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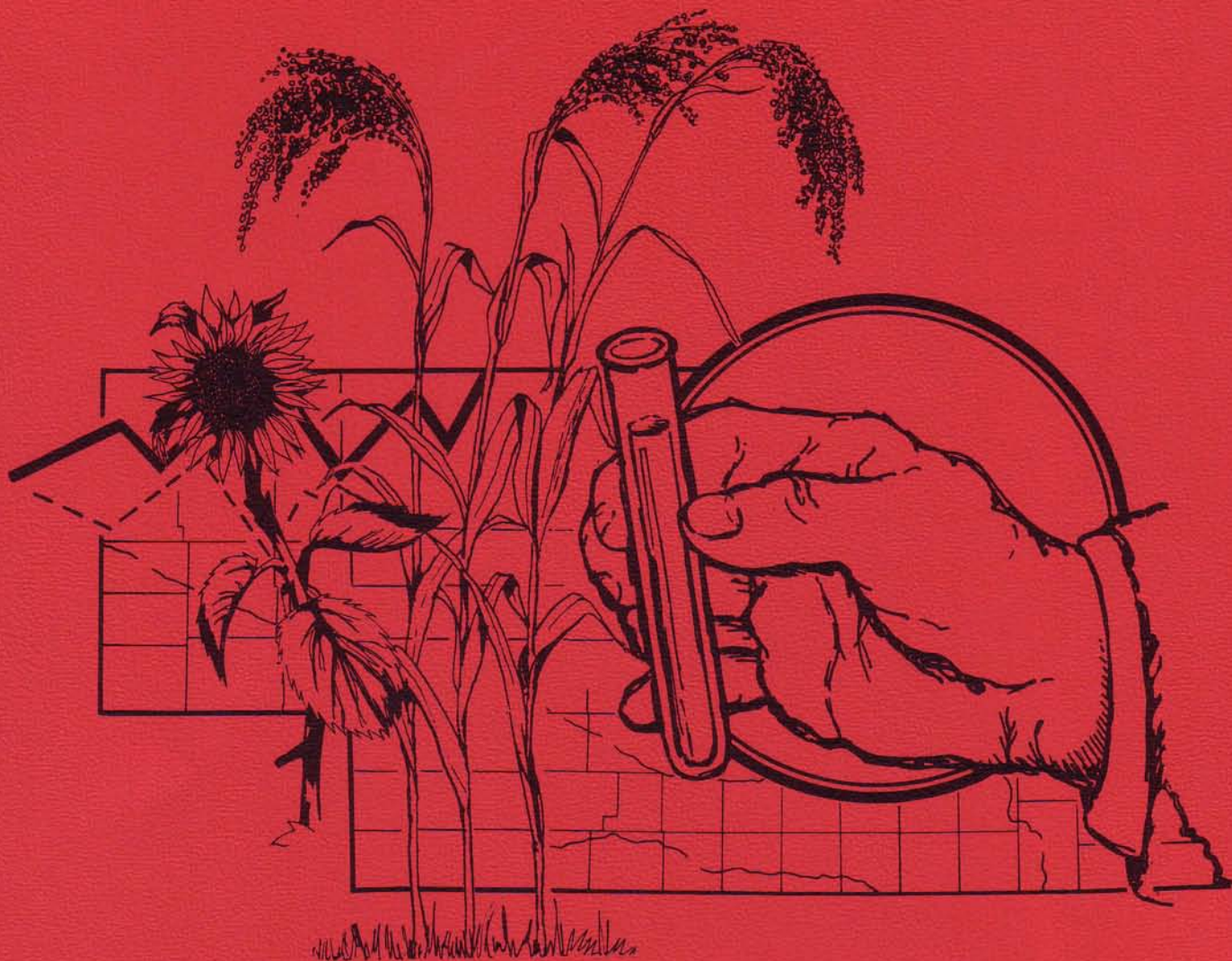


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NEBRASKA PROSO AND SUNFLOWER VARIETY TESTS 1989



University of Nebraska—Lincoln
Institute of Agriculture and Natural Resources
Agricultural Research Division
Cooperative Extension



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EXTENSION CIRCULAR 89 – 107

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ACKNOWLEDGEMENT

This circular is a progress report of proso and sunflower variety trials conducted by the Panhandle Research and Extension Center, and the High Plains Agricultural Laboratory. Conduct of experiments and publication of results is a joint effort of the Agricultural Research Division and the Cooperative Extension Service.

