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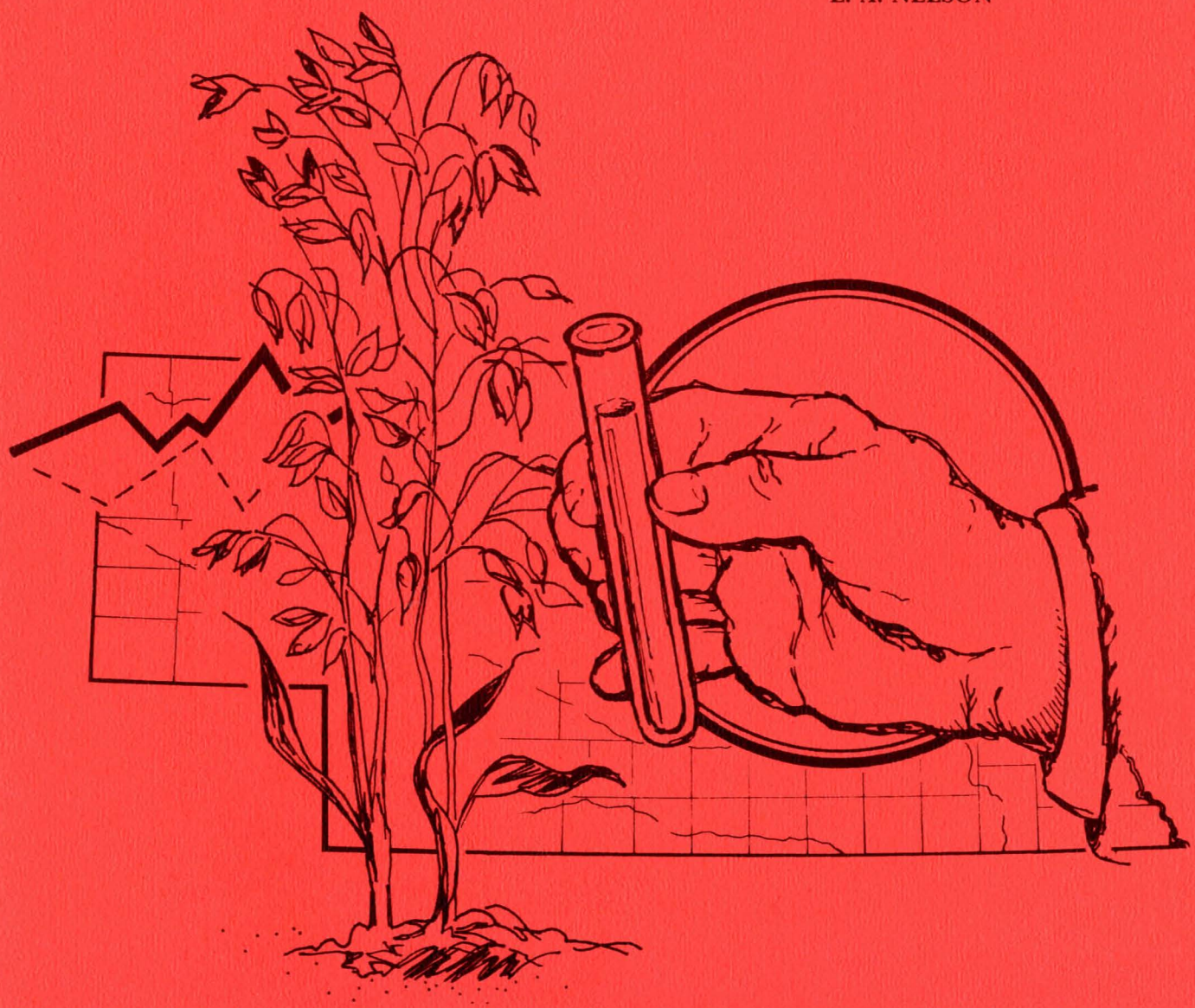
FEBRUARY 1982 NEBRASKA COOPERATIVE EXTENSION SERVICE—E.C. 82-107

# PROSO VARIETY TESTS 1981

L. A. NELSON



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EXTENSION CIRCULAR 82-107

January 1982

## FOREWORD

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.

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# PROSO VARIETY TRIALS

1981

L.A. NELSON[1/]

Proso acreage in Nebraska took a sharp decline in 1980. Although there was some recovery in 1981, the acreage did not come back to its previous level[2/]:

| Year | Yield (lb/A) | Area (acres) |
|---|---|---|
| 1977 | 1470 | 47,000 |
| 1978 | 1200 | 50,000 |
| 1979 | 1360 | 63,000 |
| 1980 | 1350 | 27,000 |
| 1981 | 1950 | 33,000 |

As evidenced by this table, yields in 1981 were excellent. This was primarily because of the abundant and timely rain in the Cheyenne Country region.

