	678
Season Totals	12.2	24.5	69	67	6956	6505

Table 7. Republic County Oilseed Sunflower Performance Test Results–Dryland, Continuous Crop, 1998-2000

Brand and hybrid	Yield (lbs/a)					Yield as % of test average			Oil (%)			Oil yields (lbs/a)		
	2000	1999	1998	2-yr	3-yr	2000	1999	1998	2000	2-yr	3-yr	2000	2-yr	3-yr
				avg	avg					avg	avg		avg	
Interstate Seed Hysun 450	1325	2278	-----	1802	-----	80	83	---	42.0	42.9	-----	556	776	-----
Interstate Seed IS 4049	2164	2879	2010	2521	2351	131	105	99	43.4	43.6	42.2	939	1100	998
Interstate Seed IS 4340	1976	-----	-----	-----	-----	120	---	---	43.2	-----	-----	854	-----	-----
Interstate Seed IS 6767	1404	2635	2439	2019	2159	85	96	120	44.3	44.1	42.9	622	888	921
Interstate Seed IS 84021	1284	-----	-----	-----	-----	78	---	---	41.7	-----	-----	536	-----	-----
Interstate Seed IS 971136 NS	1800	-----	-----	-----	-----	109	---	---	42.5	-----	-----	765	-----	-----
Interstate Seed X33204	1304	-----	-----	-----	-----	79	---	---	43.6	-----	-----	569	-----	-----
Interstate Seed IS V15045	1658	-----	-----	-----	-----	101	---	---	45.2	-----	-----	749	-----	-----
Interstate Seed X 74066	1735	-----	-----	-----	-----	105	---	---	43.2	-----	-----	750	-----	-----
Interstate Seed X 74091	1878	-----	-----	-----	-----	114	---	---	43.1	-----	-----	809	-----	-----
Kaystar Seed 9501	1983	3050	-----	2517	-----	120	111	---	42.5	42.8	-----	843	1077	-----
Monsanto DK 3881	1311	2559	2130	1935	2000	80	93	105	43.0	42.5	41.3	564	818	821
Monsanto DK 3900	1760	3247	2120	2503	2376	107	119	104	43.2	42.3	41.6	760	1051	986
Mycogen Seeds 8488NS	1661	-----	-----	-----	-----	101	---	---	41.9	-----	-----	696	-----	-----
Mycogen Seeds Cavalry	1767	-----	-----	-----	-----	107	---	---	44.4	-----	-----	785	-----	-----
Pioneer Hi-Bred Int'l. 63A70	1396	-----	-----	-----	-----	85	---	---	45.7	-----	-----	638	-----	-----
Pioneer Hi-Bred Int'l. 63A81	1289	-----	-----	-----	-----	78	---	---	43.4	-----	-----	559	-----	-----
Pioneer Hi-Bred Int'l. 63M91	1535	-----	-----	-----	-----	93	---	---	43.5	-----	-----	668	-----	-----
Pioneer Hi-Bred Int'l. 64M01	1239	-----	-----	-----	-----	75	---	---	43.3	-----	-----	537	-----	-----
Triumph Seed Co. 545A	1809	2489	-----	2149	-----	110	91	---	43.3	43.7	-----	783	940	-----
Triumph Seed Co. 562	1689	2756	2597	2222	2347	102	101	128	46.3	45.2	43.6	782	997	1015
Triumph Seed Co. 652	2301	-----	-----	-----	-----	140	---	---	43.3	-----	-----	996	-----	-----
Average	1649	2737	2036	2193	2140	100	100	100	41.8	42.5	41.4	689	935	890
LSD (.05)	210	219	181	-----	-----	---	---	---	-----	-----	-----	-----	-----	-----