The authors changed jobs during the year. Because of this a large responsibility for these test fell on Glen Frickel. We would like to thank him for his extra efforts during the summer and fall of 1989 to bring these tests to completion. Thanks to Jim Robb for his assistance on price and acreage history.

METRIC EQUIVALENTS

1 centimeter = 0.394 inches
1 hectare = 2.471 acres
1 kilogram = 2.205 pounds
1 hectoliter = 2.838 bushels

cm = inches \times 2.541
ha = acres \times 0.405
kg = pounds \times 0.454
hl = bushels \times 0.352

Kilogram/hectoliter = lb/bu \times 1.287
Kilograms/hectare = bu/A \times 62.78 (56# bu)

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PROSO PRODUCTION IN NEBRASKA

Proso production in Nebraska varies from year to year because a portion is grown on land where winter wheat has been destroyed due to adverse weather. Proso acreage reflects proso prices in relation to wheat prices or expected prices. The following table shows fluctuations in proso acreage since 1973.

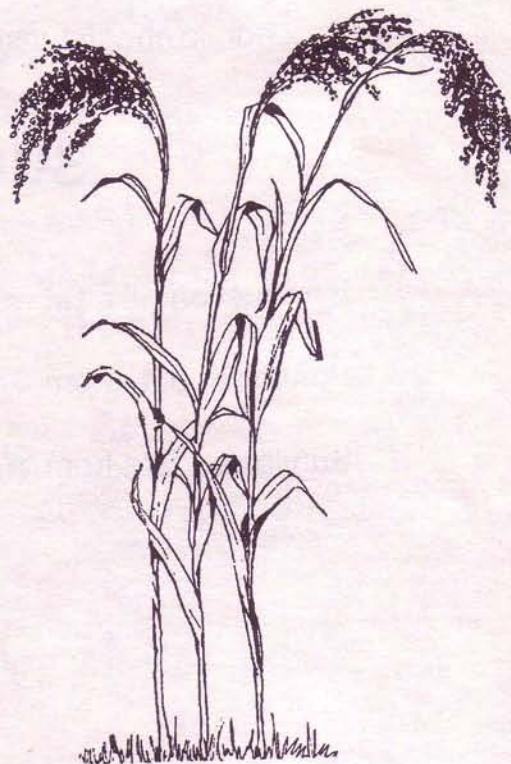
<u>Year</u>	<u>Yield</u> <u>lb/A</u>	<u>Area</u> <u>acres</u>
1973	1,500	29,000
1974	1,300	42,000
1975	1,300	40,000
1976	1,250	34,000
1977	1,470	37,000
1978	1,200	50,000
1979	1,360	63,000
1980	1,350	27,000
1981	1,950	33,000
1982	1,700	44,000
1983	1,500	43,000
1984	1,650	64,500
12 year average 1,460		42,166

As evidenced by this table, yields in 1984 were only average. Because of the larger acreage grown, there was a greater production of proso in 1984 than in any of the previous four years. The larger acreage is primarily a reflection of the government program. The statistics for 1985 through the current year are not available due to cutbacks in the Federal Crop and Livestock Reporting Service. Partially due to the large set aside since 1984 the acreage of proso has increased. In spite of this increase in acreage the market has grown and prices for proso increased to above \$10.00 per cwt during 1989.

Estimated value of proso production, using the twelve year average for yield adjusted to a 10% increase due to the use of the new variety 'Rise' and 50,000 acres of production is shown in the table below. A 15% increase in Nebraska yields based on improved varieties or cultural practices developed from research could return as much as a million dollars per year to Nebraska

<u>Year</u>	<u>Est.* Price</u> <u>-\$/cwt-</u>	<u>Value</u> <u>— \$ —</u>
1986	3.40	2,380,000
1987	3.95	2,765,000
1988	6.90	4,830,000
1989	6.50	4,550,000

*Based on production estimate of 700,000 cwt.



