AAC Peace River field pea

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AAC Peace River is a semi-leafless, yellow cotyledon field pea (Pisum sativum L.) cultivar developed at Agriculture and Agri-Food Canada, Lacombe Research Centre, Lacombe, Alberta, Canada. It is an early-maturing cultivar and is resistant to powdery mildew caused by Erysiphe pisi Syd. AAC Peace River is adapted to all field growing regions in western Canada, and is especially suited to regions with short growing seasons.

Key words: Field pea, Pisum sativum L., powdery mildew resistance, cultivar description

AAC Peace River is a semi-leafless, yellow cotyledon field pea (Pisum sativum L.) cultivar developed at Agriculture and Agri-Food Canada, Lacombe Research Centre, Lacombe, Alberta, Canada. It has early maturity, medium seed size, and is resistant to powdery mildew caused by Erysiphe pisi Syd (syn. E. polygoni DC.). AAC Peace River is adapted to all field pea growing regions in western Canada, and is especially suited to the regions with short growing seasons. AAC Peace River was registered on 2012 Mar. 28 at the Variety Registration Office, Canadian Food Inspection Agency. The registration number is 7169.

Breeding Methods and Pedigree

AAC Peace River was developed from the cross P9561098/Eclipse/MP1566. P9561098 was a breeding line developed at AAFC Morden Research Station, Morden, Manitoba, Canada, which was later registered as cultivar Canstar (Bing et al. 2006). Eclipse was a cultivar developed by Cebeco Zaden, the Netherlands. MP1566 was a high yielding, but powdery mildew susceptible breeding line developed at AAFC Morden Research Station from the cross Montana/Miko.

The breeding method used to develop AAC Peace River was pedigree selection combined with single seed descent. The cross P9561098/Eclipse/MP1566 was made in the greenhouse at the AAFC Morden Research Station, MB in the early spring of 2001. The F₁ was grown in the field in Morden, MB, in the summer of 2001. The F₂ was planted at two sites in the field in 2002 in Morden, MB. A total of 112 powdery mildew resistant plants were selected from the F₂ population, and advanced to the F₃ in the greenhouse at the AAFC Morden Research Station in the winter of 2002 using single seed descent. A total of 472 seeds harvested from the F₃ were planted in the F₄ nurseries in Morden, MB, and Lacombe, AB, in 2003, and 119 single plants were selected on the basis of early maturity. The selected plants were grown in 1-m² plots in the field in 2004 in Lacombe, AB, from which 13 lines were selected on the basis of early maturity, good lodging resistance and high yield potential. These selected lines were evaluated in a replicated preliminary yield test in 2005 in Morden, MB, and Lacombe, AB. Among the 13 breeding lines, P0117-03 had good lodging resistance, round seed shape, medium seed size, and early maturity. Breeding line P0117-03 was evaluated in a replicated yield test at eight sites in western Canada in 2006: two sites in Lacombe, AB, one site in Westlock, AB, two sites in Morden, MB, one site in Saskatoon, SK, and one site in
In the Pea Cooperative Registration Test over 20 station-years, the yield of AAC Peace River was 22% lower than the yield of the check cultivar Eclipse, but it was 8% lower than the yield of the check cultivar Cutlass (Table 1). AAC Peace River had significantly earlier in maturity than Eclipse and Cutlass by 6 and 4 d, respectively. It had a plant height of 71 cm, similar to Eclipse and Cutlass but higher than Cutlass.

As part of the Pea Cooperative Registration Test, AAC Peace River was evaluated in a disease nursery at AAFC Morden Research Station in 2008 and 2009 for its reactions to mycosphaerella blight [caused by Mycosphaerella pinodes (Berk. & Blox.) Vestergr.], powdery mildew and fusarium wilt [caused by race 2 of Fusarium oxysporum Schlecht. emend. Snyd. & Hans. f. sp. pisi (van Hall) Snyd. & Hans]. AAC Peace River had an average disease core of 6.0 for mycosphaerella blight, similar to the check cultivars. AAC Peace River was resistant to powdery mildew, similar to Eclipse and Cutlass. Fusarium wilt score was rated as the percentage of wilted plants at the stage of early pod formation. AAC Peace River had an average disease infection score of 22.5. AAC Peace River had a lodging resistance score of 4, similar to Cutlass, but higher than Eclipse.

Table 1. Agronomic performance, seed quality and disease resistance of AAC Peace River and the check cultivars in the 2008–2009 Field Pea Co-operative Registration Test

<table>
<thead>
<tr>
<th></th>
<th>Yield (kg ha⁻¹)</th>
<th>DTM (d)</th>
<th>Height (cm)</th>
<th>PHL (1-9)</th>
<th>TSW</th>
<th>Shape</th>
<th>SCB (%)</th>
<th>Protein (%)</th>
<th>MB (1-9)</th>
<th>PM (1-9)</th>
<th>FW (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAC Peace River</td>
<td>5264</td>
<td>97</td>
<td>71</td>
<td>4</td>
<td>222</td>
<td>3.5</td>
<td>4.7</td>
<td>22.5</td>
<td>7.0</td>
<td>5.0</td>
<td>41.7</td>
</tr>
<tr>
<td>Eclipse (CK)</td>
<td>5228</td>
<td>103</td>
<td>69</td>
<td>3</td>
<td>247</td>
<td>2.8</td>
<td>3.1</td>
<td>24.1</td>
<td>9.0</td>
<td>3.7</td>
<td>41.7</td>
</tr>
<tr>
<td>Cutlass (CK)</td>
<td>5696</td>
<td>101</td>
<td>71</td>
<td>4</td>
<td>236</td>
<td>2.8</td>
<td>3.3</td>
<td>22.5</td>
<td>8.3</td>
<td>4.0</td>
<td>15.0</td>
</tr>
<tr>
<td>LSD (p = 0.05)</td>
<td>288</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>7</td>
<td>0.2</td>
<td>2.7</td>
<td>1.1</td>
<td>1.2</td>
<td>1.0</td>
<td>0</td>
</tr>
<tr>
<td>Station-year</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>18</td>
<td>20</td>
<td>20.0</td>
<td>8.0</td>
<td>2.0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

*Days to maturity.
1Plant height (cm).
2Pre-harvest lodging score, 1 = upright, 9 = prostrate.
3Thousand seed weight (g).
4Seed shape, 1 = round, 5 = cubed.
5Mycosphaerella blight, 0 = no disease, 9 = whole plant severely blighted.
6Powdery mildew, 0 = no disease, 9 = whole plant severely mildewed.
7Fusarium wilt, percentage of the wilted plants.
infection of the disease when growing AAC Peace River
in fusarium wilt prevalent areas.

Availability of Propagating Material
Breeder seed of AAC Peace River is maintained at the
Agriculture and Agri-Food Canada, Research Farm,
Indian Head, Saskatchewan, Canada S0G 2K0. Exclu-
sive rights for the sale and production of the pedigreed
seed for commercial production have been awarded to
Hadland Seed Farm Ltd., P.O. Box 89, Baldonnel,
British Columbia, Canada V0C 1C0.

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Bing, D.-J., Sloan, A., Conner, R., Warkentin, T., Xue, A., Gan,
Y., Vera, C., Turkington, K., Clayton, G., Orr, D. and Gehl, D.