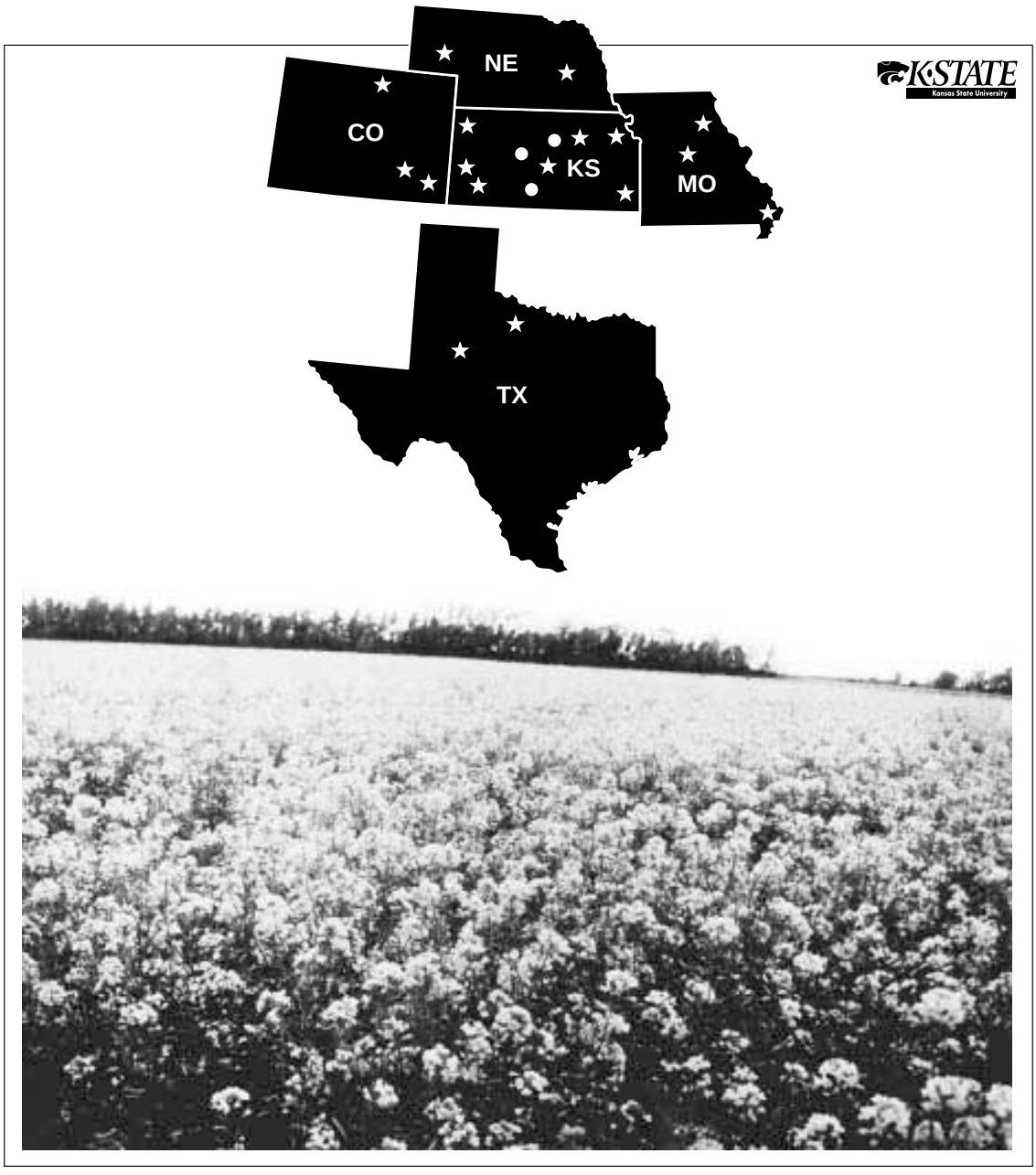
1999
GREAT PLAINS CANOLA RESEARCH



Report of Progress 851

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

CONTENTS

INTRODUCTION 1

1999 GREAT PLAINS CANOLA VARIETY TESTS. 2

Objectives 2

Procedures 3

Growing Condition 3

Test Locations.. 3

ACKNOWLEDGMENTS 3

RESULTS FROM GREAT PLAINS LOCATIONS OF THE 1999 NATIONAL WINTER CANOLA VARIETY TRIAL

Colby, KS, Table 1 4

Garden City, KS, Table 2 6

Hutchinson, KS, Table 3 8

Manhattan, KS, Table 4 10

Ottawa, KS, Table 5 12

Parsons, KS, Table 6 14

Columbia, MO, Table 7 16

Novelty, MO, Table 6 18

Portageville, MO, Table 9 20

Lincoln, NE, Table 10 22

Sidney, NE, Table 11 24

Bushland, TX, Table 12. 26

Munday, TX, Table 13. 28

Figure 1. Great Plains Winter Canola Summary, 1996-1999. 30

Table 14. Sources of Seed for Great Plains Entries in the 1999 National Winter Canola Variety Trial 32

Contribution no. 00-311-S from the Kansas Agricultural Experiment Station.

1999 Great Plains Canola Research

INTRODUCTION

Canola is a specific crop developed from rapeseed. Canola also has been called double zero rapeseed because of the low contents of erucic acid (less than 2 percent in the oil) and glucosinolates (less than 30 micromoles per gram in the oil-free meal). Food and oil-processing industries have a great interest in canola, because it produces a high-quality oil that is lower in saturated fat than other sources of dietary fats. The meal remaining after oil extraction is used as a protein supplement by the livestock industry.

Production of rapeseed was first reported in Europe in the 13th century, but it probably has been cultivated in Asia for thousands of years. It always has been used in Asia for cooking oil, but it was used originally in Europe as a source of lamp oil and lubricant. During World War II, Canada grew millions of acres to provide a marine lubricant, but production declined as diesel replaced steam engines.

The first oilseed rape with low levels of erucic acid in the oil was developed in Canada in 1957. Interest in rapeseed increased, and Canadian production reached 1 million acres in 1965. In 1971, 'Span', the first low erucic acid variety, was released. Three years later, 'Tower' was released. It is low in both erucic acid and glucosinolates and became the first true canola variety. The term canola was trademarked by the Western Canadian Oilseed Crushers Association in 1978 and still is used to describe rapeseed that is genetically low in erucic acid and glucosinolates. In 1985, the FDA in the United States ruled that rapeseed oil with less than 2 percent erucic acid is safe for human consumption. One year later, the American Heart Association urged Americans to reduce their saturated fat intake. Canola oil contains 6 percent saturated fat, the lowest level of any commercially available vegetable oil.

Canola oil consumption increased from zero prior to 1986 to the equivalent of over 2 million acres of production in 1994. This represented an increase in consumption of 50% since 1992. Most of this oil was imported from Canada. Canola is one of the few new crops that possessed a substantial market before its production was established. United States canola production has tripled in the past 3 years and reached 1.13 million acres in 1998, but consumption still outpaces production at the rate of nearly 3 to 1. Most of this production is from spring types in the northern Great Plains states of North Dakota, Montana, and Minnesota. Over the past few years, interest in winter cultivars also has increased in areas where production is feasible, especially the Pacific Northwest, Southern Great Plains, and the Southeast. A crushing facility at Velva, ND has been crushing canola for several years. Colorado Mills, Lamar, CO, began crushing canola and other oilseeds in 1999 and was the delivery point for the 1999 southern Great Plains crop. Several oilseed crushers in the Great Plains are capable of crushing canola and will crush the crop when sufficient quantities become available.

Canola-quality seed has been developed in three *Brassica* species

Brassica napus, also called Argentine rape, summer rape, winter rape, or Swede rape, was the first and is the most common canola grown. *Brassica rapa,* also called *B. campestris,* Polish rape, summer turnip rape, or field mustard, has many canola-quality cultivars and is grown on a large acreage where it is adapted *Brassica juncea* (yellow mustard) lines with canola quality have been identified. Cultivars are just now being released, and all *B. juncea* lines are spring types. Most winter canola varieties grown in the United States have been developed from *B. napus.*

Winter canola yields are generally 30% greater than yields of the spring types. Winter canola is planted in late summer. The plants need to reach the 6 to 8 true-leaf stage and about 8 to 10 inches in height before freeze-down to increase winter survival. Plants overwinter as rosettes and bolt early the next spring. Harvest takes place about the same time as winter wheat harvest in a given area.

Canola research began in the United States in the late 1980's. Industrial rapeseed had been investigated prior to this, but because of the limited demand for this product, interest was low. Winter canola production was attempted in the late 1980's but was not successful. The failure was primarily due to the lack of adapted varieties, the lack of management recommendations for the area, and the lack of a local market for the crop. Since that time, canola-quality lines have been developed that are significant improvements over previously tested varieties. Advancements in production research have led to management recommendations consistent with the conditions of the region. Increased oil consumption has led to increased demand for canola seed and a market interest by oil processors.

Canola production would fit well into Great Plains agriculture. Canola makes an excellent rotational crop with winter wheat. Yields of wheat following canola are reported to be 8 to 12% better than yields of wheat following wheat. Because canola is a broadleaf crop, more effective and less expensive herbicides can be used to control grass weeds. No major diseases are common between the two crops, so canola can help break some disease cycles. Canola also is produced with the same equipment used for small grains. A major investment in equipment is not needed to try a small canola acreage. Because canola is an oilseed, its commodity price is not tied to that of grains, and it can be used to help spread economic risk to more than one commodity class

1999 GREAT PLAINS CANOLA VARIETY TESTS

Objectives

The data reported here are from the Great' Plains locations of the National Winter Canola Variety Trial. The objectives of these tests are to evaluate germplasm over a wide range of environments, determine what canola varieties and experimental lines are adapted to what areas, and to increase the visibility of winter canola across the regions. Information obtained from these tests will help determine what experimental lines should be released and where released cultivars might be marketed. Over the past few years, this trial has expanded the number of environments and now has locations in the Great Plains, Midwest, and Southeast. The wide diversity in environments has increased our knowledge and understanding of rapeseed germplasm

for use in the Great Plains.

Procedures

This test was distributed to 16 locations in the Great Plains during the fall of 1998. It included 14 released varieties and 17 experimental lines from six different breeding programs. Management guidelines were supplied to each cooperator, but past experience at that locality was used for final management decisions. Local management, site descriptions, and growing conditions can be found on the page for each location established. All tests were planted in small plots (approximately 100 square feet) and replicated three times. The University of Idaho, Moscow, ID, performed analysis for total oil samples. Results for yield and winter survival at most locations also include data from previous years or 2-year and 3-year summaries. Lines are listed in order from highest to lowest yields for 1999.

1998-99 Growing Conditions

For most locations, temperature and precipitation data are plotted at the bottom of the site description page. On the temperature graph, the thick black line represents the long-term average daily temperatures (ºF) for that location. The upper thin line represents the actual daily high temperatures, and the lower thin line represents the actual daily low temperatures over the 1998-99 growing season. On the precipitation graph, the thick black line represents the long-term average precipitation, and the thin line represents the actual precipitation over the growing season.

Test Locations

Of the 16 tests distributed in 1998, all but two were established successfully (Ft. Collins, and Walsh, CO). Only two locations did not survive the winter (Manhattan, KS and Lincoln, NE). Five other sites were lost during the spring growing season (Parsons, Garden City, and Ottawa, KS; Sidney, NE; and Lubbock, TX), leaving yield data from seven locations in three states.

This test was continued in 1999-2000 and included 19 experimental lines from five different breeding programs and 16 released cultivars. Three production centers also were established in Kansas in 1999-2000. These sites are located on farmers' fields and include fertility, seeding rate, and variety studies. Production management information will be included in future publications.

ACKNOWLEDGMENTS

This work was funded in part by the National Canola Research Program, United States Department of Agriculture, Cooperative States Research Program and the Kansas Agricultural Experiment Station. Assistant Scientist Cindy LaBarge, as well as student workers Gaylon Corley, Maria Sweat, and Barrett Robinson helped with planting, care, harvest, and data preparation of some of these tests.

COLBY, KS

COOPERATOR: Herb Sunderman,
KSU Northwest Res.-Ext. Center

PREVIOUS CROP: wheat
PLANTING DATE: August 31, 1998
HARVEST DATE: July 7, 1999

PESTICIDES:
Roundup Ultra on Aug.10
Asana, 0.5 pt/a on Sept.16

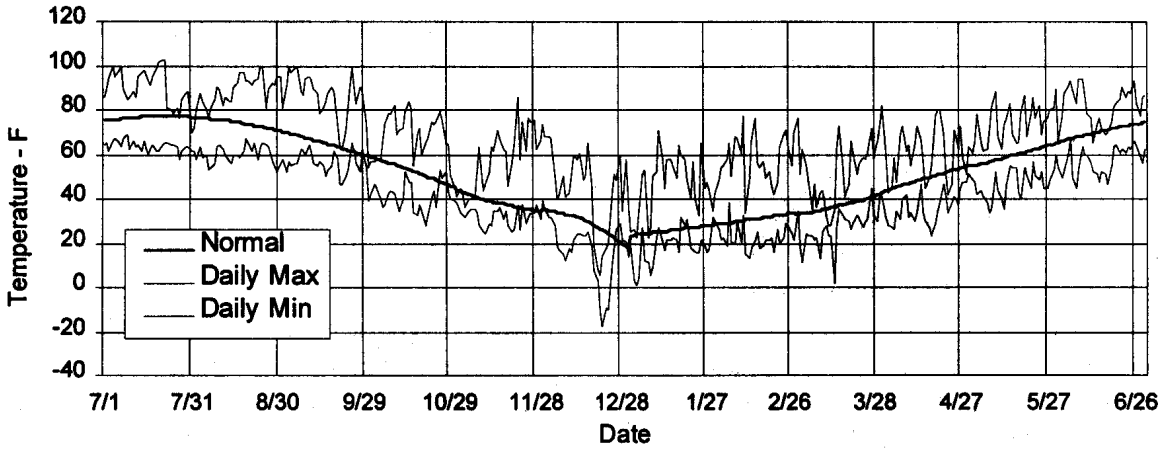
SOIL TEST
0-6 in P = 19 ppm; K = 920 ppm; pH = 7.1
6-12 in P = 10 ppm; K = 732 ppm; pH = 7.7

FERTILIZATION
Fall: 46 – 0 – 0 – 53S on Sept. 9
Spring: 80 – 0 – 0 on April 21

SEEDING RATE: 5 lb/a
ROW SPACING: 12 inches
IRRIGATION: 0.34" Aug; 0.76" Sept.; 0.60" Oct.; 1.00" May
SOIL TYPE: Keith silt loam

ELEVATION: 3170 ft
LATITUDE: 39° 29' N
AVG. WINTER SURVIVAL: 99%
AVERAGE YIELD: 1537 lb/a

COMMENTS:
Nonuniform emergence necessitated replanting at a less favorable date. A low temperature of 22F on April 17 may have harmed early flower buds. A 3.55-in rainfall within 2 hours and a large amount of pea-sized hail on June 11 caused damage to vegetative tissue and pods.



