Bulletin No. 181 - Oat Varieties for Northeastern Wyoming

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AGRICULTURAL
EXPERIMENT STATION

OAT VARIETIES FOR
NORTHEASTERN WYOMING

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Oat Varieties for Northeastern Wyoming

By R. S. TOWLE

INTRODUCTION

This bulletin gives the yields obtained from the varieties of oats grown in experiments at the Sheridan Field Station, Sheridan, Wyoming.* Varietal experiments with small grain have been conducted at this station each year since it was established in 1916. The trials are conducted to determine the crop varieties best adapted for northeastern Wyoming.

The station is located on a non-irrigated tract of land about eight miles northeast of Sheridan. The land on which these experiments were conducted is on a northeast slope which is fairly uniform and is representative generally of the greater part of the dry-farmed land in this part of the state. The soil is a dark, heavy clay loam with a small quantity of gumbo. The altitude of the station is 3,800 feet.

The rainfall at the station shows wide fluctuations both in quantity and in its distribution during the season. (See Table I.) The average annual precipitation from 1917 to 1930, inclusive, was 15.42 inches, with a range from 8.56 inches in 1919 to 25.18 inches in 1923. The seasonal rainfall, April 1 to August 31, ranged from 4.14 inches in 1919 to 15.50 inches in 1927. Evaporation as determined at the station is considerably less than in other parts of the Great Plains. The temperature seldom reaches a maximum of 100° F. The wind velocity is relatively low compared with other sections of the Great Plains.

*This station is conducted cooperatively by the Office of Dry-Land Agriculture of the United States Department of Agriculture and the Division of State Experiment Farms, Agricultural College, University of Wyoming. The varietal experiments are conducted in cooperation with the Office of Cereal Crops and Diseases of the United States Department of Agriculture.
<table>
<thead>
<tr>
<th>Road 1</th>
<th>Road 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 Day guard</td>
<td>60 Day guard</td>
</tr>
<tr>
<td>Swedish Select</td>
<td>O. A. C. 144</td>
</tr>
<tr>
<td>Liberty</td>
<td>Worthy</td>
</tr>
<tr>
<td>Victory</td>
<td>O. A. C. 201</td>
</tr>
<tr>
<td>Golden Rain</td>
<td>Rainbow</td>
</tr>
<tr>
<td>Idamine</td>
<td>Upright</td>
</tr>
<tr>
<td>Worthy</td>
<td>Markton</td>
</tr>
</tbody>
</table>

Fig. 1. Plan of Plots for Testing Oats at the Sheridan Field Station, 1930.
PLAN OF EXPERIMENTS

Throughout the entire period each variety was grown in the three systematically replicated plots in order to correct for differences caused by soil variation. Figure I shows the seeding order in 1930. Previous to 1921, twentieth-acre plots were used, but beginning with 1921 the size of the plots was reduced to one-fortieth of an acre.

In 1917 all crops on the station were grown on sod land broken in 1916. From 1917 to 1922 the varieties of spring grain followed corn, and from 1923 to 1930 they were on fallow.

Seed of all varieties was treated for covered smut each year, with the exception of 1 or 2 years during the first ten years of the experiment. The formaldehyde treatment was used for several years, but during the last few years one of the commercial mercury dusts has been used. At no time when the seed was treated was there any smut. No rust has appeared on any of the varieties at any time.

A total of 21 varieties of oats has been grown in this trial. In Table II the varieties are divided into 3 groups according to the time of maturity: early, midseason, and late varieties. Not all of the varieties included in the trial were grown in any one year. As soon as it is determined that a variety has no advantage in yield over other varieties of its class more commonly grown, it is frequently discarded in order that other varieties may be tested. In some cases a lower yielding variety is retained in order to have a standard with which the yielding capacity of varieties may be more readily compared. The yields obtained in this experiment, as given in Table II, are the average of 3 replications.

The test was started in 1917 with 6 varieties. Two varieties were discontinued after 1923, and other varieties were included at intervals until twelve varieties were being grown in 1927. Four more varieties were discontinued after 1928, and 6 more included in 1929. These changes were made in an effort to find a variety with good yielding qualities for this section and with a stiffer straw which would not lodge so readily as those previously grown.
### TABLE I. ANNUAL AND SEASONAL (APRIL 1 TO AUGUST 30) RAINFALL IN INCHES FROM 1917 TO 1930, INCLUSIVE, SHERIDAN FIELD STATION, SHERIDAN, WYOMING

<table>
<thead>
<tr>
<th></th>
<th>1917</th>
<th>1918</th>
<th>1919</th>
<th>1920</th>
<th>1921</th>
<th>1922</th>
<th>1923</th>
<th>1924</th>
<th>1925</th>
<th>1926</th>
<th>1927</th>
<th>1928</th>
<th>1929</th>
<th>1930</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual</td>
<td></td>
<td></td>
<td>17.26</td>
<td>13.64</td>
<td>10.61</td>
<td>17.85</td>
<td>25.18</td>
<td>13.95</td>
<td>17.95</td>
<td>14.90</td>
<td>22.16</td>
<td>17.27</td>
<td>17.05</td>
<td>8.68</td>
</tr>
</tbody>
</table>
DISCUSSION OF YIELDS

When the yields are averaged over a period of years, 3 distinct groups of averages for different periods appear over the time that the trial has been conducted: for the period from 1917 to 1923; from 1924 to 1928, and from 1927 to 1930.

