RED WEEVIL AND ITS CONTROL

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Introduction

Among the insect pests of the coconut palm, the Red Weevil (*Rhynchophorus ferrugineus*) is most capable of destroying palms. It is present in all coconut growing areas in Ceylon. In places where infested palms are left unattended, the insect breeds heavily and as their numbers increase, all young palms in that area are in danger of its attack. In the replanting and new planting projects, the danger of the Red Weevil pest should be considered seriously. The first steps in the protection of palms is vigilance and adoption of preventive measures.

Identification

The Red Weevil is a fairly known pest insect in coconut plantations. Yet there appears to be some confusion in identifying this pest correctly. The following notes should be helpful.

The weevil is reddish brown in colour. It measures about $1\frac{1}{2}''$ long and $\frac{1}{2}''$ broad. It bears a snout, which is usually broader in the male than in the female. The snout of the male weevil has a brush of hair towards the apex. The picture (Plate I) below is that of a male and female weevil.

The female weevil lays eggs; sometimes as many as two hundred and fifty by a single female. An egg will measure, approximately, 2.2 mm. long, 1 mm. broad. They are whitish in colour. They hatch out in 2 to 5 days time. Plate II, is a picture of freshly laid eggs.

The eggs hatch out to produce larvae or grubs. These grubs are fleshy, without legs. The head is brown; the body is white. The grub has a mouth adapted for biting and chewing.

They grow into large sized grubs, passing through several stages marked by the shedding of skin (moulting). Each stage is called an Instar. Eight instars have been observed in the laboratory before it is fully grown in a period of about 40 days. The picture below (Plates III to X), illustrate the various stages of development.

