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THE INFLUENCE OF RAINFALL ON THE POPULATION OF NEMATODES IN BANANA FIELD

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The influence of environment on the population of different organisms has always been an interesting field of study. There are a number of reference on the effect of soil moisture, temperature, pH and soil pore-size on the population of nematodes.¹⁻⁴ Wallace⁵ has discussed in length the influence of environment on nematodes. Stray references also exist on the relationship of rainfall with the population of nematodes.⁶⁻⁸

During the course of population studies an appreciable population of nematodes was found in the banana fields of Malir in the second week of August 1970. Soil samples collected from the same field in the last week of August 1970, after the intermittent rains for a period of 12 days, totalling about 6 in, showed a significant decline in the population of nematodes.

Materials and Methods

Five random samples, each consisting of about 500 g of rhizosphere soil and plant roots were taken at about 20 cm depth in polythene bags in the second and fourth week of August 1970. Isolation of nematodes was done according to modified Baermann technique as described earlier.⁹ After the isolation, five samples of nematode-water suspension were obtained. Counting of nematodes from each sample was done separately in two heads, stylet and nonstylet-bearing nematodes. For the purpose of counting $\frac{1}{2}$ cm squares were made on the lower surface of a petri dish by a diamond pencil. A 10-ml suspension of nematode and water was taken in this dish with the help of a pipette after thorough shake-up. After counting this suspension was transferred back to the container of the remaining suspension and the mean of five such readings was taken. The whole of the suspension was then measured and the total number of stylet and nonstylet-bearing nematodes was calculated. All the five samples were examined in this manner. The mean of five samples gave the approximate number of nematodes/100 ml of soil.

Results and Discussion

From the results given in Table I, it would appear that the population of stylet and nonstylet-

TABLE I.—POPULATION OF NEMATODES BEFORE AND AFTER THE RAINS IN BANANA FIELDS OF MALIR.

Nematodes	Population of nematodes/ 100 ml of soil		
	Before rainfall	After rainfall	Decrease %
Stylet-bearing	1500	300	80
Nonstylet-bearing	2300	1100	52.2

bearing nematodes was high before the rains. After 6-in rains the population of stylet-bearing nematodes was found to be 1/5th of the population before the rains, indicating the disappearance of 80% of the nematodes. The population of non-stylet-bearing nematodes was also affected and only about 48% of nematodes could be isolated as compared to the count before the rains. It seems that nonstylet-bearing nematodes are less affected by excessive water than the stylet bearing forms. This decline in population could also possibly have been attributed to other factors¹⁰⁻¹² but since the duration between the two readings (before and after the rains) was very short, and the only significant change in the soil environment was that of moisture and, of course, other concomitant changes which might have taken place, the decline is attributed mainly to rainfall. Hollis and Johnston⁶ observed that the population of *Tylenchorhynchus martinii* in soyabean crop decreased with the increase in rainfall. On the other hand Norton⁷ suggested that population of *Paratylenchus projectus*, *Tylenchorhynchus brevidens* and *Aphelenchoides avenae* increased after rainfall. Minton *et al.*⁸ however did not find any close correlation between rainfall and population of *Meloidogyne incognita acrita*, *Trichodorus christiei*, *Pratylenchus brachyurus* and *criconemoides curvatum*. They, however, found some correlation for *Hoplolamus tylenchyformis*.

The stylet-bearing nematodes which were isolated during these studies consisted mostly of ectoparasitic migratory forms such as *Tylenchorhynchus* sp. and *Hoplolamius* sp. The decrease in the population of these nematodes due to rains corroborates the findings of Hollis and Johnston⁶ and Minton *et al.*⁸ It would, therefore, be worth while to examine this phenomenon of population changes in nematodes in different environmental conditions.

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