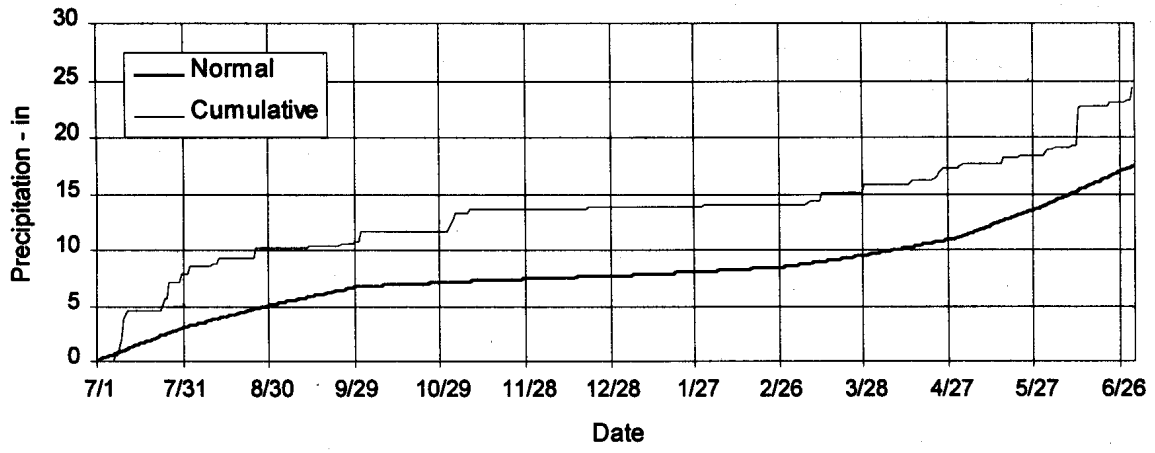


Table 1. Results from the 1999 National Canola Variety Trial, Colby, KS.

Line	Yield			Winter Survival			Fall	Plant	Shat-	Mois-	Test	Total
	1999	2yr 1/	3yr 2/	1999	2yr 3/	3yr 4/	Stand	Height 5/	tering	ture	Weight	Oil
	lb/ac			%			%	in.	%	%	lb/bu	%
ID93WC.5.17.3	1956 *	-----	-----	99 *	---	---	100 *	49 t	2 *	14.3	47.9	36.6
Olsen	1948 *	-----	-----	99 *	---	---	83	44	3 *	15.7	47.8	37.5 *
ID92WC2.24.5.3	1907 *	-----	-----	99 *	97 *	---	100 *	46 t	1 *	15.0	47.5	37.4
Pendleton	1903 *	-----	-----	98 *	---	---	100 *	45	1 *	12.3	48.7	37.9 *
Casino	1896 *	1464 *	-----	99 *	96 *	75 *	100 *	50 t	1 *	16.4	47.2	36.1
ID93WC.4.6.3	1860 *	-----	-----	99 *	---	---	100 *	44	2 *	16.2	47.3	37.6 *
Plainsman	1837 *	1608 *	1485 *	100 *	100 *	73 *	100 *	44	0 *	12.9	46.9	37.0
MO503-1	1819 *	1554 *	1380 *	100 *	100 *	75 *	100 *	43	2 *	12.9	48.0	37.4 *
WW1089	1818 *	-----	-----	100 *	98 *	---	77	44	1 *	17.4	47.0	36.6
Jetton	1814 *	1533 *	-----	96	91	63	100 *	39 s	1 *	11.2 *	48.5	35.8
ID92WC2.14.1.2	1683 *	-----	-----	99 *	---	---	90 *	46	2 *	15.0	47.0	37.6 *
Wichita	1608 *	1369 *	1161	100 *	99 *	81 *	100 *	44	2 *	9.0 *	49.3 *	35.8
Ceres	1534 *	1307	1305 *	98 *	94	64	100 *	48 t	6	14.1	48.2	36.8
IDWR.465.2.4.8	1500	-----	-----	99 *	94	---	100 *	47 t	8	12.6	48.0	37.8 *
Falcon	1497	1231	-----	93	90	61	100 *	46	4 *	13.6	48.3	36.7
KS3203	1489	-----	-----	100 *	98 *	78 *	100 *	46 t	1 *	11.6	48.7	35.7
Selkirk	1475	-----	-----	100 *	98 *	76 *	100 *	50 t	5	14.6	46.7	36.6
ARC91017-44E-	1454	-----	-----	100 *	---	---	87	44	4 *	11.5 *	48.1	37.2
Contact	1441	-----	-----	99 *	---	---	100 *	42 s	3 *	11.7	47.9	38.4 *
GA488.7H	1395	-----	-----	100 *	98 *	---	100 *	41 s	7	9.8 *	49.6 *	36.9
KS1701	1375	1176	1081	100 *	100 *	82 *	100 *	42	2 *	14.2	47.4	38.2 *
ARC91016-41L-2	1350	-----	-----	100 *	---	---	80	45	7	11.7	48.6	36.8
ARC91004-12L-3	1339	-----	-----	100 *	97 *	---	70	47 t	4 *	14.0	46.5	36.8
ST994	1332	-----	-----	96	---	---	100 *	43	6	13.8	47.4	37.2
DC H29	1268	-----	-----	99 *	---	---	100 *	42	6	11.9	48.9 *	36.4
ARC91003-7L-3	1205	-----	-----	100 *	72	---	60	44	4 *	12.8	47.2	37.0
Ericka	1194	-----	-----	98 *	91	65	100 *	40 s	5	9.4 *	49.7 *	36.3
ARC91022-59L-4	1151	-----	-----	100 *	95 *	---	50	44	4 *	13.5	46.6	36.2
Bridger	1135	741	608	99 *	98 *	82 *	100 *	43	7	12.1	47.4	37.8 *
Winfield	911	828	749	100 *	99 *	69	87	38 s	7	9.4 *	47.9	38.1 *
Mean	1537	1228	1107	99	95	71	93	44	3	13.0	47.9	37.0
LSD (0.05)	432	244	237	3	5	11	13	4	4	2.5	0.9	1.0
CV (%)	17.0	15.1	22.7	1.9	4.5	19.5	8.5	5.0	70.0	12.0	1.0	1.7

* Upper LSD group - Differences among those marked with an asterisk are not statistically significant.

1/ 2yr means include data from 1996 and 1999.

2/ 3yr means include data from 1995, 1996, and 1999.

3/ 2yr means include data from 1998 and 1999.

4/ 3yr means include data from 1997, 1998, and 1999.

5/ Values marked "s" are not statistically different from the shortest value; those marked "t" are not statistically different from the tallest.

GARDEN CITY, KS

COOPERATOR: Merle Witt,
KSU Southwest Res.-Ext. Center

PREVIOUS CROP: fallow, 1998; wheat, 1997
PLANTING DATE: September 3, 1998
HARVEST DATE: July 6, 1999

PESTICIDES:
none

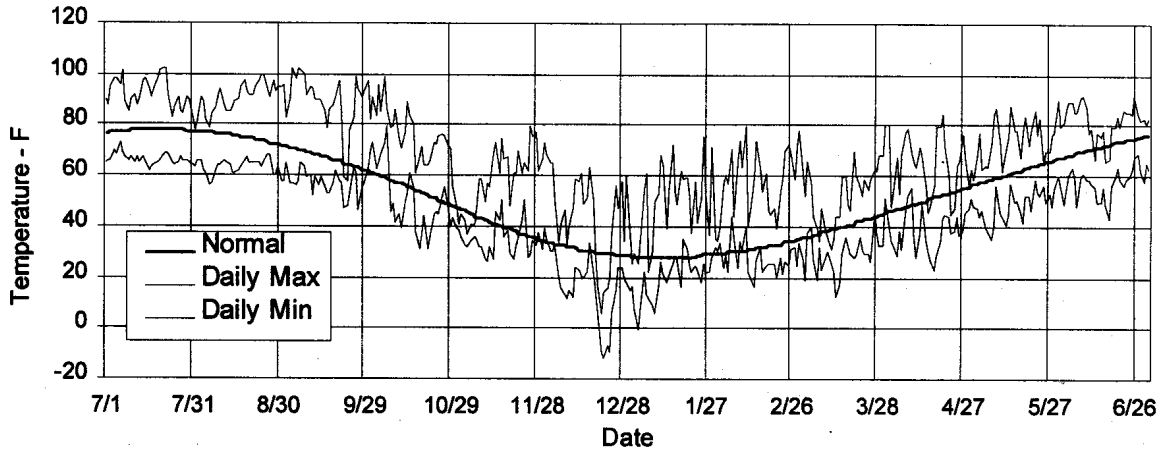
SOIL TEST
P = 473 ppm; K = 766 ppm; pH = 7.7

FERTILIZATION
Fall: 50 – 0 – 0 in August
Spring: 0 – 0 – 0

SEEDING RATE: 9 lb/a
ROW SPACING: 12 inches
IRRIGATION: none
SOIL TYPE: Keith silt loam

ELEVATION: 2874 ft
LATITUDE: 37° 55' N
AVG. WINTER SURVIVAL: 63%
AVERAGE YIELD: not reported

COMMENTS:
Herbicide drift caused damage to some plots, and slight cutworm damage was observed. Shattering notes presented were taken prior to 2.4 inches of rain and hail on June 28. Plots were harvested for oil samples, but yields are not reported because of severe shattering.



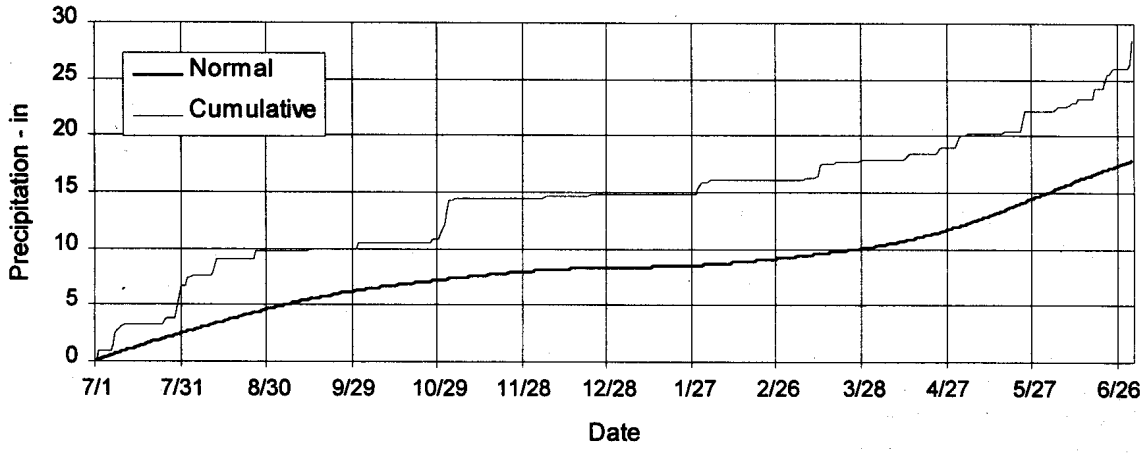


Table 2. Results from the 1999 National Canola Variety Trial, Garden City, KS.

Line	Yield			Winter Survival			Fall	50%	Plant	Shat-	Total
	1999	1998	2yr 1/	1999	2yr 2/	3yr 3/	Stand	Bloom 4/	Height 5/	tering	Oil
	lb/ac			%			%	date	in.	%	%
ARC91003-7L-3	------	740	------	66 *	83	----	47	4/24 e	39 s	17	35.8
ARC91004-12L-3	------	627	------	73 *	87	----	37	4/30 l	43 s	10 *	36.4
ARC91022-59L-4	------	940	------	83 *	92	----	37	4/25 e	43 t	10 *	36.1
ARC91016-41L-2	------	------	------	73 *	----	----	47	4/25 e	42 s	13 *	35.1
ARC91017-44E-5	------	------	------	62 *	----	----	53	4/25 e	39 s	12 *	36.4
IDWR.465.2.4.8	------	889	------	65 *	83	----	73 *	4/25 e	44 t	13 *	37.4 *
ID92WC2.24.5.3	------	976	------	54	77	----	80 *	4/25 e	39 s	7 *	37.1 *
ID92WC2.14.1.2	------	------	------	59	----	----	83 *	4/27 l	41 s	10 *	36.9
ID93WC.4.6.3	------	------	------	65 *	----	----	73 *	4/25 e	43 s	13 *	37.4 *
ID93WC.5.17.3	------	------	------	53	----	----	73 *	4/30 l	43 s	3 *	36.7
KS3203	------	707	------	72 *	86	78	67	4/27 l	46 t	18	34.0
Wichita	------	1198 *	1272	72 *	86	81	63	4/22 e	43 s	25	35.5
MO503-1	------	1130	1103	69 *	85	70	73 *	4/22 e	45 t	20	36.3
GA488.7H	------	919	------	73 *	87	----	57	4/25 e	41 s	18	36.0
KS1701	------	464	875	81 *	90	73	50	5/1 l	43 t	17	37.7 *
WW1089	------	1280 *	------	64 *	82	----	63	4/24 e	42 s	5 *	36.8
Bridger	------	609	843	54	77	56	83 *	4/23 e	39 s	13 *	37.4 *
Casino	------	1016	------	65 *	83	57	70 *	4/25 e	45 t	17	36.8
Ceres	------	746	1397	44	72	54	73 *	4/27 l	41 s	17	36.6
Contact	------	------	------	48	----	----	83 *	4/26	39 s	7 *	38.1 *
DC H29	------	------	------	75 *	----	----	57	4/29 l	40 s	8 *	34.3
Ericka	------	1011	------	69 *	85	69	77 *	4/22 e	41 s	27	35.1
Falcon	------	625	------	55	78	55	83 *	4/27 l	43 s	17	35.6
Jetton	------	987	------	47	73	48	83 *	4/24 e	39 s	12 *	34.2
Olsen	------	------	------	76 *	----	----	73 *	4/27 l	44 t	13 *	37.5 *
Pendleton	------	------	------	58	----	----	83 *	4/25 e	43 s	13 *	38.1 *
Plainsman	------	735	1144	74 *	87	67	57	4/28 l	47 t	12 *	35.4
Selkirk	------	917	------	63 *	82	72	63	4/24 e	45 t	17	35.4
ST994	------	------	------	22	----	----	70 *	4/25 e	40 s	10 *	37.2 *
Winfield	------	698	938	60 *	80	55	60	4/22 e	39 s	18	38.1 *
Mean	------	836	1025	63	82	63	66	4/26	42	14	36.4
LSD (0.05)	------	242	NS	24	----	----	15	4	5	12	1.1
CV (%)	------	14.5	28.8	22.9	11.7	32.9	14.0	10.7	6.7	52.8	1.9

* Upper LSD group - Differences among those marked with an asterisk are not statistically significant.

1/ 2yr means include data from 1995 and 1998.

2/ 2yr means include data from 1998 and 1999.

3/ 3yr means include data from 1997, 1998, and 1999.

4/ Values marked "e" are not statistically different from the earliest value; those marked "l" are not statistically different from the latest.

5/ Values marked "s" are not statistically different from the shortest value; those marked "t" are not statistically different from the tallest.

