

Nematology

Field Screening of Chickpea Genotypes for Resistance to the Root-Knot Disease Caused by *Meloidogyne* spp in Nepal

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Chickpea is an important pulse crop in Nepal. Like many other vegetable and legume crops, it suffers from the root-knot disease caused by *Meloidogyne* spp. The disease is widespread but is particularly important in the inner *turai* region. At the research farm of the National Grain Legumes Improvement Program, located at Rampur in the Chitwan valley, the incidence of root-knot is very high in chickpea, cowpea, and pigeonpea, particularly in soils of low pH. In the 1987/88 crop season, we utilized this site, which has mixed populations of *Meloidogyne javanica* and *M. incognita* race 2, to evaluate 267 chickpea genotypes for resistance to this disease. Some of the genotypes had been found resistant to this disease in pot screening under glasshouse conditions in India.

Each genotype was sown in a 4-m row, with 10 cm plant-to-plant spacing and 30 cm between rows. Two highly susceptible control genotypes (Dhanush and ICC 4) were sown after every 10 test entries. Each entry was replicated three times. Five plants were uprooted at random from each plot, 4 months after sowing, and the numbers of galls on the root systems were counted. Almost all the genotypes had more than 50 galls per root system, and were considered susceptible to the disease. However, T 11-1 and NEC 321, with fewer than 50 galls per root system, were considered less susceptible. The following lines were found highly susceptible (>100 galls):

Annigeri; Avrodhi; Chaffa; Gaurav 35; BG 208, 209, 267, 273, and 405; H 208; JG 74; Pant 102, 104, and 114; Pusa 209, 212, and 240; K 4 and K 468; GL 604 and 629; NEC 330, 348, 351, 370, 377, 381, 392, 393, 400, 435, 440, 445, 1105, 1582, 1585, 2548, 2566 and 2588; P 20, 21, 35, 37, 4401, 46-1, 59, 59-1, 69, 70-1, 74, 74-1, 78, 88-1, 104, 116, 235, 324, 326, 919-1, and 1872-1; V 23, 40, 52, 53-1, 63, 74, 77, 87, and 88; RPSP 243, 250, 251, 253, 256 and 303; ICC 184, 375, 444, 594, 999, 1405, 1437, 2225, 3099, 3328, 3439, 4485, 4948, 5003 and 8933; ICC 4, 13 and 32; ICCL 81300, 82108, 82443, 84205, 84219 and 85225; and ICCV 5.

Effect of Different Inoculum Densities of Stunt Nematode, *Tylenchorhynchus brassicae* on the Growth of Chickpea

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A preliminary soil survey around the Aligarh Muslim University campus revealed that the stunt nematode, *Tylenchorhynchus brassicae* Siddiqi is consistently associated with unthrifty growth of chickpea. We therefore studied the effect of different inoculum densities of stunt nematode on growth parameters of chickpea cultivars H 208 and K 850 and the rate of their multiplication. Seeds of H 208 and K 850 were surface-sterilized with 1% mercuric chloride and washed several times with distilled water. Three to four seeds were directly sown in 15-cm diameter earthen pots containing 1 kg autoclaved soil-compost mixture (3:1). Seven days after germination, seedlings were thinned to one plant pot⁻¹.

When the plants were 15 days old, homogenized suspensions containing 10, 100, 1000, 5000, and 10 000 *T. brassicae* nematodes were added to the pots. Each treatment, including the noninoculated control, was replicated five times. The effect of different inoculum densities on plant growth was recorded in terms of length and fresh mass of shoots and roots 60 days after inoculation. The final population of *T. brassicae* in the soil was estimated by using Cobb's sieving and decanting method, followed by modified Bearmann's funnel technique (Southey 1986).

Results show that plant length (height of shoot plus length of roots), plant mass, and number of pods plant⁻¹ were all adversely affected by *T. brassicae*. Significant reduction in plant mass and pod number was observed at 1000 or more nematodes plant⁻¹ in H 208, and at 5000 or more nematodes plant⁻¹ in K 850. Both plant growth and rate of nematode reproduction decreased with increased inoculum levels (Fig. 1).

Acknowledgment. The senior author is grateful to the Council of Scientific and Industrial Research, New Delhi, for the grant of a Senior Research Fellowship.

Reference

Southey, J.F. 1986. Laboratory methods for work with plant and soil nematodes. London, UK: HMSO (Her Majesty's Stationery Office).