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PATHOGENICITY OF XIPHINEMA INSIGNE
ON VITIS VINIFERA CV. ANABESHAHI

by
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Xiphinema insigne Loos, 1949 is widespread in India. It has been reported in association with fruit trees, cereals, tea, coffee, vegetables and grasses (Loos, 1949; Siddiqi, 1959; Yadav and Varma, 1967; Janarthanan et al., 1969; Bajaj and Jairajpuri, 1977). Large populations of X. insigne were found on grapevine cv. Anabeshahi during a survey of the National Bureau of Plant Genetic Resources, New Delhi. Because of the paucity of information on the pathogenicity of X. insigne, a pot experiment was undertaken to assess its damage potential to grapevine.

Xiphinema insigne used in the experiment were from a population cultured for a year on Vitis vinifera cv. Anabeshahi growing in sterilized soil in 35 cm diameter clay pots. Suspensions of nematodes (adults and juveniles) were pipetted around the roots of rooted cuttings of Anabeshahi grapevines growing in pots, each containing 3.5 Kg of autoclaved sandy clay loam. There were four treatments with different densities of nematodes added plus a control without nematodes (Table I). Each treatment was replicated five times and the experiment was arranged in a randomized block design in the open. The plants were treated as necessary to control pests and diseases. After 200 days, the growth of the plants were measured (Table I) and the nematodes were extracted from each pot by Cobb’s sieving technique.

Sixty days from the start of the experiment, chlorosis of the leaves was noticeable in the treatment with 5000 nematodes per pot. Later, these symptoms appeared in the treatment with 500 nematodes per pot but only at 180 days from the start of the experiment in
Table I - Effects of different inoculum densities of Xiphinema insigne on the growth of grapevine cv. Anabeshahi.

<table>
<thead>
<tr>
<th>Treatment (initial inoculum)</th>
<th>Root dry wt (g)</th>
<th>Shoot dry wt (g)</th>
<th>Leaf no.</th>
<th>Total leaf area (cm²)</th>
<th>Shoot ht (cm)</th>
<th>Final nematode population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>12.22</td>
<td>7.60</td>
<td>56</td>
<td>1701.82</td>
<td>79.40</td>
<td>—</td>
</tr>
<tr>
<td>Nematode free associated control</td>
<td>11.98</td>
<td>7.62</td>
<td>55</td>
<td>1695.38</td>
<td>78.80</td>
<td>—</td>
</tr>
<tr>
<td>50 nematodes per pot</td>
<td>9.10</td>
<td>4.74</td>
<td>40</td>
<td>1300.31</td>
<td>60.65</td>
<td>4,060</td>
</tr>
<tr>
<td>500 nematodes per pot</td>
<td>7.44</td>
<td>2.98</td>
<td>34</td>
<td>1036.17</td>
<td>48.82</td>
<td>29,960</td>
</tr>
<tr>
<td>5,000 nematodes per pot</td>
<td>2.72</td>
<td>1.62</td>
<td>23</td>
<td>504.58</td>
<td>31.20</td>
<td>66,080</td>
</tr>
<tr>
<td>S.E.M. ±</td>
<td>0.37</td>
<td>0.29</td>
<td>2.02</td>
<td>91.06</td>
<td>5.27</td>
<td>—</td>
</tr>
<tr>
<td>C.D. (P = .05)</td>
<td>0.78</td>
<td>0.63</td>
<td>4.29</td>
<td>193.04</td>
<td>11.17</td>
<td>—</td>
</tr>
</tbody>
</table>

the treatment with 50 nematodes per pot. Statistically significant reductions were recorded in the main shoot height, root and shoot weights, leaf number and leaf area, proportional to the inoculum density (Table I). The root tips of inoculated plants were swollen, bent and sometimes blackened. At the end of the experiment the highest number of nematodes were recorded from pots with the highest inoculum density, but the greatest rate of multiplication occurred in pots with the lowest inoculum density.

The effect of X. insigne on grapevine is similar to that of X. americanum on sugar maple (Di Sanzo and Rhode, 1969) or X. americanum and X. chambersi on strawberry (Perry, 1958). The conspicuous galling of the root tips of grapevine caused by X. index and X. diversicaudatum (Davis and Jenkins, 1960; Raski and Radewald, 1958) was not observed in the experiment with X. insigne. However, Cohn and Orion (1970) and Weischer and Wyss (1976) did not observe galling on root tips of grapevines infested with X. index.

LITERATURE CITED


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