

Coconut palm is susceptible to attack by several pests which can reduce its growth and yield. Pests are organisms causing undesired conditions by imposing themselves when they are not wanted. The pests can be insects, mites, mammals (rodents), pathogenic micro organisms or weeds. Protection of the coconut palm at all of its stages of growth and the harvested crop especially the Copra is essential to get maximum profit by the cultivator.

Coconut being a perennial crop, the harmful organisms can survive and multiply due to the continuous availability of food and shelter in the plantations. Therefore the crop protection measures differ from those of the annual crops. Further as the palms are tall spraying chemical insecticides is difficult. Thus the pest management requires integration of various methods which are relevant to the specific conditions of the pest infestation.

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Crop Protection of Coconut

In Sri Lanka the coconut palm is subjected to attack by five major insect pests, four minor insect pests and more than ten lesser known insects and mites. The caterpillar, *Opisina arenosella*, the Red Weevil, *Rhynchophorus ferrugineus*, the Scale, *Aspidiotus destructor*, the Black Beetle *Oryctes rhinoceros* are important pests at the moment. The Leaf Miner, *Promecotheca cumingi*, a serious pest of coconut about ten years back is now found in only one coconut plantation. Termites, Nettle Grub, Bag Worm and Yellow Spotted Locust are minor pests and are less common.

Rats, bandicoots and porcupines attack seedlings. Rats, squirrels and bats attack tender nuts.

Copra is infested by several species of insects in the stores. These reduce the quality of the copra and the products derived from it.

Some pathogenic fungi can cause serious damage in neglected plantations especially during the rainy seasons. The diseases caused by fungal pathogens such as Bud Rot, Leaf Blight and Stem Bleeding are common in some plantations. Leaf Scorch Decline and tapering of trunk at the apex are also common disorders. The causal agents for these two disorders are not known yet.

Methods of Crop Protection

The long term means of crop protection which every farmer and grower looks forward to is the development of resistance by plant breeding. However, insects and pathogens mutate and frequently new strains arise which overcome the induced resistance. We do not have resistant varieties of coconut against our major pests. However, our varieties are apparently resistant to some serious pests recorded in other countries. Mites cause severe damage to developing fruits on some commercial varieties grown in Pacific Islands but in Sri Lanka mites are not serious pests on coconut.

Plant Quarantine

We do not import planting material into our country without adequate plant quarantine measures in order to prevent the introduction of new pests and diseases. However, in the past the Coconut Leaf Miner pest was introduced into our country accidentally. Similar introductions of pests occurred in several other countries too.

Using natural enemies—The idea of biological control

We use natural enemies to help manage many pests. This is called biological control. By this method one kind of organism is kept in balance by another kind of organism. Harmful insects can be managed by other beneficial

insects or by diseases. Weeds can be managed by insects or by plant pathogens. Rodents can be kept in check by larger animals such as cats and owls. For further details on biological control please refer page—.

In nature natural enemies work in groups. Populations of organisms affect one another. The way populations affect one another can keep a pest organism from becoming a problem.

Biological methods are important in an integrated pest management programme. However natural enemies are not available for the control of all of the pests of coconut. Chemical pesticides have to be used under such circumstances

Chemical Pesticides

Chemical pesticides are useful to arrest the spread of a serious pest in a plantation in the initial stages. On young palms when caterpillar infestation is severe we recommend spraying of chemical insecticides which have low residual effect to reduce the pest population. Carbaryl is suitable for this purpose. Later parasite releases can be made. When only a few very tall palms (15-20 meters) are infested with scales or caterpillars 15-20 ml of a systemic insecticide such as 60% monocrotophos may be injected into the trunk by making a fresh hole of about 15 cm deep. This will be translocated into the leaves and the insect pests will be killed. Nuts harvested from these treated palms should not be consumed for at least 2 months after treatment.

For the control of Red Weevil and Termites, we recommend chemical insecticides because there are no suitable natural enemies to control these pests. Black Beetle damage to seedlings and young palms should be prevented by treating crowns with chemical insecticides, in addition to the use of pathogens, destruction of breeding grounds and establishment of a continuous green cover.

Our officers will inspect the pest infested plantations to determine the necessity for spraying chemical insecticides.

Diseases of coconut are less serious than the insect pests in Sri Lanka. However in plantations with poor management with nutrient deficient soils leaf blight can damage seedling leaves severely.

Proper fertilizer application and spraying of copper based fungicides as a preventive measure will be useful.

Over crowding of palms, excessive shade due to trees like jak, mangoes etc. can induce fungal infections due to slow drying of moisture on coconut leaf surfaces and crowns. This can be avoided.

In the plantations regular surveys, once a month should be carried out to detect the pest infestations. If adequate control measures are taken at the initial stages of an insect infestation or a disease incidence heavy expenditure on crop protection can be avoided. The Coconut Development Officer in your area should be consulted first and his recommendations be carried out without delay. However, if satisfactory results are not obtained, you may write to the Director, Coconut Research Institute and seek advice. Information on exact nature of the damage, the extent of the damaged area and directions to your land should be given. If possible you should send a small sample of the damaged portion of the palm and the pests for correct identification. We will take necessary action to help you to protect your crop.

Mass rearing and releasing of parasites against the coconut caterpillar is being carried out in our laboratories. These parasites are supplied to the growers free of charge.

If the pest infestation is severe chemical insecticides have to be sprayed to reduce the population before parasites can be released. Our officers will help the growers to use our power sprayers to spray the insecticides but the cost of the chemical and labour should be borne by the owner of the land.

As chemical insecticides are poisonous to man and animals reared in the estate adequate precautions should be taken to avoid poisoning.