HUTCHINSON, KS

COOPERATOR: William Heer, South Central Exp. Field, Kansas State University

PREVIOUS CROP: fallow, 1998; wheat, 1997
PLANTING DATE: September 11, 1998
HARVEST DATE: June 28, 1999

PESTICIDES:
Treflan, 2 pt/a on Sept. 10
Pounce, 6 oz/a on Feb. 24, army cutworms

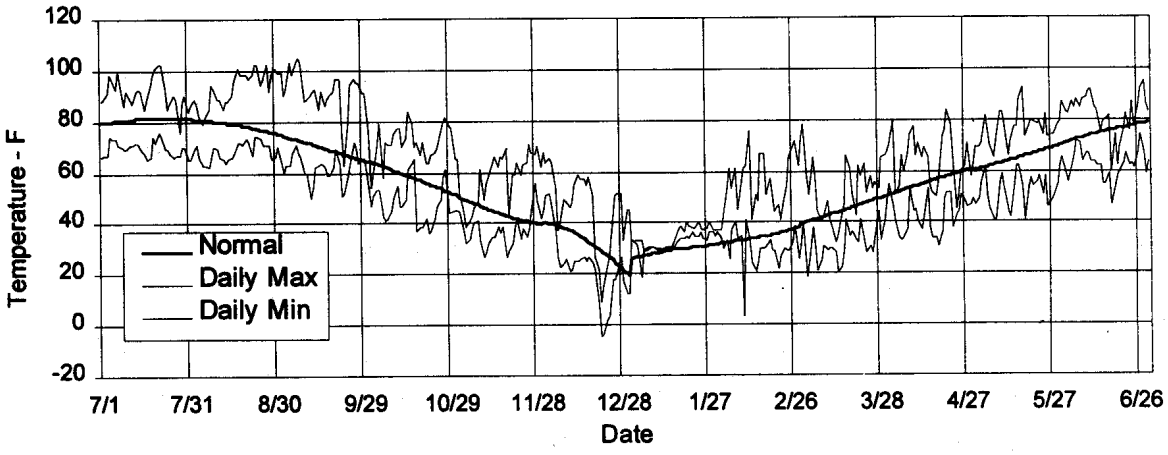
SOIL TEST
0-6 in P = 35 ppm; K = 227 ppm; pH = 5.7
6-12 in P = 8 ppm; K = 163 ppm; pH = 7.2

FERTILIZATION
Fall: 30 – 0 – 0.
Spring: 50 – 0 – 0

SEEDING RATE: 5 lb/a
ROW SPACING: 8 inches
IRRIGATION: none
SOIL TYPE: Ost silt loam

ELEVATION: 1570 ft
LATITUDE: 37° 56' N
AVG. WINTER SURVIVAL: 100%
AVERAGE YIELD: 2036 lb/a

COMMENTS:
The test was seeded into dry soil, and no emergence occurred until a 2-inch rain event. Stands were poor, but excellent conditions contributed to good growth and good yields for many entries. Harvest was delayed by wet conditions, but shattering was not a significant problem.



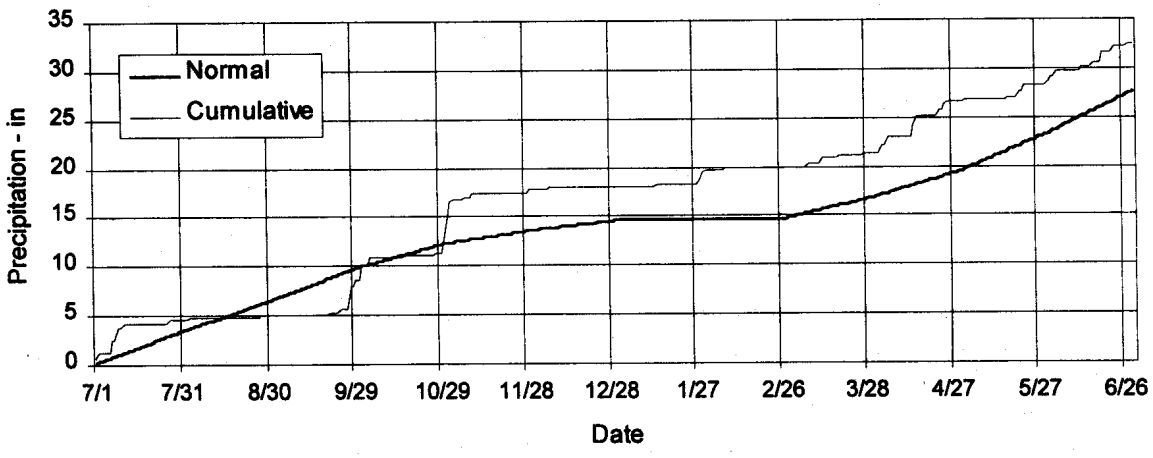


Table 3. Results from the 1998-1999 National Canola Variety Trial, Hutchinson, KS.

Line	Yield 1999	Yield 2yr 1/	Yield 3yr 2/	Winter Survival 1999	Winter Survival 3yr 2/	Fall Stand	50% Bloom 3/		Plant Height 4/	Moisture	Test Weight	Total Oil
	lb/ac			%		%	date		in.	%	lb/bu	%
Casino	2933 *	1880 *	2170	100	100	60	4/16		59	12.7	49.7	39.0
WW1089	2628 *	1682	-----	100	----	43	4/19	l	57	14.8	48.7	39.0
Jetton	2616 *	2164 *	2437 *	100	100	50	4/10	e	48 s	8.4 *	50.1 *	39.4
Ericka	2513 *	1653	1723	100	100	63	4/9	e	51	8.5 *	50.7 *	39.9 *
ID93WC.4.6.3	2490 *	-----	-----	100	----	70 *	4/12	e	59	13.0	49.6	40.0 *
Olsen	2483 *	-----	-----	100	----	70 *	4/11	e	53	11.2	50.3 *	40.4 *
Ceres	2456 *	1768 *	2386 *	100	100	53	4/12	e	54	10.2	51.0 *	40.2 *
Bridger	2445 *	1554	1258	100	100	80 *	4/11	e	55	9.3 *	50.4 *	40.9 *
IDWR.465.2.4.8	2428 *	1711	-----	100	----	50	4/10	e	56	9.7	49.8 *	40.5 *
Falcon	2425 *	1554	2314 *	100	100	50	4/13		55	10.5	51.1 *	38.7
ID92WC2.24.5.3	2415 *	1865 *	-----	100	----	73 *	4/10	e	59	9.8	50.7 *	39.1
DC H29	2391 *	-----	-----	100	----	53	4/15		53	9.2 *	50.4 *	39.1
ID92WC2.14.1.2	2307 *	-----	-----	100	----	63	4/11	e	56	11.8	47.8	41.5 *
Pendleton	2237	-----	-----	100	----	43	4/14		52	11.4	49.4	39.9 *
Contact	2168	-----	-----	100	----	63	4/12	e	49 s	9.1 *	49.9 *	39.0
Winfield	2067	1474	1805	100	100	40	4/10	e	46 s	7.7 *	50.2 *	40.2 *
Wichita	1971	1873 *	2305 *	100	100	23	4/12	e	43 s	9.9	49.8 *	39.4
GA488.7H	1938	1500	-----	100	----	37	4/13		52	9.8	50.5 *	39.4
ID93WC.5.17.3	1925	-----	-----	100	----	77 *	4/15		65 t	11.4	50.2 *	39.0
ST994	1754	-----	-----	100	----	57	4/14		54	9.0 *	50.1 *	39.8 *
ARC91016-41L-2	1706	-----	-----	100	----	17	4/16		45 s	10.2	48.6	40.6 *
KS1701	1662	1016	1351	100	100	37	4/18		55	14.0	49.3	39.6 *
MO503-1	1647	1064	1538	100	100	30	4/11	e	49 s	10.6	49.4	40.2 *
Plainsman	1638	1395	1657	100	100	23	4/21	l	53	13.2	48.5	40.8 *
Selkirk	1605	1175	1554	100	100	43	4/17		58	13.0	49.2	39.8 *
ARC91004-12L-3	1421	1243	-----	100	----	23	4/14		53	11.7	50.1 *	39.6 *
ARC91003-7L-3	1420	1379	-----	100	----	20	4/13		47 s	10.2	50.1 *	40.5 *
ARC91017-44E-5	1297	-----	-----	100	----	23	4/17		45 s	8.7 *	50.4 *	39.0
KS3203	1057	989	1428	100	100	20	4/18		55	13.7	48.7	40.6 *
ARC91022-59L-4	346	754	-----	100	----	10	4/10	e	43 s	14.0	48.6	39.6
Mean	2036	1497	1654	100	100	47	4/14		54	11.3	51.5	39.7
LSD (0.05)	751	431	331	NS	NS	15	3		6	1.7	1.3	1.9
CV (%)	19.1	28.4	24.0	----	----	20.7	13.8		7.4	9.7	1.6	2.9

* Upper LSD group - Differences among those marked with an asterisk are not statistically significant.

1/ 2yr means include data from 1998 and 1999.

2/ 3yr means include data from 1997, 1998, and 1999.

3/ Values marked "e" are not statistically different from the earliest value; and those marked "l" are not different from the latest value.

4/ Values marked "s" are not statistically different from the shortest value; and those marked "t" are not different from the tallest value.

MANHATTAN, KS

COOPERATOR: Charlie Rife,
Kansas State University

PREVIOUS CROP: oats
PLANTING DATE: September 3, 1998
HARVEST DATE: not harvested

PESTICIDES:
Treflan, 1.5 pt/a

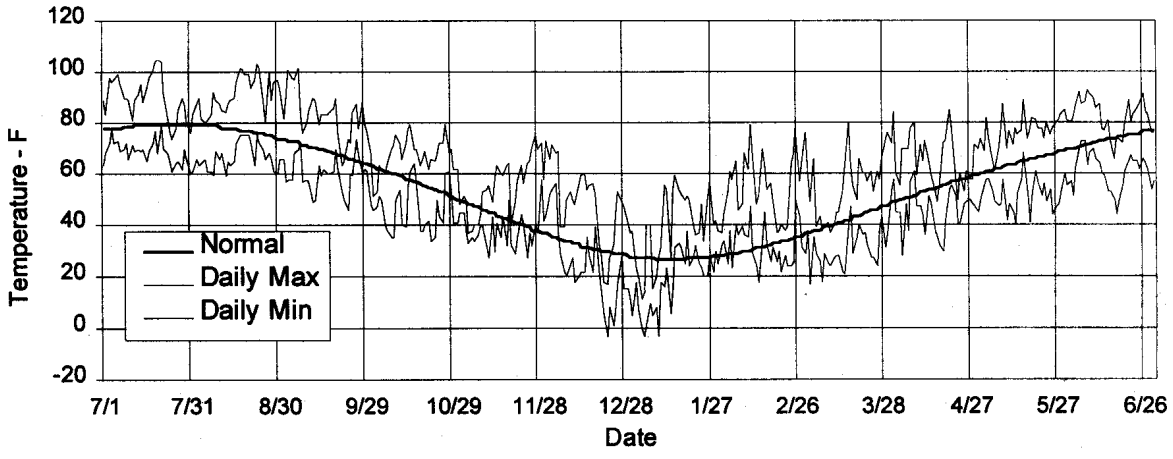
SOIL TEST
not taken

FERTILIZATION
Fall: 70 – 24 – 0
Spring: 0 – 0 – 0

SEEDING RATE: 5 lb/a
ROW SPACING: 8 inches
IRRIGATION: none
SOIL TYPE: Reading silt loam

ELEVATION: 1064 ft
LATITUDE: 39° 12' N
AVG. WINTER SURVIVAL: 11%
AVERAGE YIELD: not harvested

COMMENTS:
Warm conditions, good moisture, and high fertility contributed to excessive fall growth. Most entries had substantial stem elongation with growing points as much as 8 inches above the soil surface. Most death loss occurred early during a cold period in mid-December.



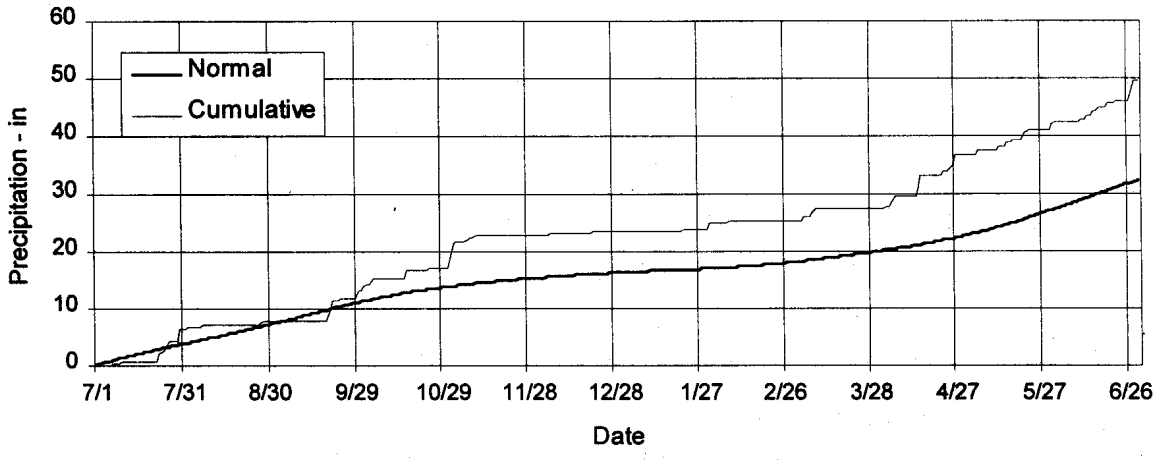


Table 4. Results from the 1999 National Canola Variety Trial, Manhattan, KS.

Line	Yield			Winter Survival			Fall	Fall
	1999	1997	2yr 1/	1999	2yr 2/	3yr 3/	Stand	Growth 4/
	lb/a			%			%	
ARC91003-7L-3	------	------	------	3	41	----	23	2.0
ARC91004-12L-3	------	------	------	28	58	----	23	2.2
ARC91016-41L-2	------	------	------	13	----	----	30	2.5
ARC91017-44E-5	------	------	------	18	----	----	37	2.7
ARC91022-59L-4	------	------	------	17	47	----	17	1.7 *
Bridger	------	1129	755	1	35	49	90 *	4.0
Casino	------	2794	1863	4	43	60	77	3.0
Ceres	------	3719 *	2406 *	2	44	58	53	2.5
Contact	------	------	------	0	----	----	60	3.0
DC H29	------	------	------	1	----	----	57	3.0
Ericka	------	2403	------	1	37	56	83 *	4.0
Falcon	------	2074	1258	1	47	48	78	4.0
GA488.7H	------	------	------	0	44	----	100 *	4.0
ID92WC2.14.1.2	------	------	------	6	----	----	67	3.3
ID92WC2.24.5.3	------	------	------	2	42	----	90 *	3.7
ID93WC.4.6.3	------	------	------	3	----	----	77	3.3
ID93WC.5.17.3	------	------	------	1	----	----	83 *	3.3
IDWR.465.2.4.8	------	------	------	4	22	----	80	3.3
Jetton	------	3555 *	2097	1	6	34	77	3.7
KS1701	------	2958	2116	78 *	88 *	85 *	57	1.2 *
KS3203	------	3386 *	------	8	52	68	70	2.5
MO503-1	------	2634	2112	10	53	67	70	3.0
Olsen	------	------	------	19	----	----	43	2.3
Pendleton	------	------	------	5	----	----	80	3.3
Plainsman	------	3909 *	2616 *	32	65	77 *	57	1.8 *
Selkirk	------	2310	------	17	45	61	63	2.2
ST994	------	1434	------	1	----	----	72	3.0
Wichita	------	3081	2100	35	58	66	45	2.0
Winfield	------	1342	1025	6	43	60	63	3.0
WW1089	------	------	------	24	58	----	47	2.3
Mean	------	2175	1528	11	44	58	62	2.9
LSD (0.05)	------	774	284	21	13	11	18	0.8
CV (%)	------	20.8	26.1	111.6	62.2	46.0	17.6	17.2

* Upper LSD group - Differences among those marked with an asterisk are not statistically significant.

