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BANANA SCAB MOTH

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ABSTRACT

Banana scab moth is of some economic importance in the Islands region of Papua New Guinea but does not attack bananas on the mainland. Merits of control tactics against the moth are discussed.

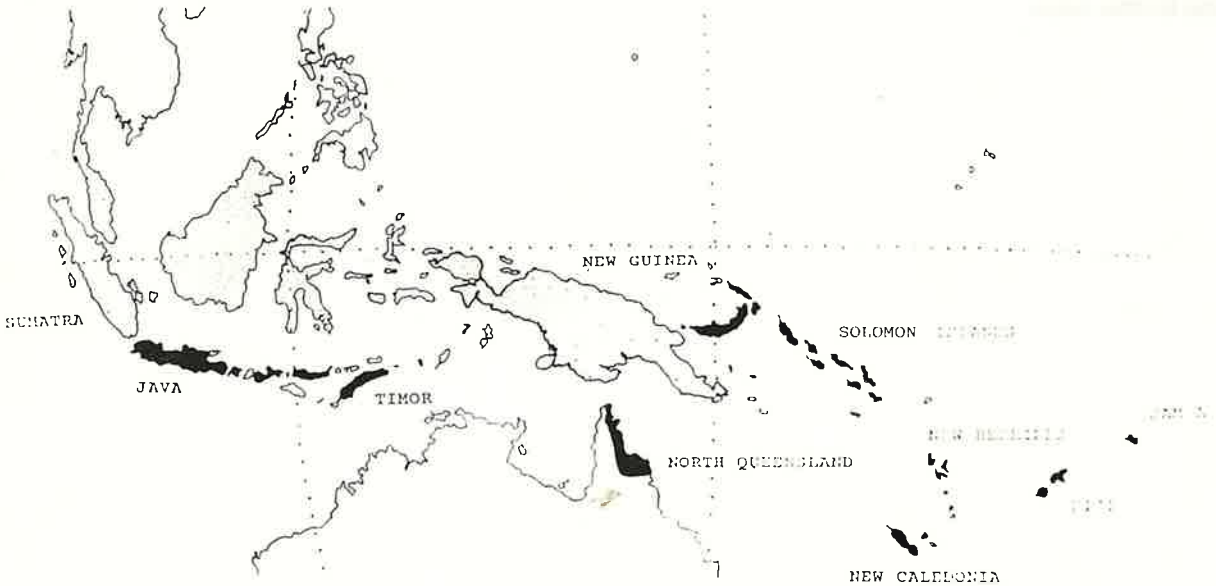

Figure 1. **Recorded geographical distribution of scab moth. The shaded areas represent places where scab moth has been found feeding on banana. The dotted areas are where scab moth is present, but does not feed on bananas.**

INTRODUCTION

Banana scab moth (*Nacoliea octasema*) occurs throughout the southwest Pacific region. It has been recorded from banana, *Heliconia, Pandanus* and *Nypa* palm. It is a pest of banana in only some areas (see Figure 1). In Papua New Guinea, it feeds on bananas only in New Britain, New Ireland and North Solomons.

BIOLOGY

The adult moth is a dull yellow-grey colour with several small dark blotches on the wings and a band of silvery scales on the dorsal (upper) surface of the abdomen. Its wing span is around 20 mm. It is very rarely seen, being active at night and resting during the day.

Egg laying occurs mostly on the underside of leaves during the early stages of emergence of a banana bunch from the throat of the plant. The eggs are about 1 mm to 2 mm in diameter, flattened and oval shaped. They are laid in overlapping clusters which look like fish scales. When first laid, they are almost clear with a pearl-like sheen. Within a day or so, they begin to darken to a pale yellow color and the head shields of the larvae can be seen developing inside.

