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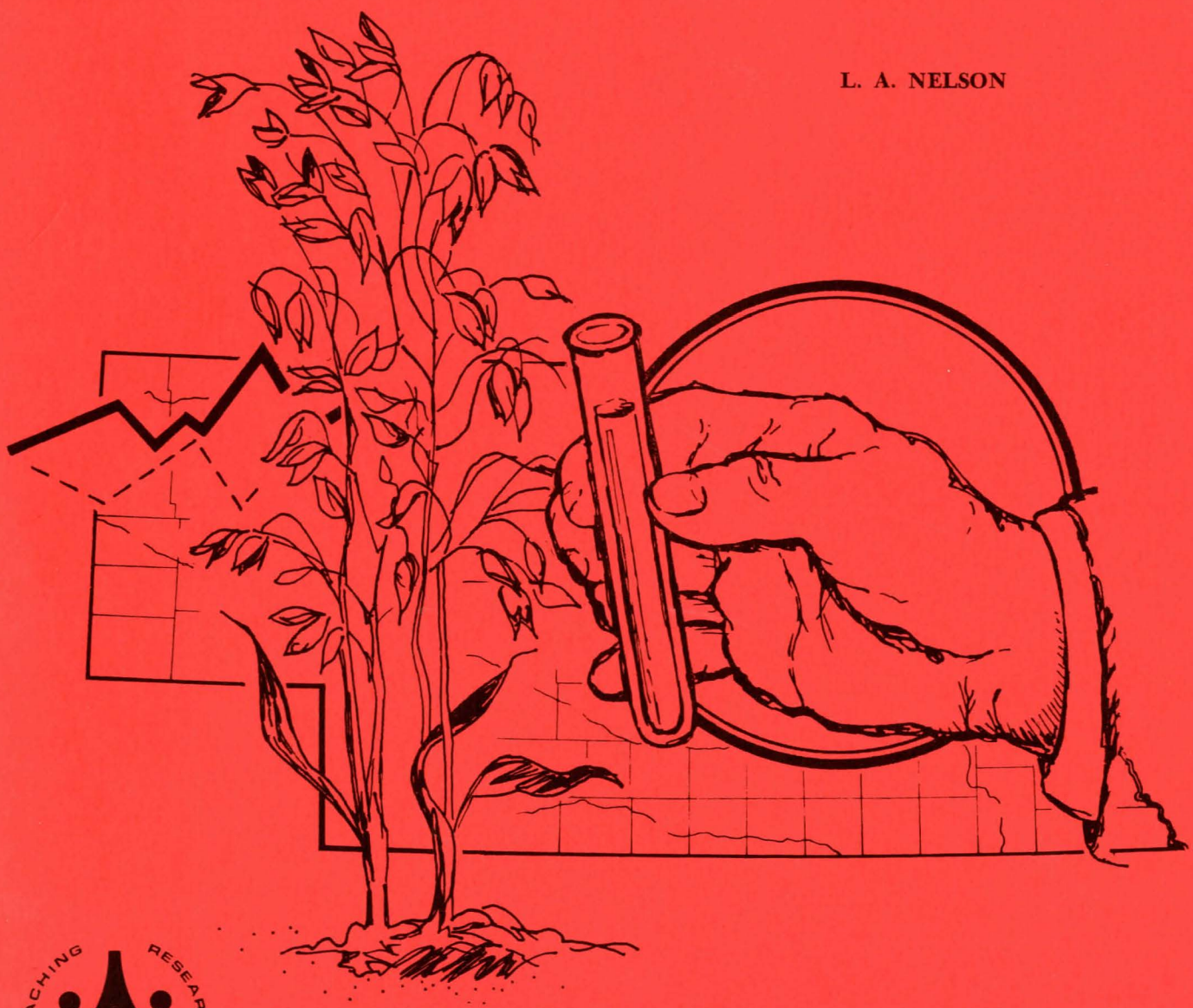
PROSO VARIETY TESTS

1979

L. A. NELSON



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the Counties and the U.S. Department of Agriculture
Leo E. Lucas, Director

EXTENSION CIRCULAR 80-107

February 1980

FORWARD

This circular is a progress report of proso variety trials conducted by the Panhandle Station, High Plains Agricultural Laboratory, and Northwest Agricultural Laboratory. These Extension Circulars replace the Outstate Testing Series. Conduct of experiments and publication of results is a joint effort of the Agricultural Experiment Station and the Cooperative Extension Service. Special acknowedgement is made to Ted McIrwin for furnishing land for irrigated trials in Kimball County.