1/ 2yr means include data from 1997 and 1996.

2/ 2yr means include data from 1999 and 1998.

3/ 3yr means include data from 1999, 1998, and 1997.

4/ Fall Growth Rating: 1 = prostrate, 4 = the growing point 6 inches or more from the soil surface.

OTTAWA, KS

COOPERATOR: Keith Janssen, East Central Exp. Field, Kansas State University

PREVIOUS CROP: wheat
PLANTING DATE: September 9, 1998
HARVEST DATE: not harvested

PESTICIDES:
none

SOIL TEST
not available

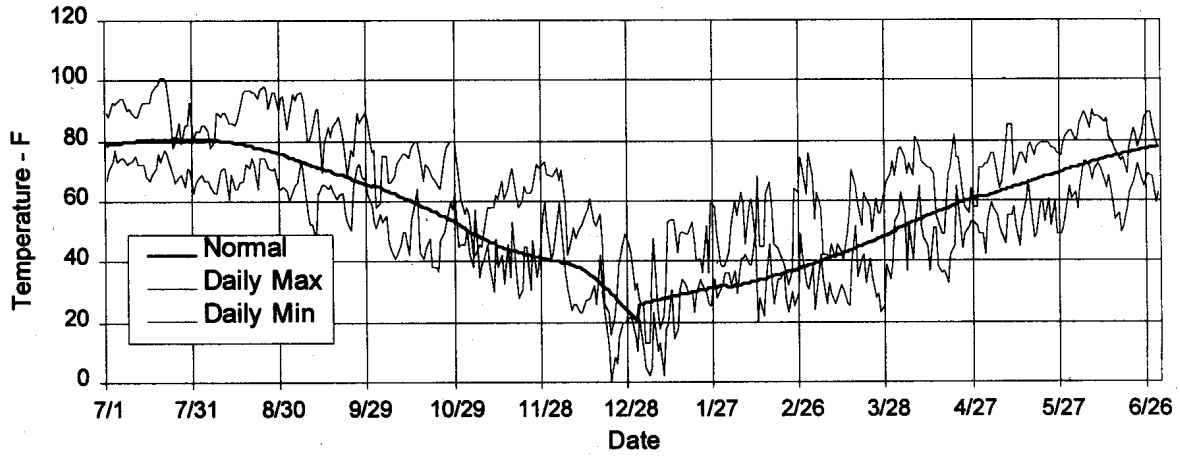
FERTILIZATION:
Fall: none
Spring: 70 – 0 – 0 on March 4

SEEDING RATE: 5 lb/a

ROW SPACING: 6 inches
IRRIGATION: none
SOIL TYPE: Woodson silt loam

ELEVATION: 899 ft
LATITUDE: 38° 37' N
AVG. WINTER SURVIVAL: 100%
AVERAGE YIELD: not harvested

COMMENTS:
Six inches of rain that fell 4 days after planting contributed to poor stands. Conditions remained wet throughout the growing season, and plants were less vigorous than normal. Wet conditions delayed harvest, and 83 mph winds on June 28 caused shattering so severe that the test was abandoned.



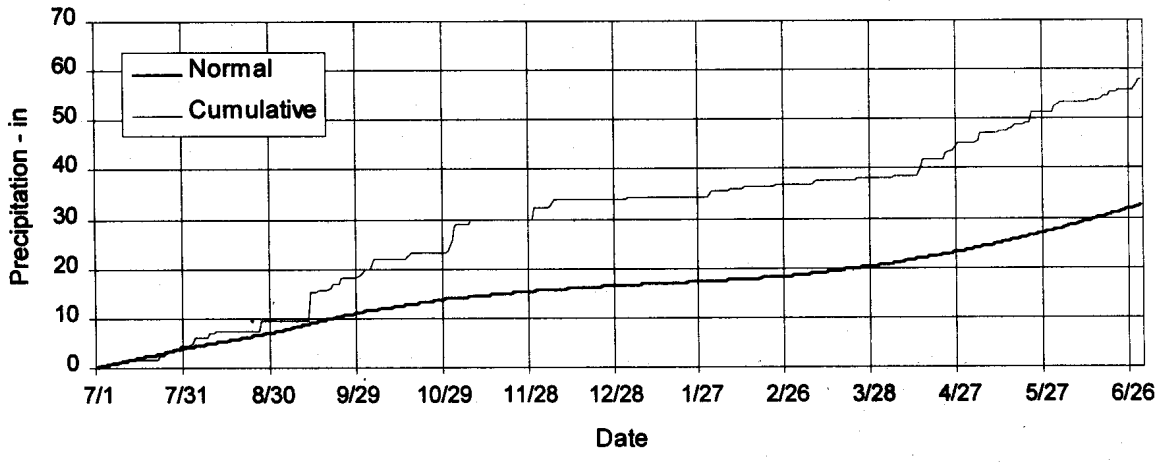


Table 5. Results from the 1999 National Canola Variety Trial at Ottawa, KS.

Line	Yield		Winter Survival		Fall	50%	Plant		
	1999	1998	1999	2yr 1/	Stand	Bloom 2/	Height 3/	Lodging	Shattering
	lb/ac		%		%	date	in.	%	%
ARC91003-7L-3	-----	736	100	100	20	4/10	41	80	33 *
ARC91004-12L-3	-----	440	100	100	17	4/11	41	17 *	20 *
ARC91022-59L-4	-----	774	100	100	13	4/9	38	57	33 *
ARC91016-41L-2	-----	-----	100	-----	27	4/10	41	30 *	28 *
ARC91017-44E-5	-----	-----	100	-----	33	4/10	38	50 *	23 *
IDWR.465.2.4.8	-----	439	100	100	57	4/7 e	42	68	40
ID92WC2.24.5.3	-----	255	100	100	70 *	4/8	41	62	33 *
ID92WC2.14.1.2	-----	-----	100	-----	60	4/9	45 t	68	30 *
ID93WC.4.6.3	-----	-----	100	-----	57	4/12 l	40	32 *	65
ID93WC.5.17.3	-----	-----	100	-----	67 *	4/12 l	41	63	63
KS3203	-----	567	100	100	37	4/13 l	41	37 *	22 *
KS3580 (Wichita)	-----	811	100	100	37	4/10	38	37 *	15 *
MO503-1	-----	147	100	100	43	4/10	42	33 *	25 *
GA488.7H	-----	433	100	100	50	4/9	39	43 *	37
GA #2 or KS1701	-----	400	100	100	47	4/14 l	44	43 *	43
WW1089	-----	397	100	100	23	4/13 l	42	67	25 *
Bridger	-----	537	100	100	63	4/6 e	40	48 *	37
Casino	-----	399	100	100	63	4/12 l	43	15 *	30 *
Ceres	-----	944 *	100	100	57	4/11	39	68	32 *
Contact	-----	-----	100	-----	60	4/8	34	10 *	25 *
DC H29	-----	-----	100	-----	47	4/12 l	38	63	28 *
Ericka	-----	456	100	100	60	4/6 e	32 s	38 *	53
Falcon	-----	99	100	100	73 *	4/8	40	67	27 *
Jetton	-----	1059 *	100	100	77 *	4/6 e	31 s	28 *	12 *
Olsen	-----	-----	100	-----	50	4/10	40	65	23 *
Pendleton	-----	-----	100	-----	63	4/11	41	70	25 *
Plainsman (KS3505)	-----	852 *	100	100	33	4/14 l	39	13 *	27 *
Selkirk	-----	331	100	100	60	4/12 l	45 t	72	47
ST994	-----	-----	100	-----	67 *	4/11	35	68	47
Winfield	-----	245	100	100	43	4/8	36	27 *	27 *
Mean	-----	499	100	100	49	4/10	40	48	33
LSD	-----	220	NS	NS	13	2	1	44	23
CV	-----	27.0	-----	-----	15.8	11	8	56	44

* Upper LSD group - Differences among those marked with an asterisk are not statistically significant.

1/ 2yr means include data from 1999 and 1998.

2/ Values marked "e" are not statistically different from the earliest value; those marked "l" are not different from the latest.

3/ Values marked "s" are not statistically different from the shortest value; those marked "t" are not different from the tallest.

PARSONS, KS

COOPERATOR: James Long,
KSU Southeast Agric. Res. Center

PREVIOUS CROP: canola
PLANTING DATE: October 16, 1998
HARVEST DATE: July 12, 1999

PESTICIDES:
none

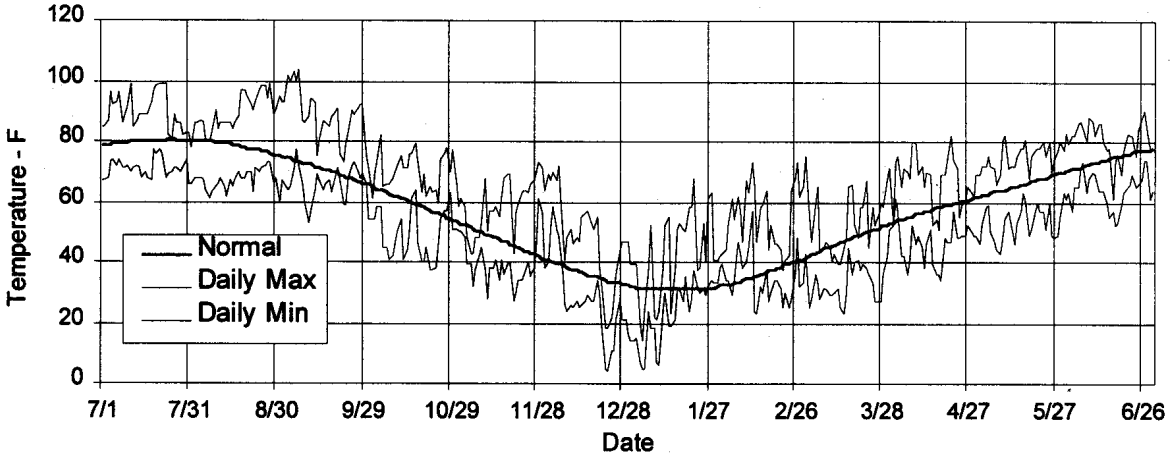
SOIL TEST
not taken

FERTILIZATION:
Fall: 85 – 60 – 60
Spring: 40 – 0 – 0

SEEDING RATE: 5 lb/a
ROW SPACING: 7 inches
IRRIGATION: none
SOIL TYPE: Parson silt loam

ELEVATION: 900 ft
LATITUDE: 37° 21' N
AVG. WINTER SURVIVAL: 87%
AVERAGE YIELD: not reported

COMMENTS:
The late planting date did not affect establishment, because a very warm fall allowed for growth. Several lines had poor emergence. Those with adequate stands produced sufficient biomass. Wet conditions delayed harvest, and yields are not reported because of excessive shattering.



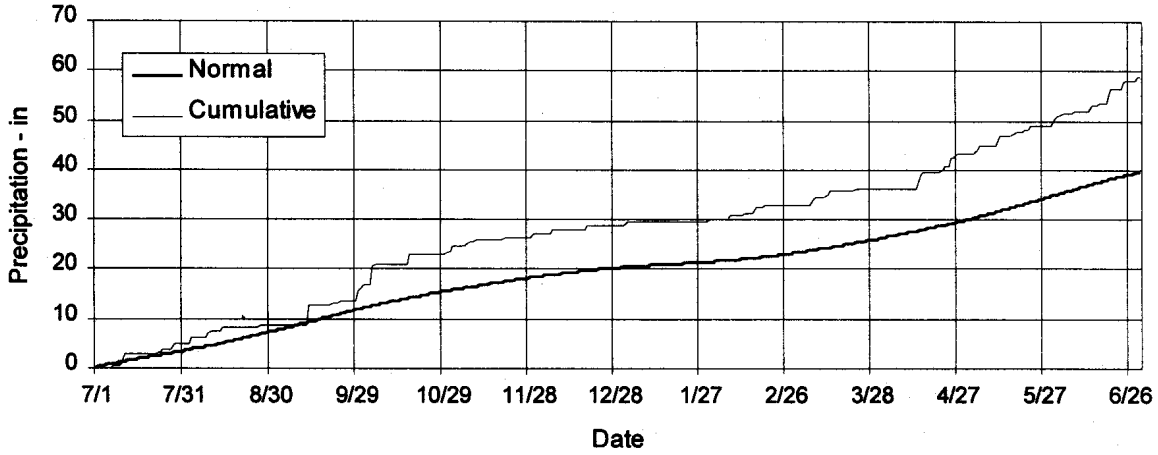


Table 6. Results from the 1999 National Canola Variety Trial at Parsons, KS.

Line	Yield			Winter Survival			Fall	50%
	1999	1997	2yr[1/]	1999	2yr[2/]	3yr[3/]	Stand	Bloom[4/]
	lb/ac			%			%	date
ARC91003-7L-3	----	----	----	67	83	----	27	4/22
ARC91004-12L-3	----	----	----	75	88	----	20	4/21 e
ARC91022-59L-4	----	----	----	100	100	----	17	4/22
ARC91016-41L-2	----	----	----	50	----	----	20	4/24
ARC91017-44E-5	----	----	----	83	----	----	30	4/21 e
IDWR.465.2.4.8	----	----	----	85	93	----	47	4/21 e
ID92WC2.24.5.3	----	----	----	93	97	----	60 *	4/21 e
ID92WC2.14.1.2	----	----	----	89	----	----	37	4/24 l
ID93WC.4.6.3	----	----	----	89	----	----	57 *	4/21 e
ID93WC.5.17.3	----	----	----	93	----	----	53 *	4/23
KS3203	----	892	----	100	100	100	33	4/21 e
Wichita	----	694	871	96	98	97	33	4/22
MO503-1	----	687	881	83	92	94	37	4/22
GA488.7H	----	----	----	67	83	----	37	4/22
KS1701	----	310	746	50	75	83	33	4/24
WW1089	----	----	----	100	100	----	20	4/26 l
Bridger	----	614	710	100	100	100	50 *	4/21 e
Casino	----	817	----	95	98	98	50 *	4/21 e
Ceres	----	1166	973	100	100	100	40	4/22
Contact	----	----	----	64	----	----	47	4/25 l
DC H29	----	----	----	69	----	----	47	4/21 e
Ericka	----	373	----	94	97	98	57 *	4/20 e
Falcon	----	1387 *	----	100	100	100	63 *	4/21 e
Jetton	----	1730 *	----	100	100	98	60 *	4/20 e
Olsen								
Pendleton	----	----	----	83	----	----	47	4/22
Plainsman	----	1352 *	1200 *	95	98	98	40	4/25 l
Selkirk	----	757	----	95	98	98	47	4/22
ST994	----	1035	----	90	----	----	60 *	4/23
Winfield	----	1041	829	100	100	100	37	4/22
Mean	----	712	776	87	93	95	42	4/22
LSD (0.05)	----	524	213	NS	NS	NS	16	1.792
CV (%)	----	43.6	36.3	26	----	----	23	4.92

* Upper LSD group - Differences among those marked with an asterisk are not statistically significant.

