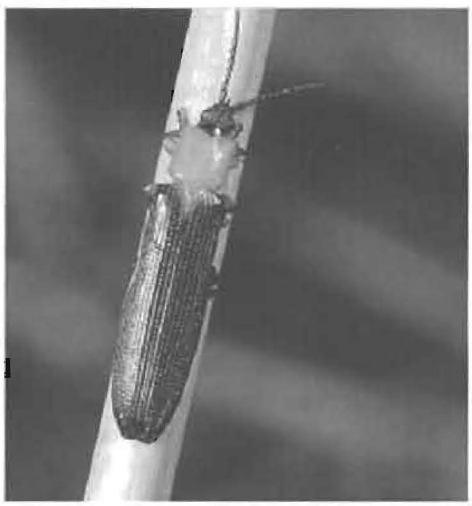
Red Alert:Invasive pests of Coconut

Jayasree A
Farm Manager, CDB DSP Farm, Neriamangalam

Coconut farmers and Farmer Producer Organizations are warned to be on alert against one of the most damaging pests of coconut- the Coconut leaf beetle. Huge damage has been occurred by this pest on coconut to our neighbouring countries and hence the researchers and scientists expect every chance of invading of the same to our coconut growing belts shortly. The pest spread rapidly causing significant losses to the coconut industry. Severe attacks destroy unopened leaves, affect growth of the palm and reduce its productivity drastically.

Coconut leaf beetle with scientific name *Brontispalongissima* (Gestro) belonging to Phylum Arthropoda, Class Hexapoda, Order Coleoptera, Family Chrysomelidae is one of the most invasive and destructive pest worse than coconut mite. Coconut leaf beetle is believed to be endemic to Indonesia, Malaysia, Papua New Guinea and the Solomon Islands. In the twentieth century the beetle was introduced in several other countries in Southeast Asia and the Pacific and became widespread accidentally. The pest is currently distributed in Australia, Pacific Islands, Singapore, Cambodia, Laos, Thailand, Vietnam, Maldives, Philippines, Myanmar and China.

In China the coconut leaf beetle was first found in Haikou city in Hainan province in June, 2002. In Myanmar it was reported as a serious pest to the coconut trees during 2004. In 2006, an article written by Daxim Lucas, cited the arrival of a pest that is "threatening the $760-million Philippine Coconut industry". In 2010, Inquirer published a report of the coconut leaf beetle attacking coconut farms in Maasin City was published Business World reported coconut farm infestation spreading in



The adult pest

Central Mindanao. The introduction of the beetle in Hainan Island in southern China, is believed to have occurred through a shipment of ornamentals from the Taiwan province. At the same time, the pest was introduced into the Maldives.

Being a leaf beetle it preys on the young leaves of coconut trees but also damage seedlings and mature coconut palms. The coconut leaf beetle is not only one of the most damaging pests to coconut it also attacks more than 20 other palm species and coconut is its favorite host. The larvae and adult beetles feed on the youngest leaf. Both larvae and adults of the beetle feed on tissues of developing unopened leaves of the trees. The beetle cause significant production losses and high infestation levels may result in the death of the palm. The affected leaves dry up and leave the palm stunted with reduced nut production. Early detection of the pest is necessary. Otherwise the young palms will be attacked. The pest if left untreated will cause the death of the palm.

The adult beetle is 7.5–10 mm long and 1.5–2 mm wide. It has a flat, black body, with orange head and shoulders. Larvae and adults are nocturnal and remain in unopened leaflets. The beetle is capable of taking short flights of few hundred meters only and hence the natural spread is slow. Its eggs are brown and flat, often laid in longitudinal rows surrounded by debris and excrement in unopened leaflets of both young and mature palms.The whole life cycle takes 5–9 weeks, and the adult beetle fully matures in two weeks after emergence from the pupa and lives for 2–3 months.

Young palms are more susceptible than older ones, as heart leaves of old palms are firmer and less suitable as breeding ground for the beetle. Majority of cases where palms are victimized by the leaf beetle show central leaves appearing brown in colour followed by shedding of fruits. According to the Asia-Pacific Forest Invasive Species Network, shipment of ornamental palms from infested countries had been the main source

of spread within the Asia-Pacific region.

The pest is being controlled by the infested countries at present adopting mechanical, chemical as well as biological methods.Mechanically the pest is being controlled initially by pruning, clean culture and proper disposal of infested coconut palms and parts thereof. Blockading and cutting of coconut palms up to three kilometers from the infestation spot are done to prevent the beetle from spreading.