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PROSO VARIETY TRIALS

1979

L. A. NELSON [1/]

The amount of proso grown in Nebraska has shown a slow but steady increase in the last few years:

Year	Yield lb/A	Yield (kg/ha)	Area acres	Area (hectares) [2/]
1975	1,300	(1457)	40,000	(16,200)
1976	1,250	(1401)	34,000	(13,770)
1977	1,470	(1650)	47,000	(19,845)
1978	1,200	(1345)	50,000	(20,250)
1979	1,360	(1525)	63,000	(25,515)

'White Proso' remains the most widely grown variety with 65% of the total. 'Abarr' has increased to 14%, 'Dawn' has remained about 8% and 'Panhandle' has dropped to about 4%. Proso yields have remained quite consistent over the period.

This year the yield trial contained six check varieties and 16 experimental lines. Two of the lines were from the Minnesota breeding program and 14 were crosses with Dawn made at the Panhandle Station. All of the Dawn crosses were F_4, F_5, and F_6 selections made from head rows grown in 1978. Selections were based on height, vigor, and maturity as an attempt to retain the Dawn type while increasing height and yield.

The following is a description of the six varieties included as check varieties. All are available from their state of origin if they are not available locally.

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.

Cerise is a 1974 release from Nebraska. It is the only red seeded variety included in this years yield trial. It is about one day earlier than Turghai, the variety it replaced, and has a yield and height similar to Panhandle. Cerise is probably a better forage than the other varieties. There is some demand for red seed in the bird seed trade but generally is easier to keep pure if raised outside the normal white proso producing areas.

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

Dawn is 1976 Nebraska release. It is shatter resistant and ripens uniformly to make it suitable for direct combining. It has large seed with good white color and has been well accepted in the bird seed trade. Its early maturity and short stature have made it less suitable under environmental stress conditions.

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[2/] Nebraska Crop & Livestock Reporting Service.

Its yield potential is good when fertilizer and moisture are favorable.

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

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 standard for many years.

Six proso variety trials were planted in 1979 but only four were harvested. The six trials included early black fallow, late black fallow and early eco-fallow at High Plains Ag. Lab. (Sidney), black fallow and eco-fallow at Northwest Ag. Lab. (Alliance), and an irrigated trial on the Ted McIrwin farm near Dix. A late season hail storm destroyed the irrigated test and poor stands eliminated the ecofallow plot at Northwest Ag. Lab. All plots were treated with atrazine pre-emergence for weed control.

Plots were seeded with a 6-row double disc drill, each plot was 44' (13 x m) long with half the length of the plot getting 40 lb/A (45 kg/ha) nitrogen as ammonium nitrate and half getting no fertilizer. Fifteen feet (5 x m) were harvested from each plot with a 4' (125 cm) self propelled combine when the variety was mature. Four replications of each plot were planted at each location.

Two or three of the Dawn crosses look quite promising based on this years data. They are later than Dawn, are about four inches taller than Dawn and have good yield. These data are encouraging for developing an improved 'Dawn type' of proso.

The portion of this trial that deals with fertilizer response indicates that nitrogen response varied with location. Ecofallow and the NWAL responed to nitrogen while the black fallow at HPAL did not respond to nitrogen. There were no varieties which responded differently to nitrogen than the others.

