

Life history of Red Palm Weevil

RED PALM WEEVIL— HIDDEN ENEMY OF COCONUT PALM

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RED palm weevil (*Rhynchophorus ferrugineus*) is a widely growing menace to the coconut palm in India. As compared to the other pests of coconut, this tissue boring "hidden enemy that strikes to kill from within" is most dreadful and damaging because, till recently, when once a palm was attacked by this pest, there was very little chance of saving it and it brought about the eventual death of the palm within six to eight months. Formerly, it was regarded as a sporadic pest on coconut and other palms. But now it has become very serious, found throughout the year and levying a very heavy toll on the coconut crop. If this pest goes unchecked and is allowed to multiply at the present rate, the great life-giving tree in Kerala will be moving fast to the brink of disaster. In this article, information gained in the laboratory and field studies on the red weevil at the Central Plantation Crops Research Institute, Regional Station, Kayangulam is furnished to enable the farmer to successfully control the pest.

Host Plants

This pest is also a deadly enemy of the date palm and the sago palm. Besides, it attacks other palms such as the wild date or the toddy palm, the palmyra, the African oil palm, the talipot palms, the sugar palm, the sedang palm, the royal palm, etc.

Distribution and Damage

This and other species of the same genus enjoy a very wide range of distribution and is present in most of



Symptoms of Red Palm Weevil attack

the important coconut growing countries of the world viz., Indonesia, Philippines, India, Ceylon, Malaya, etc. In India it has become very serious in Kerala and is gradually becoming a major pest in other parts also.

The weevil attack is more serious in young plantations between 5 and 20 years of age. The stems of the young palms are soft and juicy and easily penetrated. They nip the coconut palm in the prime of its youth by consuming the tender soft tissues from within, safe and concealed, and eventually cause the toppling of the crown by which time the tree is dead. A closely allied species is vector of the nematode causing red ring disease of coconut in Trinidad. In many parts of Kerala about 5 to 10 per cent palms in the age group 5 to 20 years are attacked by the pest.

