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THE EFFECT OF DIFFERENT INOCULUM LEVELS OF *PRATYLENCHUS INDICUS* ON THE GROWTH AND YIELD OF RICE

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Yield reductions of rice caused by the root-lesion nematode, *Pratylenchus indicus* Das have been reported in India to range from 7 to 28 per cent (Prasad and Rao, 1978). The effect of nematode infestation at different levels of inoculum density was investigated in relation to the growth and yield of rice and is reported here.

Thirty stone-ware pots were filled with steam sterilized soil (1 kg) and one rice seed of cv. Bala was sown per pot. Ten days after germination the pots were ino-

culated with 5, 50, 500 or 5000 nematodes. An uninoculated control was maintained separately. There were six replicates of each treatment. The experiment was conducted in a greenhouse. The plants were harvested after 80 days and various parameters of plant growth and yield were recorded (Table I). Nematodes were extracted from the entire root system (Caveness and Jensen, 1955) in each pot and from the soil by elutriation and sieving (Oostenbrink, 1960).

TABLE I - Effect of *Pratylenchus indicus* inoculum density on the growth and yield of rice and final nematode population.

| Parameter | | Level of inoculum | | | | C.D. 0.05 |
|----------------------------------|------------------|-------------------|------|------|------|--------------|
| | | 0 | 5 | 50 | 500 | |
| <i>Plant characters</i> | | | | | | |
| Shoot | height (cm) | 80 | 75 | 67 | 51 | 5.5 |
| | dry weight (g) | 8.4 | 7.9 | 6.6 | 5.4 | 2.2 |
| Root | length (cm) | 14 | 14 | 11 | 9 | 1.9 |
| | fresh weight (g) | 2.1 | 1.9 | 1.7 | 1.5 | 0.3 |
| Grain yield | per earhead (g) | 0.98 | 0.99 | 0.96 | 1.00 | |
| | per plant (g) | 8.1 | 7.7 | 6.4 | 4.8 | 0.46 |
| <i>Final nematode population</i> | | | | | | |
| Eggs | Root | | 933 | 1580 | 6902 | |
| Juveniles | Root | | 56 | 230 | 1588 | |
| | Soil | | 87 | 511 | 1343 | |
| Adult Males | Root | | 12 | 69 | 431 | |
| | Soil | | 51 | 118 | 1014 | |
| Females | Root | | 57 | 369 | 2377 | |
| | Soil | | 110 | 871 | 2294 | |

At the highest nematode inoculum level (5000/pot) the seedlings did not survive for more than ten days. At 500 nematodes/pot there were significant ($P=0.05$) reductions in shoot height, root growth, number of tillers and grain yield per plant, although grain weight per ear was similar in all treatments (Table I). The effect on plant growth, including reduction in yield, was generally related to the level of initial inoculum and final nematode population in roots and soil (Table I).

Increase in nematode inoculum apparently increased the ratio of adults to juveniles in the populations at harvest, probably indicating a reduction in reproduction due to crowding. The number of eggs per root system increased with inoculum density.

Literature cited

- CAVENESS F.E. and JENSEN H.J., 1955 - Modification of the centrifugal-floatation technique for the isolation and concentration of nematodes and their eggs from soil and plant tissues. *Proc. helminthol. Soc. Wash.*, 22: 87-99.
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