1998
KANSAS PERFORMANCE TESTS WITH
SUNFLOWER HYBRIDS
REPORT OF PROGRESS 827
Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service

 summer fallow  dryland  irrigated
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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.
INTRODUCTION

TEST OBJECTIVES AND PROCEDURES

Sunflower performance tests were conducted in 1998 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.

Five test locations in 1998 included Republic County and Greeley County—dryland; Reno County—dryland, continuous crop; and Thomas County—irrigated and fallow sites. Oilseed entries were grown at all locations. Confectionary entries were included in all tests except Republic County. 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 1998, as well as period-of-years average data, are included in Tables 1-11. Entrants and entries in 1998 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 number to the Kansas State Grain Inspection Department 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. Technician John Jones aided in planting and harvesting the plots; Vicki Struckmeyer, secretary, assisted in preparing this report; and temporary workers Joel Kniep, Shelby 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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NORTHEASTERN 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 1996, fallow 1997

FERTILIZATION: 86 lbs N/a spring 1998

PLANTING DATE: June 10, 1998

HEADING DATES: Aug. 5-13, 1998

HARVEST DATE: Oct. 9, 1998

PEST CONTROL: Treflan, May 4; Asana,
Aug. 17

POPULATIONS: Double-planted and thinned
to desired stands:

Oil (O) 17000 plants/a
Confectionary (C) 14900 plants/a

TEST YIELDS:
Avg. (lbs/a): (O) 2895, (C) 3181
Range: (O) 2268-3651, (C) 2660-3570
LSD (lbs/a): (O) 398, (C) 488
CV (%): (O) 12, (C) 13

GROWING CONDITIONS: A favorable
growing season produced some very good
yields. Diseases did not cause problems.
Table 1. Thomas County Oilseed Sunflower Performance Test Results—Fallow, 1996-1998

<table>
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<tr>
<th></th>
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<td>LSD (.05)</td>
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continued
Table 1. Thomas County Oilseed Sunflower Performance Test Results–Fallow, 1996-1998, continued

<table>
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<tr>
<th>Brand and hybrid</th>
<th>Days to ½ bloom 1998 avg</th>
<th>Plant height (in) 2-yr avg 3-yr avg</th>
<th>Lodging (%) 2-yr avg 3-yr avg</th>
<th>Test wt (lbs/bu) 2-yr avg 3-yr avg</th>
<th>200 seed wt (g) 2-yr avg 3-yr avg</th>
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<td>27.6 --- --- 11.2 --- ---</td>
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<td><strong>Pioneer Hi-Bred International 6451</strong></td>
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Table 2. Thomas County Confectionary Sunflower Performance Test Results–Fallow, 1996-1998

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<th>Brand and hybrid</th>
<th>Yield (lbs/a)</th>
<th>Yield as % of test avg</th>
<th>Days to 1/2 bloom</th>
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<th>Test weight (lbs/bu)</th>
<th>200 seed weight (g)</th>
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Table 3. Seed Size Distribution for Thomas County Confectionary Sunflower Performance Tests—Fallow, 1996-1997