Brand and hybrid	Days to 1/2 bloom			Plant height (in)			Lodging (%)			Test weight (lbs/bu)			200 seed weight (g)		
	2000	2-yr	3-yr	2000	2-yr	3-yr	2000	2-yr	3-yr	2000	2-yr	3-yr	2000	2-yr	3-yr
		avg	avg		avg	avg		avg	avg		avg	avg		avg	avg
Interstate Seed Hysun 450	61	61	---	32	45	---	4	2	--	29.4	29.1	-----	7.9	8.7	----
Interstate Seed IS 4049	58	59	60	39	49	62	5	4	6	30.2	30.3	30.2	8.8	9.1	9.5
Interstate Seed IS 4340	61	---	---	33	---	---	3	--	--	29.8	-----	-----	8.2	---	---
Interstate Seed IS 6767	60	60	60	35	44	55	4	2	4	29.9	30.5	30.6	7.2	8.5	9.4
Interstate Seed IS 84021	60	---	---	30	---	---	3	--	--	29.7	-----	-----	6.8	---	---
Interstate Seed IS 971136 NS	57	---	---	39	---	---	2	--	--	30.8	-----	-----	7.2	---	---
Interstate Seed X33204	60	---	---	44	---	---	5	--	--	29.7	-----	-----	6.9	---	---
Interstate Seed IS V15045	61	---	---	39	---	---	2	--	--	29.3	-----	-----	7.5	---	---
Interstate Seed X 74066	63	---	---	40	---	---	5	--	--	30.2	-----	-----	7.1	---	---
Interstate Seed X 74091	62	---	---	33	---	---	4	--	--	30.4	-----	-----	7.3	---	---
Kaystar Seed 9501	60	60	---	40	50	---	2	1	--	29.8	30.1	-----	6.8	7.8	----
Monsanto DK 3881	61	60	60	34	43	55	2	1	4	29.7	29.9	29.7	7.3	8.2	9.1
Monsanto DK 3900	62	61	61	35	43	54	3	2	5	29.2	29.3	29.8	6.9	7.9	8.9
Mycogen Seeds 8488NS	63	---	---	35	---	---	2	--	--	30.1	-----	-----	7.1	---	---
Mycogen Seeds Cavalry	58	---	---	36	---	---	4	--	--	30.4	-----	-----	7.0	---	---
Pioneer Hi-Bred Int'l. 63A70	58	---	---	36	---	---	2	--	--	29.6	-----	-----	7.4	---	---
Pioneer Hi-Bred Int'l. 63A81	59	---	---	33	---	---	2	--	--	29.3	-----	-----	7.2	---	---
Pioneer Hi-Bred Int'l. 63M91	58	---	---	33	---	---	2	--	--	29.8	-----	-----	7.2	---	---
Pioneer Hi-Bred Int'l. 64M01	60	---	---	32	---	---	3	--	--	30.0	-----	-----	7.8	---	---
Triumph Seed Co. 545A	59	59	---	40	49	---	2	1	--	29.7	30.2	-----	7.3	8.4	----
Triumph Seed Co. 562	62	61	60	40	49	61	6	4	6	30.2	30.0	30.4	8.3	8.9	9.6
Triumph Seed Co. 652	63	---	---	36	---	---	2	--	--	30.0	-----	-----	7.4	---	---
Average	60	59	60	37	46	57	3	2	4	29.9	30.1	30.1	7.4	8.4	9.2
LSD (.05)	---	---	---	---	---	---	--	--	--	-----	-----	-----	-----	-----	-----

**SOUTH CENTRAL KANSAS
 DRYLAND, CONTINUOUS CROP
 SUNFLOWER TEST-OILSEED**

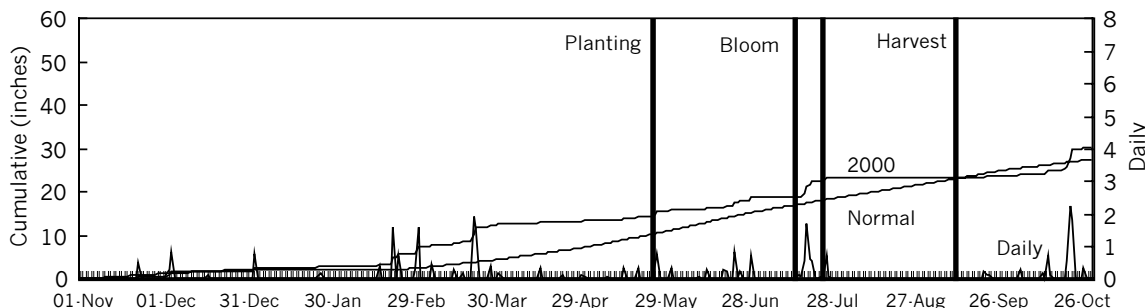
PEST CONTROL: Bythroid 7/14, 8/17
POPULATION: 22,000 plants/a
TEST YIELDS:

