

# Insecticidal control of rhinoceros beetle helps to increase yield of coconuts

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## INTRODUCTION

INDIA falls short of her total annual requirement of coconut by about 30 per cent. About 5 per cent reduction in tonnage is estimated to copra in storage due to deterioration by pests and fungi. A great part in the retarded production is played by diseases and pests. Of the latter there are mainly four — the rhinoceros beetle attacking the crown, the red palm weevil tunnelling into the stem, the leaf eating caterpillar and the root feeding cockchafer. The ravages brought about by the rhinoceros beetle are considerable because of its ubiquitous distribution. Even though a correct

estimate of the damage caused has not been made, the increase in yield of palms due to control of the pest is an index to the economic aspect of rhinoceros beetle control and pin-points to the urgent need for implementation of the control measures against the pest.

## NATURE AND EXTENT OF DAMAGE

The adult beetle bores into the tender parts of the crown cutting across unopened leaves and spathes. Consequently the leaves on emergence exhibit characteristic cuts. Severe infestation results in damage of the flower bunches and distortion of the entire crown. Further, the wounds made by the beetle

on the crown may provide vulnerable points for entry of the harmful bacteria, fungi or the dreaded palm weevil. It has been assessed that the rhinoceros beetle causes an annual loss of well over two crores of rupees to coconut growers in India.

#### BREEDING SOURCES AND LIFE CYCLE OF THE PEST

The rhinoceros beetle lays eggs almost anywhere, where there is sufficient quantity of decaying organic matter

such as refuse heaps, farmyard manure, decaying vegetable matter, dead and rotting trunks of coconut and other palms, compost and municipal refuse heaps and any similar organic material.

The life cycle of the beetle consists of four stages—the egg, the larva, the pupa and the adult (Fig. 1) and is completed in about six months. All the stages of the pest may be found in the breeding places. The adults keep on changing their abode going to the crown for feeding and returning to the breeding

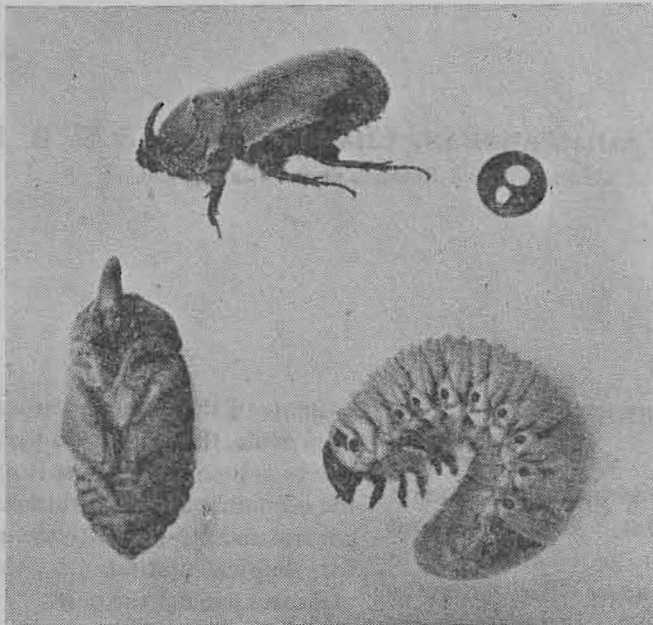


FIG. I

*Life cycle of Oryctes rhinoceros*

place for mating and oviposition. The pupae are generally found in the soil close to the breeding material. The destructive adult stage lasts over 200 days in a generation.

#### CONTROL

The mechanical control of the beetle by extraction with the aid of a beetle hook is the simplest method generally adopted.

It has been recently established by extensive field experiments that insecticidal treatment of the breeding sources of the beetle is the most effective method in controlling this pest. The pest gets killed in the immature stages and with their death an essential link in the life cycle of the beetle is broken. This

treatment at higher doses also kills any adults in the breeding places. The control measure was successfully demonstrated through field experiments at the cultivators' gardens at Sasthamcotta and Karunagapally in Quilon District of Kerala State and the results are reported here.



FIG. II  
*Insecticidal treatment of the breeding places with 0.01 p. c. B. H. C.*

A large scale experiment was started in 1960 at Sasthamkotta to demonstrate the efficacy of BHC applied in the breeding material of the beetle in controlling the pest and reducing the incidence of beetle attack on palms. An area of 11 sq. km. of coconut plantation was selected for this experiment and divided

into six blocks consisting of 80 plots. A total of 2,000 palms were selected at random and kept under observation, 1000 in the treated area and 1000 in the untreated control. All possible breeding places of the beetle such as cattle dung, compost, decaying organic matter etc., were sprayed with BHC (W) 50% at

0.01% by weight, in relation to the weight of cowdung, at quarterly intervals. Observations of the incidence of beetle attack on leaves, spathes and yield data were recorded each quarter.

A similar field experiment at Karunagapally using 0.01% Aldrex 30% E.C. in an area of 1 sq. km. comprising 5 plots with 25 palms per plot was also undertaken.

## RESULTS

A perusal of the data for 6 years collected under the above experiment at Sasthamcotta and Karunagapally gave the following results.

1. Treatment of breeding material is effective and has direct effect in reducing the pest population and thereby minimizing the rate of attack of leaves and bunches, and consequently increases the yield.

2. At Sasthamcotta (BHC treatment) the pre-treatment incidence of 56% beetle attack was brought down to 8% within a period of six years.

At Karunagapally (Aldrin treatment) the incidence of beetle attack at the time of pre-treatment was 70 per cent which was reduced to 7 per cent after treatment.

3. A minimum of two years' continuous treatment is necessary to

achieve the reductions in the rate of attack.

4. The data on yield indicate that the ultimate increase in yield that could be achieved in the course of 3-4 years by adopting the above control measures may be of the order of 5-6 nuts per tree per year.

Similar field experiments are proposed to be conducted in other centres in Kerala State with different topographical and climatic conditions which may enable us to give more specific recommendations to suit the different regions of the State.

The importance of co-operation in plant protection practices among ryots needs no emphasis. In perennial crops like coconut, the control of pests like *Oryctes* should not be restricted to small gardens owned by individuals. The pest is a good flier and is not a respecter of even international boundaries. In other words, the best results are obtained when the control measures are operated in extensive areas rather than in small holdings. Hence the need for collective drive against the pest. Denying oviposition sites to the beetle by treating all possible breeding sources with 0.01 per cent BHC/Aldrin is an important factor contributing to the success of the campaign.