The varieties remained fairly similar to 1980. White proso remained most common with 'Dawn' and 'Panhandle' making up most of the remaining acreage. Lack of height prevents Dawn from substantially increasing in acreage. The need for a Dawn 'type' proso with increased height is still needed.

The 1981 proso test contained 22 entries of which seven were named varieties used as check varieties. The other 15 entries were selections and crosses from the proso breeding program at the Panhandle Station. All of these selections and crosses involve the variety Dawn and the primary purpose of this trial is to identify a tall, improved "Dawn type" plant.

The following is a description of the seven varieties included as check varieties. All are available from their states 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 it generally is easier to keep pure if raised outside the normal 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 a 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. Its yield potential is good when fertilizer and moisture are favorable.

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1/Associate Professor of Agronomy, Panhandle Station, Scottsbluff, Nebraska.

2/Nebraska Crop & Livestock Reporting Service.

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.

Minsum is a 1980 release from Minnesota. It is quite early and medium in height. Its most noticable characteristic is an extremely loose panicle (effusum). It has a good yield potential and may have some potential in Nebraska

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 conducted in 1981. Three were located at the High Plains Ag. Lab. near Sidney and three at the Northwest Ag. Lab. near Alliance. The three at High Plains Ag. Lab. were early black fallow, late black fallow, and ecofallow. The three tests at Northwest Ag. Lab. were black fallow, ecofallow and irrigated planted the same day.

Plots were seeded with a 6-row double disc drill. Each plot was 22 feet long and six feet wide. The center 4 by 15 foot segment was 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 at High Plains Ag. Lab were treated preemergence with atrazine for weed control. The plots at Northwest Ag. Lab. were treated with 2,4-D for weed control.

## THE METRIC SYSTEM

Metric equivalents and conversions are 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 1981 locations and conditions.

| Location | Designation | Planting date | Stand | Weed control | Av. yield cwt/A |
|---|---|---|---|---|---|
| HPAL (Sidney) | Early (black) | May 28 | Good | Exc. | 27 |
| HPAL (Sidney) | Ecofallow | June 2 | Good | Exc. | 24 |
| HPAL (Sidney) | Late (black) | June 17 | Good | Exc. | 26 |
| NWAL (Alliance) | Black fallow | June 3 | Good | Exc. | 22 |
| NWAL (Alliance) | Ecofallow | June 3 | Good | Exc. | 11 |
| NWAL (Alliance) | Irrigated | June 3 | Exc. | Exc. | 33 |

Table 2. Five year average yield of check varieties.

| | Yield in cwt/A | | | | | |
|---|---|---|---|---|---|---|
| Variety | 5 Yr. Average | 1981 | 1980 | 1979 | 1978 | 1977 |
| Abarr | 16 | 23 | 15 | 11 | 14 | -- |
| Cerise | 16 | 19 | 11 | 13 | 13 | 22 |
| Cope | 18 | 26 | 14 | 16 | 14 | 20 |
| Dawn | 14 | 15 | 14 | 14 | 15 | 14 |
| Minco | 18 | 25 | 16 | 14 | 16 | 17 |
| Minsum | 17 | 25 | 14 | 14 | 17 | 14 |
| Panhandle | 16 | 24 | 16 | 11 | 15 | 16 |

Table 3. Characteristics of varieties and lines entered in the 1981 proso variety trials.