Avg. (lbs/a): 1630
 Range (lbs/a): 829-2296
 LSD (lbs/a): 333
 CV (%): 17.3,

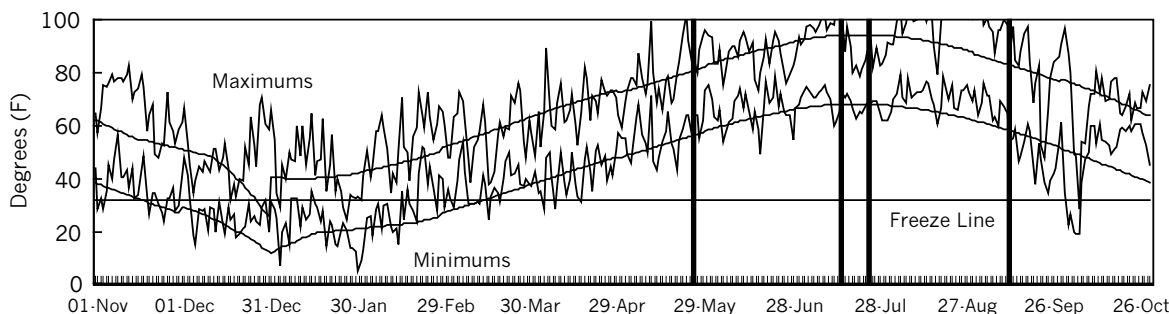
LOCATION: South Central Kansas
 Experiment Field, Hutchinson, Reno Co.
COOPERATOR: William Heer, agronomist
TEST SITE: Ost silt loam
 Fallow 1999, Wheat 1998
FERTILIZATION: 140-40-0/a spring 2000
PLANTING DATE: May 25, 2000
HEADING DATES: July 15-July 25, 2000
HARVEST DATE: Sept. 11, 2000

GROWING CONDITIONS: Good stands were established, and favorable growing conditions continued through July. August was hotter and drier than normal. Pressure from head moth and fall army worm was heavy.

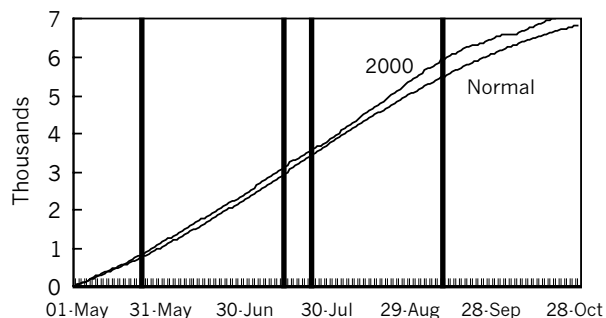
PRECIPITATION



DAILY TEMPERATURES



GROWING DEGREE DAYS



GROWING-SEASON WEATHER SUMMARY

Month	Precipitation		Average Temp.		GDD	
	2000	Normal	2000	Normal	2000	Normal
April	0.8	2.6	54	56	0	0
May	2.3	3.9	68	65	1038	940
June	2.5	4.3	76	75	1266	1234
July	5.3	3.4	81	81	1444	1454
August	0.0	3.1	85	79	1594	1385
Sep.	0.5	3.3	72	70	1139	1072
Oct.	6.4	2.5	59	58	795	748
Season Totals	17.8	23.1	71	69	7275	6833

Table 8. Reno County Oilseed Sunflower Performance Test Results–Dryland Continuous Crop, 1998-2000