THE METRIC SYSTEM

Data in this circular are given in commonly used U. S. units followed by metric units in parentheses ( ). Some equivalents and conversions used were as follows:

1 centimeter (cm) = 0.394 inches	cm = inches x 2.54
1 hectare (ha) = 2.471 acres	ha = acres x 0.405
1 kilogram (kg) = 2.205 pounds	kg = pounds x 0.454
1 kilogram/hectare (kg/ha) = 0.892 pounds per acre	kg/ha = lb/A x 1.121
1 kilogram/hectare (kg/ha) = 0.892 pounds per acre	kg/ha = cwt/A x 112.1

Table 1. List of 1979 locations and conditions.

Location	Designation	Planting date	Stand	Weed control	Avg. yield cwt/A (kg/ha)	Harvested
Dix	Irrigated	June 21	Good	Excellent	-	Hail
HPAL (Sidney)	Early	May 22	Poor	Excellent	12 (1345)	Yes
HPAL (Sidney)	Ecofallow	May 24	Poor	Excellent	12 (1345)	Yes
HPAL (Sidney)	Late	June 20	Good	Excellent	17 (1906)	Yes
NWAL (Alliance)	Black Fallow	May 18	V. Good	Excellent	15 (1682)	Yes
NWAL (Alliance)	Ecofallow	May 18	V. Poor	Excellent		Poor stand

Table 2. Five year average of check varieties.

Variety	1979 (4 tests) cwt/A	(kg/ha)	1978 (4 tests) cwt/A	(kg/ha)	1977 (4 tests) cwt/A	(kg/ha)	1976 (4 tests) cwt/A	(kg/ha)	1975 (5 tests) cwt/A	(kg/ha)
Abarr	11	(1233)	14	(1569)	-		8	(897)	16	(1794)
Cerise	13	(1457)	13	(1457)	22	(2466)	9	(1009)	15	(1682)
Cope	16	(1794)	14	(1569)	20	(2242)	10	(1121)	16	(1794)
Dawn	14	(1569)	15	(1682)	14	(1569)	17	(1906)	13	(1457)
Minco	14	(1569)	16	(1794)	17	(1906)	9	(1009)	15	(1682)
Panhandle	11	(1233)	15	(1682)	16	(1794)	11	(1233)	15	(1682)
L.S.D. .05	1.1	(123)	2.1	(235)	2.7	(303)				

Table 3. Characteristics of varieties and lines entered in the 1979 proso variety trials

Variety or line (parentage)	Seed color	Height	Straw strength	Maturity
Abarr	White	Medium	Weak	Med.
Cerise	Lt. red	Medium	Fair	Early
Cope	White	Tall	Good	Late
Dawn	White	Short	Good	V. early
Minco	White	Med. tall	Fair	Med.
Panhandle	White	Medium	Weak	Early
Minn. 55	White	Medium	Weak	Med.
Minn 77-III	White	Med. short	Fair	V. early
Dawn X Abarr 76003-18-7	White	Medium	Weak	Med.
Dawn X Abarr 76003-9-6	White	Med. short	Fair	Late
Dawn X Common White 76001-21-7	White	Medium	Fair	Early
Dawn X Common White 7600-7-1	White	Medium	Fair	Med.
Dawn X Panhandle 76010-5-10	White	Med. short	Good	V. early
Dawn X Panhandle 76010-10-8	White	Med. short	Fair	Med.
Dawn X Panhandle 76010-6-3	White	Med. short	Good	Med.
Dawn X Minn 402 76004-3-8	White	Med. short	Good	Med.
Dawn X Akron 29 76006-15-5	White	Med. short	Good	V. late
Dawn X PI 346943 76002-15-2	White	Med. short	Weak	Med.
76045-3	Tan-white	Medium	Weak	V. late
75072-5-3	White	Medium	Good	V. late
75070-5-4	White	Medium	Good	Late
75074-3-8	White	Med. short	Fair	V. early

Table 4. Proso yields at four locations in 1979.