| Variety or line (parentage) | Seed color | Height in inches | Straw strength | Maturity |
|---|---|---|---|---|
| Abarr | White | 42 | Weak | Medium |
| Cerise | Lt. red | 38 | Good | Early |
| Cope | White | 45 | Fair | Late |
| Dawn | White | 27 | Fair | Early |
| Minco | White | 40 | Fair | Medium |
| Minsum | White | 38 | Weak | M. early |
| Panhandle | White | 39 | Weak | M. early |
| Tall Dawn | White | 41 | Weak | M. late |
| 76001-10-7(Dawn X common white) | White | 38 | Weak | Late |
| 76001-21-2(Dawn X common white) | White | 35 | Fair | M. early |
| 76001-7-6(Dawn X common white) | White | 36 | Fair | Medium |
| 76003-18-3(Dawn X Abarr) | White | 39 | Weak | Late |
| 76003-9-6(Dawn X Abarr) | White | 37 | Weak | M. late |
| 76004-19-1(Dawn X Minn 402) | White | 39 | Fair | Late |
| 76004-3-6(Dawn X Minn 402) | White | 34 | Good | Early |
| 76004-3-8(Dawn X Minn 402) | White | 34 | Weak | Medium |
| 76010-10-8(Dawn X Panhandle) | White | 35 | Fair | M. early |
| 76010-16-8(Dawn X Panhandle) | White | 33 | Fair | Medium |
| 76010-5-10(Dawn X Panhandle) | White | 35 | Fair | Early |
| 76010-5-4(Dawn X Panhandle) | White | 36 | Weak | Early |
| 76010-6-3(Dawn X Panhandle) | White | 33 | Fair | M. late |
| 76010-8-3(Dawn X Panhandle) | White | 36 | Weak | M. early |

Table 4. Yield in cwt/A of all entries at each location of the 1981 proso trials.

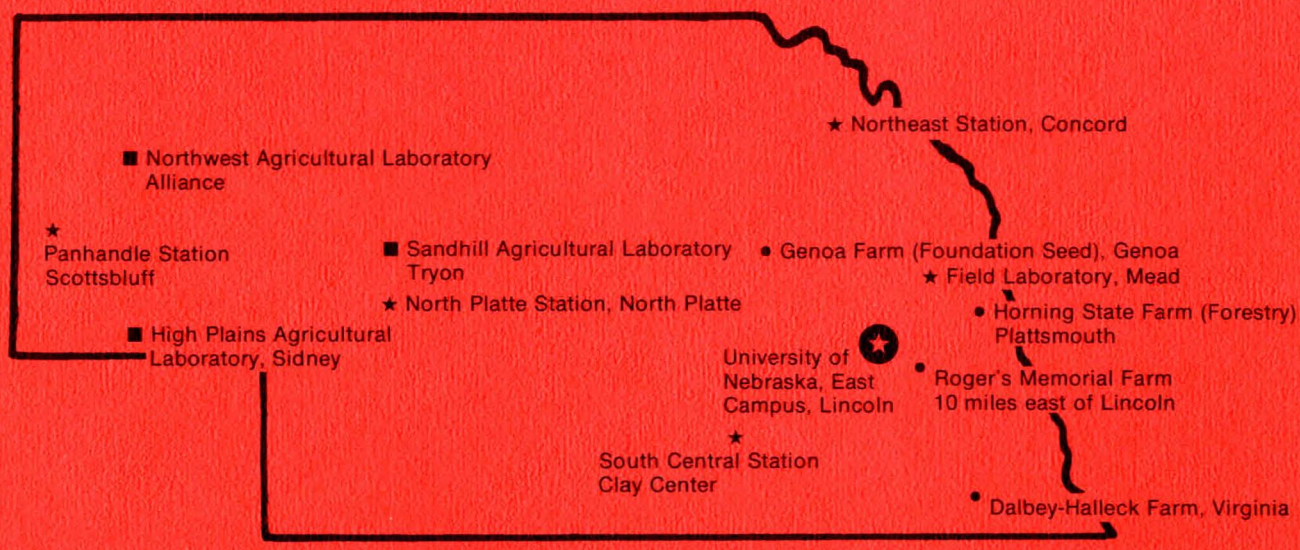
| Variety | HPAL Early | HPAL Eco. | HPAL Late | NWAL Eco. | NWAL Black | NWAL Irr. | Avg. - 6 locations |
|---|---|---|---|---|---|---|---|
| | Yield in cwt/A | | | | | | |
| Abarr | 26.5 | 23.0 | 26.7 | 13.0 | 24.6 | 25.4 | 23.2 |
| Cerise | 33.2 | 19.9 | 20.5 | 8.7 | 14.9 | 19.3 | 19.4 |
| Cope | 33.3 | 23.8 | 22.4 | 13.5 | 25.9 | 38.5 | 26.2 |
| Dawn | 9.2 | 13.9 | 21.5 | 8.6 | 9.3 | 25.3 | 14.6 |
| Minco | 30.9 | 24.4 | 27.0 | 11.8 | 20.8 | 35.9 | 25.1 |
| Minsum | 34.3 | 26.3 | 25.8 | 14.9 | 21.6 | 26.5 | 24.9 |
| Panhandle | 25.9 | 22.5 | 23.8 | 13.7 | 23.2 | 36.2 | 24.2 |
| Tall Dawn | 29.2 | 19.6 | 26.2 | 15.4 | 24.9 | 36.3 | 25.5 |
| 76001-10-7 | 29.4 | 30.2 | 27.1 | 14.8 | 27.7 | 38.4 | 27.9 |
| 76001-21-2 | 22.5 | 22.4 | 25.8 | 12.4 | 21.7 | 39.4 | 24.0 |
| 76001-7-6 | 28.3 | 22.0 | 23.8 | 12.9 | 22.4 | 35.5 | 24.1 |
| 76003-18-3 | 27.0 | 22.8 | 24.1 | 9.5 | 18.6 | 36.5 | 23.1 |
| 76003-9-6 | 32.8 | 25.3 | 26.3 | 11.5 | 27.0 | 33.6 | 26.1 |
| 76004-19-1 | 35.9 | 24.6 | 28.9 | 17.6 | 27.2 | 38.3 | 28.9 |
| 76004-3-6 | 20.1 | 22.0 | 29.7 | 13.7 | 19.9 | 41.5 | 24.5 |
| 76004-3-8 | 29.1 | 27.4 | 32.1 | 16.2 | 29.4 | 39.6 | 29.0 |
| 76010-10-8 | 27.1 | 26.2 | 28.4 | 15.0 | 23.3 | 40.1 | 26.7 |
| 76010-16-8 | 27.2 | 26.5 | 31.3 | 15.4 | 27.4 | 46.6 | 29.1 |
| 76010-5-10 | 23.0 | 26.1 | 26.5 | 14.1 | 25.6 | 37.4 | 25.5 |
| 76010-5-4 | 27.6 | 25.8 | 27.2 | 11.3 | 25.4 | 30.6 | 24.7 |
| 76010-6-3 | 22.5 | 25.5 | 27.5 | 16.2 | 21.0 | 42.3 | 25.8 |
| 76010-8-3 | 21.6 | 23.5 | 24.6 | 16.1 | 26.7 | 38.0 | 25.1 |
| Average | 27.1 | 23.8 | 26.2 | 13.6 | 23.1 | 33.3 | 24.9 |
| LSD .05 | 7.4 | 4.8 | 4.7 | 3.8 | 5.1 | 8.3 | 2.5 |