Brand and hybrid	Yield (lbs/a)		Yield as % of test average			Oil (%)			Oil yields (lbs/a)					
	2000	1999	1998	2-yr	3-yr	2000	1999	1998	2-yr	3-yr	2000	2-yr avg	3-yr avg	
				avg	avg				avg	avg				
Interstate Seed Hysun 450	1507	1494	-----	1501	-----	92	96	----	35.2	37.3	-----	397	471	-----
Interstate Seed IS 4049	1749	1917	1573	1833	1746	107	123	98	35.4	38.9	40.4	701	713	756
Interstate Seed IS 4340	829	-----	-----	-----	-----	51	----	----	34.1	36.7	-----	514	586	-----
Interstate Seed IS 6767	2296	1760	1386	2028	1814	141	113	86	33.1	36.7	38.6	579	770	667
Interstate Seed IS 84021	1473	-----	-----	-----	-----	90	----	----	32.7	----	-----	271	-----	-----
Interstate Seed IS V15045	1305	-----	-----	-----	-----	80	----	----	37.6	38.9	40.5	863	706	606
Interstate Seed X 74066	1268	-----	-----	-----	-----	78	----	----	33.2	----	-----	489	-----	-----
Interstate Seed X 74091	1766	-----	-----	-----	-----	108	----	----	33.9	----	-----	443	-----	-----
Kaystar Seed 9404	2011	-----	-----	-----	-----	123	----	----	33.7	----	-----	427	-----	-----
Monsanto DK 3872NS	1126	1196	-----	1161	-----	69	77	----	35.9	----	-----	634	-----	-----
Monsanto DK 3900	1980	1683	1738	1832	1800	121	108	108	36.3	----	-----	730	-----	-----
Mycogen Seeds 8488NS	1875	-----	-----	-----	-----	115	----	----	36.7	----	-----	688	-----	-----
Mycogen Seeds Cavalry	1380	-----	-----	-----	-----	85	----	----	38.4	----	-----	530	-----	-----
Pioneer Hi-Bred Int'l. 63A70	1630	1649	-----	1640	-----	100	106	----	38.2	39.7	-----	623	678	-----
Pioneer Hi-Bred Int'l. 63A81	1052	1444	-----	1248	-----	65	93	----	34.7	37.1	-----	365	569	-----
Pioneer Hi-Bred Int'l. 63M80	2009	-----	-----	-----	-----	123	----	----	37.1	----	-----	745	-----	-----
Pioneer Hi-Bred Int'l. 63M91	2204	1537	-----	1870	-----	135	99	----	37.0	38.3	-----	815	607	-----
Triumph Seed Co. 545A	1419	1676	-----	1547	-----	87	108	----	39.2	41.4	-----	556	731	-----
Triumph Seed Co. 562	1713	1980	1986	1847	1893	105	128	124	35.6	37.3	39.1	610	772	850
Triumph Seed Co. 652	2016	-----	-----	-----	-----	124	----	----	34.8	----	-----	701	-----	-----
Average	1631	1552	1606	1591	1596	100	105	100	35.6	38.0	39.7	584	660	720
LSD (.05)	333	313	235	-----	-----	----	----	----	-----	-----	-----	-----	-----	-----

