

TRUNK INJECTION OF SYSTEMIC INSECTICIDES

The important leaf-eating pests of coconut in Sri Lanka include the black headed caterpillar, *Opisina arenosella*, the coconut scale, *Aspidiotus destructor* and the leaf miner, *Promecotheca cumingi*.

The leaf miner and the scale pests are effectively kept under control by their natural enemies in the field. Hence chemical control measures are rarely required. On the other hand, the natural enemies of the coconut caterpillar are effective only under certain weather conditions. The control achieved is therefore not always satisfactory.

Coconut caterpillar infestations are common in all coconut growing areas in Sri Lanka. In severe outbreaks, the mature fronds of palms in large tracts are reduced to dead brown tissue with only a few young leaves remaining green.

In outbreak situations it is often necessary to resort to the use of insecticides for the control of the caterpillar. However, spraying of insecticides to the crowns of tall palms requires motorised power sprayers and is therefore difficult, causing considerable environmental pollution. Spraying of insecticides is also harmful to the natural enemies of the pest.

Recent studies have clearly shown the possibility of controlling leaf-eating pests, using systemic insecticides injected into the palm. Systemic insecticides when applied to a plant are translocated from the point of application to other parts of the plant through the sap and thus kill insects feeding on the treated plant.

Among the different techniques of application of systemic insecticides, application by trunk injection and feeding through the roots are the most effective techniques for the control of the leaf-eating pests. In trunk injection an oblique hole, 1 cm in diameter and about 10 cm

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in depth is drilled on the trunk at a height of about 1 m from ground level or at any other convenient height to the operator and the undiluted systemic insecticide is poured into the hole.



Making a hole on the trunk with the electric drill.

In root feeding technique, two healthy roots in each palm are exposed and cut and the cut end of the intact root dipped into the systemic insecticide in a glass tube. The insecticide could be diluted with water for quicker absorption. The insecticide will be absorbed by the palm and translocated to the crown within 1-3 days depending on the age of the palm and the prevailing weather conditions. If the insecticide was not absorbed by the root within three days the application should be repeated with another freshly exposed healthy root. For both techniques of application, 6 ml of 60% monocrotophos or 60% methamidophos per palm will be adequate.

Application of systemic insecticides by trunk injection and root-feeding has many advantages over other methods of application. With these methods there will be no pollution of the environment, parasitoids attacking eggs and the resting stage of the pest (pupa) are not affected and only those parasitoids which attack the caterpillars feeding on treated palms will be affected.

A major advantage is that timing of insecticide application is much less important than when spraying because the systemic insecticide persists long enough to kill overlapping gene-

rations of the pest. The application of systemic insecticide does not require expensive power sprayers and repeated application. It is not labour intensive and could be used, when the terrain or the height of palms preclude the use of sprayers. The quantity of insecticides required is low for trunk injection and for root feeding whereas much more insecticide would be necessary for soil application or for spraying the leaves. Much of the insecticide sprayed or applied in the soil is wasted if rain follows the application whereas the insecticide applied by trunk injection or root feeding using a glass tube could be protected from being washed off.

Application by trunk injection is quicker when electric drills are used, but a permanent hole is left on the trunk of the palm. On the other hand, root feeding does not cause damage but is easily done only in sandy soils. In gravelly, clayey or other hard soils, exposure of roots is difficult and time-consuming. Trunk injection is therefore an ideal method to rapidly control a pest outbreak while sparing the natural enemies, thereby lowering the chances of subsequent resurgence of the pest. This method would enable the simultaneous use of biological and chemical control methods.



Administering the insecticide.

Pesticide residue analysis of edible parts of coconut palms treated with monocrotophos revealed that the residue levels were below the levels approved by the Food and Agriculture Organization (FAO) and the World Health Organization (WHO).

The Coconut Research Institute (CRI) has a fully equipped crop protection service facility to treat coconut palms with systemic insecticides by trunk injection using electric drills. When an infestation is notified to the Director, CRI, it is inspected to ascertain the control measures required. If treatment by trunk injection is indicated, the CRI will provide the crop protection facility free of charge. However the grower has to provide the following:

1. Insecticide, usually at the rate of 6 ml of 60% monocrotophos or 60% methamidophos per palm.
2. Fuel for the electricity generators.

3. Labourers to handle the generators and the drills.
4. Fungicide to treat the injection hole if wet weather prevails.

In a plantation, about 600 palms/day could be treated using two electricity generators.

As the insecticides, monocrotophos and methamidophos are very toxic to human beings, these should be used with great care and the following precautions should be taken.

1. The mature nuts should be harvested before insecticidal treatment.
2. Fresh nuts should not be harvested from treated palms and consumed for at least two months after treatment.
3. Nuts harvested in the first pick after treatment should preferably be used for copra making.
4. Children should not be allowed near the treated palms for about two weeks after treatment.

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