CULTIVAR DESCRIPTION

AC Mustang oat

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Kibite, S., Nadja, H., Fairey, N. A., Pearen, J. R., Clayton, G., Ferguson, T. and Westerlund, D. 1995. AC Mustang oat. Can. J. Plant Sci. 75: 895–897. AC Mustang is a dual purpose (grain/silage) oat with high grain yield, good lodging resistance, plump kernels, high test weight, and desirable agronomic features. Its maturity rating is intermediate to Cascade and Dumont, and its forage/silage yield potential is higher than other registered cultivars with the exception of Foothill. Its hull content is higher than is desirable for milling. AC Mustang is well adapted to Alberta and the rust-free areas of western Saskatchewan.

Key words: Avena sativa, oat (spring), cultivar description


Mots clés: Avena sativa, avoine (printemps), description de cultivar

AC Mustang is a dual purpose (grain/silage) oat (Avena sativa L.) cultivar developed by Agriculture and Agri-Food Canada, Lacombe Research Centre, Lacombe, Alberta. It was registered (Reg. no. 4020) by the Plant Variety Registration Office, Seed Division, Food Production and Inspection Branch, Agriculture and Agri-Food Canada, on 15 December 1994. AC Mustang is recommended for Alberta and western Saskatchewan.

Pedigree and Breeding Method

AC Mustang was selected from a Cascade/Fraser cross made in 1984. The F₁ generation was grown in a greenhouse, and the F₂ through F₆ generations were grown in growth chambers using single-seed descent. Panicle-rows were grown in the F₇ generation and selected for earliness, lodging resistance, test weight and morphological uniformity. Each selected F₇ panicle-row was harvested in bulk. AC Mustang was evaluated as LAO-453-018 in a Preliminary Oat Yield Nursery at three central Alberta locations in 1987, entered into the Advanced Oat Yield Nursery at four Alberta locations in 1988, and has been evaluated in the Alberta Project Oat Test conducted at seven Alberta and two Saskatchewan locations in 1989. In 1990, AC Mustang was assigned the experimental designation OT766 and tested for 3 yr in the Western Cooperative Oat Test. This 16 site test was conducted at the University of Saskatchewan in Saskatoon, at the Alberta Wheat Pool Research sites at Olds and Bentley, the United Grain Growers Research Farm at Neepawa, and at the Agriculture and Agri-Food Canada Research Centres located in Winnipeg, Brandon, Morden, Swift Current, Regina, Indian Head, Melfort, Scott, Lacombe, Lethbridge, Beaverlodge and Fort Vermillion. End-use quality evaluations were conducted by the Canadian Grain Commission, Grain Research Laboratory, and by the Agriculture and Agri-Food Canada Research Centres in Winnipeg and Saskatoon. Forage yield evaluations were made in replicated forage yield trials conducted at eight Alberta locations including Acme, Breton, Brooks, Lacombe, Mundare, Standard, Vegreville and Fort Vermillion in 1993.

The breeder seed of AC Mustang was developed from a balanced composite sample of approximately 150 F₁¹ derived F₁₃ panicle-row plots. Each panicle-row plot was selected for uniformity and trueness-to-type.

Performance and Adaptation

In 3 yr of testing in the Western Cooperative Oat Test (49 location-years), AC Mustang has out-yielded Dumont and Cascade by 9.7 and 5.8%, respectively for grain yield. AC Mustang is best adapted to the Black and Grey-wooded soils of Alberta and Saskatchewan (Zone 2), and the Brown and Dark-Brown soils of Alberta (Zone 3). In Zone 2, grain yield of AC Mustang was 13.8% more than Dumont, and 7.1% more than Cascade; in Zone 3, it has yielded 10%
Table 1. Grain yield and agronomic characteristics of AC Mustang and check cultivars based on data from the Western Cooperative Out Test, 1990-1992

