Research Notes : Canada : On the response of the Rpsl-b allele to race 17 of Phytophthora megasperma f. sp. Glycinea

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1) On the response of the $Rpsl-b$ allele to race 17 of *Phytophthora megasperma* f. sp. *glycinea*.

The first report of the interaction between race 17 of *Phytophthora megasperma* f. sp. *glycinea* (Pmg) and the $Rpsl-b$ allele was made by Keeling (1982) in his initial report on this race. Keeling (1982) reported that 'Sanga' ($Rpsl-b$) gave a resistant response to race 17, but that PI 171442 ($Rps3$) and 'Tracy', which possesses the $Rpsl-b$ and $Rps3$ alleles (Athow et al., 1979), gave a susceptible response. The relative responses of Tracy and Sanga were unexpected, since, in all cases studied to date, an $Rps$ allele for resistance is epistatic to $Rps$ alleles for susceptibility at any loci (e.g., Athow et al., 1980; Layton et al., 1984; Ploper et al., 1985; Athow et al., 1986).

Laviolette and Athow (1983) and Athow (1985) appeared to confirm the pattern reported by Keeling (1982), but it is not clear whether this was the result of independent experimentation, or merely a repetition of the table from Keeling. Buzzell et al. (1984) advised other researchers that their preliminary information did not agree with the published response for $Rpsl-b$ and race 17.

Following the World Soybean Research Conference III in 1984, Dr. Athow sent a copy of the race-response pattern of the various $Rps$ alleles to most of the known races of Pmg to workers dealing with this disease. In this review, he categorized the response of Sanga ($Rpsl-b$) to race 17 as being susceptible (S). The current work was designed to fully clarify this interaction.

In the current work, Sanga ($Rpsl-b$), OX681 ($Rpsl-b$), Harosoy-NeB [a line derived from 'Nezumisaya' X 'Harosoy'] ($Rpsl-b$), Tracy ($Rpsl-b$, $Rps3$) and PI 171442 ($Rps3$) were compared for response to race 17. Table 1 shows that each line possessing $Rpsl-b$ or $Rps3$ or both displays a susceptible reaction to race 17. The identity of race 17 is confirmed by its reaction to the other lines in the differential host series.

It appears that the actual response of the $Rpsl-b$ allele to Pmg race 17 is an S (susceptible) reaction. The reasons for the results that occurred in the original work of Keeling (1982) are not known. It is important to clarify the actual situation regarding this race response in order that breeders do not count on a source of resistance that isn't real (i.e., $Rpsl-b$ as a source of resistance to race 17).
Table 1. Response of soybean lines to inoculation with *Phytophthora megasperma* f. sp. *glycinea* race 17

<table>
<thead>
<tr>
<th>Line</th>
<th>Allele</th>
<th>Observed&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harosoy</td>
<td><em>Rps?</em></td>
<td>16/16</td>
<td>S</td>
</tr>
<tr>
<td>Harosoy 63</td>
<td><em>Rps1-a + Rps?</em></td>
<td>2/17</td>
<td>R</td>
</tr>
<tr>
<td>Sanga</td>
<td><em>Rps1-b</em></td>
<td>41/41</td>
<td>S</td>
</tr>
<tr>
<td>Mack</td>
<td><em>Rps1-c</em></td>
<td>0/31</td>
<td>R</td>
</tr>
<tr>
<td>PI 171442</td>
<td><em>Rps3</em></td>
<td>29/29</td>
<td>S</td>
</tr>
<tr>
<td>Altona</td>
<td><em>Rps6</em></td>
<td>17/18</td>
<td>S</td>
</tr>
<tr>
<td>PI 103091</td>
<td>???</td>
<td>37/37</td>
<td>R</td>
</tr>
<tr>
<td>Tracy</td>
<td><em>Rps1-b + Rps3</em></td>
<td>20/20</td>
<td>S</td>
</tr>
<tr>
<td>OX681</td>
<td><em>Rps1-b</em></td>
<td>41/42 (54/65)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>S</td>
</tr>
<tr>
<td>Harosoy-Ne&lt;sub&gt;B&lt;/sub&gt;</td>
<td><em>Rps1-b + Rps?</em></td>
<td>99/99</td>
<td>S</td>
</tr>
</tbody>
</table>

<sup>a</sup>Observed number of susceptible plants/total number inoculated.

<sup>b</sup>Data from Buzzell et al., 1984.

References


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