

The Use of Insecticides to Protect Cocoa Fruit from the Attack of Cocoa Pod Borer, *Conopomorpha cramerella* in Cocoa Plants

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Abstract : Cocoa pod borer is the main pest of cocoa in Indonesia because it can reduce yields in quality and quantity. The aim of the study was to examine the effect of insecticides on cocoa fruit damage, seed damage and yield loss. The experiment was arranged in a randomized block design of six treatments and repeated four times. The treatment consisted of synthetic insecticide (0.05% deltametrin) and botanical insecticides. Garlic 5.2%, 5.2% lemongrass, 5.2% Bitung seeds, fragrant lemongrass mixture (5.2%) + Bitung seeds (5.2%) + galangal (5.2%) and control (water). Each block of insecticide application was used two rows of cocoa plants. The application of insecticides was carried out five times, and 40 cocoa fruits (6-8 cm long) were used per treatment. Mature fruits were harvested to obtain data on cocoa fruit damage. Synthetic and botanical insecticides are able to protect cocoa fruits from attacks by cocoa pod borer. The yield loss in some insecticidal treatments was as follows: deltametrin 17.80%, garlic 35.00%, lemongrass fragrant 37.70%, Bitung seeds 40.80%, mixed lemongrass fragrant + Bitung seeds + galangal 52.50%, and control 62.78%. Botanical insecticides that can significantly reduce damage to cacao fruits were garlic and fragrant lemongrass. Deltametrin, garlic, and lemongrass fragrant insecticides can be recommended to protect the attack of cocoa pod borer. The attack of cocoa pod borer caused a decrease in wet weight of 15.2%. Deltametrin and botanical insecticides do not show phytotoxic symptoms in cocoa fruit.

Keywords : Synthetic, botanical Insecticides, *Conopomorpha cramerella*, Cocoa fruit.

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