Brand and hybrid	Days to 1/2 bloom			Plant height (in)			Lodging (%)			Test weight (lbs/bu)			200 seed weight (g)		
	2000	2-yr avg	3-yr avg	2000	2-yr avg	3-yr avg	2000	2-yr avg	3-yr avg	2000	2-yr avg	3-yr avg	2000	2-yr avg	3-yr avg
Interstate Seed Hysun 450	57	58	---	53	59	---	1	4	--	26.5	28.1	-----	9.4	9.7	----
Interstate Seed IS 4049	57	57	56	62	66	66	2	5	5	25.1	27.9	27.7	9.6	9.8	10.1
Interstate Seed IS 4340	58	---	---	56	---	---	2	--	--	23.7	-----	-----	9.4	9.3	----
Interstate Seed IS 6767	53	54	53	55	55	57	3	5	7	29.0	30.1	30.0	8.9	9.2	9.7
Interstate Seed IS 84021	56	---	---	58	---	---	0	--	--	26.4	-----	-----	8.6	-----	-----
Interstate Seed IS V15045	57	---	---	62	---	---	2	--	--	25.1	-----	-----	11.0	11.3	11.4
Interstate Seed X 74066	59	---	---	55	---	---	0	--	--	24.6	-----	-----	8.6	----	----
Interstate Seed X 74091	55	---	---	57	---	---	1	--	--	26.9	-----	-----	8.1	----	----
Kaystar Seed 9404	53	---	---	56	---	---	2	--	--	27.7	-----	-----	8.9	----	----
Monsanto DK 3872NS	55	56	---	65	66	---	1	6	---	26.1	28.6	-----	8.9	----	----
Monsanto DK 3900	55	56	55	59	60	59	1	6	7	26.2	28.4	28.3	10.8	----	----
Mycogen Seeds 8488NS	54	---	---	64	---	---	1	--	--	28.7	-----	-----	9.1	----	----
Mycogen Seeds Cavalry	55	---	---	61	---	---	1	--	--	28.8	-----	-----	9.9	----	----
Pioneer Hi-Bred Int'l. 63A70	52	52	---	53	53	---	6	6	--	28.6	29.8	-----	9.5	10.5	----
Pioneer Hi-Bred Int'l. 63A81	56	57	---	57	57	---	0	3	--	24.9	27.0	-----	9.7	10.0	----
Pioneer Hi-Bred Int'l. 63M80	52	---	---	54	---	---	2	--	--	28.0	-----	-----	11.1	----	----
Pioneer Hi-Bred Int'l. 63M91	53	54	---	61	65	---	4	4	--	28.1	29.4	-----	10.0	10.7	----
Triumph Seed Co. 545A	52	53	---	55	55	---	8	8	--	28.8	30.0	-----	9.2	10.1	----
Triumph Seed Co. 562	53	54	53	56	57	60	7	7	6	28.5	30.1	30.3	10.3	11.2	11.8
Triumph Seed Co. 652	55	---	---	57	---	---	2	--	--	27.3	-----	-----	10.7	----	----
Average	55	55	54	58	59	59	2	5	6	26.9	28.9	28.9	9.6	10.1	10.6
LSD (.05)	2	---	---	5	---	---	3	--	--	1.3	-----	-----	-----	-----	-----