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<tr>
<th>Brand and hybrid</th>
<th>1998 21/64 20/64 19/64 18/64 16/64</th>
<th>2-year average 21/64 20/64 19/64 18/64 16/64</th>
<th>3-year average 21/64 20/64 19/64 18/64 16/64</th>
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<td>E Abc</td>
<td>E Abc</td>
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<td>40.0 22.3 16.0 10.8 4.4 4.7 1.8</td>
<td>53.4 18.7 11.5 7.5 3.1 3.3 2.4</td>
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<td>32.0 20.3 14.9 13.5 7.1 7.9 4.4</td>
<td>49.7 15.1 11.3 8.8 4.8 5.0 5.4</td>
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<td>29.9 20.4 17.7 11.8 8.3 7.3 1.2</td>
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<td>Agway, Inc. RH2373</td>
<td>28.7 17.7 22.3 15.6 7.2 5.2 3.2</td>
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<tr>
<td>Interstate Payco Seed IS 49097</td>
<td>20.9 24.3 20.6 17.5 7.7 6.7 5.5</td>
<td>--- --- --- --- --- --- ---</td>
<td>--- --- --- --- --- --- ---</td>
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<tr>
<td>Mycogen Seeds 9490</td>
<td>27.7 15.6 22.2 21.6 10.8 9.8 2.2</td>
<td>37.8 15.6 15.0 14.2 7.3 6.7 3.4</td>
<td>28.5 17.2 17.8 16.7 8.7 8.0 3.2</td>
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<td>22.9 24.1 18.5 17.9 6.6 8.2 2.0</td>
<td>26.7 21.1 17.0 15.8 6.2 7.9 5.3</td>
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<td>25.4 13.0 12.7 13.9 10.4 14.1 10.7</td>
<td>22.4 13.3 12.4 14.4 10.4 16.1 11.0</td>
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<td>33.5 14.2 11.2 11.9 9.2 13.3 6.7</td>
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<td>Red River Commodities 9490</td>
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<td>--- --- --- --- --- --- ---</td>
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<td>Red River Commodities EX2412</td>
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<tr>
<td>Seeds 2000 Kodiak</td>
<td>17.3 12.2 16.0 17.9 12.4 17.8 6.7</td>
<td>28.9 14.3 14.1 14.4 8.9 11.5 8.0</td>
<td>22.7 13.3 13.7 15.6 10.4 15.2 9.3</td>
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<td>34.0 19.3 17.7 14.5 5.7 4.6 4.3</td>
<td>25.3 18.1 19.7 17.7 7.9 7.2 4.2</td>
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<td>45.1 17.3 14.3 10.2 4.7 5.9 2.6</td>
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<td>Average</td>
<td>24.8 18.9 18.0 16.3 8.5 9.7 3.8</td>
<td>37.4 17.0 14.1 12.2 6.5 7.6 5.2</td>
<td>29.6 16.0 14.7 14.5 8.7 10.7 5.8</td>
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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
Soybeans 1996, Corn 1997
FERTILIZATION: 110 lbs N/a 4/21/98
PLANTING DATE June 9, 1998
HEADING DATES: Aug. 2-11, 1998
HARVEST DATE: Oct. 10, 1998

IRRIGATIONS: (3") July 21, Aug. 18, 1998
PEST CONTROL: Treflan, May 18; Asana, Aug. 17

POPULATIONS: Double-planted and thinned
to desired stands:
Oil (O) 23000 plants/a
Confectionary (C) 17000 plants/a

TEST YIELDS:
Avg. (lbs/a): (O) 2246, (C) 2836
Range: (O) 1504-2906, (C) 2177-3324
LSD (lbs/a): (O) 436, (C) 579
CV (%): (O) 17, (C) 17

GROWING CONDITIONS: Excellent stands
were established, but rabbits did damage in
some plots. Insecticide seemed to control
head moth, and diseases did not cause
problems.

TEST YIELDS:
Heading Dates: Aug. 2-11, 1998

PEST CONTROL: Treflan, May 18; Asana,
Aug. 17

POPULATIONS: Double-planted and thinned
to desired stands:
Oil (O) 23000 plants/a
Confectionary (C) 17000 plants/a

TEST YIELDS:
Avg. (lbs/a): (O) 2246, (C) 2836
Range: (O) 1504-2906, (C) 2177-3324
LSD (lbs/a): (O) 436, (C) 579
CV (%): (O) 17, (C) 17

GROWING CONDITIONS: Excellent stands
were established, but rabbits did damage in
some plots. Insecticide seemed to control
head moth, and diseases did not cause
problems.
Table 4. Thomas County Oilseed Sunflower Performance Test Results—Irrigated, 1996-1998

<table>
<thead>
<tr>
<th>Brand and hybrid</th>
<th>Yield (lbs/a)</th>
<th>Yield as % of test average</th>
<th>Oil (%)</th>
<th>Oil yields (lbs/a)</th>
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<td>35.4 38.4 —</td>
<td>848 — —</td>
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<td>116 96 103</td>
<td>42.6 43.2 42.3</td>
<td>1111 1115 988</td>
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continued
Table 4. Thomas County Oilseed Sunflower Performance Test Results—Irrigated, 1996-1998, continued

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<tr>
<th>Brand and hybrid</th>
<th>Days to 1/2 bloom</th>
<th>Plant height (in)</th>
<th>Lodging (%)</th>
<th>Test weight (lbs/bu)</th>
<th>200 seed weight (g)</th>
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<td>2-yr avg 3-yr avg</td>
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### Table 5. Thomas County Confectionary Sunflower Performance Test Results—Irrigated, 1996-1998