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Grain yield (t ha⁻¹)</th>
<th>Days to-mature</th>
<th>Height Lodging</th>
<th>Test wt.</th>
<th>Kernel wt.</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Zone 1^†</td>
<td>Zone 2*</td>
<td>Zone 3^‡</td>
<td>Irrigation^§</td>
<td>Mean</td>
<td>(1-9)</td>
</tr>
<tr>
<td>Dumont</td>
<td>4.10</td>
<td>1.54</td>
<td>5.09</td>
<td>4.41</td>
<td>4.63</td>
<td>95.5</td>
</tr>
<tr>
<td>Cascade</td>
<td>4.21</td>
<td>5.46</td>
<td>5.26</td>
<td>4.46</td>
<td>4.80</td>
<td>92.7</td>
</tr>
<tr>
<td>AC Mustang</td>
<td>4.33</td>
<td>5.85</td>
<td>5.60</td>
<td>5.03</td>
<td>5.08</td>
<td>94.8</td>
</tr>
<tr>
<td>LSD^a</td>
<td>0.38</td>
<td>0.59</td>
<td>0.45</td>
<td>1.44</td>
<td>0.30</td>
<td>2.9</td>
</tr>
<tr>
<td>Station-years</td>
<td>(21)</td>
<td>(10)</td>
<td>(15)</td>
<td>(3)</td>
<td>(49)</td>
<td>(37)</td>
</tr>
</tbody>
</table>

^† Locations in Zone 1 (Black Soils of Manitoba and Saskatchewan) included Glenlea, Portage, Morden, Brandon, Neepawa, Indian Head and Melfort; Locations in Zone 2 (Black and Grey Wooded Soils of Alberta) included Bentley, Lacombe, Beaverlodge and Fort Vermillion; Locations in Zone 3 (Brown Soils of Saskatchewan and Alberta) included Regina, Saskatoon, Swift Current, Scott and Acme; The irrigated test was conducted at Lethbridge.

^* Cut I = at panicle emergence; Cut 2 = 2 wk after panicle emergence.

^§ Least significant difference (P = 0.05).

Table 2. Silage yield (t ha⁻¹) of AC Mustang and other cultivars based on data from a multi-location trial conducted in 1993

<table>
<thead>
<tr>
<th>Variety</th>
<th>Acme</th>
<th>Breton</th>
<th>Brooks</th>
<th>Standard</th>
<th>Lacombe</th>
<th>Vegreville</th>
<th>Mundare</th>
<th>Fort Vermillion</th>
<th>Mean</th>
<th>Overall Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cut 1</td>
<td>Cut 2</td>
<td>Cut 1</td>
<td>Cut 2</td>
<td>Cut 1</td>
<td>Cut 2</td>
<td>Cut 1</td>
<td>Cut 2</td>
<td>Cut 1</td>
<td>Cut 2</td>
</tr>
<tr>
<td>Grizzly</td>
<td>4.71</td>
<td>10.82</td>
<td>4.44</td>
<td>9.98</td>
<td>7.00</td>
<td>13.29</td>
<td>6.37</td>
<td>12.02</td>
<td>9.11</td>
<td>16.73</td>
</tr>
<tr>
<td>Foothill</td>
<td>5.89</td>
<td>12.85</td>
<td>5.66</td>
<td>11.08</td>
<td>8.51</td>
<td>15.65</td>
<td>7.44</td>
<td>12.63</td>
<td>10.21</td>
<td>17.70</td>
</tr>
<tr>
<td>Cascade</td>
<td>5.78</td>
<td>12.17</td>
<td>5.29</td>
<td>10.54</td>
<td>7.59</td>
<td>13.82</td>
<td>6.67</td>
<td>13.14</td>
<td>7.35</td>
<td>14.98</td>
</tr>
<tr>
<td>LSD^a</td>
<td>1.02</td>
<td>1.07</td>
<td>1.30</td>
<td>0.87</td>
<td>1.33</td>
<td>0.93</td>
<td>1.60</td>
<td>0.02</td>
<td>0.33</td>
<td>0.34</td>
</tr>
</tbody>
</table>

^a Cut 1 = at panicle emergence; Cut 2 = 2 wk after panicle emergence.

^Least significant difference (P = 0.05).