1/ 2yr means include data from 1995 and 1997.

2/ 2yr means include data from 1998 and 1999.

3/ 3yr means include data from 1997, 1998, and 1999.

4/ Values marked "e" are not statistically different from the earliest value; and those marked "l" are not different from the latest value.

COLUMBIA, MO

COOPERATORS: Harry Minor and Carl Morris, University of Missouri

PREVIOUS CROP: wheat
PLANTING DATE: October 1, 1998
HARVEST DATE: June 30, 1999

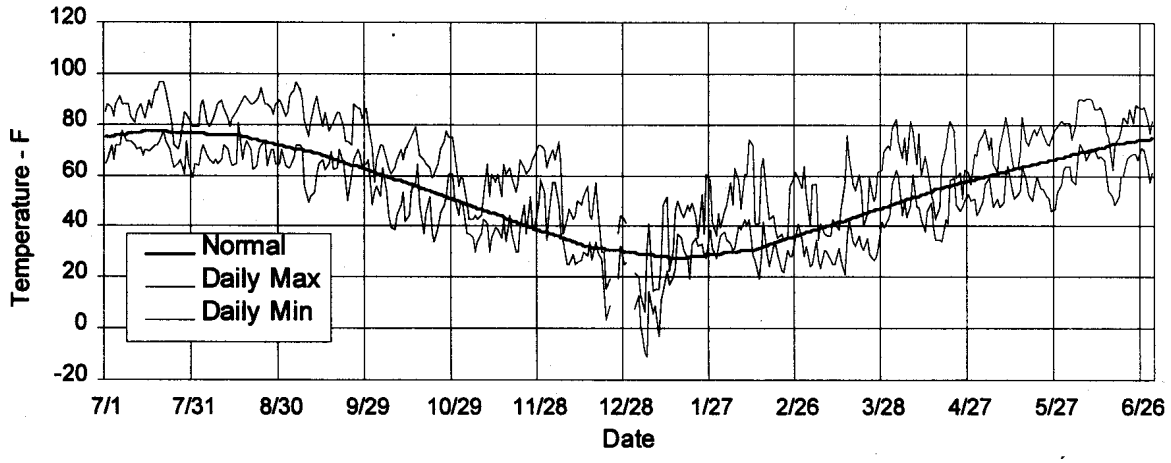
PESTICIDES:
Treflan, 1 qt/a

SOIL TEST
P = 34 ppm; K = 335 ppm; pH = 6.4

FERTILIZATION
Fall: 70 – 70 – 70 on Oct 1
Spring: 50 – 0 – 0 on March 12

SEEDING RATE: 8 lb/a
ROW SPACING: 7.5 inches
IRRIGATION: none
SOIL TYPE: Putnam silt loam

ELEVATION: 870 ft
LATITUDE: 38° 32' N
AVG. WINTER SURVIVAL: 100%
AVERAGE YIELD: 1048 lb/a



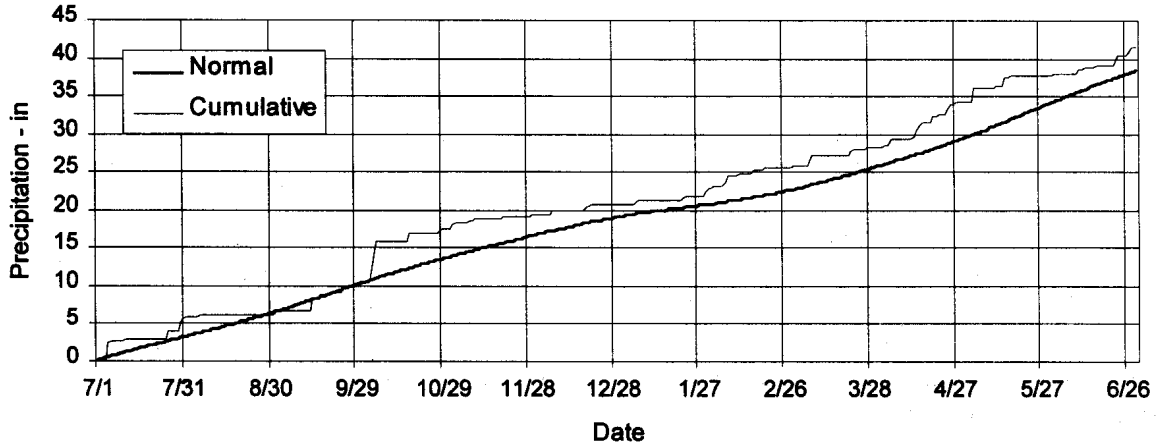


Table 9. Results from the 1999 National Canola Variety Trial, Columbia, MO.

Line	Yield 1999	Yield 2yr 1/	Yield 3yr 2/	Winter Survival 1999	Winter Survival 3yr 2/	Fall Stand	Plant Height 3/	Lodging	Mois-ture	Total Oil
	---------- lb/ac ----------			-------- % --------		%	in.	%	%	%
Ceres	2450 *	1992 *	1972 *	100	100	78 *	48 s	8 *	13.4	42.8 *
KS3203	2071 *	1725 *	1974 *	100	100	10	55 t	8 *	14.9	40.7
Ericka	1999 *	1355	1577 *	100	100	37	48 s	0 *	15.1	40.5
Falcon	1660 *	1471	1733 *	100	100	37	57 t	17 *	14.4	42.5 *
Jetton	1644 *	1620 *	1861 *	100	100	22	44 s	0 *	13.0	42.1
Pendleton	1608 *	-----	-----	100	----	35	52	0 *	13.6	42.5 *
ID92WC2.14.1.2	1504	-----	-----	100	----	33	51	0 *	13.9	42.2 *
Olsen	1445	-----	-----	100	----	79 *	46 s	8 *	14.1	42.9 *
Bridger	1409	1209	1405	100	100	28	52	0 *	13.6	43.9 *
ID93WC.5.17.3	1356	-----	-----	100	----	49	61 t	8 *	17.4	40.7
ID92WC2.24.5.3	1236	1457	-----	100	----	50	55 t	0 *	14.1	41.5
ID93WC.4.6.3	1220	-----	-----	100	----	31	52	0 *	14.0	43.1 *
Casino	1202	1362	1965 *	100	100	23	58 t	8 *	13.3	40.9
DC H29	1154	-----	-----	100	----	24	54	8 *	13.8	42.0
IDWR.465.2.4.8	1042	982	-----	100	----	30	55 t	0 *	13.3	43.1 *
Selkirk	1023	1034	1358	100	100	25	56 t	0 *	13.0	42.7 *
Contact	932	-----	-----	100	----	19	49 s	0 *	12.9	43.6 *
Wichita	764	1178	1621 *	100	100	13	47 s	25	13.1	40.9
ARC91017-44E-5	754	-----	-----	100	----	30	49 s	8 *	15.3	42.5 *
GA488.7H	618	1033	-----	100	----	17	48 s	33	14.3	41.3
MO503-1	599	893	1202	100	100	16	48 s	17 *	11.6	40.9
Plainsman	599	1177	1494	100	100	14	56 t	25	13.8	39.5
Winfield	565	817	1286	100	100	12	50 s	8 *	13.8	43.0 *
ST994	536	-----	-----	100	----	25	50 s	8 *	12.6	43.9 *
ARC91016-41L-2	406	-----	-----	100	----	9	49 s	8 *	11.6	41.6
ARC91022-59L-4	399	748	-----	100	----	11	50 s	17 *	11.2	39.7
KS1701	351	562	1066	100	100	9	49 s	8 *	13.4	41.8
WW1089	324	897	-----	100	----	10	47 s	17 *	11.9	41.6
ARC91003-7L-3	306	1000	-----	100	----	3	46 s	25	10.2	41.7
ARC91004-12L-3	261	808	-----	100	----	7	49 s	33	12.7	39.1
Mean	1048	1150	1421	100	100	26	51	10	13.4	41.8
LSD (0.05)	933	519	443	NS	NS	17	7	21	NS	1.8
CV (%)	54.5	36.5	33.2	----	----	39.9	8.1	129.4	14.4	2.6

* Upper LSD group - Differences among those marked with an asterisk are not statistically significant.

1/ 2yr means include data from 1998 and 1999.

2/ 3yr means include data from 1997, 1998, and 1999.

3/ Values marked "s" are not statistically different from the shortest value; those marked "t" are not statistically different from the tallest.

NOVELTY, MO

COOPERATORS: Harry Minor and Carl Morris, University of Missouri

PREVIOUS CROP: fallow
PLANTING DATE: September 18, 1998
HARVEST DATE: June 25, 1999

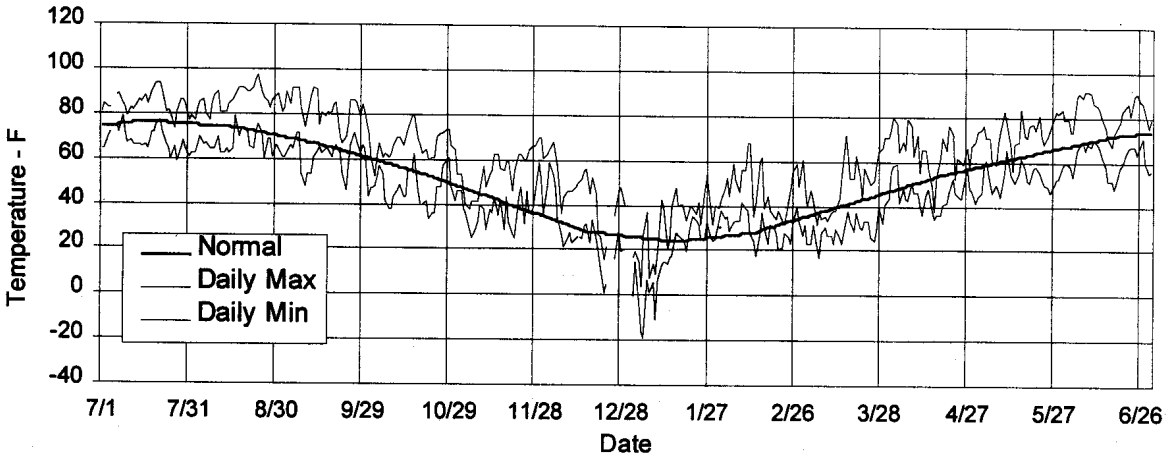
PESTICIDES:
Treflan, 1 qt/a

SOIL TEST
P = 144 ppm; K = 733 ppm; pH = 6.5

FERTILIZATION
Fall: 50 – 50 – 100 on Sept 18
Spring: 50 – 0 – 0 on March 15

SEEDING RATE: 8 lb/a
ROW SPACING: 7.5 inches
IRRIGATION: none
SOIL TYPE: Putnam silt loam

ELEVATION: 823 ft
LATITUDE: 40° 1' N
AVG. WINTER SURVIVAL: 100%
AVERAGE YIELD: 1451 lb/a



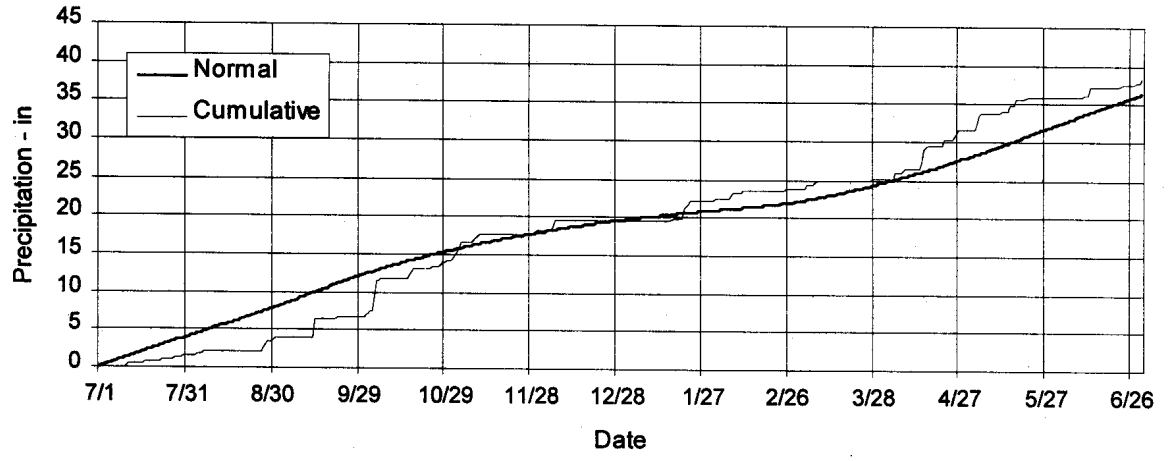


Table 10. Results from the 1999 National Canola Variety Trial, Novelty, MO.

Line	Yield 1999	Yield 2yr 1/	Winter Survival 1999	Winter Survival 2yr 1/	Plant Height	Lodging	Moisture	Total Oil
	-------- lb/ac --------		-------- % --------		in.	%	%	%
Olsen	2028 *	-----	100	----	49	17	12.7	41.0
Casino	1885 *	1582	100	100	44	25	13.8	40.3
Jetton	1878 *	1752 *	100	100	44	17	12.3	40.7
Wichita	1841 *	1810 *	100	100	47	8	14.6	40.5
Pendleton	1795 *	-----	100	----	48	8	12.7	40.9
Falcon	1742 *	1706 *	100	100	52	8	12.2	40.3
Selkirk	1642 *	1404	100	100	49	8	14.6	41.0
ID92WC2.24.5.3	1621 *	1922 *	100	100	48	8	11.8	40.8
ST994	1587 *	-----	100	----	46	17	14.9	43.7 *
WW1089	1522	1969 *	100	100	49	33	17.4	39.2
MO503-1	1517	1407	100	100	46	25	11.9	40.0
ID93WC.4.6.3	1514	-----	100	----	49	17	12.4	41.7 *
Plainsman	1488	1662 *	100	100	47	25	13.4	38.3
ARC91004-12L-3	1478	1803 *	100	100	47	33	11.7	36.7
ID92WC2.14.1.2	1478	-----	100	----	53	25	10.9	40.9
Ceres	1448	1602	100	100	42	25	14.9	40.1
ID93WC.5.17.3	1424	-----	100	----	44	8	14.5	39.7
Contact	1419	-----	100	----	45	17	11.0	42.4 *
GA488.7H	1367	1522	100	100	51	17	13.0	39.5
IDWR.465.2.4.8	1310	1242	100	100	45	33	12.6	41.1
ARC91016-41L-2	1302	-----	100	----	46	25	13.3	39.7
ARC91022-59L-4	1261	1309	100	100	46	25	12.3	40.0
ARC91017-44E-5	1247	-----	100	----	45	8	13.0	40.7
KS1701	1224	1035	100	100	43	38	15.9	40.2
Bridger	1212	1241	100	100	47	33	12.0	40.7
KS3203	1202	1527	100	100	48	0	14.1	39.0
DC H29	1150	-----	100	----	42	42	11.8	39.8
Ericka	1112	1120	100	100	44	25	12.0	38.9
ARC91003-7L-3	987	1345	100	100	45	17	13.0	39.3
Winfield	838	983	100	100	45	33	12.5	40.2
Mean	1451	1450	100	100	47	21	13.1	40.2
LSD (0.05)	461	344	NS	NS	NS	NS	NS	2.1
CV (%)	19.5	20.9	----	----	9.6	95.1	20.7	3.2

* Upper LSD group - Differences among those marked with an asterisk are not statistically significant.