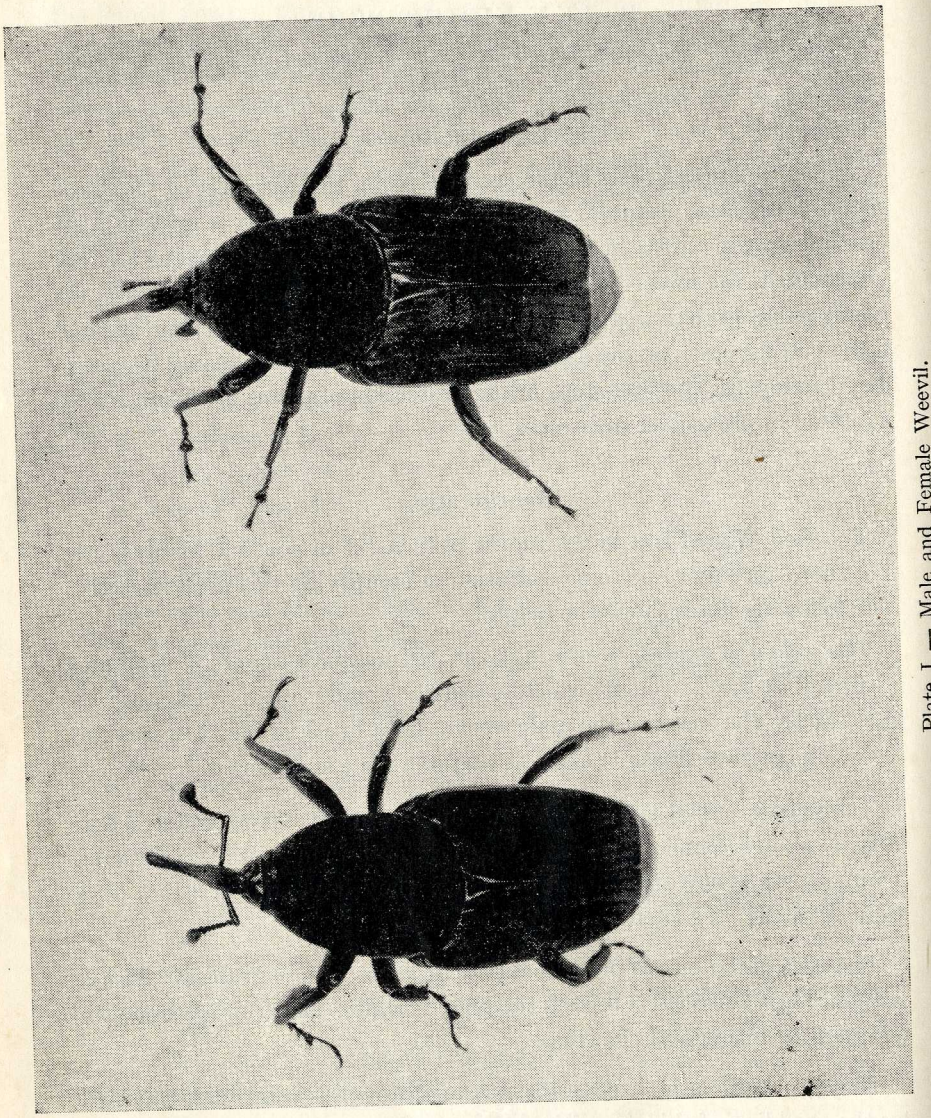

Plate I — Male and Female Weevil.

In that state of inactive life, the insect lives inside the cocoon for nearly 20 days. During that period, a wonderful change takes place, whereby the pupa becomes a weevil. The newly formed weevil will soon mature to emerge from the cocoon and fly out into open space. It will possess that potential capacity to visit young coconut palms and if it is a female its grubs could destroy those palms.

Occurrence and Economic Importance

Thus the drama of its life continues generation after generation. Always, their presence has been found on living coconut palms. Therefore, when one palm is infested all young palms in the neighbourhood are in danger.

In a plantation of ten acres, an infestation broke out which destroyed forty palms completely. The palms were nearly seven years old. When the expense on raising these palms to that age is considered and the cost of replacement and the loss of yield till replacement yield is reckoned, the total loss is very considerable.

Nature of Damage and Detection

Palms from about two to five are likely to be attacked. The damage is caused by the grubs which hatch out from eggs laid in cracks, or wounds on any part of the palm. These grubs bore tunnels forming hollow stems. When they are in large numbers, the stem will soon be reduced to decomposing matter, which may appear and flow out as an exudate from cracks in the trunk of the palm.

When the stem is hollow inside, it is likely to fall with heavy wind.

If the grubs reach the crown of the palm, the palm succumbs to the attack very quickly as the bud dies off. In this case signs of attack may be observed earlier, when the central bud leaf has withered.

It is rather difficult to detect the presence of weevil grubs inside trunks of palms when there are no external signs. However, by careful observation, it could be possible to see a withered bud, the frass that is put out from holes or the exudation from cracks. When the infestation is advanced, there should be holes on the stem and chewed up fibre thrown out from these holes. Some of these wounds become visible when leaf bases are torn off. As the grubs keep feeding, they could be heard, producing a crunching noise, when the ear is placed to the trunk of the palm. It has been suggested that a medical stethescope could be used for this purpose.

Ways and Means of Preventing an Attack

(i) *Vigilance:* When the palms are young, it is necessary to inspect them periodically. It is necessary to look for cracks and wounds on

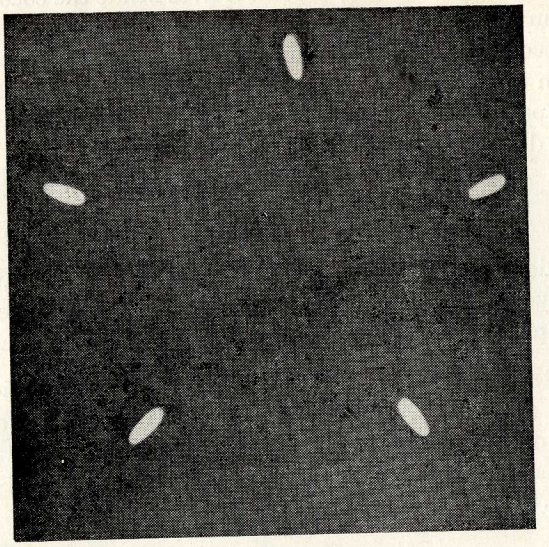

Plate II — Freshly laid eggs of Red Weevil.