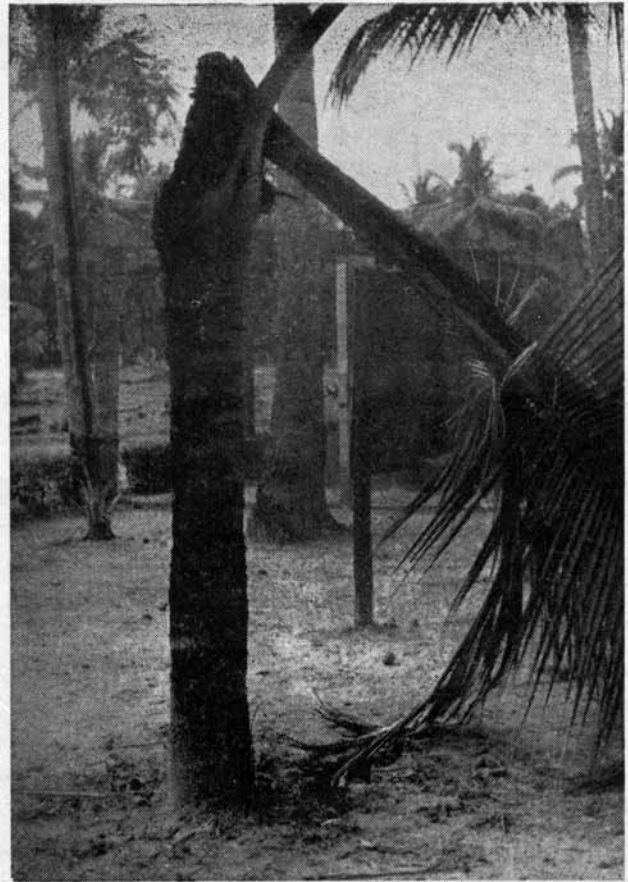
Life History

The weevil has four different stages, egg, grub, pupa and adult. All these are spent on the palm itself and the life cycle cannot be completed elsewhere. Numerous eggs are laid by adults in separate holes or injuries on the palm. Eggs hatch out in two or three days into soft, white, legless grubs which bore into the interior of the palm, moving by peristaltic muscular contractions of the body and feed on the soft succulent tissues, discarding all fibrous material. There is no dearth of food for the growing larvae. The larval period varies from one and a half to two and a half months and when full grown, each grub measures about four centimetres in length. It is somewhat yellowish-brown in colour. The body is more or less distinctly curved, bulging in the middle and slightly narrowing towards the head and tail regions. The grubs pupate in an elongate oval, cylindrical cocoon made out of fibrous strands. At the end of the pupation period which lasts two to three weeks, the adult weevil emerges. Thus the period from egg to adult stage takes about four months.

The male weevil has a tuft of soft reddish-brown hairs along the dorsal aspect of snout; it is absent in the female. The insect is a sombre reddish-brown, cylindrical weevil with a long curved and pointed snout or rostrum.

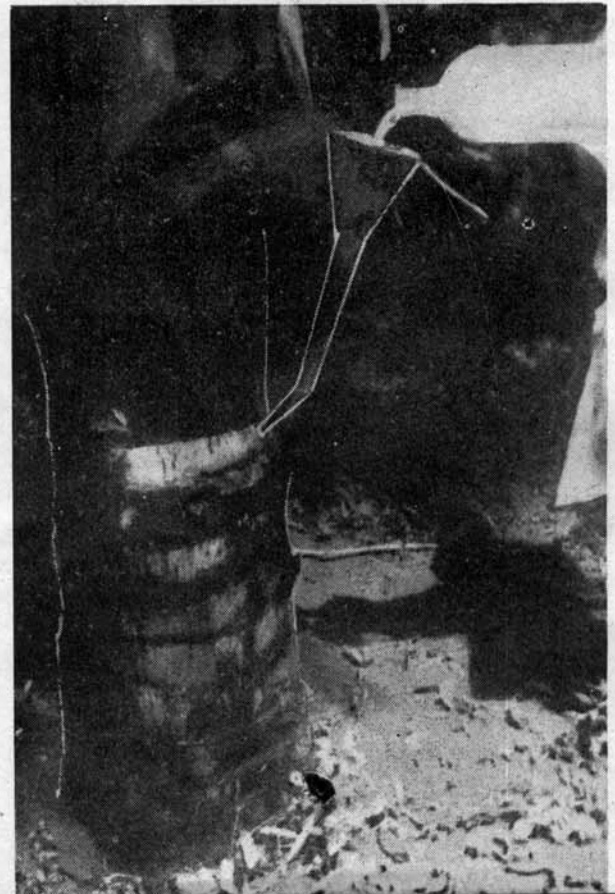
Symptoms of Infestation

Generally, the pest infestation goes unnoticed. The pest offers additional complication in that any measure taken to control the pest should not be harmful to the host plant which harbours the pest. It becomes possible to resort to curative chemical method of control only if timely detection of infestation is made before it reaches the growing point or cabbage. For this a thorough knowledge about the various symptoms manifested by the infested palms is very essential. Infestation by red weevil is broadly of two types—from the crown and through the different parts of the stem including the leaf axil and the bole.



Young coconut palm killed by Red Palm Weevil—see the toppled crown

Application of insecticide



In many cases the attack of the rhinoceros beetle on the spindle leaves or an incidence of bud rot is followed by the attack of red palm weevil. Invariably associated with infestation from the crown wilting or yellowing of inner leaves is observed. This is the most dangerous type of attack because the growing point is damaged much earlier than in others. These, unless detected early, can never be successfully treated. The rotting of crown due to infestation by red weevil gives out a characteristic odour which can, with experience, be differentiated from the foul smell emitted by completely rotten mass of soft portions infected by bud rot.