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<tr>
<th>Brand and hybrid</th>
<th>Acre yield (lbs)</th>
<th>Yield as % of test avg.</th>
<th>Days to 1/2 bloom</th>
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| LSD (.05)                  | 579   | 387   | 347   | ----   | ----  | ----  | ----  | 2     | ----  |

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<th>Plant height (in)</th>
<th>Lodging (%)</th>
<th>Test weight (lbs/bu)</th>
<th>200 seed weight (g)</th>
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<td>Agway, Inc. RH 2373</td>
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<th>3-year average</th>
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<td>22/64 21/64 20/64 19/64 18/64 16/64</td>
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<table>
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<th>1998</th>
<th>2-year average</th>
<th>3-year average</th>
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<td>21/64 20/64 19/64 18/64 16/64</td>
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<tr>
<td></td>
<td>22/64 21/64 20/64 19/64 18/64 16/64</td>
<td>22/64 21/64 20/64 19/64 18/64 16/64</td>
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Agripro Seeds Inc. RH3701
- 31.4 18.4 17.4 14.1 6.0 8.6 4.5
- 32.7 21.0 16.4 12.9 5.5 6.7 5.1

Agripro Seeds Inc. RH3733
- 32.3 18.3 18.4 13.0 7.5 7.1 3.7
- 38.7 19.1 13.8 9.8 6.9 6.8 5.2

Agway, Inc. RH 2073
- 30.1 19.8 18.2 16.1 6.5 6.1 3.6

Agway, Inc. RH 2373
- 24.8 15.0 14.7 14.9 7.6 10.1 2.3

Interstate Payco Seed 49097
- 30.1 19.8 18.2 16.1 6.5 6.1 3.6

Mycogen Seeds 9490
- 30.1 19.8 18.2 16.1 6.5 6.1 3.6

Red River Commodities 2211
- 22.6 21.2 20.4 15.7 7.6 10.1 2.3

Red River Commodities 2213
- 27.2 23.7 17.9 16.0 6.6 5.3 2.5

Red River Commodities 2331
- 24.8 15.0 14.7 15.3 8.5 12.3 9.7

Red River Commodities 49490
- 13.5 12.4 15.3 23.6 12.7 16.6 5.6

Red River Commodities EX2412
- 35.0 19.9 14.7 12.6 6.8 6.6 4.2

Red River Commodities EX2413
- 24.5 21.6 15.4 14.4 10.2 9.9 3.6

Seeds 2000 Kodiak
- 17.3 13.7 12.5 13.4 12.9 19.5 10.7

Triumph Seed 520C
- 20.4 17.3 20.6 19.3 9.4 9.3 3.1

Triumph Seed 760C
- 27.5 21.1 17.5 15.8 7.1 8.7 2.4

Triumph Seed 765C
- 26.4 20.6 21.5 16.5 5.6 5.9 3.0

Average
- 24.9 18.1 16.7 15.8 8.7 10.7 5.1

The table above provides the seed size distribution for various hybrid sunflower seeds in Thomas County, Georgia, from 1996 to 1998. The data includes the seed size distribution in percentage for different hybrid sunflowers, categorized into different seed size ranges. The values represent the percentage of seeds falling into each size range for the 2-year and 3-year averages, respectively. This data is crucial for understanding the quality and performance of sunflower seeds under irrigated conditions.
PLANTING DATE: June 6, 1998
TEST SITE: Crete silt loam
Grain sorghum 1996, soybeans 1997
FERTILIZATION: 90-30-0 spring
HARVEST DATE: October 20, 1998

PEST CONTROL: Prowl, May 18, 1998
Warrior, Aug. 9 & 18
POPULATIONS: Double-planted and thinned to desired stands:
Oil (O) 22000 plants/a

TEST YIELDS:
Avg. (lbs/a): 2036
Range: 1655-2597
LSD (lbs/a): 181
CV (%): 8

GROWING CONDITIONS: Uniform stands were established in all plots, and growing conditions remained favorable with nearly ideal rainfall throughout June and July. August and September were very hot and dry. No significant disease outbreaks occurred.
Table 7. Republic County Oilseed Sunflower Performance Test Results—Dryland, 1996-1998

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SOUTH CENTRAL KANSAS
DRYLAND, CONTINUOUS CROP
SUNFLOWER TEST--OILSEED AND CONFECTIONARY

LOCATION: South Central Kansas
Experiment Field, Hutchinson, Reno Co.