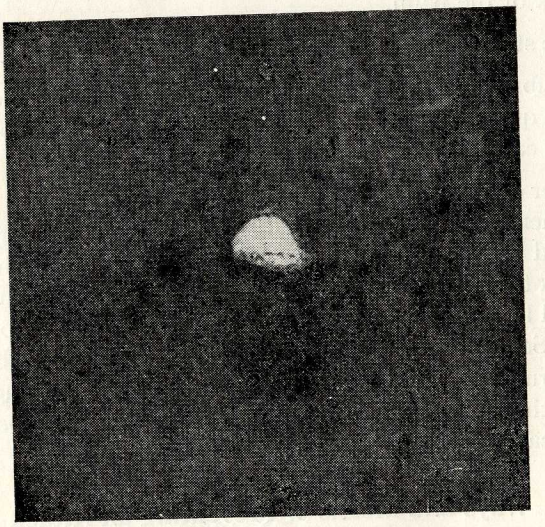

Plate III — Newly hatched grub with egg shell. 1st stage.

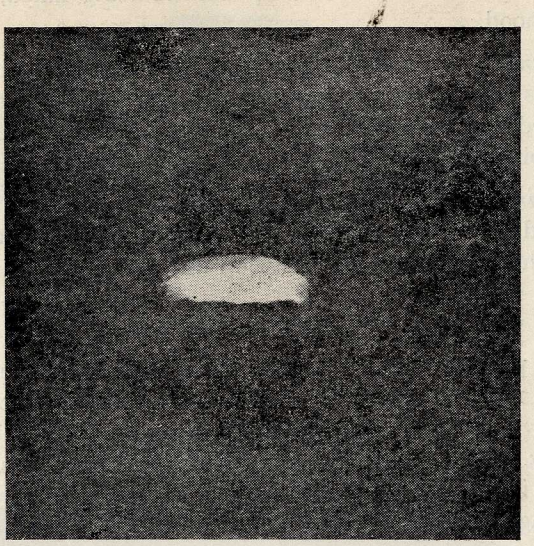

Plate IV — 2nd stage.

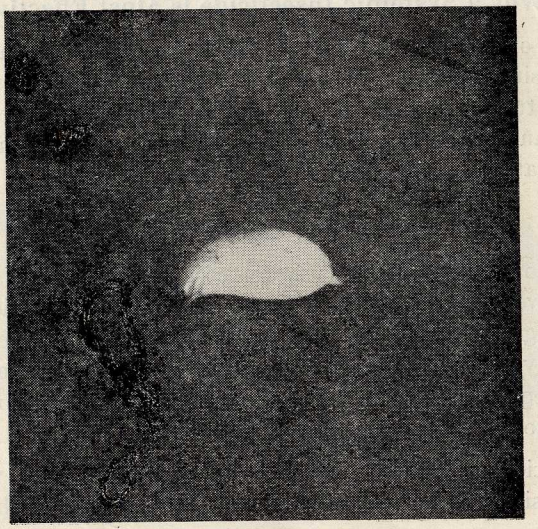

Plate V — 3rd stage.

palms and detect infestations early. A watch should be kept with greater care, in areas where palms are being killed, in the neighbourhood.

(ii) *Prevention of Wounds:* Avoid unnecessary wounding of young palms since all wounds are attractive to egg laying. Wounds are caused by careless harrowing, knife stabbing, driving vehicles over drooping fronds and other careless operations.

(iii) *Treating Wounds:* All wounds should be smeared with tar. Cracks should be treated, periodically, because after one application of tar, the same crack may develop further.

No Biological Control

Up to the present time, no natural enemies of Red Weevil have been observed. In 1957, an observation has been recorded whence some grubs of Red Weevil, in captivity, appeared to be parasitized by *Megaselia scalaris* Loew. This fly has not gained much importance as a parasite, but its behaviour in this instance, has to be watched further before assessing its value as an agent of biological control.

Chemical Control, The Next Weapon of Defence

In the absence of natural control, the compulsory use of an insecticide is evident. *Among the range of insecticides available, some of those which have systemic properties have proved to be effective.

