# The effect of nematode (*Meloidogyne incognita* race 2) on root and shoot traits in susceptible and tolerant tomato cultivars

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## Abstract

Root-knot nematodes cause physiological and anatomical disorders in plants. The present study contains the results of an investigation of the effect of *Meloidogyne incognita* race2 on the growth of roots and aerial organs of tomato under greenhouse conditions. The split-split plot experiment was carried out as a completely randomized design on two susceptible (Falat Y) and tolerante (Gina VF) tomato cultivars at four nematode population levels (0 (control), 500, 1000 and 2000 second-stage juveniles) in four termination times (20, 40, 60 and 80 days after inoculation). The species and race of nematode were determined after sampling and purification. Inoculum densities were obtained by reproduction of pure population on Rutgers tomato cultivar. Nematode population levels were inoculated at four-leaf stage and characteristics were measured at the mentioned times. Results showed that increasing nematode population level, increased the number of galls, egg sacs and second stage juvenile in both cultivars, and this change was more prominent in the susceptible cultivar. But the reproduction factor had a descending trend. The nematode stress affected plants' morphological traits and growth indices. At high population levels, plant growth characteristics such as chlorophyll, leaf relative water content, stem diameter, leaf area, plant height, dry and fresh weights of stem, ratio of root length to root volume, ratio of leaf area to root area, root density and ratio of root dry weight to soil volume were decreased. But fresh and dry weights of root, root area, ratio of root fresh weight to soil volume, root diameter, root volume and root area density were increased.

**Keywords:** Growth indices, Physiological disorders, Root-knot nematode.

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