1/ 2yr means include data from 1998 and 1999.

PORTAGEVILLE, MO

COOPERATORS: Harry Minor and Carl Morris, University of Missouri

PREVIOUS CROP: soybean
PLANTING DATE: September 21, 1998
HARVEST DATE: June 23, 1999

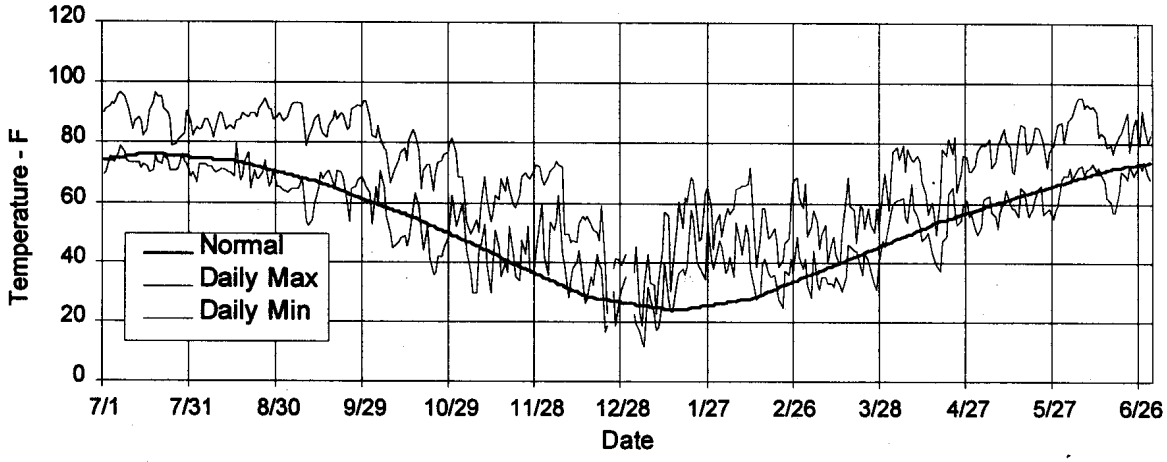
PESTICIDES:
Treflan, 1 qt/a

SOIL TEST
P = 109 ppm; K = 356 ppm; pH = 6.5

FERTILIZATION
Fall: 50 – 0 – 0 on Sept 21
Spring: 50 – 0 – 0 mid March

SEEDING RATE: 8 lb/a
ROW SPACING: 7.5 inches
IRRIGATION: none
SOIL TYPE: Tiptonville silt loam

ELEVATION: 284 ft
LATITUDE: 36° 14' N
AVG. WINTER SURVIVAL: 90%
AVERAGE YIELD: 1087 lb/a



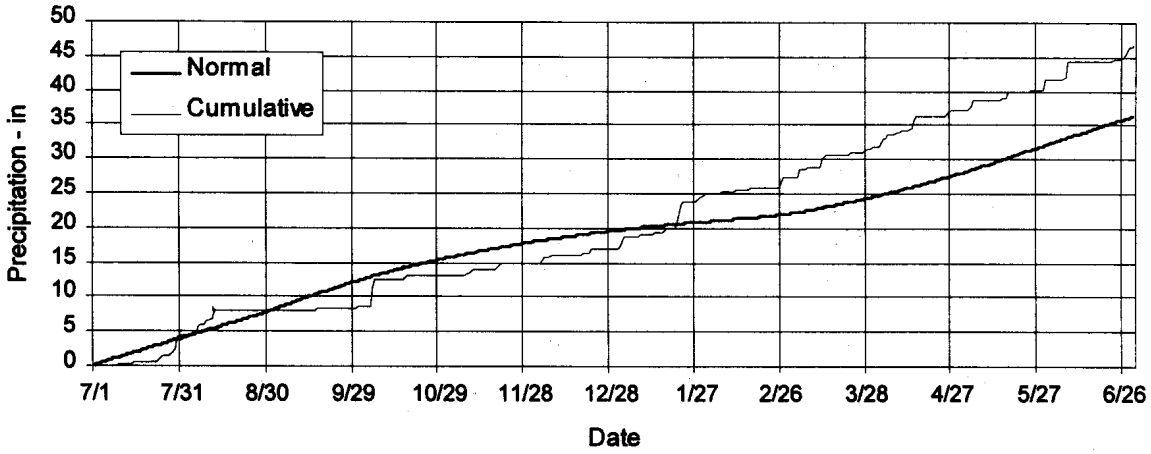


Table 11. Results from the 1999 National Canola Variety Trial, Portageville, MO.

Line	Yield 1999		Yield 2yr 1/		Winter Survival 1999		Winter Survival 2yr 1/		Fall Stand		Plant Height 2/		Lodging		Total Oil	
	-------- lb/ac --------				--------- % ---------				%		in.		%		%	
Casino	2335	*	1874	*	100		84	*	42		45	t	10	*	38.8	
Falcon	2186	*	1684	*	100		78	*	77	*	40	st	20	*	40.0	*
ID93WC.4.6.3	2079	*	-----		100		----		33		41	t	20	*	38.7	
ID92WC2.14.1.2	1941	*	-----		100		----		77	*	43	t	13	*	39.4	*
IDWR.465.2.4.8	1914	*	-----		100		----		42		45	t	20	*	40.2	*
GA488.7H	1712	*	-----		100		----		23		43	t	30		39.0	
ID93WC.5.17.3	1642	*	-----		100		----		63	*	44	t	13	*	36.1	
Pendleton	1629	*	-----		100		----		32		40	st	13	*	39.4	*
Bridger	1571	*	1223		100		70	*	53	*	42	t	27		40.9	*
Jetton	1415	*	1404	*	100		73	*	47		33	s	20	*	40.2	*
ID92WC2.24.5.3	1278		-----		100		----		63	*	40	t	13	*	39.5	*
ARC91016-41L-2	1192		-----		100		----		5		38	s	17	*	38.2	
DC H29	1039		-----		100		----		28		40	st	20	*	36.0	
Ceres	1003		1147		100		74	*	40		34	s	13	*	38.9	
KS3203	929		987		100		81	*	23		44	t	13	*	40.7	*
Plainsman	914		908		100		72	*	15		43	t	13	*	38.1	
Olsen	911		-----		100		----		77	*	39	st	10	*	38.6	
Ericka	908		781		100		65		55	*	36	s	10	*	39.6	*
Winfield	731		667		100		66		40		39	st	33		36.4	
ARC91017-44E-5	697		-----		100		----		5		35	s	33		39.4	*
ARC91022-59L-4	697		-----		100		----		5		37	s	23		39.7	*
ARC91003-7L-3	663		-----		100		----		8		38	s	27		39.8	*
MO503-1	599		684		100		75	*	27		37	s	20	*	38.1	
Contact	489		-----		100		----		32		35	s	20	*	41.9	*
Wichita	474		645		100		65		10		37	s	13	*	38.6	
Selkirk	440		445		100		61		52	*	39	st	17	*	37.4	
ARC91004-12L-3	388		-----		100		----		8		36	s	23		40.7	*
ST994	303		900		100		77	*	13		39	st	23		39.4	*
WW1089	281		-----		100		----		15		36	s	13	*	39.0	
UGA96200E	248		439		100		57		37		33	s	13	*	39.8	*
Mean	1087		966		100		68		35		39		19		38.8	
LSD (0.05)	944		480		NS		15		28		7		11		2.7	
CV (%)	42.5		39.9		----		26.5		50.0		10.6		36.9		4.3	

* Upper LSD group - Differences among those marked with an asterisk are not statistically significant.

1/ 2yr means include data from 1997 and 1999.

2/ Values marked "s" are not statistically different from the shortest value; and those marked "t" are not different from the tallest value.

LINCOLN, NE

COOPERATOR: Lenis Nelson, University of Nebraska

PREVIOUS CROP: oats
PLANTING DATE: September 4, 1998
HARVEST DATE: not harvested

PESTICIDES:
Treflan, 1.5 pt/a

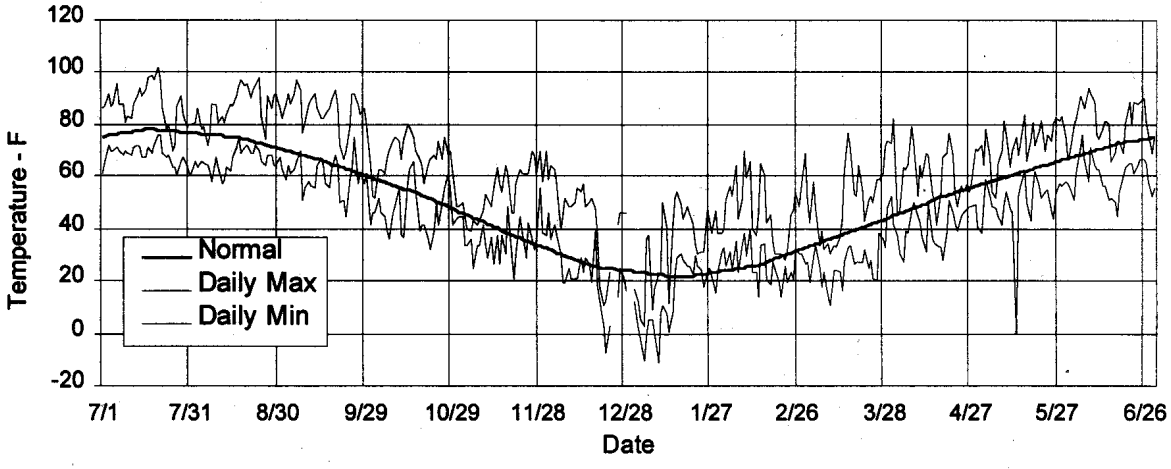
SOIL TEST
P= 50 ppm; K= 400 ppm; pH= 6.0

FERTILIZATION
Fall: 0 – 0 – 0
Spring: 0 – 0 – 0

SEEDING RATE: 5 lb/a
ROW SPACING: 9 inches
IRRIGATION: none
SOIL TYPE: Sharpsburg silt clay loam

ELEVATION: 850 ft
LATITUDE: 40° 51' N
AVG. WINTER SURVIVAL: 13%
AVERAGE YIELD: not harvested

COMMENTS:
The test was abandoned in the spring because of severe winterkill.



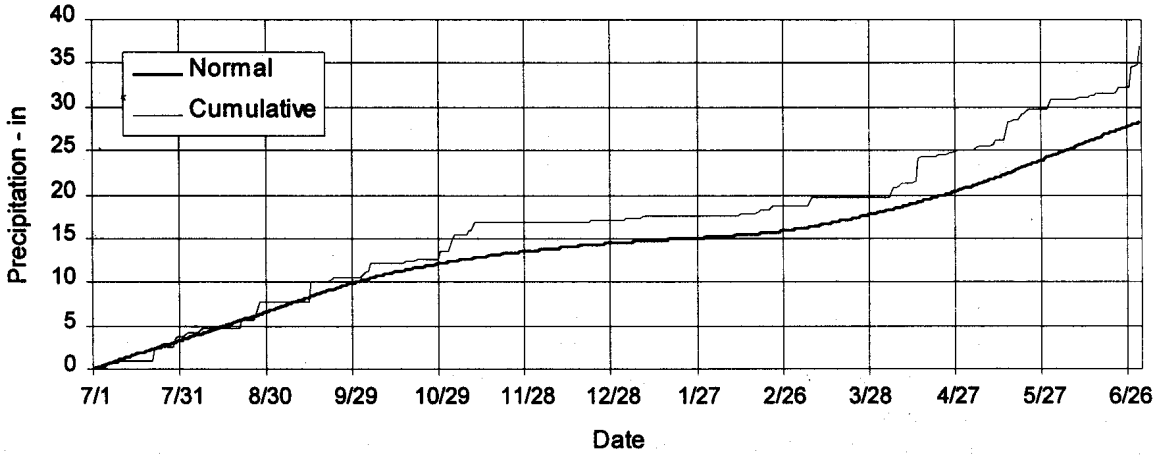


Table 10. Results from the 1999 National Canola Variety Trial, Lincoln, NE.

Line	Yield		Winter Survival			Fall
	1999	1995	1999	2yr 1/	3yr 2/	Stand
	lb/a		%			%
ARC91003-7L-3	-----	-----	14	54	----	53
ARC91004-12L-3	-----	-----	8	53	----	63
ARC91022-59L-4	-----	-----	10	55	----	47
ARC91016-41L-2	-----	-----	10	----	----	77
ARC91017-44E-5	-----	-----	7	----	----	67
IDWR.465.2.4.8	-----	-----	19	60	----	100 *
ID92WC2.24.5.3	-----	-----	5	49	----	100 *
ID92WC2.14.1.2	-----	-----	20	----	----	93 *
ID93WC.4.6.3	-----	-----	13	----	----	93 *
ID93WC.5.17.3	-----	-----	4	----	----	87 *
KS3203	-----	-----	14	57	43	83
Wichita	-----	783 *	13	52	46	97 *
MO503-1	-----	663 *	24	57	40	97 *
GA488.7H	-----	-----	6	53	----	97 *
KS1701	-----	637 *	35 *	63	47	90 *
WW1089	-----	-----	23	59	----	83
Bridger	-----	427	3	45	34	97 *
Casino	-----	-----	6	50	36	100 *
Ceres	-----	613 *	12	56	41	97 *
Contact	-----	-----	0	----	----	87 *
DC H29	-----	-----	4	----	----	97 *
Ericka	-----	-----	19	58	41	100 *
Falcon	-----	-----	13	54	37	90 *
Jetton	-----	-----	2	49	33	100 *
Olsen	-----	-----	12	----	----	97 *
Pendleton	-----	-----	5	----	----	97 *
Plainsman	-----	527 *	48 *	72 *	53 *	87 *
Selkirk	-----	-----	30	60	41	93 *
ST994	-----	-----	13	----	----	93 *
Winfield	-----	374	9	50	36	93 *
Mean	-----	500	13	54	39	88
LSD (0.05)	-----	324	13	7	8	15
CV (%)	-----	39.8	58.5	31.1	20.8	10.2

* Upper LSD group - Differences among those marked with an asterisk are not statistically significant.

1/ 2yr means include data from 1999 and 1998.

2/ 3yr means include data from 1999, 1998, and 1997.

