

STEM BORER

IMPORTANCE

Zeuzera coffeae (Lepidoptera) attacks many other hosts apart from cocoa and is found in South East Asia and Papua New Guinea. In parts of Indonesia, stem borers are increasingly becoming a pest.

Pantorhytes species (Coleoptera) are found usually in the islands of New Guinea and the Solomons, although one species is found in Cape York Peninsula of Australia. Six *Pantorhytes* species are primary pests and at least eight others have been associated with stem boring damage of cocoa.

Other stem boring insects occur but these are of local or minor importance.

SYMPTOMS

The larvae attack stems that are from 1.5-20.0cm in diameter causing damage to seedlings and mature trees. The tunnel bored by the larva has a single entrance hole at its base and it runs length-ways inside the stem and is not normally longer than 30cms. The entrance hole is the same width as the tunnel.



Stem borer larva in length-ways tunnel inside stem, when the larva is active inside, a sticky sap dribbles down the bark causing a distinctive dark water stain. In thin stems the tunnel is simple but in larger stems several tunnels may start from one entrance hole. Stems of medium thickness may have side tunnels in the form of a loop. Tunnel entrances in cocoa taproots have been found as deep as 20cms below the soil. Sometimes the bark of the trunk and larger branches splits lengthways at a point not more than 30cms above the entrance hole. Such cracks are superficial but considerable amounts of sticky sap can escape.

Attack by stem borers allows many diseases to gain entrance into the cocoa tree, such as *Phytophthora* species, which will cause extensive stem and trunk cankers and often lead to sudden wilt and rapid death. This process is worsened by successive prolonged wet seasons.



ECOLOGY

Zeuzera coffeae adults are called leopard moths because of the pattern of dark bluish spots on a translucent white background on the forewings.

Sticky strings or groups of pale yellow eggs are laid on small stems and branches. No attempt is made to hide them in bark cracks. After about 10-11 days the eggs turn dark yellow-red before hatching. The larvae stay together and spin a communal web. From this web each larva lowers itself on silk threads. The threads are caught by the breeze and act as 'parachutes' and the larvae can be carried considerable distances. The death-rate is very high at this stage, but a larva lucky enough to land on a suitable host bores into the bark. Early tunnels may be formed in thin stems (petioles), which are later deserted for thicker stems. In cocoa the larvae tunnel up to 30cms along the centre of a branch and finally makes a cross tunnel before pupation. The pupa sticks out of the entrance of the cross tunnel before emergence.



MANAGEMENT

Cultural control

Pruning of infested branches does reduce stem borer populations but is labour intensive. Hand picking of adults and removal of larvae using pieces of wire can achieve good results but it must start as soon as infestation is spotted. Also unfortunately this method can cause serious damage to the trees if not undertaken very carefully and its use should be strictly limited.

Planting of barrier crops such as dense stands of taro or sweet potato or *Pueraria* species has also been suggested. The stands should be at least 15 m wide and established early for new plantings, removing alternative host plants is also recommended.

Leucaena glauca has also been recommended as a barrier crop, however if left unmanaged it can become a pest because of its rapid growth and its ability to crowd out native vegetation.

Biological control

In Java, larvae of *Z. coffeae* are parasitised by *Bracon zeuzerae* (Hymenoptera). In Malaysia, *Eulophonotus myrmeleon* larvae are parasitised by a *Glyptomorpha* (Hymenoptera). However, none of the many parasites and predators of *Pantorhytes* has shown any promise of providing natural control.

Live larvae are less likely to be found in trees foraged by the ants, but the introduction of ants into cocoa orchards is difficult.

The fungus *Beauveria bassiana* infects larvae of *Z. coffeae* but there is no commercial product available at present.

Woodpeckers will frequently peck out borers.

Chemical control

There is no effective chemical control that does not involve using highly toxic and expensive chemicals.

Spraying highly toxic chemicals kills parasitic wasps such as Ichneumons (Hymenoptera). Spraying stopped at the end of 1961 and by the end of 1962 the populations of *Zeuzera* declined dramatically following the increase of parasitic wasps.

CROP LOSSES

Uncontrolled outbreaks can cause severe losses due to damage to the pod bearing branches.

PREFERRED SCIENTIFIC NAME

Zeuzera coffeae Nietner

Taxonomic position

Domain: Eukaryota
Kingdom: Metazoa
Phylum: Arthropoda
Subphylum: Uniramia
Class: Insecta
Order: Lepidoptera
Family: Cossidae

DISTRIBUTION MAP



- = Present, no further details
- = Widespread
- = Localised
- = Confined and subject to quarantine
- = Occasional or few reports
- = See regional map for distribution within the country

Crop Protection Compendium 19/03/2014

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