During the initial outbreak of the pest, traditional pest management was undertaken by using insecticide. Although pest population was significantly reduced by insecticide use, pest recurrence, insecticide resistance, environmental safety, health concerns and high cost continue to be problems. Chemical spraying may be undertaken on case to case basis and this is more feasible in nursery seedlings and young plantations. Several insecticides including imidacloprid, aldrin, aldicarb, dichlorvos, fenthion, monocrotophos, quinalphos, deltamethrin, dimethoate, diazinon, methidathion, chlordane etc. are being used in the infested countries to control the coconut leaf beetle. Trunk injections are also considered as an emergency control measure in tall and mature palms. However, the effect of these treatments reported to last only for 3-4 months. Repeated applications were found impractical and uneconomic hence could not be used as a long-term control measure. Thus research was undertaken to identify indigenous natural enemies of the *Brontispa* for using these biological control agents for better management of *Brontispa* infested gardens.

Damage on young leaves

Two parasitoids of coconut leaf beetle viz.,*Tetrastichusbrontispae* and *Asecodeshispinarum* have been successfully used in several countries to control the beetle. Use of the entomopathogenic fungus *Metarrhiziumanisopliae* is also recommended for biological control of the pest .

The significant risk of the pest spreading to countries like India, Sri Lanka and Bangladesh is a major concern since the neighboring countries viz Myanmar and Maldives are deadly infested. The beetle will not be stopped at land borders and only natural barriers such as ocean and mountain ranges may halt the natural dispersal. Since the spread of the beetle is mainly through the movement of beetle affected palms, all palms including ornamentals meant for transportation from known areas of infestation should be checked to make sure that they are beetle free. To avoid further spread, non infested countries in the regions are recommended to adopt strict quarantine measures to control the import of plant materials, soil and any organic materials from infested countries. Accidental introduction of the pest is also suspected through the travellers from the infested countries by carrying the eggs, larvae or adult beetles in hand baggages or even on their bodies which will be difficult to be traced out.

For countries like India and Sri Lanka having significant number of coconut based industries, the pest incursion would be disastrous. Even though complete eradication of the pest is not yet effected in the infested countries, quick action on detecting the pest will not only reduce the damage levels, but will also slow the rate of dispersal of the pest.

Moreover, the natural enemies, once established, will follow further outward migration of the beetle to some extent.

The Indian Council of Agriculture Research (ICAR) has classified it as a very destructive pest posing an immediate threat for states like Kerala. Having frequent air and sea connectivity with Maldives, the hotspot of the pest, the chances of migrating the pest is very high. Central Plantation Crop Research Institute, Kasargod has issued a red alert against the possibility of *Brontispalongissima* destroying coconut palms across the country along with two other invasive pests *Aspidiotusrigidus* and *Wallaces sp*. It is also mentioned in the alert that the pest could hit bio security of the country if they entered India as there were no effective control measures, even though chemical treatment is available now.

For an early detection of the pest the coconut farmers and Farmer Producing Organizations should have a vigilant look out for the pest and on noticing any incidence of the pest or symptoms should be immediately reported or brought to the notice of the nearby Agriculture Department, University, CPCRI or Coconut Development Board.

Infested palm

Commission for Agricultural Costs and Prices appreciates Coconut Development Board's initiatives

The Commission for Agricultural Costs and Prices (CACP), a statutory body that advises the Government on the pricing policy for major farm produces, has appreciated Coconut Development Boards' initiatives to enhance procurement and productivity of coconut crops and the formation of farmer collectives. The committee recommends the strengthening of the procurement machinery. The committee hopes that the Coconut Producers' Societies (CPSs) and Coconut Producers' Federations (CPFs) formed under the initiative of Coconut Development Board can undertake procurement operations in a much better way. CACP has opined that the formation of Farmer Producer Organizations (FPOs), which has facilitated better management of the gardens, adoption of scientific technologies and better harvesting and post-harvesting techniques, need to be supported and replicated on a massive scale on a sustainable basis to augment productivity levels.

The committee recommends to extend the coconut procurement period to a span of six months from the current 90 days. In its non- price recommendations made by CACP in its report on proce policy for copra for 2015 season CACP has also mentioned that the value added products from Neera, like palm sugar, syrup, honey and coconut based products such as coconut shell products and coir etc need to be supported and replicated on a massive scale as it carries immense potential for commercial exploitation. The development and broadening of the value chain of coconut products to divert the use of raw coconut from traditional products such as copra and coconut oil to new value-added coconut products would enhance profitability. It is imperative to study the productivity levels of coconut in districts such as West Godavari (Andhra Pradesh), Chitradurga (Karnataka), Malappuram (Kerala) and Krishnagiri (Tamil Nadu), which have much higher productivity than the respective states' averages, so that farming practices and inputs used in these districts could be propagated/ replicated in other districts.