Leaf axils offer soft and protected areas and, therefore, favourable sites of ovi-position for the female weevil. Tapped trees, steps cut on the tender stems and broken or cut petioles may invite the adults through the aroma of the split sap. In case of entry through the leaf-axils, the green leaves may easily come off when pulled, as the basal parts have been eaten up by the tissue borer. When these leaves wilt, dry up and fall, the presence of small round holes about 2 cm in diameter can be observed on the stem. Very often from these holes are seen exudation of a thick reddish-brown viscous fluid and extrusion of the chewed up and discarded fibres. The bases of attacked leaves sometimes split and extrusion of fibres is seen from the crack. The number of leaves on an infested tree decreases because of the early drying of the bottom whorls and delayed emergence of fresh ones. Presence of cocoon/weevil or chewed up fibres in leaf axils or at the base of the palms on the ground offers another clue for the presence of the pest. The gnawing and nibbling sound produced by the grubs while feeding is easily audible in many cases and is the surest sign of attack.

Timely detection of red weevil infestation to take to effective curative measures of control is made possible with the aid of symptoms often associated with the attack already discussed. In cases where infestation fails to be manifested through external visual symptoms, detection is possible with the help of an electronic device which can pick up the feeding sounds and amplify them to suggest attack with about 70-80 per cent certainty.

Control Measures

Sanitational. The crown of the palms should be kept clean and tidy. Coconut palms or any other host plants killed by the pest should be cut and split into small pieces, pests killed and refuse burnt along with dry rubbish collected from the plantation. Palms especially those between the age groups of 5 and 30 years that are cut for house sites and for laying new road and railway lines should be properly disposed of because these fallen and cut stems facilitate the profuse breeding of the weevil. Along with general cleaning, a thorough search should be made in the leaf axils for adults which should be collected and killed.

Trapping. Adults of the pest can be attracted to pieces of tender stems split longitudinally and placed with the cut surfaces face to face. The weevils can be collected and destroyed at regular intervals.

Prophylactic. In pest control practices preventive methods are always to be preferred to curative. This has to be emphasised in the case of this pest considering its destructive potential. To prevent entrance of the weevil the following measures may be adopted.

Fill the leaf axils of the palms with a mixture of 250 gm 5 per cent BHC dust per palm and sufficient quantity of sand (nearly the same volume) to distribute it to all the leaf axils, thrice a year, say in April, August and December to correspond to the pre-and post-monsoon periods. This protects the palm against both the red weevil and rhinoceros beetle and will cost only about half a rupee per palm per year. It is advisable to fill the tunnels bored by the rhinoceros beetle after extracting the pest, if any, with 5 per cent BHC dust to prevent the subsequent entry by the red weevil.

Curative—chemical method. The infestation can be controlled by the administration of Pyrethrins-piperonyl-butoxide (Pyrocon-E) or Carbaryl (Sevin) at one per cent concentration. These insecticides were selected from an array of more than twenty modern insecticides—chlorinated hydrocarbons, organophosphorus compounds, botanical insecticides and carbamates. The two were highly effective against the pest, least harmful to man and host plant. Administration of insecticides into the infested palms is a simple process. Any layman can do it with the aid of some simple instruments devised at the Central Plantation Crops Research Institute, Regional Station, Kayangulam. The materials required are (1) Pyrocon-E or Carbaryl suspension, (2) red palm weevil injector, (3) auger, (4) measuring vessel, and (5) cement plaster or mortar.

Plug all holes on the stem of palm with mortar or cement and allow it to set. Then locate the portion of serious attack and make a hole just above that region with the auger. The direction of the auger should be slanting. Then insert the nozzle or spout of the funnel into the hole and gradually pour the insecticide suspension. Retain the funnel in this position until the required fluid has percolated into the infested palm. In cases where the inside is largely eaten the fluid will rush in. Otherwise percolation will be slow and gradual. Injection at two or three different points around the stem is necessary in order to ensure that the chemical reaches all the grubs and adults present in remifying chambers produced by the feeding of the grubs. If the point of entry of the pest is from the top of the crown, leaves wilt and dry at that end. Cut off the infested area above the growing point, taking care not to injure the cabbage, and pour the insecticide suspension slowly over it. In such cases there will not be any need for injection.