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ASSESSMENT OF YIELD LOSS DUE TO *MELOIDOGYNE INCOGNITA* IN PAPAYA UNDER FIELD CONDITIONS

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Summary. Field studies conducted to evaluate the economic importance of *Meloidogyne incognita* on papaya indicated a growth suppression of 36.5% per tree under natural condition. There was a yield loss of 0.35 per cent in fruit yield (0.811 g) per tree for every one nematode increase per 5 g root.

Although *Meloidogyne incognita* is a major pest of papaya yield loss due to this nematode is not quantified. Therefore the present study was undertaken to assess the yield loss due to *M. incognita* in papaya under natural condition.

Materials and methods

Seedlings of papaya (*Carica papaya* L.) cv. Co6 raised in 13 cm x 8 cm polybags containing 1 kg of nematode free pot mixture were planted at 45 days after sowing in pits (0.5x0.5x0.5 m) dug in a field naturally infested with *M. incognita* (Kofoid *et* White) Chitw. A set of twelve pits treated with carbofuran 3G at 1 g a.i. per pit two days before planting and another set of twelve untreated pits were prepared. The seedlings raised individually in these pits were thinned after flowering to maintain a female plant per pit at 120 days after planting. Application of carbofuran 3G at 1 g a.i. per plant was repeated of the set of the 12 treated pits. The agronomic practices specified by Muthukrishnan and Irullappan (1990) and Singh (1992) were followed during the period of study.

Observations on total number of mature and immature fruits, their weight per plant and per fruit were recorded during the time of picking made twice at four months interval. Population of nematodes in soil samples (200 cm^3) taken before planting, and root samples (5 g) at flowering and at the time of picking the fruits were also recorded. Paired 't' test to test the significance of yield loss and regression analysis for the yield loss (y) due to the difference in root nematode population between treated and untreated (x) were performed.

Results and discussion

The plants treated with carbofuran before planting and at flowering had significant ($P = 0.05$) increases in the number of fruits (26.7), fruit weight (0.7 kg) and fruit yield (18.7 kg) per tree compared to the control: 22.7 fruits, 0.6 kg fruit weight and 13.7 kg of fruit yield per tree, respectively.

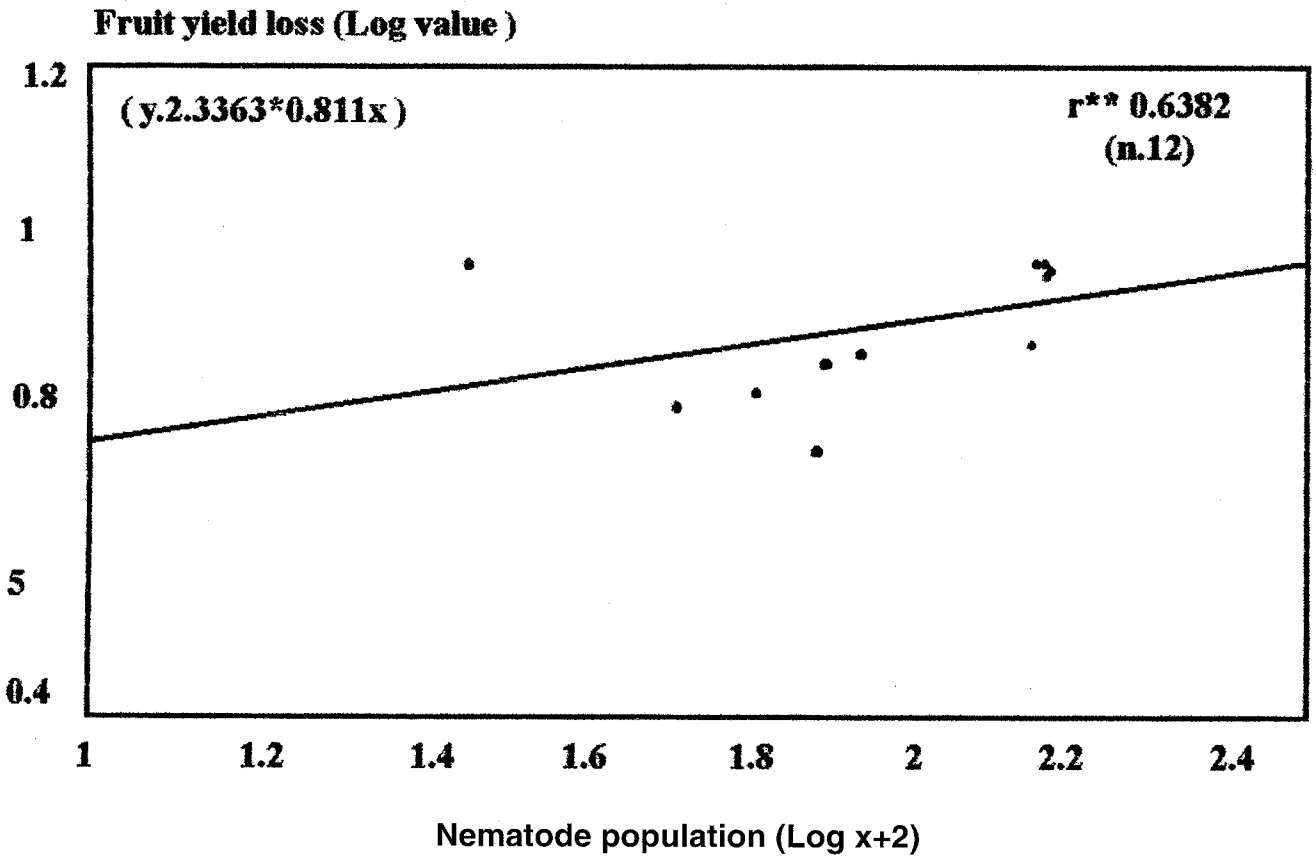

Fig. 1 - Relationship between fruit yield loss and population density of *Meloidogyne incognita* in papaya roots (5 g).

The yield loss due to *M. incognita* on papaya estimated in the present study was 17.6, 15.9 and 36.6% respectively in the number of fruits, mean fruit weight and fruit yield per tree. The regression equation showed significant positive correlation (r=+0.5882) and it was estimated that for every one nematode increase per 5 g root there was a loss of 0.35% in fruit yield (0.811 g) per tree (Fig. 1).

The present investigation appears to be the first study on yield loss due to *M. incognita* in papaya under field conditions. The extent of yield loss may be greater than recorded if the fruits harvested throughout the cropping period are taken into account. Also, the yield loss may be greater under controlled conditions and thus our results provide a conservative but reliable picture of yield loss due to *M. incognita* in papaya.

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