Variety	Early HPAL cwt/A	Early HPAL (kg/ha)	Eco-HPAL cwt/A	Eco-HPAL (kg/ha)	Late HPAL cwt/A	Late HPAL (kg/ha)	Fallow-NWAL cwt/A	Fallow-NWAL (kg/ha)	Average 4 locations cwt/A	Average 4 locations (kg/ha)
Abarr	11	(1233)	11	(1233)	12	(1345)	11	(1233)	11	(1233)
Cerise	12	(1345)	11	(1233)	15	(1682)	13	(1457)	13	(1457)
Cope	15	(1682)	14	(1569)	19	(2130)	15	(1682)	16	(1794)
Dawn	15	(1682)	10	(1121)	19	(2130)	14	(1569)	14	(1569)
Minco	10	(1121)	14	(1569)	17	(1906)	14	(1569)	14	(1569)
Panhandle	10	(1121)	7	(785)	16	(1794)	12	(1345)	11	(1233)
Minn 55	9	(1009)	11	(1233)	20	(2242)	15	(1682)	14	(1569)
Minn 77-III	15	(1682)	13	(1457)	13	(1457)	14	(1569)	14	(1569)
76003-18-7	10	(1121)	12	(1345)	16	(1794)	14	(1569)	13	(1457)
76003-9-6	13	(1457)	15	(1682)	17	(1906)	15	(1682)	15	(1682)
76001-21-7	11	(1233)	14	(1569)	18	(2018)	15	(1682)	14	(1569)
76001-7-1	10	(1121)	12	(1345)	17	(1906)	15	(1682)	13	(1457)
76010-5-10	11	(1233)	10	(1121)	20	(2242)	16	(1794)	14	(1569)
76010-10-8	14	(1569)	16	(1794)	17	(1906)	18	(2018)	16	(1794)
76010-6-3	16	(1794)	14	(1569)	21	(2354)	17	(1906)	17	(1906)
760040308	17	(1906)	16	(1794)	23	(2378)	19	(2130)	19	(2130)
76006-15-5	10	(1121)	14	(1569)	16	(1794)	17	(1906)	14	(1569)
76002-15-2	10	(1121)	16	(1794)	17	(1906)	12	(1345)	14	(1569)
76045-3	7	(785)	9	(1009)	12	(1345)	13	(1457)	10	(1121)
76072-5-3	8	(897)	9	(1009)	15	(1682)	13	(1457)	11	(1233)
76070-5-4	10	(1121)	12	(1345)	22	(2466)	16	(1794)	15	(1682)
75074-3-8	11	(1233)	9	(1009)	22	(2466)	13	(1457)	14	(1569)
L.S.D. at .05	2.4	(269)	3.8	(426)	3.3	(370)	2.3	(258)	1.1	(123)

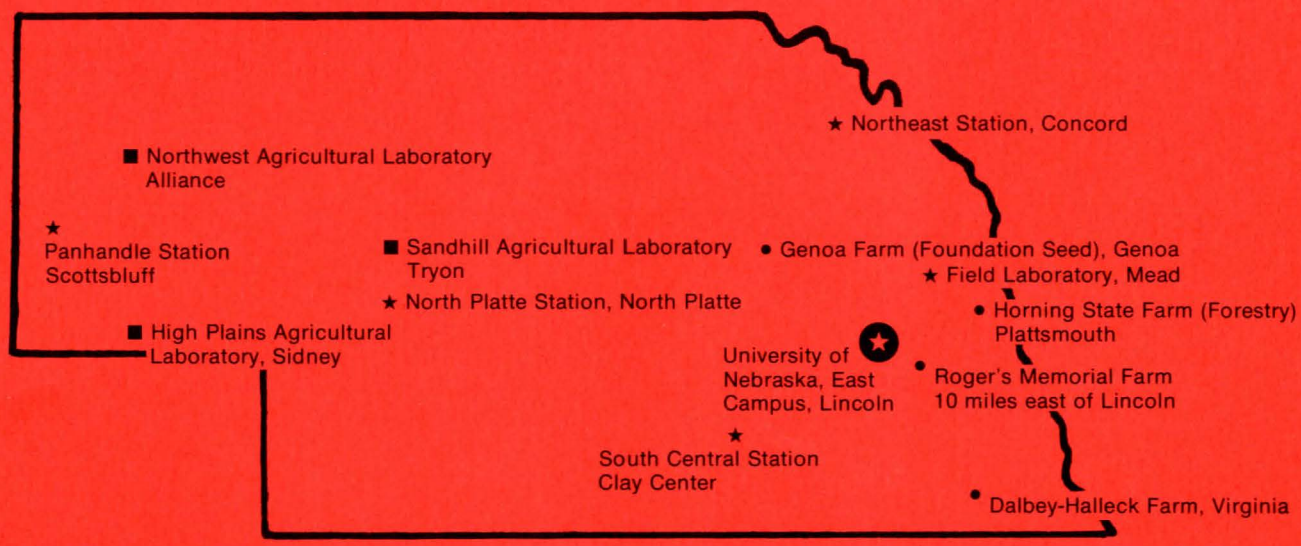
Table 5. Lodging, heading date, height, test weight, and seed weight of proso variety trial.

