

# THE NEMATODE INFESTATION AND CONTROL IN ARECANUT BASED FARMING SYSTEMS

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Arecanut *Areca catechu* L. or betel nut is a cultivated tropical palm, the nuts of which form a popular masticatory in India and West Asia. The cultivation of arecanut is confined to 28°C north and south of the equator. It grows well within a temperature range of 14 and 36°C and is adversely affected by temperatures beyond 10°C and 40°C. India is a major arecanut growing country wherein about 7,04,300 ha is under arecanut and with a production of 2,46,100 tonnes of nuts during 1989-90. Thus it plays an important role in the rural economy of the country.

The practice of intercropping in arecanut garden was in vogue from very early times. The concept of mixed and high density cropping in arecanut plantations for maximum productivity from unit area of land involves growing together of several species of plants along with the main crop of arecanut. The plant parasitic nematodes have a major role in limiting crop production in such a system, since it involves growing together of several species of plants which are hosts of the same nematode species.

A decade of continuous nematological research on palm based cropping systems has clearly indicated that major nematode problems in arecanut based farming systems are mostly due to root knot and burrowing nematodes. The burrowing nematode *Radopholus similis* is the most important nematode pathogen infesting arecanut and other component crops like black pepper and banana. This nematode is wide spread in Kerala and Karnataka in varying intensities causing severe rotting in roots. The population has been identified as the banana race of the burrowing nematode. A number of other component crops in the systems like ginger, turmeric, sweet potato are known hosts of this nematode. The burrowing nematode population is known to fluctuate throughout the year with its peak in October/November and the minimum during summer months.

The burrowing nematodes have cylindrical bodies 0.5 to 1.0 mm long. The body tapers towards the head and tail ends. It has a stylet or spear which is a sharp pointed tube like a doctor's hypodermic needle. It can be moved back and forth into plant tissue with the help of three sets of muscles attached to its base. The plant sap is sucked into the alimentary canal through the stylet tube by the vacuum created by the alternate contraction and relaxation of a median valve situated behind the stylet.

The nematode also injects a small quantity of digestive enzymes into the plant tissue. The external symptoms observed on the infested plants are as a result of the reaction caused by the toxic substances injected by the nematodes and also due to depletion of plant nutrients sucked up by the nematode. When the nematode infests the root system small lesions are first formed on the root surface. These lesions in course of time coalesce to form larger lesions which finally lead to the extensive rotting of the roots. As a result of nematode infestation by *R. similis* the secondary and tertiary roots are very much reduced. In arecanut based cropping systems comprising black pepper, banana etc. if suitable control measures are not adopted the population of *R. similis* is likely to be very high as compared to that in monocropping systems.

The root knot nematode, which causes galling root systems is a very serious menace in vegetables, ginger, turmeric, black pepper banana and tubercrops. The general decline in growth and vigour is the common symptom observed in all the plant species infested by burrowing and root knot nematodes. Recent surveys have shown heavy infestation of cyst nematodes on different banana varieties in addition to root knot and burrowing nematodes.

It is preferable to avoid crop mixes of susceptible crops. Since cacao, pineapple, cinnamon, nutmeg and clove are found to be relatively free of nematode diseases it is safer for a farmer to have such crops as intercrops in the arecanut based farming system. The slow wilt of pepper which is mainly caused by the burrowing nematode can be controlled by two applications of thimet @ 3 g a.i./vine in June/July and September/October. Since subabul was found to be highly susceptible to root knot nematodes it is better to avoid subabul as a live standard for trailing black pepper in arecanut based farming system.

The deleterious effect of nematode infestation can be brought down by adopting the following control measures.

1. Use of nematode free planting materials. This can be effected by sterilizing the nursery beds/potting mixture used for raising plants.
2. Avoid highly susceptible crop components.
3. Application of nematodes systematically for each component crop.
4. Use of resistant cultivars of the crops involved in the system.