

sub-families Melolonthinae, Rutelinae and Dynastinae. Most of the major root grubs belong to genus Holotrichia. Common plants that are attacked by root grubs include areca nut, ground nut, soya bean, corn and sugarcane. This abstract is based on the survey conducted on areca nut fields in places of Sringeri and Sagara which are in the districts of Chikkamagaluru and Shivamogga respectively. The report is focused on infestation of root grub on areca nut, one of the most common plants grown in the Southern part of India.

KEYWORDS: Root grubs, White grubs, Scarabaeidae, Coleoptera, Melolonthinae, Rutelinae, Dynastinae, Holotrichia, Areca Nut, Shivamogga, Chikkamagaluru, Sringeri, Sagara.

In the name "Areca Nut", the word "areca" has been derived from a Malayalam word a "adaykka" which means 'Cluster of nuts'. Scientifically it is known as Areca catechu L. and belongs to family palmae and genus Areca. It has over 76 species among which only Areca catechu L. is the only species cultivated. Cultivation of areca nuts is concentrated in South Western and North Eastern regions of India. According to the Food and Agricultural Organization, India ranks first in both areas (57%) and production (53%). Among different states, Karnataka is the major areca nut producing state in India. It grows over an area of 120 thousands hectares and more than 2 lakhs families of farmers are involved in areca nut production.

Areca nuts are attacked by an array of insect and non-insect pests. The pests infect all parts of the palm including stem, leaves, flowers, roots and nuts. Brown bug Saissetia hemisphaericum targ was the first record as a pest of areca nuts by Coleman and Rao (1918). Since then about 102 insect and non insect pests have been reported to be associated with areca nut palm (Nair and Daniel, 1982), among which few causes considerable economic losses to the crop. To combat this pest usually insecticides are recommended, prolonged dumping of chemicals not only causes soil pollution but also has deleterious effects on soil flora and fauna.

Identification of root grub species

The following characteristics can be used to identify Leucopholis sp.

- Maxillary stridulatory teeth arranged in a clear longitudinal line 1. palidia on the raster, separated by less than twice the length of the Pali
- 2 Roundish Pali, not very strongly sclerotised.
- 3 Body uniformly black, external surface of the body uniformly covered with subovate, yellowish spots and scales (In adults).
- 4 Pygidium is broader and slightly triangular.
- On average, females are larger than males. Antennal club is almost 5 the same length as the first antennal segment. Hind tibial spurs broad and spatula like.
- Males are externally similar to females. Antennal club 21/2 times 6. the length of the first antennal segment. Hind tibial spurs spine like and pointed.

Male genitalia : Spiculum gastrale with two slightly sclerotised areas, one on each side, sometimes connected, between the two arms.

Root grub population density:

Root grub population was more in a new paddy field converted into areca nut gardens. Reason behind this could be that, in paddy fields converted into areca nut gardens, the soil had more water holding capacity which maintained a moisture level congenial for root grub existence throughout the year near the root zone only.

Symptoms of damage :

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In an areca nut root grub was found to feed on the terminal tender portion of the roots, later move towards the bole region and began scooping of bole flesh leading to a deep gash. This profound grazing by grubs cut off the supply of water and nutrients. Prolonged shortage of

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water and nutrients results in various kinds of symptoms. Some of them include root damage, yellowing of leaves and penciling and toppling.

Different management practices :

During the survey arecanut growers were interviewed to know the management practices adopted by them to tackle the arecanut root grubs.

- More than half of the growers (64.50%) adopted chemical control 1 by using insecticides mainly chlorpyrifos 20 EC (3 ml to 12 ml per litre) and phorate 10 G (20 to 50 grams per tree)
- 2. Use of botanical insecticides accounted for 22.57%, among which 12.90% of farmers used neem products.
- Farmers who used mechanical collection of root grubs in the 3 garden recorded 9.67%.
- Other methods used by farmers included the use of salt (10 to 50 4 kg/acre) which accounted for 6.42% and 9.20% left their land without any control measures.

Studies on yield loss due to arecanut root grub:

Intervention of protection methods in a arecanut ecosystem resulted in on an average 8.85 kgs of nuts per palm compared to unprotected conditions which yielded on average 7.05 kgs of nuts per palm. Statistically both were on par with each other. Whether or not root grubs affect yield to a significant extent can only be concluded after a prolonged study of 3 to 4 years during different seasons.

REFERENCES

- Coleman and Rao, 1918, The cultivation of arecanut palm in Mysore. Department of 1.
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- Coleman and Kao, 1918, The cultivation of arecanut paim in Mysore. Department of Agril, Mysore State, Bangalore. Kumar, A.R. V, 1997, Bio-ecology and management of arecanut white grubs. Roa, K.S.N, Naidu, G.V.B and Bavappa, K.V.A., 1961, The white grub pests of arecanut. Yadava, C.P.S. and Saxena, R.C., 1977, Bionomics of Holotrichia consanguinea BLIndian J.Agric.Sci.47(1):139-142.
- 5. Nair,C.P.R and Devashyam,S., 1982, Pests of coconut and their control. Indian cocoa arecanut and spice journal.
- 6. Anonymous, 1990, Scarabaeidae larvae control in sugarcane using Metarhizium anisopliae.J.Invert.Path.
- Mishra, P.N and Singh, M.P 1993, Determination of Predominant Species of White Grub in Kumaon region of UP hills and Control. 7.
- Veeresh,G.K,Vijayendra, M.Reddy,N,V.M and Rajanna, 1982, Bioecology and Management of Arecanut White Grubs.