ture, only a few second-stage juveniles of *M. incognita* develop and reproduce. Inoculated tomato genotypes that had only a few egg masses on the average when exposed to continuous high soil temperature showed greater resistance under thermoperiodic conditions than tomato entries showing greater numbers of egg masses when exposed to continuous high soil temperature. The results suggest that metabolic mechanisms of resistance, such as those postulated to involve chlorogenic acid (7) or ascorbic acid (2), will fail to be inhibited by high daytime soil temperature if the plant is exposed to a nonstress soil temperature at night.

**LITERATURE CITED**


to calculate the natural population decrease in the absence of the host plant. Pots were randomized on a glasshouse bench and plants were grown at 20–25 C. Each treatment (nematode density) was replicated 10 times. Twenty days after sowing, the plants were thinned to one seedling per pot. Plants were harvested 104 days after sowing, and fresh top weights were recorded. Terminal nematode population densities \( (P_f) \) were determined 40 days after harvesting the plant tops thus allowing a greater number of nematode females to become cysts. The soil from each pot was mixed thoroughly and the cysts extracted (6) and counted, and numbers of eggs plus second-stage juveniles were determined.

The relation between the fresh top weight of the fig seedlings and the number of nematodes at sowing is shown in Fig. 1. Fitting a curve according to the equation \( y = m + (1-m) z^{-qT} \) (equation i) for \( P \geq T \) and \( y = 1 \) for \( P < T \) (the most probable relation between initial nematode density \( P \) and final relative plant weight \( y \); [3,7,8]) with \( z^T = 1.05 \) and \( m \), the minimum yield \( = 0 \) (y for \( P \geq 64 \)) suggests a value of tolerance limit \( T = 0.15 \) eggs and second-stage juveniles/cm\(^3\) soil (Fig. 1). Slightly smaller or larger values are about equally probable. Also \( m \) could have been slightly larger than 0, if the dying of the plants at the large initial nematode densities was due to Seinhorst’s “second mechanism of growth reduction” (8). Three plants died at 8 nematodes/cm\(^3\) soil, 6 at 16 nematodes, 9 at 32 nematodes, and all 10 at 64 nematodes and larger initial densities.

Figure 2 indicates the relation between the final \( (P_f) \) and the initial \( (P_i) \) nematode population densities. A curve according to the equation \( P_f = [a x y (1 - a^{P_i}) / -lnq] + (1 - x + Sx - Sxy) P_i \) (eq. ii) was fitted to the observation (4,5). In equation ii, \( P_i \) and \( P_f \) are initial and final nematode population densities; \( a = \) maximum rate of multiplication; \( q = a \) constant < 1; \( x = \) the proportion of eggs that hatch in the presence of the host; \( S = \) the proportion of eggs which does not hatch in absence of the host; and \( y = \) relative yield. The first part of the curve (Fig. 2) suggests an \( a \) (maximum rate of multiplication) value of 12. The multiplication rates at high densities averaged about 0.91; at low initial densities they averaged about 9.

At the initial densities \( (P_i) \) from 16 to 1,024 the relative yield was 0 according to Fig. 1. Even if there had been some initial root growth, nematode multiplication would have contributed very little to the final population at \( P_i \geq 32 \). Fitting a curve according to \( P_f = a(1-q^{P_i})^{-q/T} \) to observed \( P_f / y \) (nematode density in the portion of the soil containing roots) at \( P_i < 4 \) nematodes/cm\(^3\) soil suggests a maximum \( P_i \) in soil with roots of 21 nematodes/cm\(^3\), therefore, an average of 1 nematodes/cm\(^3\), therefore, an average of 1 nematodes/cm\(^3\) if 5% of the soil contained nematodes. The average ratio \( P_f / P_i \) at initial densities \( \geq 32 \) nematodes/cm\(^3\), 0.91, is therefore a measure of the survival in the absence of host roots, which, however, it might underestimate.
slightly. Some hatching induced by host roots shortly after the beginning of the experiment may have occurred. This survival was 0.96 in pots with infested soil but without roots. The two figures are not significantly different.

The data do not allow estimation of x. To calculate a curve for the relation between $P_f$ and $P_0$ at $P > 16$ nematodes/cm$^3$ soil x can be assumed to be unity. This reduces the second term of the right hand part of equation ii to $S(1-T)P_t$.

The $H. fici$ densities determined in field samples are smaller than real densities because eggs in eggs sacs are usually ignored. Also in this experiment this portion of eggs was not taken in account. Therefore advice on control should be based on a smaller value of T than that derived from the result of the pot experiment.

The very low value of minimum yield, $m = 0$, depends upon the very small seedlings used in the experiment. Braasch (1) reports that in ornamental fig the $H. fici$ damage was higher in small seedlings than in older plants. The value of m will undoubtedly increase with the plant age (7).

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Technique for Obtaining Eggs and Juveniles of Heterodera glycines

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We describe here our method of obtaining clean Heterodera glycines eggs and hatched infective juveniles in quantity.

Similar methods of obtaining eggs of other nematode genera have been published (1,2,4,7). Minigawa (5) compared the efficiency of a double layer centrifugal method (DCF) with extraction in Baermann funnels and direct examination for recovery of nematodes from soil. He concluded that DCF is unsuitable for quantitative extraction of nematode eggs from soil. He did not examine Heterodera spp.

Collection of eggs: We collect cysts from soil on a 60-mesh screen (250-μm apertures) by elutriation or by settling and decanting. Screenings are washed onto a 100-mesh sieve (150 μm) and macerated by gentle rubbing with a rubber stopper to release eggs. Eggs and debris are collected in a bucket with the aid of a gentle stream of water, concentrated by centrifugation at 800 g for 5 min in 50-ml conical tubes in a swinging horizontal head rotor. The supernatant is siphoned off until about 2 ml remain above the pellet. The pellet is then