

# CASSIA COBANENSIS AS A BENEFICIAL PLANT FOR SUSTENANCE OF PARASITOIDS IN BAGWORM CONTROL

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MAY 2002

149

MPOB TT No. 132

MPOB INFORMATION SERIES

ISSN 1511-7871

**B**agworm (*Metisa plana*) is one of the important leaf-eating pests of oil palm in Malaysia. Crop losses, due to the defoliation by a serious bagworm attack is inevitable. A moderate to serious bagworm defoliation may cause between 33%-47% reduction in yield (Wood *et al.*, 1973; Basri, 1993).

Parasitoids play an important role in regulating bagworm numbers (Basri *et al.*, 1995), but their populations depended on the availability of shelter and food sources (nectar), provided by beneficial plants in the oil palm ecosystem. These plants prolong the life span of the adult parasitoids (Basri *et al.*, 1999). There are four types of plants considered to be beneficial for bagworms: *Cassia cobanensis*, *Crotalaria usaramoensis*, *Asystasia intrusa* and *Euphorbia heterophylla* (Basri *et al.*, 1999).

In a recent field study, *C. cobanensis* proved to be much more superior and had attracted most parasitoid species associated with the bagworm, compared to the other plants mentioned above (Basri *et al.*, 2001). Its vigorous establishment and less maintenance makes it a suitable candidate for the establishment of natural enemies, especially parasitoids, for the long-term management of bagworms, in oil palm plantations.

## DESCRIPTION OF THE PLANT

*Cassia cobanensis* (Britton) Lundell (Family: Leguminosae) is a leguminous crop that can be planted using seeds or vegetative propagation. It forms a small to medium shrub of about 0.6-0.9 m in height at maturity (Figure 1).

The leaves are 2.5-3.8 cm long, oblong to oblong elliptic in shape, with fine hairs. It has a gland at the base of the leaves which emits nectar (Figure 2). The flower is yellow-orange and composite (Figure 3). The seeds are in pods of about 8 cm long.

The plant grows vigorously from either seeds or cuttings. It requires minimal maintenance, except at the early stage of establishment. It grows well in the open, without shade and therefore is suitable for planting at the roadsides and



Figure 1. Field planted *C. cobanensis*.



Figure 2. Arrow showing honey produced at the leaf axils.

drains where sunlight is sufficient. An example of the field planting by the roadside of a mature oil palm block is shown in Figure 4.

## EFFECTIVENESS OF *C. COBANENSIS* IN BAGWORM CONTROL

The effects of *C. cobanensis* can only be expected after about one year, when the bagworm parasitoids began to establish themselves with the plant. The effectiveness of the plants in supporting the life span of parasitoids was indicated by the low population of *M. plana* after its establishment



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Figure 3. Flowers of *C. cobanensis*.

(Basri *et al.*, 2001). *C. cobanensis* was able to support parasitoids for a longer period, as indicated by the suppression of the *M. plana* population, even after 30 months of planting.

In a field study, it was confirmed that *C. cobanensis* significantly attracted most of the bagworm parasitoids: a total of more than 300 bagworm parasitoids compared to less than 10 for *E. heterophylla*, *C. usaramoensis* and *A. intrusa* (Basri *et al.*, 2001). The species of bagworm parasitoids which normally visit *C. cobanensis* are *Brachymeria lugubris*, *Dolichogenidea metesae*, *Eurytoma* sp., *B. lasus*, *B. carinata*, *Goryphus bunoh*, *Elasmus* sp., *Paraphylax varius*, *Pediobius imbreus* and *P. anomalus*.

This also confirmed an earlier laboratory study, which proved that most of the bagworm parasitoids preferred *C. cobanensis* than any other beneficial plants (Basri *et al.*, 1999). This was likely attributed to the nectar which was produced by the stipules located at the leaf axils, rendering easy availability to the parasitoids. The high amount of sucrose (63%) and lesser amount of fructose (25%) and glucose (12%) in its nectar readily attracts parasitoids (Basri *et al.*, 1999).

The impact distance of *C. cobanensis* can be up to 150 m, with parasitisms of the bagworm larvae ranging between 10% to 22%. This suggests that the parasitoids tend to fly a fair distance to parasitise a host.

### CONCLUSION

*C. cobanensis* is a good nectar-producing plant which attracts a wide range of parasitoids which are associated

with bagworms. The percent parasitism of bagworms in areas where it is planted is much higher compared to other beneficial plants, indicating its importance in propagating the bagworm parasitoids.

### ACKNOWLEDGEMENTS

The authors wish to thank the Director-General of MPOB for his permission to publish this paper. Thanks to Mr Simon Siburat of Perlis Plantations Bhd. for his interest and support. Thanks also for Mr Othman Arshad (MPOB HQ) and En Ahzahar Amir (Station Manager, MPOB Keratong) for the field establishment of *C. cobanensis* at Keratong for the seed production.

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