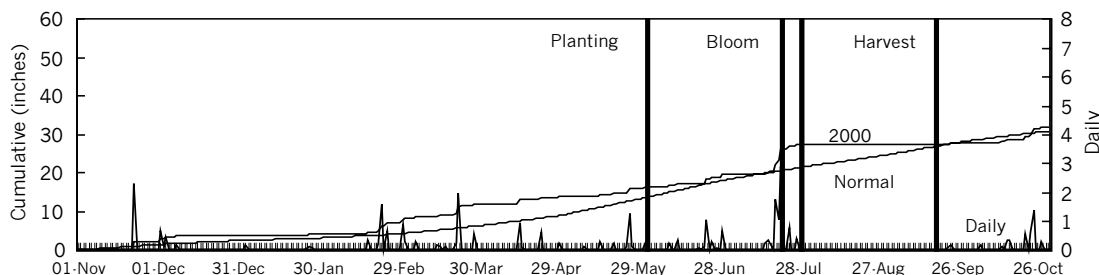
**SOUTH CENTRAL KANSAS
 DRYLAND, CONTINUOUS CROP
 SUNFLOWER TEST-OILSEED**

Range (lbs/a): 1452-1931
 LSD (lbs/a): 182
 CV (%): 8.9

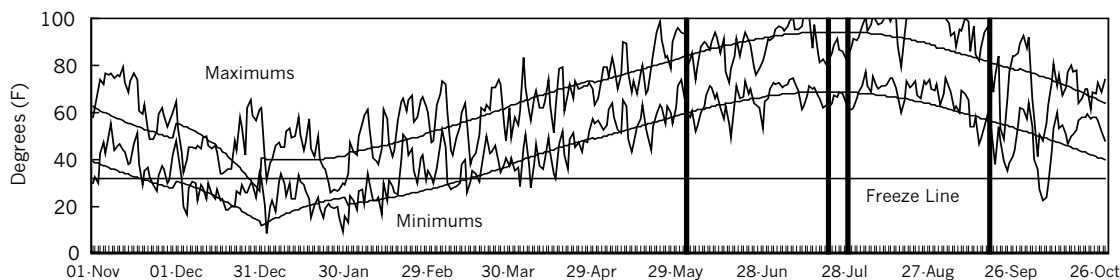
LOCATION: Harvey County Experiment
 Field, Hesston
 COOPERATOR: Mark Claassen agronomist
 TEST SITE: Ladysmith silty clay loam
 Sorghum 1998, Soybean 1999
 FERTILIZATION: 81-38-0lb/a spring 2000
 PLANTING DATE: June 1, 2000
 HEADING DATES: July 22-July29, 2000
 HARVEST DATE: Sept. 18, 2000
 PEST CONTROL: Treflan 5/23,
 Bythroid 7/27,8/7
 POPULATION: 22,000 plants/a
 TEST YIELDS:
 Avg. (lbs/a): 1684

GROWING CONDITIONS: Uniform stands were established. Mean air temperatures were near normal in May and below average in June. Precipitation in June was about 88% of normal. Despite 5 days of temperatures above 100° in July, maximum air temperatures averaged about 3° below normal. No meaningful rainfall occurred between July 28 and harvest. During this time, temperatures equaled or exceeded 100° on 23 days, and the mean maximum temperatures were 6.5 and 4.6 degrees above normal for the months of August and July, respectively. This late-season drought stress reduced yields.

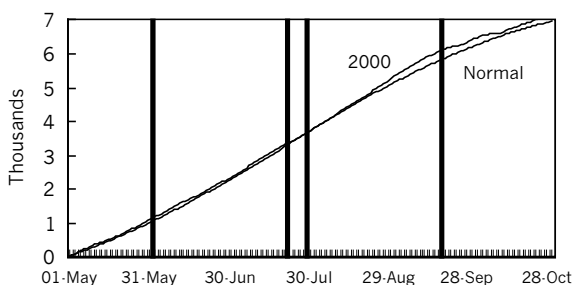
PRECIPITATION



DAILY TEMPERATURES



GROWING DEGREE DAYS



GROWING-SEASON WEATHER SUMMARY

Month	Precipitation		Average Temp.		GDD	
	2000	Normal	2000	Normal	2000	Normal
April	1.7	2.6	55	56	0	0
May	2.5	4.5	68	66	1043	963
June	2.6	4.7	75	76	1217	1251
July	8.6	3.6	80	81	1420	1460
August	0.1	3.0	84	79	1557	1407
Sep.	0.3	3.7	72	71	1130	1098
Oct.	4.1	2.6	60	59	815	780
Season Totals	19.9	24.6	71	70	7182	6959

Table 9. Harvey County Oilseed Sunflower Performance Test Results—Dryland, Continuous Crop, 2000

Brand and hybrid	Yield (lbs/a)	Yield as % of test avg	Oil (%)	Oil yields (lbs/a)	Days to ½ bloom	Plant height (in.)	Lodging (%)	Test weight (lbs/bu)	200- seedwt. (g)
Kaystar Seed 9404	1753	104	31.6	554	55	49	4	23.0	5.9
Monsanto DK 3881	1758	104	31.6	555	58	46	1	22.1	6.6
Monsanto DK 3900	1734	103	34.9	605	58	46	2	25.0	6.7
Mycogen Seeds 8488NS	1931	115	33.1	639	56	53	2	23.4	6.4
Mycogen Seeds Cavalry	1532	91	37.1	568	57	54	3	26.5	6.8
Pioneer Hi-Bred Int'l. 63A70	1612	96	35.0	564	52	48	4	23.1	7.6
Pioneer Hi-Bred Int'l. 63M80	1452	86	33.8	491	55	47	2	24.1	7.4
Pioneer Hi-Bred Int'l. 63M91	1700	101	33.2	564	55	50	3	25.2	6.2
Average	1684	100	33.8	568	55	49	3	24.1	6.7
LSD	182	----	-----	-----	1	3	2	1.2	----

