

Bio control of coconut black headed caterpillar in Andhra Pradesh

● N.B.V Chalapathi Rao, A. Nischala, G. Ramanandam, Snehalatharani and H.P. Maheswarappa

AICRP on Palms (Horticultural Research Station), Ambajipeta, (Dr. YSRHU), East Godavari, Andhra Pradesh.

The leaf eating black headed caterpillar *Opisina arenosella* is a serious pest of coconut palm causing significant yield loss in all the coconut growing tracts of India. It attacks coconut of all age groups and is a prolific feeder of coconut leaves. On the adult palms, the infestation start on the outer whorls of leaves and due to the feeding damage, the photosynthetic efficiency especially of the lower fronds will be impaired and in severe cases, whole plantation presents a burnt up appearance due to the drying of leaves. In case of severe out breaks, the attacked leaves droop, bunches buckle and the immature nuts are shed heavily, in extreme cases feeding by the caterpillar on the green nut surface is also observed. The other hosts for this pest are palmyrah (*Borassus flabellifer*), talipot (*Corypha umbraculifera*) and wild date (*Phoenix sylvestris*). Feeding damage on oil palm (*Elaeis guineensis*) is also recorded on lower intensities under out break conditions.

Severe incidence of *O. arenosella* in coastal Andhra Pradesh during 2015-16

East Godavari, West Godavari, Srikakulam, Visakapatnam and Krishna districts are the main coconut growing coastal districts in Andhra Pradesh (Total area 1.04 lakh ha). In East Godavari, West Godavari and Krishna districts coconut is grown as a sole crop, with inter crops viz., cocoa and banana and also on fish pond bunds. In 2015-16 (October to May) a high infestation of black headed caterpillar was observed in all the coastal districts of Andhra Pradesh and incidence ranging from 42.82 to was 62.86 per cent was recorded. An outbreak of black headed caterpillar was recorded in Allavaram mandal (approximate acreage affected is 675 ha) and a medium intensity damage was observed in other coconut growing mandals viz., Katrenikona, Razole, Uppalaguptam mandals (approximate acreage affected is 300 ha) in Konaseema region of East Godavari district of Andhra Pradesh. The coconut gardens affected here comprised both fish pond bund coconut trees and sole coconut gardens

Biocontrol

In order to contain the outbreak from spreading to neighboring coconut growing mandals and to reduce the pest population in affected villages, Horticultural



Severe incidence of O.arenosella at Dwarapudi village



Black headed caterpillar on nuts

Research Station, under AICRP on palms Ambajipeta (Dr YSR Horticultural University); Department of Horticulture, Government of Andhra Pradesh and M/s Noveel Coconut Producer Company together planned to manage the outbreak with the financial assistance of Coconut Development Board, Kochi under community based plant protection activities LODP scheme. Under this scheme an amount of Rs 15.58 lakhs was sanctioned for Allavaram mandal and farmers from other mandals on their own generated an amount of Rs 4.48 lakhs



Parasitoid breeding laboratory HRS., Ambajipeta



G. nephantidis parasitoid multiplied in the laboratory

for procuring the larval parasitoids of black headed caterpillar *O. arenosella* viz., *Bracon hebetor*, *Goniozus nephantidis*. From October 2015 to April 2016 about 37,88,650 of these parasitoids were produced in bio-control lab. at HRS., Ambajipeta for distribution and release in pest affected gardens in the affected mandals.

Release technique

Usually the parasitoids *G. nephantidis* are to be released at the rate of 10 parasitoid/palm and *B.hebetor* at the rate of 20 parasitoid/palm in at least ten percent of the infested palms in each village at fortnightly intervals in case of low (few damaged leaflets here and there) to medium (2–3 damaged fronds with clear drying) intensity damage. But as there is high intensity (all the lower whorls of leaves or entire crown damaged) inundative release of parasitoids was taken up. With the assistance of department of Horticulture and Coconut Producer Societies formed under the Noveal Coconut Producer Company the farmers were sensitized on pest identification, nature of damage and management of black headed caterpillar through bio-control and parasitoid release through field visits, village meetings, group discussions and press coverage. Regular field

visits to pest affected villages and dissemination of information on larval stage based parasitoid release created awareness in the farmers community on effective monitoring and scheduling of parasitoid release in the affected gardens. A total of 8-12 release of parasitoids were made in each affected villages.

Parasitoid establishment and pest regulation

The parasitoid recovery studies were also undertaken randomly in the pest affected areas (10% sample palms) to ascertain the establishment and build up of these natural enemies in the pest affected gardens. Data on parasitoid establishment after third and six months of bio agents release revealed that the natural enemies established well in the affected gardens and bio-agents effectively paralysed *O. arenosella* caterpillars. The pest population showed a sharp decline after the parasitoid release. The larval population of *O. arenosella* in the affected gardens decreased by 34.1 to 75.9 per cent after three months and up to 59.6 to 100.0 per cent after six months of release of parasitoids and no leaf damage and pest population was recorded in the newly emerged leaves. The pupal population of the pest has also decreased by to 33.3 to 94.5 per cent and up to 92.8 to 100.0 after six months. In the random leaflet samples collected the percentage of paralysed larval population recovered was 8.3 to 26.9 per cent after three months increased to 18.68 to 34.6 per cent after six months of release of parasitoids. After six months of release the impact of inundative release of bioagents in the suppression of the pest was clearly visible.

Eco-friendly and monetary benefit

The impact of biological control was clearly evident in the pest affected villages after six months. The inundative release of bio-control agents successfully regulated the



Fig.5. Demonstration and distribution of Parasitoids to farmers



Release of bio agents by farmer Sri M. Krishna Murthy, Dwarapudi

larval stage of pest and the population dwindled and came down substantially in all the black headed caterpillar affected gardens. The self perpetuating parasitoids prevented the spread of the outbreak to other mandals and the joint efforts of the government organisations weaned and prevented the farmers from resorting to the use of hazardous insecticides, monocrotophos and dichlorovas in the coconut ecosystem. The cost involved in bio-control was Rs. 20.06 lakhs and the assumed cost of chemical intervention if resorted is Rs 63.18 lakhs (for 975 ha area). There was a saving of Rs. 43.12 lakhs with compounded benefit of undisturbed natural ecosystem with self regulating biological control in operation. In the days where hazardous pesticides usage is becoming a matter of concern, this success of biological control as alternate system, gives impetus to sustainable agriculture. ■

CDB celebrated Independence day



Dr. A.K Nandi, Secretary, CDB hoisting the National Flag at CDB premises on Independence day