

L. H. NEMAT. 112  
Baker

STUNTING OF TOMATO ASSOCIATED WITH  
PRATYLENCHUS PENETRANS, AN APPARENT MIGRANT  
FROM AN ADJOINING PEACH ORCHARD<sup>1</sup>

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In studies of the root lesion nematode *Pratylenchus* in southwestern Ontario, three species have thus far been found. The most ubiquitous species appears to be *Pratylenchus minyus* Sher & Allen which infests the roots of a wide range of crops and is widespread in the lighter soils along the north shore of Lake Erie. A second species of *Pratylenchus* occurs on the roots of red clover and has not been described. *Pratylenchus penetrans* (Cobb) is the third species occurring in southwestern Ontario and has been observed in extensive numbers only in the roots of peach.

In the spring of 1954, a small field of tomatoes near Leamington, Ontario, was called to the attention of the Harrow Laboratory because of a rather peculiar growth pattern of the crop. The field, of Fox Sandy Loam, is rectangular with the long axis running north and south. When examined in late June, the tomato plants growing on the east side of this field were stunted, apparently having made little growth since they had been transplanted to the field. In contrast, the tomato plants on the west side of the field were large and growth had been vigorous. The line demarcating the healthy from the stunted plants ran north and south, approximately through the center of the field. To the east of this field and separated from it only by a laneway was a peach orchard approximately ten years old. The grower claimed that the stunting of tomato had been apparent for the past seven years, and that during this time the area of stunted plants had gradually increased away from the side adjacent to the peach orchard.

An examination of the plants showed that the stunting was associated with the condition of the roots. Healthy plants from the west side of the field possessed well-developed, much-branched roots, practically free from lesions. On the other hand, the roots of the stunted plants were poorly developed, with very few branch roots. Many lesions were evident and most of the lateral roots had apparently died back from the tips. The average weight of the healthy root systems was more than four times as great as that of the affected root systems.

Tomato roots from both sides of the field were placed in Baermann funnels and the soil from around these roots was screened for nematodes. The affected roots from the east side of the field consistently contained more than ten times as many *Pratylenchus* per plant as the healthy roots from the west side of the field. No other parasitic nematodes were observed. The grower could offer no possible explanation for this uneven distribution of root lesion nematodes in the field.

However, in the course of counting nematodes, numerous *Pratylenchus* males were observed, which indicated that at least some of these specimens could not be *Pratylenchus minyus*, inasmuch as males of this species have never been observed in Ontario. Microscopic examination of specimens from the field in question showed both *P. penetrans* and *P. minyus* to be present, the former species being much more numerous than the latter. In view of the common association of *Pratylenchus penetrans* with peach roots, the question arose as to the possibility of migration of this nematode from the peach orchard immediately to the east of the tomato field. Accordingly, tomato plants were collected at varying distances from the peach orchard for examination; from the east edge, the center, and the west edge. Studies of the population of *Pratylenchus* were made from the roots and soil at each location. First, 100 *Pratylenchus* specimens from each location were selected at random, cleared and identified, to give the percentage occurrence of each species at each location. Then the total population of each species was calculated for each location. These figures are presented in Table 1.

It may be seen from Table 1 that whereas the population of *Pratylenchus minyus* was evenly distributed throughout the field, that of *Pratylenchus penetrans* showed an uneven distribution, being abundant on the side adjacent to the peach orchard and sparse across the field.

An examination of peach roots from the adjoining orchard and of the roots of weeds used as a cover crop in the orchard showed a high population of *Pratylenchus penetrans*; on the other hand *Pratylenchus minyus* could not be found.

It is postulated that the population of *Pratylenchus penetrans* was built up originally in the

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Table 1. Populations of two species of *Pratylenchus* from different locations in a tomato field adjacent to a peach orchard.

Location of tomato plants	<i>Pratylenchus</i> from roots (per gram of root)		<i>Pratylenchus</i> from soil (per gram of soil)	
	<i>P. minyus</i>	<i>P. penetrans</i>	<i>P. minyus</i>	<i>P. penetrans</i>
East edge (nearest to orchard)	22	166	16	115
Center	17	40	22	52
West edge	23	5	12	3

peach orchard (possibly introduced in the nursery stock) and eventually migrated into the adjoining field, where at the time of this study, it formed the bulk of the population of *Pratylenchus* over the adjacent half of the tomato field. On the other hand, the evenly distributed, considerably lower population of *Pratylenchus minyus* might represent the normal parasitic nematode population of a typical tomato field in the area concerned.

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