PROSO VARIETY TRIALS

1989

The 1989 proso test contained 23 white seeded entries of which seven were named varieties used as check varieties. The other 17 entries were selections and crosses from the proso breeding program at the Panhandle Research and Extension Center. All these selections and crosses

involve the variety Dawn and the primary purpose of this trial is to identify a taller better yielding, larger 'Dawn type' variety. Sunup is a new release from the crosses and has demonstrated improved height and yield over other varieties and is larger seeded than Rise.

Description of Check Varieties

COPE

Cope is 1978 Colorado release. It is much later maturing than other varieties. It has yielded well in Nebraska, especially when planted early.

ABARR

Abarr is a 1974 release from Colorado. It is a white seeded variety with good yield potential it is similar to Panhandle with improved seed type.

DAWN

Dawn is a 1976 Nebraska release. It is shatter resistant and ripens uniformly to make it suitable for direct combining. It has a large seed with good white color and has been well accepted in the bird seed trade. Its early maturity and short stature have make it less suitable under environmental stress conditions. It has not performed well under ecofallow in University of Nebraska tests. Its yield potential is good when fertilizer and moisture are favorable.

MINCO

Minco is a joint Colorado-Minnesota release. It is taller and later than Panhandle. It has white seed and good yield.

PANHANDLE

Panhandle is a 1968 Nebraska release. It is the first variety selected from the common white proso grown in western Nebraska. It has a good yield record and has white seeded grain. It has set the yield standards for many years.

RISE

Rise is a 1983 Nebraska release. It is the result of a Dawn X Minn 402 cross made in 1975. It is later and taller than Dawn with many of the same characteristics in head type and lodging resistance. It has had a good yield record in the time it has been tested. It does not have the large seed size of Dawn. In comparison to Panhandle, it is slightly shorter and earlier.

SUNUP

Sunup is a 1989 release from Nebraska. It is a white seeded variety with good yield potential. Its height is greater than Rise but is not as tall as Panhandle. Sunup is as lodging resistant as Dawn and Rise in spite of its taller height.

DESCRIPTION OF PLOT TECHNIQUES

Five proso variety trials were conducted in 1989. All were located at the High Plains Agricultural Laboratory near Sidney, Nebraska except for one which was located at the Panhandle Research and Extension Center in Scottsbluff, Nebraska. These five trials included a black fallow site, a early continuous cropping site, a late continuous cropping site, a notill site, and a irrigated site. Table 1 shows the conditions of each of those sites.

Plots were seeded with a 6-row double disc drill. Each plot was 22 feet long and six feet wide. The center 4 rows were harvested from each plot with a self-propelled combine when the variety was mature. Four replications of each variety in each location were planted and harvested. The plots were treated with a pre-emergence herbicide, atrazine, for weed control except the irrigated trial at Scottsbluff.

Table 1. List of 1989 plot conditions.

Location	Designation	Planting	Stand	Weed	Av. yld.	Previous
	date		control	cwt/ac	crop	crop
HPAL	Fallow	June 15	Variable	good	27.4	Fallow
HPAL	Early Cont.	June 15	Uniform	good	19.0	Wheat
HPAL	Late Cont.	June 29	Uniform	good	16.4	Wheat
HPAL	Notill	June 14	Variable	good	11.9	Wheat
PREC	Irrigated	June 20	Uniform	good	29.0	Oats

RESULTS

Table 2. Six year yield summary of varieties included in test.

Variety	6 year	1989	1988	1987	1986	1985	1984
	Average						
cwt/ac							
Sunup	20	23	21	23	15	19	17
Rise	19	22	19	20	15	18	22
Minco	18	17	18	19	16	18	18
Cope	16	18	17	18	14	15	14
Panhandle	14	17	16	16	12	12	10
Abarr	14	17	17	16	12	10	12
Dawn	11	12	10	12	6	12	13
Mean	16	18	17	18	13	15	15

SUNFLOWER TEST - 1989

Table 3. Proso yields for 1989 variety trials.