Why a Systemic Insecticide is Most Effective

The grubs of Red Weevil bore into the trunk of palms. They traverse in tunnels, causing hollow stem. Unless the chemical could reach the grubs inside their tunnels, its effects will not be found. An insecticide which gets well translocated in the plant should have more chances of killing the grubs than other insecticide.

The Insecticides, Found Most Effective

When reports of infestations were received, trials with a number of insecticides were done in the field. Out of these, the insecticide *Systox* was observed to give the quickest and the best results. Being easily soluble, it gets quickly translocated in the whole plant system. In an over-dose (i.e. more than required for killing Red Weevil grubs), it was observed in the leaves (phytotoxic effects).

The insecticide Pyrenone, which is also recommended, was found to be not so easily translocated in the palm. Yet control has been obtained

*A systemic insecticide is one that will go into the whole plant system, i.e. root, stem, leaves, etc.

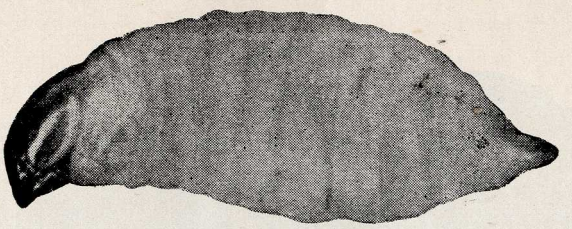

Plate VI — 4th stage.

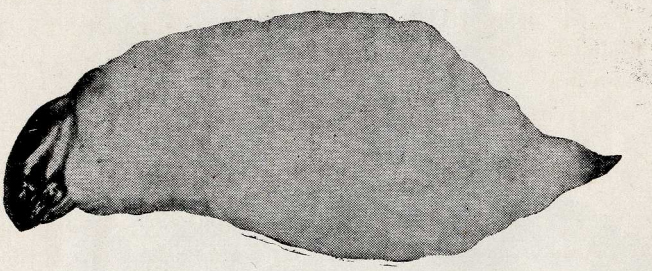

Plate VII — 5th stage.

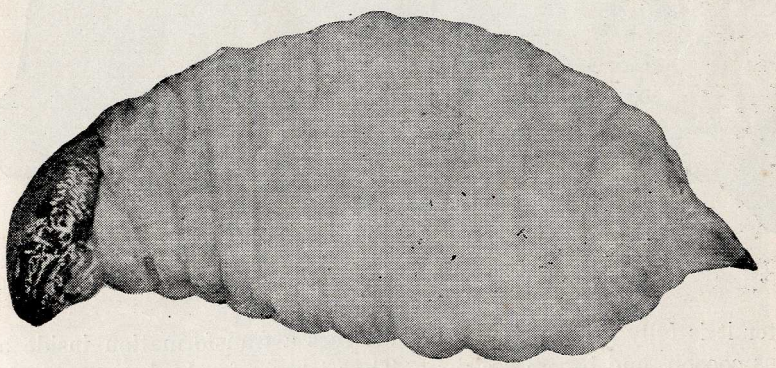

Plate VIII — 6th stage.

Plate IX — 7th stage.

