Coconut leaf beetle

Brontispa longissima

Scientific name: Brontispa longissima (Gestro)

Synonyms: Brontispa castanea, B. froggatti, B. longissima var. Javana, B. reicherti, B. longissima var. selebensis, B. simmondsi, Oxycephala longipennis, O. longissima

Common names: Coconut hispine beetle. Coconut leaf hispid, Coconut leaf beetle, Palm leaf beetle

Taxonomic position: Phylum: Arthropoda
Class: Hexapoda, Order: Coleoptera
Family: Chrysomelidae

Introduction: The coconut leaf beetle (Brontispa longissima) is one of the most damaging pests of coconut and other palms. The larvae and adults of the beetle feed on the soft tissues of the youngest leaf in the throat of the palm. Affected leaves dry up, resulting in stunting of the palm and reduced nut production. Prolonged attacks on young palms can lead to their death.

Hosts: The beetle attacks more than 20 palm species with coconut (Cocos nucifera) being the most favored host. Other hosts include Royal palm (Roystonea sp.), Alexandra palm (Archontophoenix alexandrae), Sago palm (Metroxylon sagu), California fan palm (Washingtonia filifera), Mexican fan palm (W. robusta), Bottle palm (Hyophorbe lagenicaulis), Chinese fan palm (Livistonia chinensis), Madagascar palm (Chrysalidocarpus lutescens) and Areca nut palm (Areca catechu).

Distribution: The leaf beetle is a native of Indonesia (i.e. Aru Islands, Maluku Province, Papua Province) and Papua New Guinea, including the Bismarck Archipelago. It is currently distributed in Australia (Darwin, Broome, Moa Island, Cooktown, Cairns, Innisfail, Maroocla and Townsville), many Pacific Islands, Malaysia, Singapore, Cambodia, Laos, Thailand, Vietnam, the Maldives, Philippines, Myanmar and China (Hainan, Guangdong and Taiwan provinces, with Hainan Islands, the worst affected).

Biology of the beetle: The adult coconut leaf beetle is 7.5 -10 mm long and 1.5 - 2 mm wide, with a flat body that is black in color and an orange head and shoulders. The adult male is generally smaller than the female. The larvae and adults are nocturnal in habit and remain in the unopened leaflets, moving outside only to infest nearby palms or for mating. The beetle is capable of only short flights - often only a few hundred meters - so its natural spread is slow. The eggs are brown and flat (1.4 mm long and 0.5 mm wide), commonly laid in longitudinal rows (surrounded by debris and excrement) in the unopened leaflets of both young and mature
Symptoms of attack and damage: The beetle attacks palms of all ages, but young palms are more susceptible than older ones, because the heart leaves of old palms are firmer and less suitable as breeding grounds for the beetle. Larvae of the beetle chew on large areas of the surface of leaflets still in the throat of the palm (the spear leaf), which causes the death of underlying tissues. Such leaflets show longitudinal white streaks. As the leaf emerges, the leaflets curl and turn brown, giving a characteristic scorched and ragged appearance. Photosynthesis is reduced to zero in affected leaflets. As the spear unfurls, the beetle moves on to other palms or the next emerging spear. The beetle does not attack leaves that emerge undamaged. Severe attacks destroy unopened leaves, affect growth of the palm and reduce its productivity. In most cases, all the central leaves of affected palms appear brown and fruit shedding is common in such palms. Stunted palms with less compact hearts are more susceptible to leaf beetle attacks. Damage caused to millions of palms and substantial yield loss have been reported from countries infested by the beetle. A study commissioned by FAO showed that, if left uncontrolled, beetle infestations would cause in excess of US$ 1 billion damage in Vietnam alone.

Spread: The coconut leaf beetle spreads mostly through the movement of infested palms. Its natural spread is very slow since the beetles cannot fly long distances. Shipments of ornamental palms from infested countries have been the main source of spread within the Asia-Pacific region.

Control:

Mechanical - Blockading and cutting of coconut palms up to three kilometers from the infestation spot are done to prevent the beetle from spreading. The pest is also controlled by pruning, clean culture and proper disposal of infested coconut palms and parts thereof.

Chemical - Several insecticides including imidacloprid, dialedrin, aldrin, phosdrin, aldicarb, dichlorvos, fenthion, monocrotophos, chlorfenvinfos, idiofenphos, trichlorphon, quinalphos, deltamethrin, dimethoate, cypermethrin, diazinon, azinophos, methidathion and chlordane are being used to control the coconut leaf beetle. Some insecticides are also injected in to the trunk of infested palms. However, the effect of these treatments lasts only for 3-4 months. Repeated applications may be impractical and uneconomic and cannot be used as a long-term control measure. In China, hanging insecticide bags on infested palms has been attempted successfully to check the spread of the beetle.

Biological - Two parasitoids of coconut leaf beetle viz., Tetrastichus brontispae and Asecodes hispinarum, have been successfully used in several countries to control the beetle. Use of the entomopathogenic fungus Metarrhizium anisopliae is also promising.

Strategies to avoid further spread: Since the spread of the beetle is mainly through the movement of beetle-affected palms, all palms meant for transportation from known areas of infestation should be checked to make sure they are beetle-free. A simple inspection of the young leaves in the throat of the palm will be sufficient. To avoid further spread, non-infested countries in the region should adopt strict quarantine measures to control the import of plant materials, soil and any organic materials from infested countries. Potential spread through animals and human beings who can carry eggs, larvae or adults of the beetle on their bodies cannot be ruled out. Passengers traveling from beetle-infested countries should be encouraged to examine their baggage for the presence of the beetle/eggs/larvae. Countries such as India, Bangladesh and Sri Lanka, major coconut growers, are at high risk because neighboring countries including Myanmar and Maldives are already infested. Raising awareness and capacity building through training programs is essential to contain the problem. Countries already afflicted by the beetle may adopt intensive biocontrol programs to minimize losses due to attacks and to check the further spread of the beetle.

FAO is helping countries that lack expertise in biological control to develop integrated pest management programs that suit each country’s unique environment. This support has assisted countries in identifying the coconut beetle to species level, in collecting and importing natural enemies of the beetle, rearing them in captivity for evaluation and releasing them in palm plantations for release. This support has also included training biologists in the control of coconut leaf beetle in Asia-Pacific countries.

FAO assisted countries in identifying the coconut leaf beetle to species level, in collecting and importing natural enemies of the beetle, rearing them in captivity for evaluation and releasing them in palm plantations for release. This support has also included training biologists in the control of coconut leaf beetle in Asia-Pacific countries.