High Plains Ag Lab - Sidney

Variety	Average Yield	Fallow Cont.	Early Cont.	Late Cont.	Notill	Irrigated
			cwt/ac			
83014-6-B	23.8	30.5	22.3	18.9	12.0	35.3
Sunup	23.7	31.7	22.0	19.2	15.5	30.0
86020-3-15-B	23.7	31.2	21.1	19.5	11.8	34.9
85007-1	23.0	32.2	22.4	17.7	14.0	28.7
85004-3	22.7	30.1	22.1	17.1	12.3	31.9
76010-3-10-S	22.4	30.0	19.6	19.5	12.7	30.0
86021-4-2-B	21.9	28.9	21.4	16.5	13.7	29.1
83012-6-B	21.8	26.6	19.9	18.3	12.6	31.8
83014-4-B	21.7	25.3	20.3	18.2	14.4	30.4
83011-4-B	21.7	28.7	20.7	18.8	15.0	25.3
Rise	21.7	29.3	21.8	17.9	12.1	27.2
85011-2	21.6	31.0	20.0	14.8	11.5	30.8
86020-1-16-B	21.5	29.6	20.0	17.2	13.3	27.6
83014-10-B	21.4	26.7	18.4	17.6	10.8	33.7
83019-5-B	21.2	23.8	19.2	16.3	13.3	33.2
86019-2-13-B	21.0	27.2	18.4	17.0	12.6	30.0
76010-10	20.9	29.9	18.2	14.8	12.2	29.2
83019-1-B	20.8	27.2	19.4	15.1	12.5	29.8
Cope	18.2	23.5	17.0	14.9	10.5	25.1
Abarr	17.1	23.6	14.3	12.4	10.8	24.6
Minco	17.0	28.0	13.5	11.1	9.0	23.6
Panhandle	16.7	23.4	15.1	13.2	8.2	23.5
Dawn	11.6	12.6	11.1	10.6	3.4	20.4
Average	20.7	27.4	19.0	16.4	11.9	29.0
Dif Req Sig 5%	2.7	7.3	3.2	2.9	2.1	4.8

Table 4. Agronomic characteristics of lines and varieties in 1989 trials.

Variety	Heading July	Height Inches	Weight lb/bu	Seeds* /5 g	Lodging %
83014-6-B	12.8	29.4	54.0	749	7.9
Sunup	10.9	29.8	52.8	730	0.9
86020-3-15-B	10.8	25.5	54.5	767	9.0
85007-1	10.9	29.3	54.1	760	0.6
85004-3	13.8	29.5	52.5	769	9.3
76010-3-10-S	9.6	28.6	52.7	726	6.9
86021-4-2-B	13.0	28.4	52.7	756	4.5
83012-6-B	14.9	31.6	52.4	800	1.1
83014-4-B	13.4	28.6	50.7	763	8.0
83011-4-B	13.2	28.3	53.5	765	0.9
Rise	9.4	27.8	54.4	772	6.0
85011-2	12.7	30.2	52.1	746	10.6
86020-1-16-B	12.8	27.3	53.2	767	8.4
83014-10-B	14.4	29.1	52.8	753	6.6
83019-1-B	14.9	28.1	52.0	821	6.4
83019-5-B	15.2	27.1	52.1	687	1.6
86019-2-13-B	12.5	28.4	53.9	756	6.9
76010-10-8S	10.7	27.5	53.1	736	10.4
Cope	13.0	34.3	52.8	769	3.9
Abarr	9.9	32.4	53.7	741	27.5
Minco	9.9	30.6	54.9	754	26.5
Panhandle	8.5	30.6	54.1	760	12.3
Dawn	3.4	22.2	54.6	762	26.0
Average	11.8	28.9	53.2	765	8.8
Dif Req Sig 5%	1.1	1.9	2.1	35	2.2

* Low seed counts per 5 grams of seed indicate large seed.

SUNFLOWER TEST – 1989

The 1989 sunflower test was conducted under dryland conditions in Cheyenne County. It was planted in a 10 acre sunflower field at the High Plains Agricultural Lab near Sidney, Nebraska. The test was planted on June 9. Each plot consisted of 4, 30 inch rows and each hybrid was replicated 4 times. Plots were planted 34 ft long of which 25 feet were harvested. Four rows were planted and the center 2 of each were harvested with a small plot combine. Seeding rate was 18,000 seeds per acre. Six companies entered 23 hybrids in the test. One hybrid was of confectionary type. The herbicide used on this test was Prowl at a rate of 1 1/2 pints/A. The plots were harvested on October 15.