For the 7 years from 1917 to 1923, inclusive, the average yield of Sixty Day was slightly better than that of Golden Rain, the best midseason variety being grown then. Albion, a selection from Kherson, the only other early variety included in the test at that time, yielded only 83 per cent as much as Sixty Day. For the same period Swedish Select yielded the least of the midseason varieties with an average yield of 3.3 bushels less than Golden Rain. White Russian, or White Tartar, the only late variety grown, yielded low over the entire period, and was discontinued.

From 1924 to 1928, Markton, which was first included in the trial in 1924, made the highest average yield of any of the varieties, 80.0 bushels per acre. This variety matures slightly earlier than the other midseason varieties, but not as early as the early varieties. For the same period Sixty Day yielded the highest of the early varieties, and, of all the varieties, ranked second to Markton with an average yield of about 8.1 bushels less than Markton. Gopher, a selection from Sixty Day first grown on the station in 1927, yielded much better than Sixty Day both in 1927 and 1928, and was the highest yielding of all the varieties in 1928. The average yield of Swedish Select for the same years was the lowest of any except Early Mountain No. 8, which was discontinued after 1928. The average yield of Victory for the same time was 12.6 bushels per acre below the yield of Markton.

For the 4 years from 1927 to 1930 Markton again made the highest average yield, 10.4 bushels more than Victory, and 10.5 bushels more than Swedish Select. Gopher yielded the highest of the early varieties in 3 of the 4 years, and
| Class and Variety | Yields Per Acre (Bushels) | Average | No. Years | Yield in Percentage of | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | 1930 |
|------------------|--------------------------|---------|-----------|---------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Early:           |                          |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| Albion           | 165                      |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| Iowa             | 294                      |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| Fulghum          | 706                      |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| J ogold          | 2329                     |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| Edkin            | 2330                     |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| Midseason:       |                          |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| Swedish Select   | 134                      |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| Golden Rain      | 493                      |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| Silvermine       | 716                      |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| Idamine          | 484                      |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| Victory          | 742                      |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| Early Mountain No. 8 | 2036             |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| Iogren           | 2024                     |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| Markton          | 2023                     |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| Upright          | 2142                     |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| Ohio No. 201     | 2024                     |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| O. A. C. No. 144 | 2023                     |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| Worthly          | 2345                     |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| Late:            |                          |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| White Tartar     | 732                      |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |
| (White Russian)  |                          |         |           |               |      |      |      |      |      |      |      |      |      |      |      |      |

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the average yield for the 4 years was only 1.5 bushels below that of Markton.

Of the varieties introduced in 1929, O. A. C. No. 144 yielded well in 1929, in comparison with the other varieties, but in 1930 the yields of all of the newly included midseason varieties were low. No data on lodging of these varieties were obtained either year on account of the light crop.

**SUMMARY**

For the full period of the test, an early maturing variety outyielded the midseason varieties in 7 years of the 13 years that a crop was harvested. Sixty Day yielded the best of the early varieties until Gopher was included in 1927. Gopher outyielded Sixty Day every year that it was grown. It ranked second in the average yield of all of the varieties for those years, and appears to be the best of the early varieties grown on the station so far for this section of the state. The bushel weight of Gopher oats also exceeded that of Sixty Day every year and averaged the highest of any of the early varieties.

The average 7-year yield of Markton was the best of any of the varieties grown on the station since it was included in 1924, and it was the highest of any of the midseason varieties in 6 of the 7 years.

It appears from the yields obtained so far in this trial that for the non-irrigated land of this section it is largely a matter of personal choice between the early and the midseason varieties. Some seasons have favored the early maturing oats, and other seasons the midseason varieties. The early maturing varieties usually make only a short growth and produce less straw than the midseason varieties. Gopher and Markton have given the best yields of the varieties grown.

The one late maturing variety grown yielded comparatively low throughout the time it was included in the test, and appeared to be unsuited for the non-irrigated lands of this section.
<table>
<thead>
<tr>
<th>Variety</th>
<th>C. I. No.</th>
<th>1923</th>
<th>1924</th>
<th>1928</th>
<th>1929</th>
<th>1930</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>After Sorgo and Sudan Grass</td>
<td></td>
<td>After Corn Disked</td>
<td>After W. Wheat F. Plowed</td>
<td>After Barley D. F. Cult. Seeded May 14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disked</td>
<td>No Tillage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sixty Day</td>
<td>165</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gopher</td>
<td>2063</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Markton</td>
<td>742</td>
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<td></td>
</tr>
<tr>
<td>Victory</td>
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<td>Swedish Select</td>
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<td></td>
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<td></td>
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<tr>
<td>Golden Rain</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Silvermine</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Early Mountain No. 8</td>
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</tbody>
</table>
RESULTS FROM MISCELLANEOUS SEEDINGS OF SOME VARIETIES

In some years a few of the more important varieties were grown on a different soil and under different cultural conditions than in the regular variety test. Results of these tests are shown in Table III.

In all of these trials the plots were replicated in the same manner as in the regular trial, but the size of the plots varied from one-fortieth to one-tenth acre.

In these trials the results in general followed much the same trend as in the regular variety test, although there was some variation. Under less favorable cultural conditions yields were smaller in some years, and the difference in yield between varieties was less. It will be noted, however, that in 3 of the 4 trials where Markton was included, that the yield was noticeably greater than the yield of the other midseason varieties grown.