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James Hulless Oats

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A demand for hulless oats in South Dakota was created by the release of Nakota in 1939 by the South Dakota Agricultural Experiment Station. Nakota proved to be desirable as swine and poultry feed but was lacking in leaf rust resistance, *Puccinia coronata* (Pers.) Cda., and because of this was eventually discarded in favor of varieties of common oats that were resistant to this pathogen.

In the spring of 1950, over 2,000 bushels of James, a new hulless oat, were released by this same station. James has the same leaf rust resistance that is to be found in Clinton and Mindo. In addition, it has many other desirable characteristics, including high yield.

**History**

James was derived from the cross of (Bond x Double Cross Bond, C.I. 3650) x Nakota. Previous to naming, this variety was designated by the cross number 4018-135, C.I. 5015.2 The object of the cross was to obtain a hulless oat with the many desirable characteristics of Nakota, plus leaf rust resistance. This objective was accomplished.

James has been tested for performance in four areas in South Dakota. It has also been tested in neighboring states so that information is available to farmers in adjacent areas. Farmers in other states should contact their experiment station for recommendations before purchasing seed of this variety.

**Plant and Seed Characteristics**

James is a mid-early, stiff-strawed, hulless oat (Figs. 1 and 2). The seed and plant characteristics of this variety can be described best by comparing it with the varieties shown in Table 1.

In comparison with Nakota, James shows an improvement in earliness, lodging resistance, leaf rust resistance and test weight. The increase in test weight is largely due to increase in leaf rust resistance. It should be pointed out that James, like Clinton and Mindo, is susceptible to race 45 of leaf rust and

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1Agronomist and Assistant Agronomist, respectively.
2The unselected F₁ seed was obtained in 1942 from Dr. H. C. Murphy U.S.D.A. in cooperation with Iowa State College, Ames, Iowa. This generosity advanced the release of James by at least two years.
Table 1. Average plant and seed characteristics of James, Clinton Vikota, Mindo, and Nakota, grown at Brookings, 1946-49.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Date headed</th>
<th>Lodging resistance</th>
<th>Height inches</th>
<th>Test weight lbs./bu.</th>
<th>Stem rust resistance</th>
<th>Leaf rust resistance</th>
<th>Helminthosporium victoriae resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>James</td>
<td>6/18</td>
<td>R†</td>
<td>33</td>
<td>45.0</td>
<td>MR</td>
<td>MR</td>
<td>R</td>
</tr>
<tr>
<td>Clinton</td>
<td>6/18</td>
<td>R</td>
<td>32</td>
<td>36.8</td>
<td>MR</td>
<td>MR</td>
<td>R</td>
</tr>
<tr>
<td>Vikota</td>
<td>6/18</td>
<td>MS</td>
<td>30</td>
<td>33.5</td>
<td>R</td>
<td>R</td>
<td>S</td>
</tr>
<tr>
<td>Mindo</td>
<td>6/15</td>
<td>R</td>
<td>30</td>
<td>36.4</td>
<td>MR</td>
<td>MR</td>
<td>R</td>
</tr>
<tr>
<td>Nakota</td>
<td>6/20</td>
<td>MS</td>
<td>34</td>
<td>40.9</td>
<td>MR</td>
<td>S</td>
<td>R</td>
</tr>
</tbody>
</table>

*The legal test weight for hullless oats is 42 pounds per measured bushel.
†R-resistant, S-susceptible, MR-moderately resistant, MS-moderately susceptible.

races 3 and 7 of stem rust, *Puccinia graminis avenae*, Eriks. and Henne. While no good tests on shattering are available, field observations indicate that it is equal to Nakota which was satisfactory in this respect.

The new release has the Markton type smut resistance and hence is resistant to all known races of both *Ustilago avenae* (Pers.) Rostr. and *Ustilago kollerii* Wille. James, like Nakota, has a tendency to "throw" a slight percentage of hulled oats (about 0.1 percent) of which about one-half will produce hulless types the next generation. The use of the Carter disk for seed cleaning will tend to keep the hulled types at a minimum. Under field conditions, an average of one hulled type for every two square rods has been found in the foundation seedstock.

**Yield Data**

The yield data are presented in Table 2. The 1945 yields are not included in the averages in order to avoid the bias introduced by the use of the yield data for the year in which the variety was selected. That is, the superiority of a variety in the year it was selected is obvious, as high yield is one of the factors for which the variety was selected. The yield in the selection year is therefore not competitive and one degree of freedom is sacrificed. In calculating the yields of hulless oats it is necessary to adjust for hulls in order that the data may be comparable to that from common oats. This adjustment was made on the assumption that approximately 0.3 of the weight of common oats was due to the hull and that the remaining 0.7 was due to the groat. The yield of hulless oats in terms of common oats would then be:

\[
\text{weight in lbs./acre} = \frac{\text{b h l} \times 32}{0.7} = \text{bushels per acre}
\]

It will be observed that the average yields of James, when adjusted for hulls, compare favorably with the yields of the standard varieties. At Brookings the 4-year average for James exceeds all others by a statistically significant difference. Ecologically, this variety is best suited to

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*Conclusions from data furnished by Dr. E. D. Hansing, Kansas State College, Manhattan, Kansas.*

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![Figure 2. Seed of the new hulless oat.](Actual Size)
eastern South Dakota and should be restricted west of the Missouri River to small acreages for a special purpose crop and to areas in the Black Hills.

Average yields by themselves are often misleading as they do not show the yearly fluctuation of a variety. The ability of a variety to produce an acceptable yield every year is just as important as the total or average yield over a period of years. This stability of yield can be seen in Table 3.

Yields of James have been consistently good when compared with Clinton (Table 3) and in no case was the yield of James statistically less than the yield of Clinton.

### Cultural Practices in South Dakota

James oats should be seeded at the rate of 50 pounds per acre.

No special equipment is needed for harvesting. James may be cut with a binder, windrowed, or direct combined in accordance with the best practices for common oats in the particular area. Hullless oats should not be cut green as this will cause the oats to be light weight and hard to thresh.

For feed purposes no special cleaning is required. For seed purposes, it is best to scalp with a fanning mill and then use a Carter disk.

Storage under South Dakota conditions presents no serious problem. Hullless oats that have a moisture content of 13 percent or less have been found to store well.

### Summary

A new hulless oat, James, C.I. 5015, has been described. This variety was derived from the cross of (Bond x Double Cross Bond) x Nakota. It is stiff-strawed, mid-early and has produced a high yield of good quality grain in eastern South Dakota. James has the White Russian type of stem rust resistance, *Puccinia graminis avenae*, Eriks, and Hen., and the Bond type leaf rust resistance, *Puccinia coronata* (Pers.) Cda. It is resistant to both species of smut, *Ustilago kolleri* Wille. and *Ustilago avenae* (Pers.) Rostr.