Sunflower yields were above average in fallow ground however in ground following wheat averages were down due to low soil moisture and lack of precipitation. Soil moisture at planting was fair and the crop started well. Bird and animal problems appeared minimal in this trial.

We would like to thank Glen Frickel for the extra effort he gave this plot in order to make it a success. Without his help this test could not have been conducted in 1989. Thanks to David Davis for his assistance in preparing this book.

Oil percent is based on 10% moisture basis. Analysis was provided by Dr. J. F. Miller, USDA-ARS in Fargo, ND. Samples were cleaned of all foreign material prior to analysis.

Thanks to Dr. Miller and all his assistants for their contributions to this test.

Companies entering the 1989 Sunflower Test.

Cargill Hybrid Seeds,
Jacques Seed Co.,
Triumph Seed Co.,
Conti-Seed,
Sigco Research,
Interstate Seed Co.,

Minneapolis, MN 55440
Prescot, WI 54021-1499
Ralls, TX 79357
Huron, SD 57350
Breckenridge, MN 56520
West Fargo, ND 58078

Sunflowers grown at the HPAL, Sidney, Nebraska

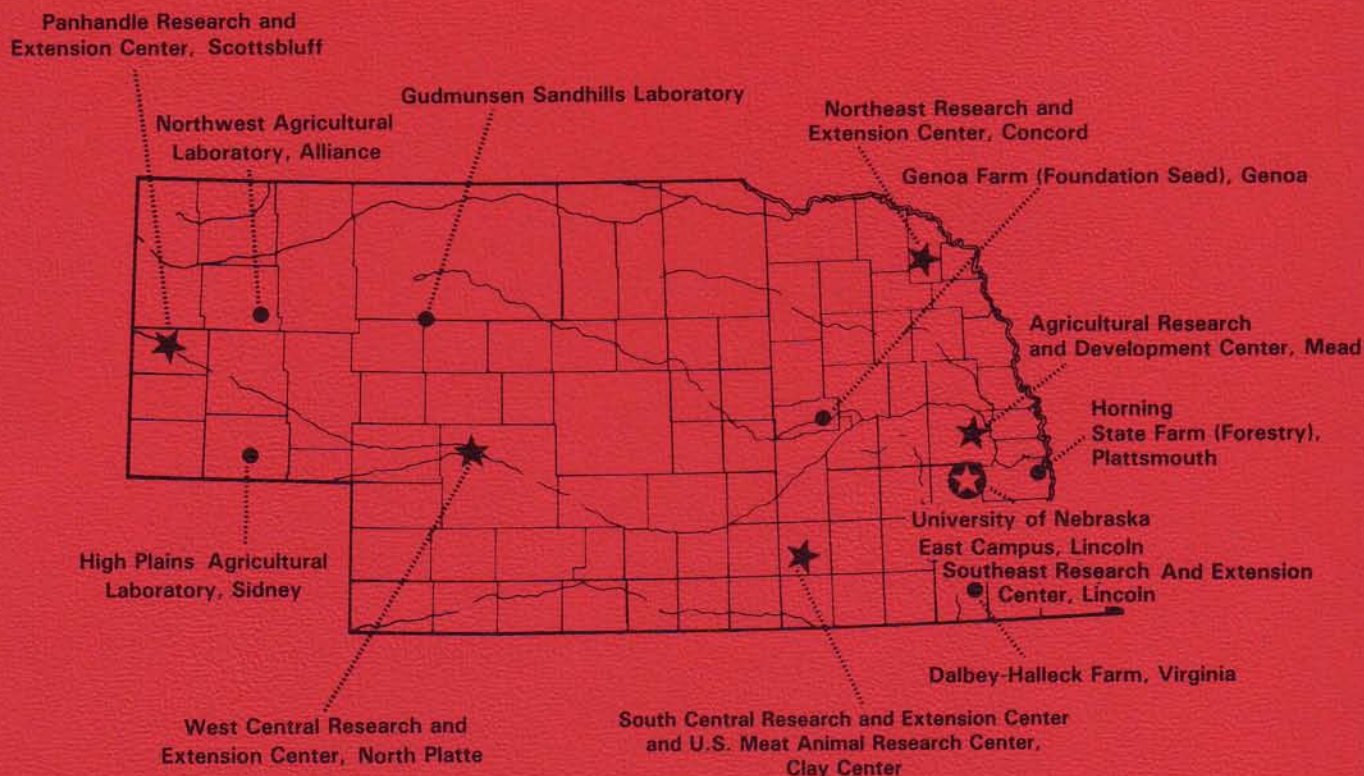
Company	Hybrid	Yield lbs/a	Flower August	Height Inches	Testwt lb/bu	Moisture %	Oil %
Sigco	EX 3513	2580	16.0	58.5	29.8	5.42	42.8
Triumph	548A (88 PR)	2542	18.0	55.7	28.3	6.60	43.3
Cargill	207A SL 3	2481	17.0	57.7	29.6	5.75	38.5
Triumph	550	2465	16.5	52.2	31.1	5.42	44.9
Conti	Hysun 354	2386	15.0	51.2	25.3	5.55	42.0
Triumph	557 DW	2300	19.0	37.7	28.0	5.20	45.1
Triumph	565	2250	16.7	51.0	29.6	5.70	42.3
Conti	Hysun 33	2215	19.7	66.5	29.2	8.70	39.2
Cargill	SF 10DA SL 3	2198	17.7	49.2	27.5	6.27	37.6
Cargill	SF 187A SL 3	2167	18.5	45.7	27.1	6.12	41.0
Sigco	458	2124	13.2	48.0	30.9	6.07	43.7
Jacques	Cadet	2122	9.0	47.7	29.1	5.95	40.5
Jacques	8713	2120	14.2	49.0	29.2	6.82	9.7
Interstate	EXP 3311	2117	14.7	52.2	30.1	6.07	41.4
Interstate	3001	2115	17.5	52.5	26.9	5.92	41.2
Triumph	560A	2086	13.7	48.7	30.4	5.30	45.6
Interstate	EXP 33085	2045	14.5	52.2	28.2	5.85	42.5
Jacques	Challenger	2006	11.0	49.7	27.4	6.70	39.7
Interstate	7116	1995	17.0	56.2	27.3	5.57	40.9
Jacques	Capri	1985	12.2	46.0	27.4	7.92	40.3
Conti	Hysun 340	1982	14.2	52.2	25.0	6.77	41.8
Conti	Sunbird II	1940	19.7	65.7	29.3	8.57	**
Interstate	7111	1756	13.2	52.5	26.7	5.65	41.2
Average		2170	15.6	52.1	28.4	6.24	41.6
LSD 0.05		530	1.4	4.3	1.3	1.00	2.9