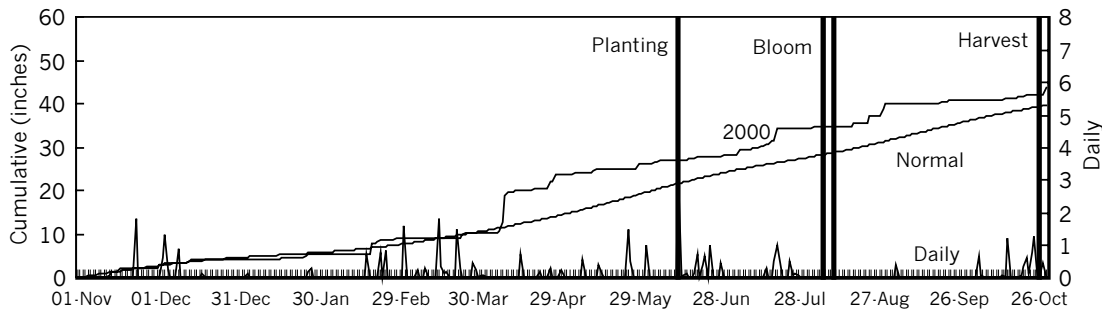
**SOUTH CENTRAL KANSAS
 DRYLAND, CONTINUOUS CROP
 SUNFLOWER TEST-OILSEED**

**PEST CONTROL: Bythroid 8/9
 POPULATION: 23,000 plants/a
 TEST YIELDS:**

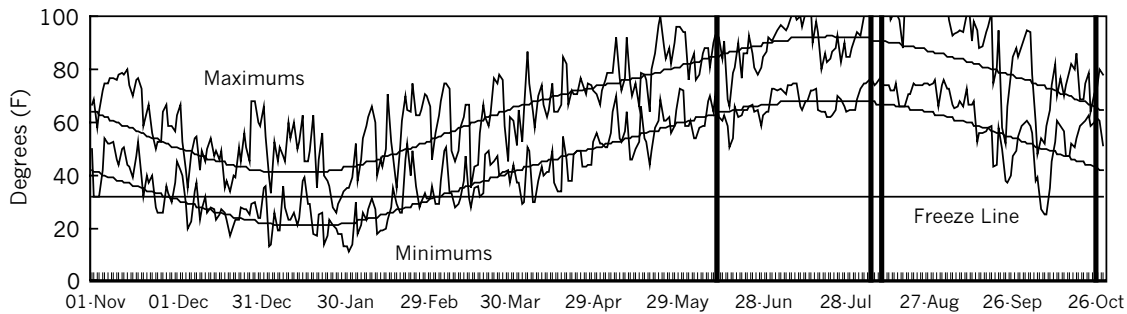
**LOCATION: One mile east of Wellington
 COOPERATOR: William Heer, agronomist
 TEST SITE: Tabler silty clay loam
 Wheat 1999, wheat 1998
 FERTILIZATION: 18-40-0 at planting
 PLANTING DATE: June 13, 2000
 HEADING DATES: Aug. 7-11, 2000
 HARVEST DATE: Oct. 27, 2000**

**Avg. (lbs/a): (202)
 Range (lbs/a): 157-257
 LSD (lbs/a): 65
 CV (%): 26.5
 GROWING CONDITIONS: Good stands were established, and favorable growing conditions continued through July, when precipitation was 7 in. above normal. August was hot and dry, which severely reduced yields.**