Table 3. Disease reactions of AC Mustang and other cultivars based on data from the Western Cooperative Out Test 1990-1992

<table>
<thead>
<tr>
<th>Genotype</th>
<th>Smut (%)</th>
<th>BYDV (1-9)^f</th>
<th>Crown rust^g</th>
<th>Stem Rust^h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dumont</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6.5</td>
</tr>
<tr>
<td>Derby</td>
<td>--</td>
<td>--</td>
<td>35</td>
<td>--</td>
</tr>
<tr>
<td>Calibre</td>
<td>40</td>
<td>45</td>
<td>--</td>
<td>9.0</td>
</tr>
<tr>
<td>Cascade</td>
<td>40</td>
<td>55</td>
<td>30</td>
<td>6.5</td>
</tr>
<tr>
<td>AC Mustang</td>
<td>20</td>
<td>45</td>
<td>14</td>
<td>8.5</td>
</tr>
</tbody>
</table>

^f Virulent R. padi non-specific isolate Y8513 (PAV like) was used. Readings were taken at the mid-late dough stage using 1 (very resistant) to 9 (very susceptible) scale.

^g Field ratings based on reaction to an artificially inoculated mixture of virulent crown rust races (no. OR192); OVR + over reaction; MS + moderately resistant; MR = moderately resistant; R = resistant; S = susceptible; TR = trace.

^h Field ratings based on reaction to an artificially inoculated mixture of virulent races of stem rust (no. NA26); R = resistant; MR = moderately resistant; S = susceptible.

more than Dumont, and 6.5% more than Cascade (Table 1).

AC Mustang is equal to Cascade and significantly better than Dumont in lodging resistance. It also has higher test weight, higher percentage of plump kernels, and a lower percentage of thin kernels than Cascade and Dumont (Table 1). AC Mustang has demonstrated a higher silage forage yield potential than Grizzly and Cascade, but lower than Foothill (Table 2). It has high hull content, and will not like-
Panicle Characteristics

Attitude. Equilateral.
Size. Medium wide; medium long.
Shape. Ovate.
Panicle branches. Semi-erect: medium long; about 5 whorls of branches per panicle; the lower whorl of branches are attached to a false node; very few, short hairs are present on lower panicle nodes.
Rachis. Straight; glabrous.
Rachilla. Medium long; narrow; glabrous.
Rachilla grooves. Shallow.

Spikelet Characteristics

Attitude. Nodding.
Number of florets. 3 or 4.
Spikelet separation. By fracture.
Floret separation. By hectofracture.
Glumes (empty). Broadly lanceolate; pointed; boat shaped; glabrous; medium wide; medium long.
Number of kernels per spikelet. 2 except in some of the terminal spikelets in which 3 kernels may be formed.

Kernel Characteristics

Size. Medium long; medium wide.
Color. White.
Shape. Plump.
Basal hairs. Very few or absent.

Lemma. Glabrous; glossy; medium-long, pointed tip.
Lemma color. White at maturity.
Lemma awns. Very infrequent; when present, the lemma awns may be straight or twisted at the base.
Palea. About the same length as the lemma.
Fluorescence. Light blue under UV light.
Caryopsis. Pubescent; long brush hairs; large and pointed scutellum.

Disease Reaction
AC Mustang is similar to Cascade in its reaction to diseases. It is resistant to Victoria blight [caused by Bipolaris victoriae (F. Meehan & Murphy) Shoemaker]; moderately resistant to smut [caused by Ustilago avenae (Pers.) Rostr., and U. kollerii Wille.], moderately susceptible to barley yellow dwarf virus (BYDV), and is susceptible to the oat crown (caused by Puccinia coronata Cda. f. sp. avenae Eriks.) and the oat stem rust (caused by P. graminis Pers. f. sp. avenae Eriks & E. Henn.) (Table 3).

Maintenance and Distribution of Pedigreed Seed Stocks
The breeder seed of AC Mustang will be maintained by Agriculture and Agri-Food Canada, Experimental Farm, Indian Head, Saskatchewan. Multiplication and distribution of other classes of pedigreed seed will be handled by Alberta Wheat Pool, Seed Business Unit, 4715 — 65 Street, Camrose, Alberta, Canada T4V 3M5.