COOPERATOR: William Heer,
agronomist

TEST SITE: Ost silt loam
Oats 1996, wheat 1997

PLANTING DATE: June 29, 1998

FERTILIZATION: 117-40-0/a spring


PEST CONTROL: Treflan 6/9, Prowl 6/30,
Bythroid and Lorsban 8/21

TEST YIELDS:

POPULATIONS: Double-planted and thinned
to desired stands:

Oil (O) 22000 plants/a
Confectionary (C) 22000 plants/a

HARVEST DATES: Aug. 15-22, 1998

TEST YIELDS:

Oil (O) 1606, (C) 1907
Confectionary (O) 1133-2117, (C) 1755-2086
LSD (lbs/a): (O) 235, (C) 368
CV (%): (O) 12, (C) 14

GROWING CONDITIONS: Good stands were established, and favorable growing conditions continued until flowering when the weather turned hot and dry. High winds (60-70 mph) and heavy rain caused some lodging in the last part of September.
Table 8. Reno County Oilseed Sunflower Performance Test Results, 1996-1998

<table>
<thead>
<tr>
<th>Brand and hybrid</th>
<th>Yield, lbs/a</th>
<th>Yield as % of test average</th>
<th>Oil, %</th>
<th>Oil yield, lbs/a</th>
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continued
### Table 8. Reno County Oilseed Sunflower Performance Test Results, 1996-1998, continued

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<th>Brand and hybrid</th>
<th>Days to ½ bloom</th>
<th>Plant height (in)</th>
<th>Lodging (%)</th>
<th>Test wt (lbs/bu)</th>
<th>200 seed wt (g)</th>
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1Lodging data not taken in 1997.

### Table 9. Reno County Confectionary Sunflower Performance Results, 1998

<table>
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<th>Yield lbs/a</th>
<th>Days to ½ bloom</th>
<th>Height (in)</th>
<th>Lodging %</th>
<th>Test weight lbs/bu</th>
<th>200 seed weight (g)</th>
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#### Seed size distribution (%)

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<th>Above 16/64</th>
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<th>26/64-27/64</th>
<th>30/64-31/64</th>
<th>Below 15/64</th>
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<td>10.3</td>
<td>12.6</td>
<td>14.6</td>
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WEST CENTRAL KANSAS DRYLAND
SUNFLOWER TESTS-- OILSEED AND CONFECTIONARY

LOCATION: Southwest Research-Extension Center, Tribune Branch, Greeley County

COOPERATOR: David Frickel, research associate, Alan Schlegel, agronomist

TEST SITE: Richfield & Goshen silt loam

PLANTING DATE: May 29, 1998

TEST YIELDS:

PEST CONTROL: Prowl--3pt/a, June 10

POPULATIONS: Double-planted and thinned to desired stands:

OIL (O) 17400 plants/a
Confectionary (C) 17400 plants/a

TEST YIELDS:

Avg. (lbs/a): (O) 2143, (C) 1796
Range: (O) 1448-2846, (C) 925-2876
LSD (lbs/a): (O) 549, (C) 537
CV (%): (O) 22, (C) 24

GROWING CONDITIONS: Excellent stands were established. Conditions were drier than normal from April through June but wetter than normal in July.

GROWING SEASON WEATHER SUMMARY

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<th>Average Temp.</th>
<th>GDD</th>
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<td>June</td>
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GROWING DEGREE DAYS

DAILY TEMPERATURES

PRECIPITATION

GROWING CONDITIONS: Excellent stands were established. Conditions were drier than normal from April through June but wetter than normal in July.
### Table 10. Greeley County Oilseed Sunflower Performance Test Results, 1996-1998

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<th>Brand and hybrid</th>
<th>Yield ,(lbs/a)</th>
<th>Yield as % of test average</th>
<th>Oil yields, (lbs/a)</th>
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## Entrants and Entries in 1998 Sunflower Performance Tests

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<td>PO Box 338</td>
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CONTRIBUTORS

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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.