SIDNEY, NE

COOPERATOR: David Baltensperger, Univ. of Neb., High Plains Laboratory

PREVIOUS CROP: fallow; sunflower, 1997
PLANTING DATE: September 2, 1998
HARVEST DATE: July 22, 1999

PESTICIDES
TR-10, 7.5 lbs

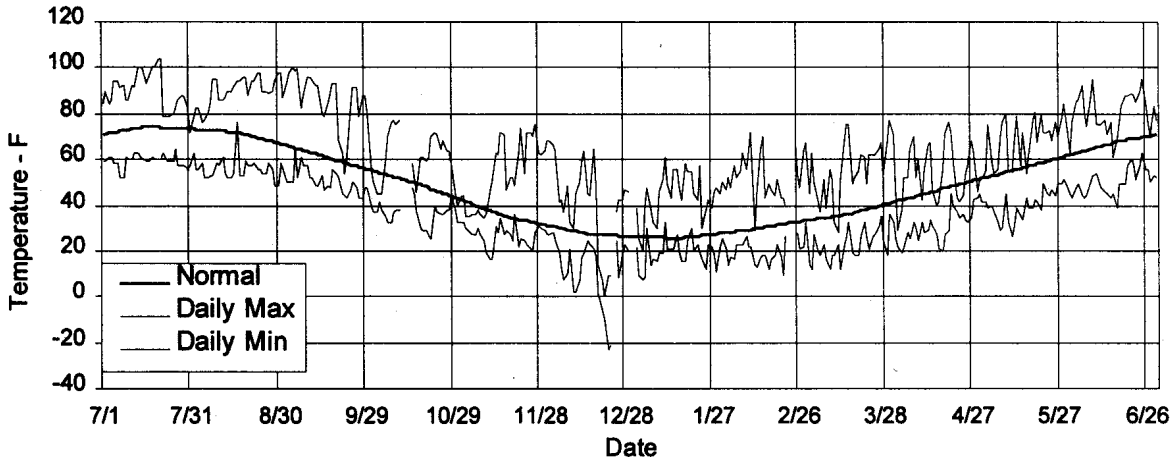
SOIL TEST
not taken

FERTILIZATION
Fall: 50 – 0 – 0 on July 15
Spring: 0 – 0 – 0

SEEDING RATE: 5 lb/a
ROW SPACING: 12 inches
SOIL TYPE: Pullman clay loam
IRRIGATION: none

ELEVATION: 4320 ft
LATITUDE: 41° 6' N
AVG. WINTER SURVIVAL: not taken
AVERAGE YIELD: not reported

COMMENTS:
Fall establishment was very good in spite of a late planting date. Warm March temperatures induced spring growth, and most winterkill occurred in April. Hail storms in late spring and early summer damaged the yield potential of the crop.



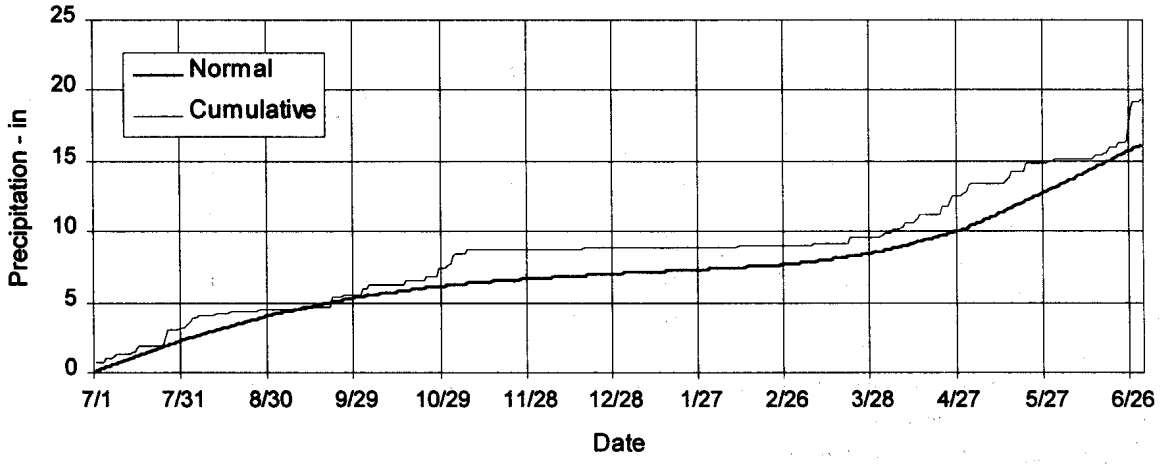


Table 11. Results from the 1999 National Canola Variety Trial, Sidney, NE.

Line	Yield			Winter Survival			Fall	50%
	1999	1997	2yr 1/	1999	2yr 2/	3yr 3/	Stand	Bloom
	lb/a			%			%	date
ARC91003-7L-3	---	---	---	67 *	41	---	33	5/21
ARC91004-12L-3	---	---	---	67 *	43	---	13	5/22
ARC91022-59L-4	---	---	---	0	5	---	10	5/21
ARC91016-41L-2	---	---	---	17	---	---	13	5/21
ARC91017-44E-5	---	---	---	100 *	---	---	10	5/19
IDWR.465.2.4.8	---	---	---	91 *	51	---	73 *	5/20
ID92WC2.24.5.3	---	---	---	84 *	52	---	83 *	5/22
ID92WC2.14.1.2	---	---	---	100 *	---	---	73 *	5/22
ID93WC.4.6.3	---	---	---	84 *	---	---	83 *	5/20
ID93WC.5.17.3	---	---	---	89 *	---	---	90 *	5/19
KS3203	---	937 *	---	100 *	78 *	79 *	67	5/22
Wichita	---	1064 *	2127	100 *	64 *	72 *	60	5/22
MO503-1	---	609	1877	100 *	73 *	77 *	73 *	5/19
GA488.7H	---	---	---	72 *	39	---	63	5/22
KS1701	---	687	1273	96 *	50	56	50	5/22
WW1089	---	---	---	48	29	---	50	5/22
Bridger	---	0	1169	68 *	56 *	38	73 *	5/22
Casino	---	269	---	92 *	64 *	54	83 *	5/22
Ceres	---	719 *	1635	100 *	51	57	77 *	5/23
Contact	---	---	---	73 *	---	---	73 *	5/22
DC H29	---	---	---	73 *	---	---	73 *	5/22
Ericka	---	492	---	88 *	51	45	80 *	5/19
Falcon	---	420	---	100 *	50	47	80 *	5/22
Jetton	---	11	---	89 *	48	35	83 *	5/22
Olsen	---	---	---	95 *	---	---	70 *	5/22
Pendleton	---	---	---	100 *	---	---	77 *	5/22
Plainsman	---	505	1249	90 *	46	55	50	5/21
Selkirk	---	174	---	50	27	20	80 *	5/22
ST994	---	452	---	42	---	---	87 *	5/22
Winfield	---	327	941	73 *	40	48	77 *	5/21
Mean	---	386	1345	78	47	45	64	5/22
LSD (0.05)	---	347	NS	37	22	18	21	NS
CV (%)	---	54.8	---	28.9	62.4	54.3	20.6	8.4

* Upper LSD group - Differences among those marked with an asterisk are not statistically significant.

1/ 2yr means include data from 1997 and 1995.

2/ 2yr means include data from 1999 and 1998.

3/ 3yr means include data from 1999, 1998, and 1997.

BUSHLAND, TX

COOPERATOR: Brent Bean,
Texas A&M University

PREVIOUS CROP: fallow
PLANTING DATE: September 30, 1998
HARVEST DATE: July 9, 1999

PESTICIDES:
Treflan, 1.5 pt/a

SOIL TEST
not available

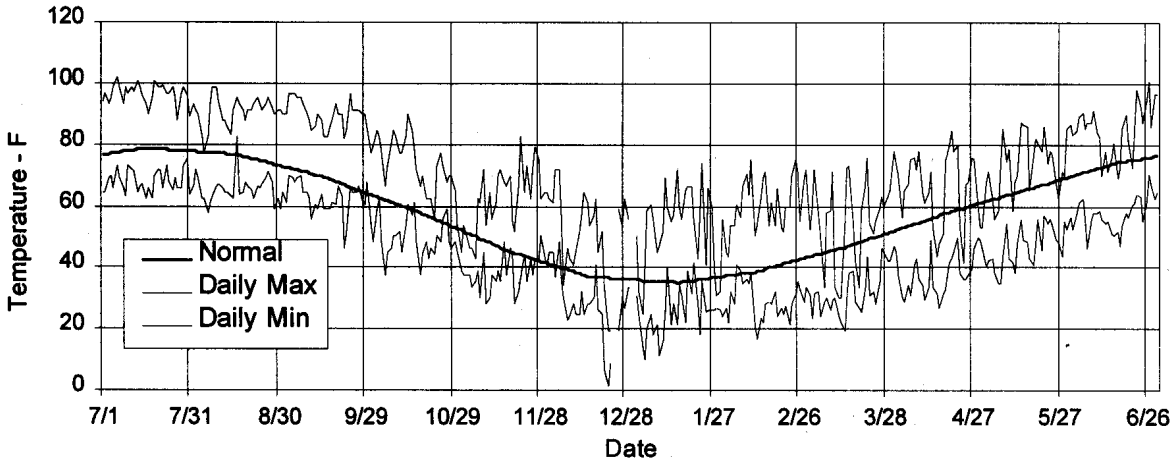
FERTILIZATION
Fall: 100 – 0 – 0
Spring: 0 – 0 – 0

SEEDING RATE: 5 lb/a
ROW SPACING: 8 inches

IRRIGATION: 12/8 and 3/3, 4" each
SOIL TYPE: Pullman clay loam

ELEVATION: 3818 ft
LATITUDE: 35° 11' N
AVG. WINTER SURVIVAL: not taken
AVERAGE YIELD: 1686 lb/a

COMMENTS:
Stands in many plots were poor and had not become well established before the first freeze of the year. It was difficult to distinguish between poor stand establishment and winterkill. The Spring Stand % is a combined rating for both. Shattering was also a major problem because of rains that prevented a timely harvest. Yield results are from replications 1 and 2.



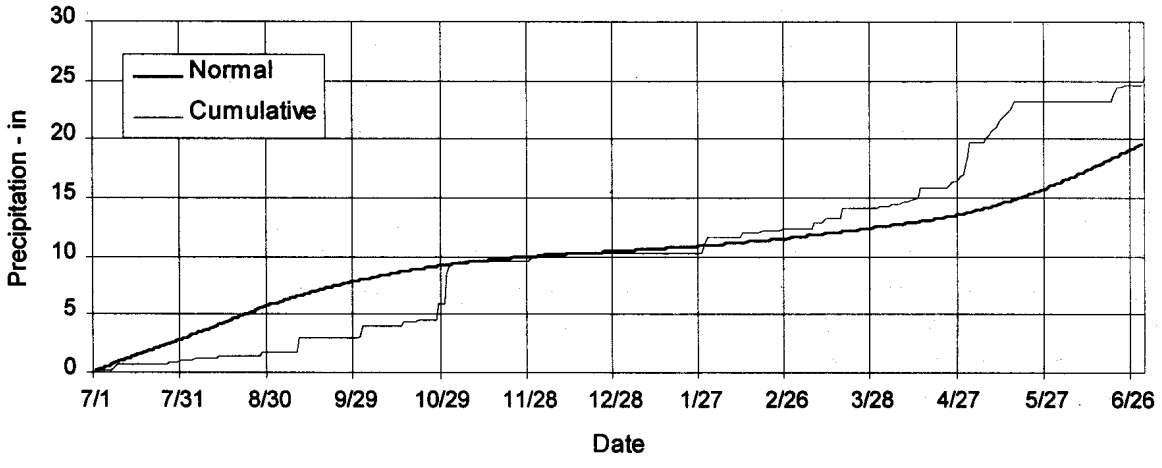


Table 12. Results from the 1999 National Canola Variety Trial, Bushland, TX.

Line	Yield 1999	Yield 2yr 1/	Spring Stand	50% Bloom 2/	Shattering	Total Oil
	lb/ac		%	date	%	%
WW1089	3446	-----	22	4/17 e	28 *	35.3
Jetton	2735	2269 *	65 *	4/15 e	30	34.9
KS1701	2321	1695 *	37	4/23 l	18 *	35.6
Contact	2142	-----	48 *	4/17 e	23 *	38.4 *
ARC91017-44E-5	2119	-----	17	4/17 e	33	37.1 *
ID93WC.5.17.3	2100	-----	23	4/20 l	20 *	36.2
Olsen	2018	-----	50 *	4/15 e	32	35.9
DC H29	2000	-----	67 *	4/16 e	33	33.4
Ericka	1969	1470	68 *	4/16 e	28 *	35.3
KS3203	1904	1621	28	4/17 e	25 *	35.4
ID93WC.4.6.3	1847	-----	55 *	4/20 l	30	36.1
ARC91004-12L-3	1706	-----	16	4/15 e	23 *	36.3
ST994	1688	1386	47 *	4/15 e	27 *	38.7 *
Bridger	1657	1393	70 *	4/14 e	32	37.5 *
ARC91022-59L-4	1642	-----	10	4/16 e	35	35.3
Winfield	1625	1327	43 *	4/16 e	28 *	39.0 *
GA488.7H	1619	-----	30	4/19 l	33	35.5
IDWR.465.2.4.8	1593	-----	58 *	4/15 e	32	33.5
Wichita	1592	1467	27	4/17 e	32	36.3
Casino	1585	1316	37	4/17 e	20 *	36.6
Ceres	1530	1560	34	4/20 l	22 *	33.5
ARC91016-41L-2	1482	-----	13	4/16 e	32	35.8
Selkirk	1471	1277	40	4/18 el	25 *	35.7
Plainsman	1390	1233	13	4/20 l	18 *	33.8
ID92WC2.24.5.3	1373	-----	42	4/23 l	27 *	36.6
ID92WC2.14.1.2	1134	-----	52 *	4/18 el	25 *	34.7
MO503-1	1014	994	15	4/21 l	23 *	37.1 *
ARC91003-7L-3	941	-----	6	4/19 l	40	35.2
Falcon	546	1049	45 *	4/16 e	40	34.2
Pendleton	403	-----	65 *	4/15 e	27 *	35.9
Mean	1686	1393	38	4/17	28	35.8
LSD (0.05)	NS	595	27	5	12	2.2
CV (%)	41.8	31.5	43.6	16.5	26.6	3.8

* Upper LSD group - Differences among those marked with an asterisk are not statistically significant.

1/ 2yr means include data from 1997 and 1999.

2/ Values marked "e" are not statistically different from the earliest value; those marked "l" are not different from the latest.

MUNDAY, TX

COOPERATOR: David G. Bordovsky, Texas A&M University

PREVIOUS CROP: wheat
PLANTING DATE: October 12, 1998
HARVEST DATE: June 3 & 4, 1999

PESTICIDES:
Treflan, .75 lb/a on Sept. 24
Malathion, 1.25 lb/a (four times) for aphids

SOIL TEST
pH= 7.4

FERTILIZATION
Fall: 16 – 19 – 0 on Sept. 25
Spring: 46 – 0 – 0 on Feb. 24

SEEDING RATE: 4 lb/a
ROW SPACING: 10 inches
IRRIGATION: 1" on 10/13, 10/28 & 1/26
SOIL TYPE: Pullman clay loam

ELEVATION: 1461 ft
LATITUDE: 33° 27' N
AVG. WINTER SURVIVAL: not taken
AVERAGE YIELD: 482 lb/a

COMMENTS:
The test was replanted late. Winter survival notes were not taken because of the difficulty of distinguishing between aphid damage and cold damage. Growth was erratic and uneven throughout the growing season. At harvest, green pods were numerous, and a substantial amount of shattering occurred.

Weather Data

Month	Precipitation	Min. Temp.	Max. Temp.
	inches	°F	°F
August, 1998	1.03	67	110
September, 1998	0.17	60	111
October, 1998	2.89	48	100
November, 1998	0.68	40	84
December, 1998	0.22	11	80
January, 1999	2.93	15	86
February, 1999	0.08	26	87
March, 1999	5.19	31	84
April, 1999	2.87	36	98
May, 1999	4.01	48	104

Table 13. Results from the 1999 National Canola Variety Trial, Munday, TX.

