Races of *Fusarium* wilt

Adaptability and use

'Sumas' appears to be well-adapted throughout the Pacific Northwest. The fruit should meet the requirements of the processing industry. It is also possible that, because of its pleasant flavor, attractive color, and good size, the fruit will be used for the fresh market, especially in the early part of the season before 'Totem' ripens. Adaptation outside the Pacific Northwest has not been determined.

Availability

The names of growers with certified 'Sumas' plants will be supplied by me on request.

Literature Cited


WSU 28 and WSU 31 Pea Inbred Lines with Resistance to Specific Races of *Fusarium* Wilt

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Additional index words. *Pisum sativum, Fusarium oxysporum, Erissyhe pisi*, breeding gous for resistance to races 1, 5, and 6 of *Fusarium* (Table 1).

Description

WSU 28 is a midseason freezing pea similar in plant phenotype to commercial cultivars of the darkseeded perfection group, but the leaves and stipules are larger and plants are 5–10 cm taller when compared to most cultivars of that group. WSU 28 typically sets two pods per node with 5–7 peas per pod. Under ideal growing conditions, this line will produce 5–7 fruiting nodes. Plant height, nodes to first flower (cotyledonal node = 0), maturity, green pea yield, and sieve size of WSU 28 are compared to 'Darkskin Perfection 70A' and 'Puget' (both from Brotherton Seed Co., Moses Lake, Wash.) (Table 2). WSU 28 is useful in breeding cultivars for resistance to races 1, 5, and 6 of *Fusarium* (Table 1).

WSU 28

Origin

WSU 28 was derived from a backcross of 'Hylite' (Galatin Valley Seed Co., Twin Falls, Idaho) the recurrent parent (P1) and P1 280616 (P2), the source of resistance to *F. oxysporum* f sp *pisi* races 5 and 6. 'Hylite' is a selection from the darkseeded perfection group of freezing peas. Backcross progenies, beginning with the first backcross, were tested for resistance to races 5 and 6 of *Fusarium*. Single plant selections were made following six backcrosses and five self-generations and tested for resistance to races 5 and 6. WSU 28 was selected as a single plant homozygous for resistance to races 1, 5, and 6 of *Fusarium* (Table 1).

WSU 31

Origin

WSU 31 was derived form a cross of WSU 28 and 'Aspen' (Pureline Seed Co., Moscow, Idaho), and was selected as a single

Table 1. Comparison of the disease reactions of WSU 28 and WSU 31 to other inbred lines of peas used for the identification of races of *fusarium oxysporum* f sp *pisi* (R = resistant; S = susceptible). 4

<table>
<thead>
<tr>
<th>Differential inbred line</th>
<th>Races of fusarium</th>
<th>Powdery mildew</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Little Marvel</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Darkskin Perfection</td>
<td>R</td>
<td>S</td>
</tr>
<tr>
<td>New Era</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>New Season</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>WSU 23</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>WSU 28</td>
<td>R</td>
<td>S</td>
</tr>
<tr>
<td>WSU 31</td>
<td>R</td>
<td>R</td>
</tr>
</tbody>
</table>

4 Differential inbred lines used by Haglund and Kraft (3, 4) in determination of *fusarium* wilt races. All differential inbred lines were derived from single plant selections.
Table 2. Comparison of plant characteristics of WSU 28 and WSU 31 ‘Darkskin Perfection’ and ‘Puget’. a,b

<table>
<thead>
<tr>
<th>Cultivar/inbred line</th>
<th>Plant ht. (cm)</th>
<th>First nodes</th>
<th>AHUb (100 T)</th>
<th>Yield (t·ha·1)</th>
<th>Sieve size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Darkskin Perfection</td>
<td>89</td>
<td>14.6</td>
<td>806</td>
<td>6.44</td>
<td>4.7</td>
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<tr>
<td>Puget</td>
<td>73</td>
<td>14.7</td>
<td>800</td>
<td>7.03</td>
<td>4.1</td>
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<tr>
<td>WSU 28</td>
<td>96</td>
<td>14.8</td>
<td>817</td>
<td>4.56</td>
<td>4.3</td>
</tr>
<tr>
<td>WSU 31</td>
<td>89</td>
<td>13.6</td>
<td>806</td>
<td>6.38</td>
<td>4.8</td>
</tr>
</tbody>
</table>

a Data for plant height and nodes to first flower were observed in 1976 from single rows and AHU to 100 T, yields and sieve size were from replicated yield trials in 1979.
b AHU 100 T = accumulated heat units (°C) to 100 tenderometer calculated on a base temperature of 4.4°C.

n, wtn is the sum weight of all sieve size classes, and n is the sieve size number.

plant in the F2. Progeny of the cross were tested for resistance to races 5 and 6 of F. oxysporum f sp pisi beginning with the F3 generation. Single plant selections were made in the F6 and evaluated for resistance to races 1, 2, 5, and 6. Selections resistant to the four races were tested for resistance to powdery mildew (Erisyphe pisi Snyder) (Table 1).

Description
WSU 31 is a midseason freezing pea similar in plant type to ‘Puget’. This inbred line will have 2–4 fruiting nodes, depending on environmental conditions, and will produce three flowers per node and set 2 to 3 pods per node. WSU 31 is susceptible to water congestion and will develop severe symptoms under high humidity, warm temperature, and high soil moisture (1). This inbred line tends to abort ovules, thereby reducing peas to 3–5 per pod. WSU 31 is useful as a parent for development of cultivars with multiple resistance to races 1, 2, 5, and 6 of F. oxysporum f sp pisi and powdery mildew. Table 2 lists some of the phenotypic characteristics of this inbred line as compared to ‘Darkskin Perfection 70A’ and ‘Puget’. WSU 31 is also a standard differential used to identify F. oxysporum f sp pisi races (Table 1).

Availability
Seed of these two inbred lines are available from the Northwestern Washington Research and Extension Center, Washington State Univ., Mount Vernon, WA 98273. Requests for seed should be forwarded to W.A. Haglund or W.C. Anderson.

Literature Cited