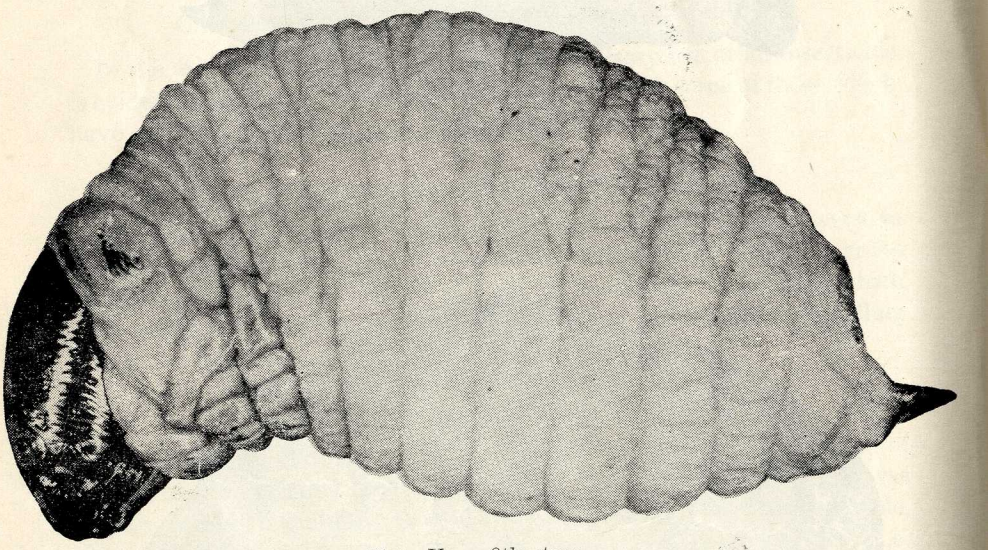

Plate X — 8th stage.

After it is fully grown, the grub undergoes a transformation inside a fibrous cocoon, and becomes a pupa. The picture of a broken cocoon is given below, showing the pupa inside it.

Plate XI — Pupa in Cocoon.

in some instances, with the use of this insecticide when it was applied above the area of infestation.

Treatment (when grubs are present).

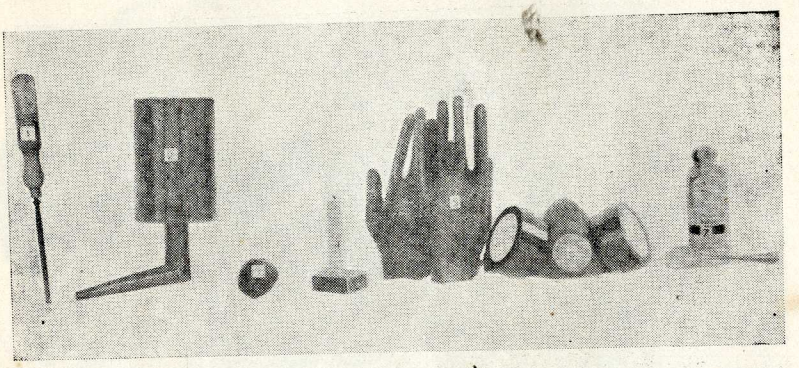

Plate XII — Tin funnel and other articles.

1. *Requirements:*

   (i) Two (2) teaspoonsful of systox, per treatment.

   (ii) Make a tin funnel. To an empty tin, that can hold 2 cups of water, get a funnel stem fixed by a tinker. There should be no leaks. It should have a tightly fitting lid — (vide illustrations). Paint it in red, if possible.

   (iii) Sealing material. This is prepared by heating together, old jak tree latex and a little of gum resin. When cooled, it will set hard like sealing wax.

   (iv) One chisel — $\frac{1}{4}$" size.

   (v) One box of matches and a candle.

   (vi) One bucket of water, soap and towel — required to wash body in case of accidental spilling of insecticide.

   (vii) One pair of rubber gloves.

   (viii) One respirator (may not be necessary if operations are carefully done).

2. *Methods of Application:*

   (i) On the trunk of the palm, a few inches above the area of infestation, drill a hole in a downward, oblique, direction. Use the chisel. Make the hole about 2" deep. The width of the hole should be as small as possible.

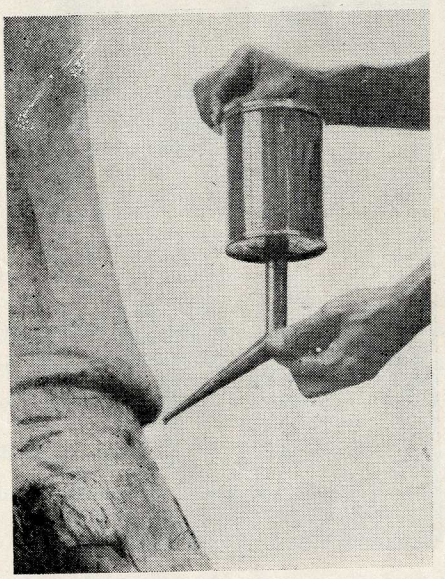

Plate XIII — Fixing funnel to stem.