Table 5. Heading date, height, test weight and seed weight data.

| Variety | Heading date After July 1 | Harvest date* After Sept. 1 | Test Wt. lb/bu | Seed Wt.* seeds/5g |
|---|---|---|---|---|
| Abarr | 26.7 | 10.1 | 55.8 | 674.3 |
| Cerise | 24.2 | 9.0 | 55.8 | 788.7 |
| Cope | 29.9 | 15.0 | 56.0 | 699.7 |
| Dawn | 22.8 | 1.3 | 56.9 | 709.3 |
| Minco | 26.8 | 13.8 | 56.9 | 722.6 |
| Minsum | 25.7 | 10.2 | 56.8 | 652.7 |
| Panhandle | 24.6 | 9.0 | 55.9 | 695.2 |
| Tall Dawn | 28.3 | 14.6 | 57.2 | 680.0 |
| 76001-10-7 | 30.5 | 9.0 | 56.6 | 730.2 |
| 76001-21-2 | 24.9 | 9.0 | 55.4 | 679.5 |
| 76001-7-6 | 26.5 | 9.0 | 55.4 | 684.1 |
| 76003-18-3 | 30.3 | 9.0 | 55.4 | 664.6 |
| 76003-9-6 | 27.9 | 9.0 | 55.7 | 646.5 |
| 76004-19-1 | 29.5 | 14.9 | 57.2 | 733.7 |
| 76004-3-6 | 24.3 | 11.1 | 57.2 | 714.9 |
| 76004-3-8 | 26.7 | 10.0 | 56.0 | 728.6 |
| 76010-10-8 | 25.9 | 10.6 | 55.7 | 672.9 |
| 76010-16-8 | 26.3 | 9.0 | 55.8 | 695.2 |
| 76010-5-10 | 24.3 | 9.5 | 56.2 | 679.9 |
| 76010-5-4 | 24.2 | 9.4 | 56.1 | 677.1 |
| 76010-6-3 | 27.6 | 10.7 | 55.6 | 654.9 |
| 76010-8-3 | 24.8 | 13.2 | 56.4 | 669.6 |
| Average | 26.2 | 10.3 | 56.2 | 693.3 |
| LSD .05 | 1.3 | 1.4 | 0.77 | 12.5 |

*Means are of the three plots at High Plains Ag. Lab.

# 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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