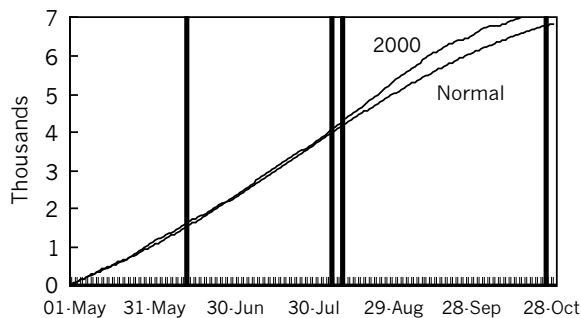
PRECIPITATION



DAILY TEMPERATURES



GROWING DEGREE DAYS



GROWING-SEASON WEATHER SUMMARY

Month	Precipitation		Average Temp.		GDD	
	2000	Normal	2000	Normal	2000	Normal
April	1.4	3.7	55	58	0	0
May	3.5	5.0	68	66	1031	965
June	7.6	4.7	73	75	1180	1215
July	3.8	3.5	81	80	1443	1418
August	0.0	3.9	86	78	1624	1371
Sep.	0.5	4.5	75	70	1243	1095
Oct.	5.8	3.8	63	60	898	791
Season Totals	22.6	29.2	72	69	7418	6853

Table 10. Sumner County Oilseed Sunflower Performance Test Results—Dryland Continuous Crop, 2000

Brand and hybrid	Yield (lbs/a)	Yield as % of test avg	Oil (%)	Oil yields (lbs/a)	Days to ½ bloom	Plant height (in.)	Test weight (lbs/bu)	200-seed weight (g)
Kaystar Seed 9404	157	77	38.7	99.4	57	45	21.2	6.4
Kaystar Seed 9501	205	102	35.2	55.1	58	48	22.5	5.3
Monsanto DK 3900	257	127	36.2	74.2	58	47	22.5	5.3
Mycogen Seeds 8488NS	161	80	37.5	60.4	57	50	19.9	5.5
Mycogen Seeds Cavalry	185	92	44.4	82.3	58	48	24.0	6.0
Pioneer Hi-Bred Int'l. 63A70	174	86	39.7	69.2	57	45	20.9	6.4
Pioneer Hi-Bred Int'l. 63M80	241	120	38.2	92.2	58	50	20.2	8.0
Pioneer Hi-Bred Int'l. 63M91	236	117	35.8	84.3	57	47	21.1	5.0
Average	202	100	38.2	77.2	57	47	21.5	6.0
LSD	65	----	-----	-----	1	3	1.9	----

Entrants and Entries in 2000 Sunflower Performance Tests

Adrian Associates 9697 W. Main Kalamazoo, MI 49009		DN 1156, 1183 (NuSun), 1691, 1704, 2015
Agway, Inc. 314 3 rd Street Grandin, ND 58038	Agway	RH Exp 001
Cargill Hybrid Seeds 1401 41st Street N.W. Fargo, ND 58102	Cargill	SF 125NL, 187, 260, 270, 290NL
Croplan Genetics PO Box 1291 Minot, ND 58702	NuSun	CL 345, 380, 385
Interstate Seed Co. PO Box 338 West Fargo, ND 58078	Garst Interstate	HYSUN 449, IS 4049, 4040, 8084 IS 6767, 84021, K 41978. V15045. X74066. X74091
Kaystar Seed Co. PO Box 947 Huron, SD 57350	Kaystar	9401, 9501
Monsanto 3100 Sycamore Road DeKalb, IL 60115	Dekalb	DK 3875, 3881, 3900, 3872NS DK F29-90, F31-01NS, F36-40NS EX 9915NS
Mycogen Seeds 9330 Zionsville Road Indianaopolis, IN 46268	Mycogen	Cavalry, 8488NS
Novartis Seeds 1 North Main, Suite 517 Hutchinson, KS 67501-5228	Novartis	NK 278, T46-R9
Pioneer Hi-Bred, International 1616 S. Kentucky, Suite C-150 Amarillo, TX 79102	Pioneer Brand	63A70, 63A81, 63M80, 63M91, 64M01
Red River Commodities, Inc. 1320 East College Drive Colby, KS 67701	RRC	2213, 2413, 2582
Seeds 2000 Box 200 Breckenridge, MN 56520	Seeds 2000	Bronco, Maverick, Mustang, X3247, X3988
Triumph Seed Co., Inc. PO Box 1050 Ralls, TX 79357	Triumph	540, 545A, 562, 652, 765C, 766CRT TRX 0448, 0451CRT, 0453CRT, TRX 9443

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NOTE: Trade names are used to identify products. No endorsement is intended, nor is any criticism implied of similar products not named.