Control of brontispa beetle (*Brontispa longissima*) on coconut by inundative release of asecodes wasp (*Asecodes hispinarium*)

Introduction

Brontispa longissima (Coleoptera: Chrysomelidae) or commonly known as brontispa beetle is a serious pest of coconut and other palms in the South East Asian region and the Pacific. It is native to Indonesia and Papua New Guinea. This pest has made its way into many other countries in the South East Asian region and the Pacific, since 2000. In Malaysia, it could have entered the country via various palm planting materials, around 2001 – 2002. Being an introduced pest, it is difficult to control.

Both adult and larva inhabit the developing unopened spears of the palms, where they feed on the leaf tissue from the leaflets and thus destroying the growing points of the palms. This pest attacks palms of all ages, although it is most damaging to young palms in nurseries and during the first four or five years after planting out in the field. This pest is often mistaken with another pest, *Plesispa rechei*. These beetles could be recognised by the shape of their head.

Adult brontispa beetles (size 10 mm long)

Larvae of brontispa beetles

Damaged spear

Damaged leaflets

Damaged frond

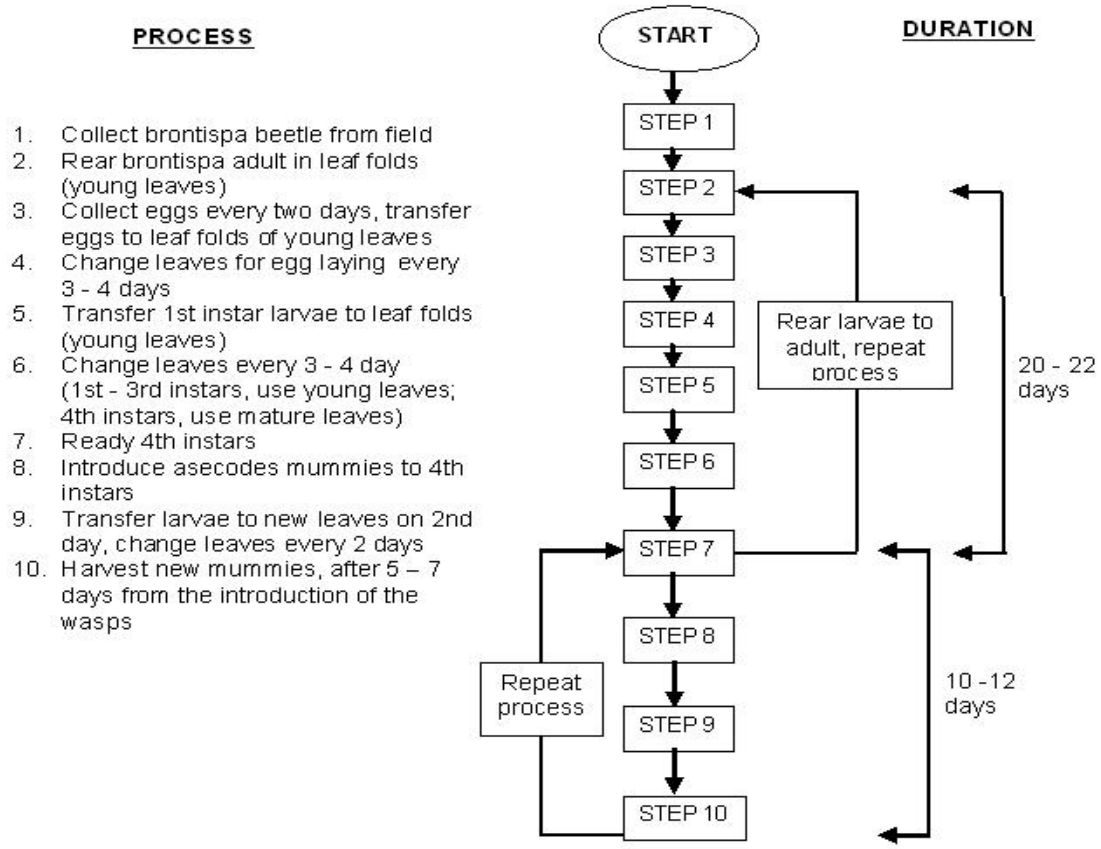
Brontispa affected farm

Biological control project

We embarked on the biological control project using the biocontrol agent, asecodes wasps (*Asecodes hispinarium*), from Thailand in 2009. The wasp is a gregarious larval endoparasitoid that attacks the third and fourth instars of the brontispa beetle. The techniques employed by the Department of Agriculture in Bangkok, Thailand for the mass rearing of the brontispa beetles and asecodes wasps and field release of the wasps were adopted and adapted to suit our local condition. 50 pieces of the asecodes mummies were obtained from the Department of Agriculture in Kuala Lumpur on 1st November 2009.

A state-wide detection survey to determine the distribution and severity of the pest infestation was carried out in August – October 2009. All the major coconut growing areas were affected and the pest was found in most farms. The seriously affected farms were in Kuching, Lundu, Asajaya and Bintulu districts. The infestation levels varied from farm to farm. However, they tend to be higher in newly established farms of Matag and Pandan coconut.

Figure 1. Flow chart for mass rearing of brontispa beetles and asecodes wasps



Rearing of brontispa beetles and asecodes wasps

The rearing of both brontispa beetles and asecodes wasps was carried out under laboratory conditions. The adult beetles were reared on young coconut leaves in plastic containers for egg laying. The details for the rearing are as shown in Figure 1. Decomposing leaf materials, faeces and frass were removed every two days to prevent build-up of moisture and pathogens.

Adult asecodes wasp (0.7 mm long)

Asecodes wasps parasitising on brontispa larvae

Hanging of plastic cup for field release

Field release of asecodes wasps

Releases of the asecodes wasps were made in the affected coconut areas since December 2009. One week old mummies were placed in small plastic tubes, at a rate of 10 mummies per hectare plot. These tubes were hung on the fronds. Six rounds of release were made at bi-weekly intervals.

18 farms in Asajaya, Samarahan, Kuching and Lundu districts were selected for the assessment of the wasps' effect on the pest population. This assessment was based on the reduction of the pest infestation level. A mean reduction of 83 percent in the infestation level was obtained, nine months after the wasps' first batch of release. The new spears and young leaves around the crown area of the affected palms were greener.

Benefits

This method has effectively reduced the pest infestation and subsequently, reduced the use of insecticides in the farms. The newly established farms of Matag, Pandan and Local tall coconut have benefited from this biological control programme. These wasps could spread within an area of 10 km radius. Thus over time, the wasps are expected to spread to the other coconut farms.

Article contributed by Senior Research Officer, Megir Gumbek (megirg@sarawaknet.gov.my)