** Oil % not taken on confectionary type.

Table 6. Three year summary of yield and percent oil data of sunflower entries in trials from western Nebraska. 1987 - 1989.

Company	Hybrid	1989		1988		1987		Three Year Average	
		Yield lbs/ac	Oil %	Yield lbs/ac	Oil %	Yield lbs/ac	Oil %	Yield lbs/ac	Oil %
Triumph	550	2470	44.9	1260	43.0	1840	48.7	1860	45.5
Triumph	565	2250	42.3	1250	44.9	1760	48.1	1750	45.0
Interstate	3001	2120	41.2	1220	40.9	1600	43.4	1650	42.0
Interstate	7116	2000	40.9	1160	40.7	1650	42.8	1600	41.5
Triumph	548A	2540	43.3	1070	43.4	1960	41.9	1860	43.0
Average		2276	42.5	1192	42.6	1762	45.0	1744	43.4

AGRICULTURAL RESEARCH AND EXTENSION FOR ALL OF NEBRASKA



The Agricultural Research Division of the Institute of Agriculture and Natural Resources is responsible for studies to broaden our basis of knowledge for agricultural production. Research centers and field laboratories provide applied information for development of Nebraska's largest industry — agriculture.

The Cooperative Extension Service transmits data and provides interpretation to users through Extension Agents and Specialists. Extension Agents may be contacted through 85 local Extension offices for additional information and more specific recommendations.

Nebraska is a large state and has great variation due to topography and the continental type of climate. The elevation ranges from 1,000 feet to near a mile high in the northwest portion of the state, rainfall varies from less than 15 to more than 35 inches per year, and the soil types vary from sands to heavy clays. The research and extension programs thus are broad in subject matter and geography, resulting in the need for various centers, satellite locations, and local offices.