Line	Yield			Winter Survival		Fall	50%	Plant	Lodg-	Shat-	Mois-	Test	Total
	1999	2yr 1/	3yr 2/	1998	2yr 3/	Stand	Bloom 4/	Height 5/	ing	tering	ture	Weight	Oil
	lb/ac			%		%	date	in.	%	%	%	lb/bu	%
ARC91017-44E-	902 *	---	---	---	---	59 *	4/1	48 t	0 *	47	6.8	47.5 *	34.4
Jetton	864 *	1975 *	1962 *	100 *	90 *	59 *	4/1	36	0 *	25 *	6.8	45.7	35.2
Falcon	634 *	1524	1711	100 *	93 *	78 *	4/6	40	2 *	33 *	7.4	49.9 *	31.9
Casino	605 *	1710 *	1505	100 *	89 *	55 *	4/12	43 t	4 *	24 *	7.0	48.6 *	35.1
Olsen	582	---	---	---	---	74 *	4/5	41	3 *	24 *	8.4	48.1 *	33.4
Wichita	580	1858 *	1753 *	100 *	85	60 *	4/2	36	11 *	61	7.0	48.1 *	34.1
ARC91016-41L-2	554	---	---	---	---	20	4/3	41	32	30 *	7.7	47.9 *	35.3
ARC91003-7L-3	508	1713 *	---	99 *	---	42	3/27 e	43 t	8 *	63	8.2	47.6 *	34.2
Pendleton	508	---	---	---	---	63 *	4/6	40	1 *	40 *	7.2	45.3	38.7
ARC91004-12L-3	507	1766 *	---	99 *	---	45	3/31	42 t	2 *	54	7.2	49.8 *	34.7
ST994	500	---	---	---	---	70 *	4/6	36	3 *	46 *	7.2	44.8	34.9
ARC91022-59L-4	498	1726 *	---	100 *	---	43	4/1	42 t	1 *	51	7.1	47.1 *	36.0
WW1089	493	1801 *	---	100 *	---	50	4/9	38	10 *	18 *	7.5	47.8 *	33.0
Bridger	486	1863 *	1656	100 *	81	40	3/28 e	42 t	7 *	47	7.4	45.4	35.8
Ceres	478	1441	1687	96	87	65 *	4/6	38	0 *	26 *	7.5	46.8 *	33.4
KS3203	442	1256	1294	100 *	86	67 *	4/7	43 t	2 *	31 *	8.6	45.4	32.4
Contact	347	---	---	---	---	65 *	4/4	36	1 *	56	7.3	45.0	35.7
DC H29	321	---	---	---	---	61 *	4/8	40	7 *	38 *	7.7	43.4	35.0
Selkirk	312	1241	1189	100 *	87	61 *	4/11	41	11 *	28 *	8.0	47.7 *	33.7
Winfield	303	1624	1646	100 *	93 *	65 *	4/3	35 s	1 *	72	6.8	46.3	35.4
Ericka	290	1426	1455	100 *	89 *	66 *	4/3	36	23	61	7.7	49.5 *	31.6
Plainsman	214	1441	1440	100 *	79	61 *	4/1	43 t	1 *	53	7.0	49.2 *	34.7
UGA96200E	169	---	---	---	---	53	4/17 l	29 s	0 *	20 *	8.0	--- *	35.4
MO503-1	---	---	---	100 *	78	---	---	---	---	---	---	---	---
ID92WC2.24.5.3	---	---	---	97	---	---	---	---	---	---	---	---	---
IDWR.465.2.4.8	---	---	---	100 *	---	---	---	---	---	---	---	---	---
GA488.7H	---	---	---	100 *	---	---	---	---	---	---	---	---	---
Mean	482	1598	1513	99	83	57	4/5	40	6	41	7.5	47.1	34.5
LSD (0.05)	317	280	249	2	6	21	3.7	6	17	28	NS	3.6	NS
CV (%)	38.4	24.9	23.4	1.5	6.2	21.7		9.4	176	40.0	12.4	4.3	7.6

* Upper LSD group - Differences among those marked with an asterisk are not statistically significant.

1/ 2yr means include data from 1998 and 1999.

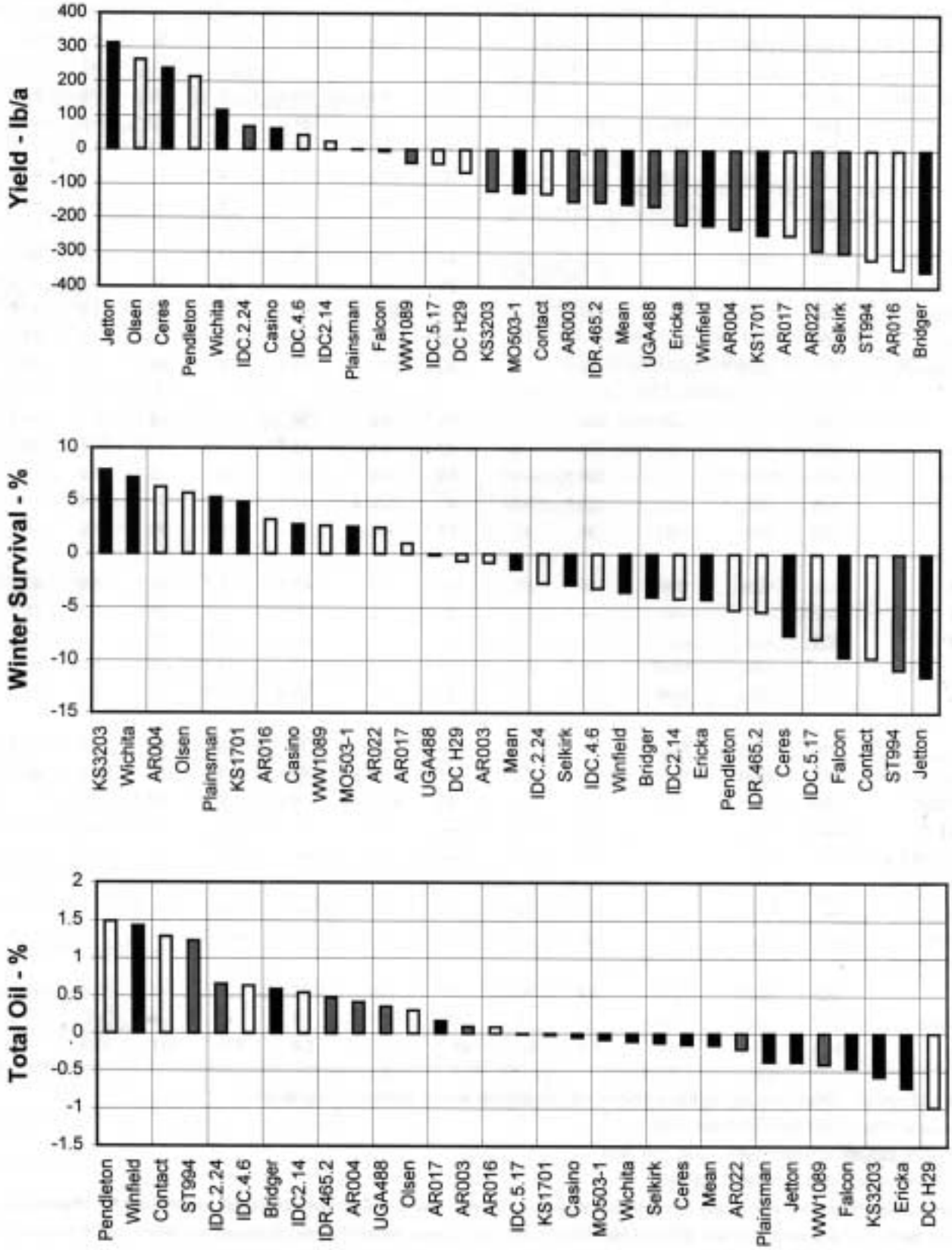
2/ 3yr means include data from 1997, 1998, and 1999.

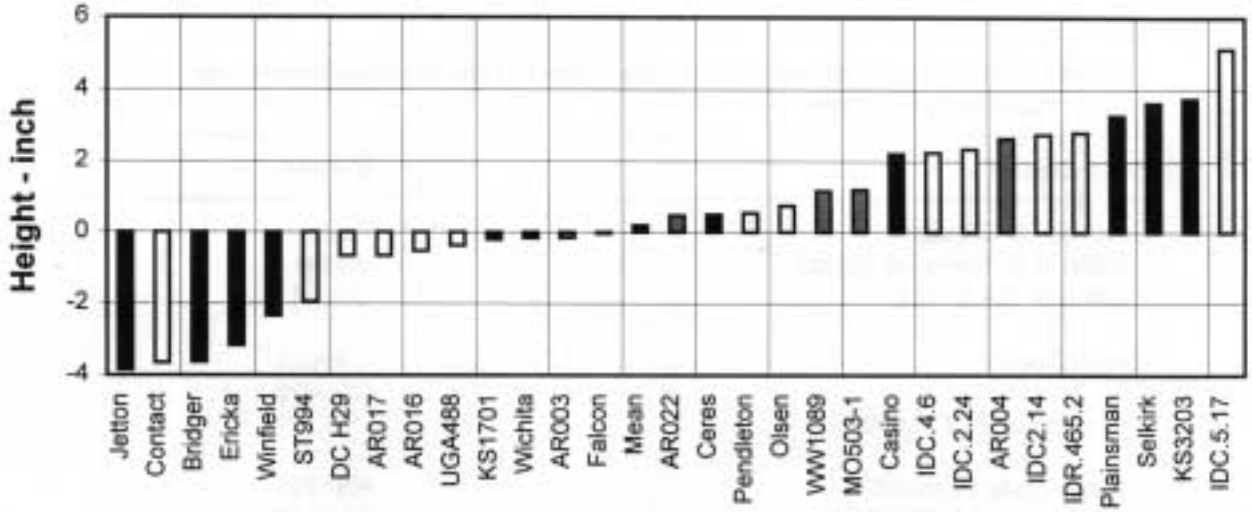
3/ 2yr means include data from 1997 and 1998.

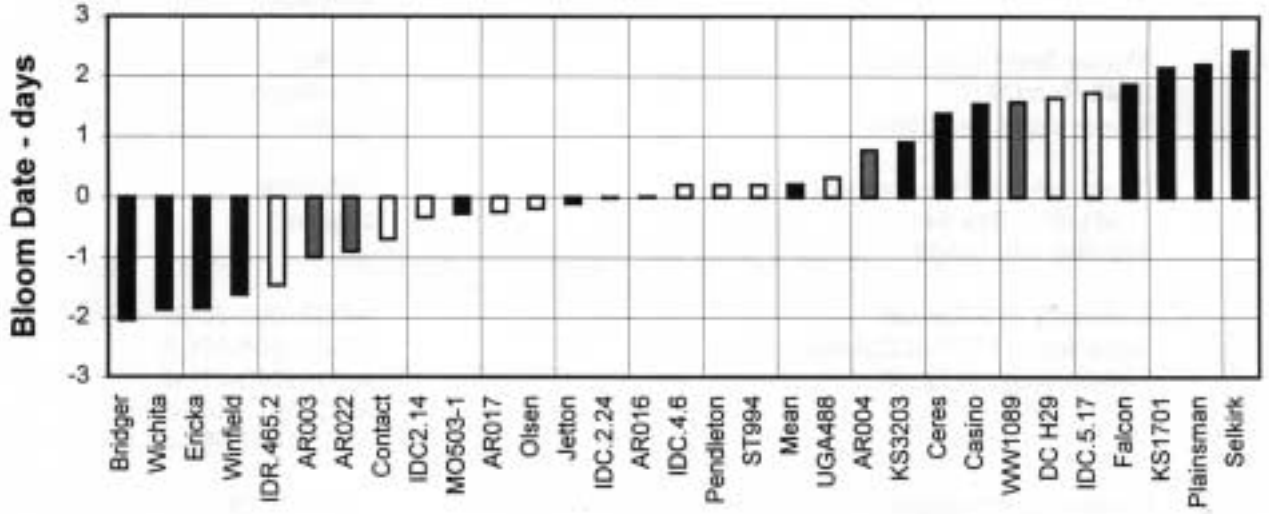
4/ Values marked "e" are not statistically different from the earliest value; those marked "l" are not statistically different from the latest.

5/ Values marked "s" are not statistically different from the shortest value; those marked "t" are not statistically different from the tallest.

Figure 1. Great Plains Winter Canola Summary, 1996-1999.







Note: Values are averages of the differences between each cultivar and the mean of Bridger, Ceres, Plainsman, and Wichita for yield (lb/a), winter survival (%), total oil content (%), plant height (inches), and 50% bloom date (days). The number of observations for each trait is represented by the different colors of the bars (as shown at the right).

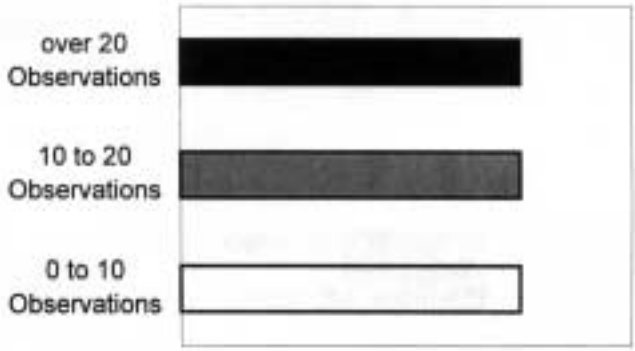


Table 14. Sources of Seed for Great Plains Entries in the 1999 National Winter Canola Variety Trial.

Seed Source	Entries
Calgene Oil Division 1190-A U.S. Route 19 South Leesburg, GA 31763	Falcon Jetton ST994
Cargill Seeds P.O. Box 5645 Minneapolis, MN 55440	Contact DC H29
Kansas State University Department of Agronomy Throckmorton Hall Manhattan, KS 66506-5501	KS1701 KS3203 Wichita (KS3580) Plainsman Winfield
McKay Seed Company 2945 Road N N.E. Moses Lake, WA 98837	Ceres Pendleton Olsen
Spectrum Crop Devlopment Post Office Box 541 Ritzville, WA 99169	WW1089 Casino
University of Arkansas Department of Plant Science Fayetteville, AR 72701	ARC91003-7L-3 ARC91004-12L-3 ARC91016-41L-2 ARC91017-44E-5 ARC91022-59L-4
University of Georgia Department of Crop & Soil Science Georgia Station, Griffin, GA 30223-1797	UGA488.7H UGA96200E
University of Idaho Dept. of Plant, Soil, and Envir. Science Moscow, ID 83843-4196	Bridger Ericka ID92WC2.14.1.2 ID.92.WC.2.24.5 ID93WC.4.6.3 ID93WC.5.17.3 ID.WR.465.2.4 Selkirk
University of Missouri Waters Hall Columbia, MO 65211	M0503-1

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Herbert Sunderman, KSU Northwest Research-Extension Center, Colby
Merle Witt, KSU Southwest Research-Extension Center, Garden City
Richard Auld, Texas Tech University, Lubbock
David Baltensperger, University of Nebraska, Scottsbluff
Brent Bean, Texas A&M University, Bushland
David Bordovsky, Texas A&M University, Vernon
Duane Johnson, Colorado State University, Ft. Collins
Harry Minor, University of Missouri, Columbia
Lenis Nelson, University of Nebraska, Lincoln

Kansas State University Agricultural Experiment Station and Cooperative Extension Service, Manhattan 66506

SRP 851 March 2000