



## CONOGETHES PUNCTIFERALIS GUENEE – A DEVASTATING PEST OF COCOA, THEOBROMA CACAO LINN

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Pest management is one of the critical components in health management of cocoa. More than 50 insect pests infesting cocoa are recorded in India (Mariamma Daniel, 1994). As insects are highly adaptive to climate change, some minor pests like castor shoot and capsule borer (*Conogethes punctiferalis* Guenee) gradually became a major pest in cocoa by enhancing their feeding potential and shifting of host range. The biology, alternate host, symptoms of infestation and management of this castor shoot and capsule borer in cocoa are described below.

### ☆ Biology

Adult moth can be identified by the presence of small black dots on pale yellowish wing (Fig. 1). Adult prefers to mate during darker hours after 7.30 PM. Female moth lays pinkish oval flat eggs singly or in groups mostly in between wart or grooves of pods/cherelles/flower cushions of cocoa. Life cycle consists of egg, five larval instars, pupa and adult stage. The



**Fig. 1. Adult**



**Fig. 2. Larva**

incubation period of eggs is 2.9 days (Alagar *et al.*, 2013). The full grown larva is very active, 3 to 3.5 cm long, reddish brown in colour with brown marks on each segment (Fig. 2).

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First instar larvae took 23.82 days to pass through four different moults for entering into pupal stage. The larvae after hatching feed on flower cushions, flower buds, rind of cocoa cherelles/pods, later bore and feed the internal content. The total developmental period is 34.7 days. The longevity of male and female moths are reported to be 5.7 and 6.5 days, respectively (Alagar, *et al.*, 2013). The full grown larva pupates inside the damaged pods or cherelles or in a thin silken cocoon outside the damaged pods/cherelles. Pupal stage lasts for 7-10 days.

#### ☆ Alternate hosts

Larvae of this lepidopterous moth are polyphagous pests attacking more than 120 wild and cultivated diversified plants *viz.*, peach, chestnut, durian, citrus, papaya, castor, cardamom, ginger, eggplant, and maize (Sekiguchi, 1974; Ganesh *et al.*, 2013).

#### ☆ Symptoms of infestation

After hatching from eggs caterpillar feeds on rind/ husk of cocoa pods (Fig. 3). During severe incidence larvae bores into the rind and feeds on internal content of pods. Throughout the



**Fig. 3.** Larva feeding on rind/husk



**Fig. 4.** *Conogethes* infested pods

life the larvae hide under a cover of silk and frass or excreta attached on damaged pods and cherelles. Adult female prefers to lay eggs on pods those are touched together; hence, degree of infestation is directly proportional to number of pods touches together (Fig. 4).

Pods damaged by *Conogethes* are exposed to secondary infection by pathogens that lead to pod rot. During 1975, a study of cocoa pests in Thrissur district of Kerala revealed that *C. punctiferalis* was found to damage cocoa flower cushions severely and occasionally on cocoa bark (Mohanan and Kumar, 1975). The damage of *C. punctiferalis* on cocoa is observed from December and peak incidence is noticed during March to May. On an average 2% damage was recorded in the ICAR-Central Plantation Crops Research Institute, Regional Station, Vittal, during 2010-13. During 2015-16, incidence has increased drastically and reached up to 25% in the same farm.

#### ☆ Management

- ◆ Field sanitation is of utmost importance to bring down the population of fruit borer.



- ◆ Planting of castor trees as a trap crop on the border of the cocoa farm will help to reduce incidence of *C. punctiferalis*.
- ◆ Collection and destruction of infested pods and cherelles from the plantation will lower the pest incidence.
- ◆ Newer molecules like chlorantraniliprole 20 SC @ 0.006% and indoxacarb 14.5 SC @ 0.015% are found to be effective against this pest in castor (Patel and Borad, 2016). Whereas, the efficacy of newer chemicals, botanicals and biopesticides are yet to be evaluated in cocoa.
- ◆ Spraying of neem oil (0.03%) found effective against *C. punctiferalis* in castor (Naik *et. al.*, 2006)

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