(ii) Insert the funnel stem, keep the funnel in an erect position (vide illustration).

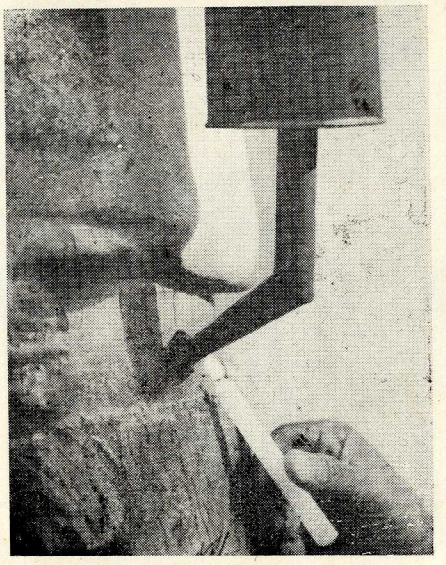

Plate XIV — Applying sealing material.

(iii) Warm the sealing material and apply it round the funnel stem, at the mouth of the hole in the trunk of the palm. This should be done properly. (Light up a small fire. Heat the edge of the chisel with the heated chisel, the sealing material could be well plastered).

(iv) After about five (5) minutes, pour about $\frac{1}{2}$ cup of water to check whether there are leaks. If there are leaks, the funnel should be pulled out, cleaned and fixed again.

(v) If there are no leaks, pour more water into the tin funnel, till the quantity is 2 cups full.

(vi) Wear the pair of rubber gloves (important), and the respirator, if available.

Plate XV — Measuring Chemical.

(vii) Measure out 2 teaspoonsful of *systox* and pour it into the tin funnel. Do it carefully to avoid spilling. Stir with an ekel and bury the ekel. *Close the systox container without fail.*

(viii) *Close the lid of the tin funnel.*

(ix) Wash hands and gloves with soap and water.

(x) Fix a warning board or tag, if necessary.

Precautions

Systox is a deadly poison. The chemical can be absorbed through the skin. The following precautions should be STRICTLY observed.

(i) Always wear a pair of gloves.

(ii) No spraying should be done.

(iii) No smoking or chewing of beetle at time of operation.

(iv) Avoid inhalation of fumes.

(v) Wash hands well with soap and water, after operation.

(vi) Store the chemical bottle in a safe place, preferably, under lock.

Poisoning and Antidote

In case of poisoning caused by negligence or improper handling, a doctor should be summoned, immediately.

The typical symptoms are —

(i) Nausea.

(ii) Giddiness.

(iii) Headache.

(iv) Vomitting.

As an antidote, the doctor will inject atropine (0.5 — 2 mg.), repeated if necessary.

N.B. — There is no risk if precautions are observed.

Cost of Treatment

Items of capital expenditure —

One pair of rubber gloves	4.00
One respirator	5.00
Tin funnel	0.75
Chisel	3.00

Cost per application —

Chemical	1.00
Sealing material	0.15
Labour, 1 man, a hour (approx.) ..	0.30
	1.45

From where to Procure the Chemical

Systox is obtainable from Messrs. Chatham House Ltd., Post Box No. 743, Colombo 1.

(We are not aware of other firms, importing this chemical). Manufactured by Bayer, Leverkusen, Germany.

When to Apply the Treatment

This treatment is applicable when grubs are found inside the trunks of palms. They can be detected from the following observations:

(i) When chewed up fibre is put out from holes in the stem.
(ii) Stem bleeding, when the internal tissue has decayed.
(iii) The central leaves withered and palm about to collapse.
(iv) If the ear is kept tight to the stem, the grubs could be heard making a crunching noise, inside the trunk of palms.

After Care

In about four days after treatment, the grubs will not be heard. Then the funnel could be removed and the hole should be plugged with cement and sand motar (1 : 3).

If there are cavities, these should also be filled up with cement and sand mortar.

Young palms which have been heavily damaged should be supported with props for sometime.