NEW TECHNOLOGY IN CROP PROTECTION

P A C R Perera
Coconut Research Institute, Lunuwila.

The coconut palm, like any other plant is attacked by pests and diseases. Fortunately, serious coconut diseases such as Cadang Cadang, prevalant in the Philippines are not found in Sri Lanka, but the insect pests can be a major threat to the coconut industry and are capable of inflicting considerable economic damage. The insect pests of coconut could be categorized into:

(1) Major Pests
(2) Minor Pests
(3) Lesser known Pests.

The first group contains four insects; they are the coconut caterpillar, red weevil, black beetle and the leaf miner insect. The second group contains the coconut scale pest, nettle grub bag worm and termite. Of the major pests, the most important is the coconut caterpillar, *Opisina arenosella.*

The larval stage of the coconut caterpillar damages the coconut leaf. The female moth lays eggs on the underside of the leaflet. The resulting caterpillars (larvae) eat the leaf tissue except the upper epidermis. As a result, the leaflets dry up and become brown. As the pest population increases, the damage intensity is also increased. The fully grown caterpillar is about 15 mm in length and has a dark brown or blackish head. The body is slightly greenish with reddish spots. The caterpillar develops into the resting stage (called pupa) which finally develops into a moth. The female moth lays about 150 eggs.

Normally the coconut caterpillar is kept under control by the parasitoids found in the field. The parasitoid population decreases during unfavourable weather conditions. Recent investigations have revealed that very high and very low temperatures affect the development of parasitoids and reduce their population.

High temperatures affect some parasitoids while some others are affected by low temperatures. Normally, when the day temperature is very high, the night temperature is low. It has been shown that a temperature of over 32 C will cause a reduction in the parasitoid population and will thereby allow an outbreak of the coconut caterpillar. These data are used in optimising the use of parasitoids in the field.

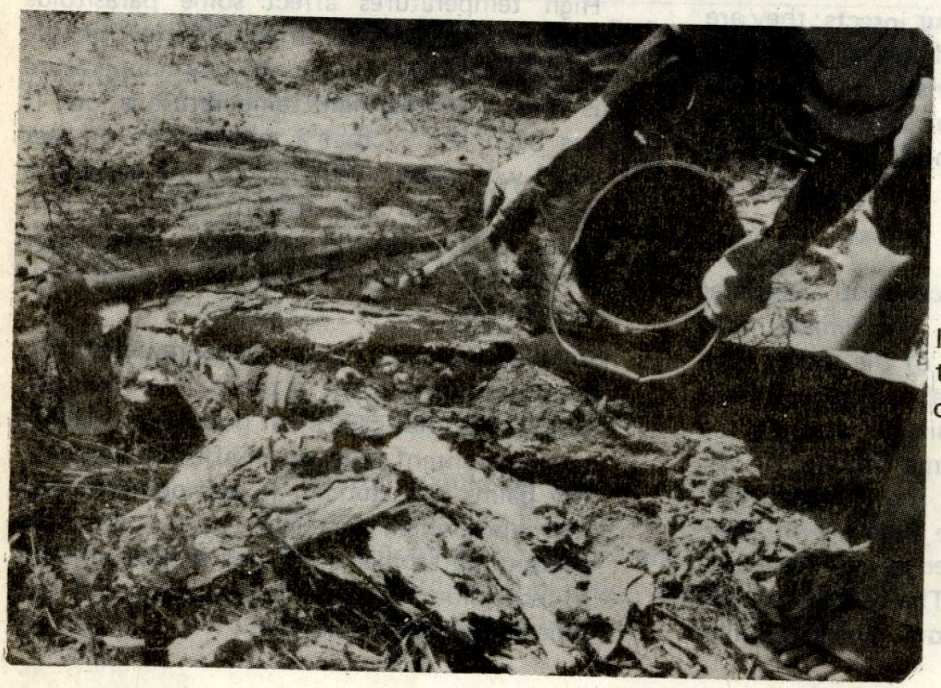
Some of the recent experiments revealed that the potassium content of the leaf is correlated withthe coconut caterpillar population. The potassium content of leaves of affected and healthy palms was studied. It was observed that the palms which are regularly attacked by the coconut caterpillar contained a lesser amount of potassium. Further investigations on this aspect are being carried out.

The female coconut caterpillar produces a special chemical to attract the male. These chemicals are referred to as sex pheromones. Preliminary investigations to identify this chemical have been completed, and it is hoped to synthesise the chemical in the laboratory. This chemical can then be used in the field to monitor the pest population is an "early-warning system".

The worm (larvae) stage of the red weevil attacks the young palms. These larvae feed on the immature and soft tissue inside the trunk. Until recently, this pest was controlled by the application of systemic insecticides, using a funnel. However, techniques have been developed to control this insect using such insecticides, applied through a hole drilled with an electric drill or through a live root. The leaf miner pest *(Promecotheca cumingi)* and the coconut scale pest *(Aspidiotus destructor)* could be controlled using systemic insecticides in this manner.

Another major pest is the black beetle, the adult of which cause damage to palms of all ages. They bore into the unopened bud. When such buds eventually open, characteristic geometric cuts are visible. The immature stages of this pest are found in cow dung heaps, in ganic matter and in rotting coconut logs. The pest could be effectively controlled by destroying the breeding grounds.

The immature stages which live in these breeding grounds could be controlled by using a mold, *Metarhizium anisopliae* and a virus, *Baculovirus* of *Oryctes*. This mold and the virus infect the larval stage of the black beetle thereby killing it. These pathogens disseminate rapidly, thereby controlling the pest. The mould is multiplied in the laboratory on maize grains and is distributed to places where the black beetle breeds.



Introducing the fungus in to the breeding grounds of black beetle.

PRESIDENTIAL AWARD FOR THE CHAIRMAN COCONUT RESEARCH BOARD

Dr. D.Vincent Liyanage, the Chairman of the Coconut Research Board, Sri Lanka was honoured with the presidential award, "Vidya Nidhi" (first class) on 22-05-87 for his scientific achievements and contribution in the field of coconut research.

Dr.Liyanage's scientific carrier started at the Coconut Research Institute, Sri Lanka in 1945 as a Research Officer and ended up in 1966 as Head of the Division of Botany. During this 21 years of service in Sri Lanka he initiated and executed a coconut breeding programme to produce improved varieties, including germplasm survey and variety tests. His work also included rehabilitating senile coconut plantations, production of improved seed required by the industry and the establishment of one of the earliest seed gardens.

From 1966-1981, he was attached to the FAO and worked in Tonga Islands, Maldive Islands and Indonesia.

Dr.Liyanage has also served in FAO consultancy missions to Fiji Islands, Indonesia and Philippines Governments and has also visited many other countries viz. Hawaii, India, Ivory Coast, Jamaica, Malaysia, Thailand and Western Samoa, to study the coconut industry.

Since 1983 Dr. Liyanage has been the Chairman, Coconut Research Board, Sri Lanka.