Variety	Lodging % 3 locations	Days to heading 4 locations	Height (4 locations) inches	(cm)	Test wt. (4 locations) lb/bu	(kg/hl)	No. of seeds 5 grams 3 locations
Abarr	23	73	37	(94)	53	(68)	735
Cerise	15	71	37	(94)	57	(73)	876
Cope	14	74	40	(102)	54	(69)	757
Dawn	13	69	28	(71)	55	(71)	779
Minco	23	72	37	(94)	54	(69)	796
Panhandle	22	70	37	(94)	53	(68)	770
Minn 55	29	71	35	(89)	54	(69)	739
Minn 77-III	17	69	32	(81)	56	(72)	936
76003-18-7	24	73	36	(91)	53	(68)	740
76003-9-6	15	75	33	(84)	54	(69)	707
76001-21-7	15	71	36	(91)	53	(68)	755
76001-7-1	19	73	36	(91)	55	(71)	765
76010-5-10	12	69	32	(81)	54	(69)	741
76010-10-8	15	72	34	(86)	54	(69)	755
76010-6-3	11	72	31	(79)	54	(69)	718
76004-3-8	9	74	32	(81)	54	(69)	800
76006-15-5	13	76	32	(81)	54	(69)	837
76002015-2	32	71	33	(84)	54	(69)	779
76045-3	25	75	36	(91)	57	(73)	876
76072-5-3	11	77	35	(89)	53	(68)	875
76070-5-4	14	74	37	(94)	55	(71)	773
75074-3-8	14	69	34	(86)	54	(69)	774
L.S.D. at .05	3.6	2.1	1.3	(3.3)	0.42	(0.54)	9.1

Table 6. Effects of fertility and location on yield, test wt., lodging, and seed size.

Location	Fertilizer	Yield cwt/A	(kg/ha)	Test Wt. lb/bu	(kg/hl)	Lodging %	No. of seeds/5 g
HPAL	40# N	11	(1233)	53.9	(69.4)	27	805
Early	0# N	12	(1345)	53.9	(69.4)	19	791
HPAL	40# N	14	(1569)	54.6	(70.3)	-	787
Ecofallow	0# N	10	(1121)	54.9	(70.7)	-	777
HPAL	40# N	18	(2018)	51.8	(70.5)	2	775
Late	0# N	17	(1906)	54.9	(70.7)	1	770
NWAL	40# N	16	(1794)	53.0	(68.2)	26	-
Fallow	0# N	13	(1457)	53.9	(69.4)	29	-
4 trial	40# N	15	(1682)	54.1	(69.6)	18	789
Averages	0# N	13	(1457)	54.4	(70.0)	17	779

Agricultural Research for All of Nebraska



The agricultural research division of the Institute of Agriculture and Natural Resources is the Nebraska Agricultural Experiment Station. The Experiment Station relies on its research centers and field laboratories to provide applied knowledge for development of Nebraska's largest industry—agriculture. In addition, many Nebraska farmers cooperate by furnishing land and other facilities for research projects. This provides information from areas not well represented by stations.

The Cooperative Extension Service transmits data to users through District and County Extension Offices. Area and County Extension Agents are available to provide additional interpretation 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 14 to 40 inches per year, and the soil types vary from sands to heavy clays. The research program thus is broad in subject matter and geography, resulting in the need for various stations and satellite locations.

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