PATHOGENICITY OF AN ECTOPARASITIC NEMATODE, 
XIPHINEMA DIVERSICAUDATUM, ON STRAWBERRIES 1)

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Nematodes of the genus Xiphinema have been found associated with both cultivated and wild strawberrries (Bosher, 1954; Brooks, 1952; Goheen and Braun, 1956). In view of recent greenhousc experiments (Schindler, 1957) demonstrating the parasitism and pathogenicity of one species of dagger nematodes, X. diversicaudatum (Micoletzky, 1927) Thorne, 1939 on rose and fig plants, it appeared advisable to determine its effects on strawberry plants.

MATERIALS AND METHODS

In general, the procedures used were similar to those described for experiments on the effects of X. diversicaudatum on rose and fig plants (Schindler, 1957). The nematodes were obtained from populations of X. diversicaudatum established and maintained on rose plants in pots in the greenhouse. The screenings obtained by processing soil from these pots were washed into beakers and dilution counts were made. Then, after standing for 1 hour, the upper 1/3 to 1/2 of the water from which the nematodes had settled was decanted. Twenty strawberry plants, 3/4 to 1 inch in height, grown from seed obtained from a cross of two commercial varieties, were transplanted into steam-sterilized soil in 5-inch clay pots. Inoculation consisted of pouring either water containing the specimens of X. diversicaudatum or the decanted water onto the roots of plants at the time of transplanting.

The pots were divided into 4 groups of 5 pots each by random selection. Each group received 1 of the following treatments:

1) Received for publication: 22 September, 1956.
(1) No treatment.
(2) Approximately 100 ml. of the decanted water.
(3) Approximately 530 nematodes.
(4) Approximately 2,600 nematodes.

Pots were arranged in a randomized-block design on the greenhouse bench. To eliminate the possibility of cross contamination they were separated by 12 inches of space and each pot was set in a saucer and watered from below during the course of the experiment.

After 12 weeks the plants were removed from the pots and their roots were washed clean of soil. The results of the treatments were determined by (1) recording the numbers of runners and runner plants produced by each plant, and (2) separately weighting the tops, including runners and runner plants, and the roots of each plant.

RESULTS

From the time of planting to the termination of the experiment all plants in treatment 4 made little or no increase in growth of either above-ground parts or roots, having an average total weight of only 1.4 gms. at the end of the experiment. In contrast, plants in treatments 1, 2, and 3 had average total weights of 19.4, 18.6, and 15.8 gms., respectively. The mean top weight of the plants in treatment 4 was significantly less, at the 1% level, than that of all other treatments (Table I). The mean root weight of plants in treatment 4 was significantly less, at the 1% level, than in treatments 1 or 2. There was also a highly significant difference in the mean root weights in treatments 1 and 3.

TABLE 1
Effects of *Xiphinema diversicaudatum* on the growth of strawberry seedlings.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean top wgt. (gm.)</th>
<th>Mean root wgt. (gm.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Control</td>
<td>13.3</td>
<td>6.1</td>
</tr>
<tr>
<td>(2) Supernatant water</td>
<td>13.7</td>
<td>4.9</td>
</tr>
<tr>
<td>(3) Approximately 530 nematodes</td>
<td>13.0</td>
<td>2.8</td>
</tr>
<tr>
<td>(4) Approximately 2,600 nematodes</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>L.S.D. .05</td>
<td>7.3</td>
<td>2.3</td>
</tr>
<tr>
<td>L.S.D. .01</td>
<td>10.7</td>
<td>3.3</td>
</tr>
</tbody>
</table>