Larvae hatch from the eggs in about three days. They then make their way to the bunch where they crawl under the protective bracts and begin to feed on the fruit. When bracts lift from the fruit and drop off the plant, the larvae usually crawl down the bunch to the next bract protected hand. Other common feeding sites are between two fruit on a hand which are close together, and inside the fruit (in cases where the number of larvae on the bunch is very high and the amount of fruit on a bunch relatively small (eg. cooking bananas). The larvae always choose very sheltered positions in which to feed.

There are five larval instars (stages), which have a total duration of approximately 13 to 16 days. The first instar larva is only about 1 mm to 2 mm long. The fifth instar larva just before pupation is about 30 mm. The larvae vary in colour from pale cream to very dark, almost black. They have a black head shield and a number of dark blotches on the body, including two which form a collar just behind the head shield. There are also sparse hairs on the body.

The pupa is about 10 mm to 15 mm long and is a rich brown colour. The female pupa is much larger than the male. They are covered by a fine silken cocoon which often contains dry frass (faeces) to disguise it. Pupae are often hard to find. Common sites of pupation are between two fruits, in the crevice formed where a hand of fruits attaches to the bunch, in the channel on the upper surface of the leaf petioles, and in tunnels the feeding larvae formed within the fruit. The pupal period lasts from eight to ten days. The day before the adult moth emerges the pupa becomes much darker in colour.

ECONOMIC IMPORTANCE

Where bananas are grown commercially for example Australia and Fiji, any scab moth damage is economically important. This is because consumers will not buy scarred fruit, even though damage is confined to the skin only. In some areas such as the Islands Region where bananas are not grown commercially, scab moth can still be a problem as the damage it does is often much more severe. The larvae often actually eat into the fruit, completely destroying it.

CONTROL

In Australia at present control is achieved purely by the use of insecticides. In the past they were applied by aerial spraying or by spraying from a hand held applicator into each bunch just as the bracts were beginning to lift. Both of these methods were extremely expensive and time consuming. Recently most farmers have switched to a method where each bunch is injected with a small amount of insecticide just as it is emerging from the throat of the plant. The tool used to do this is a long pole with a curved, pointed end to which is attached a long rubber tube connected to a metered pump and small back pack (Figure 2). This method has been found to give much better control than previous methods and uses far less chemicals, giving a significant reduction in costs to the farmer. It is still a very time consuming method of control however.

The most common insecticide utilised in Australia is chlorpyrifos (Lorsban). Application rates using the bunch injection method are 30 millilitres of insecticide per bunch. The correct concentration of insecticide is obtained by:

20g Lorsban 25 WP (R)
5L Water.

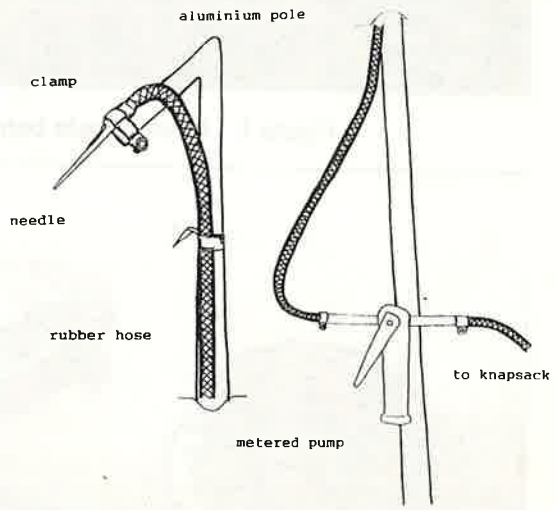

Figure 2. **Diagram of the basic design of a bell injector used by banana farmers in Australia**

Research is currently being conducted in Australia into alternative control measures for this pest. The methods being investigated are the introduction of biological control agents and the use of artificial pheromones. Pheromones are chemicals produced by female insects which are released into the air to attract mates. If the chemical can be identified it can be artificially copied. The artificial pheromone can then be used to either trap male scab moths, or confuse them and prevent them from finding the female moths.

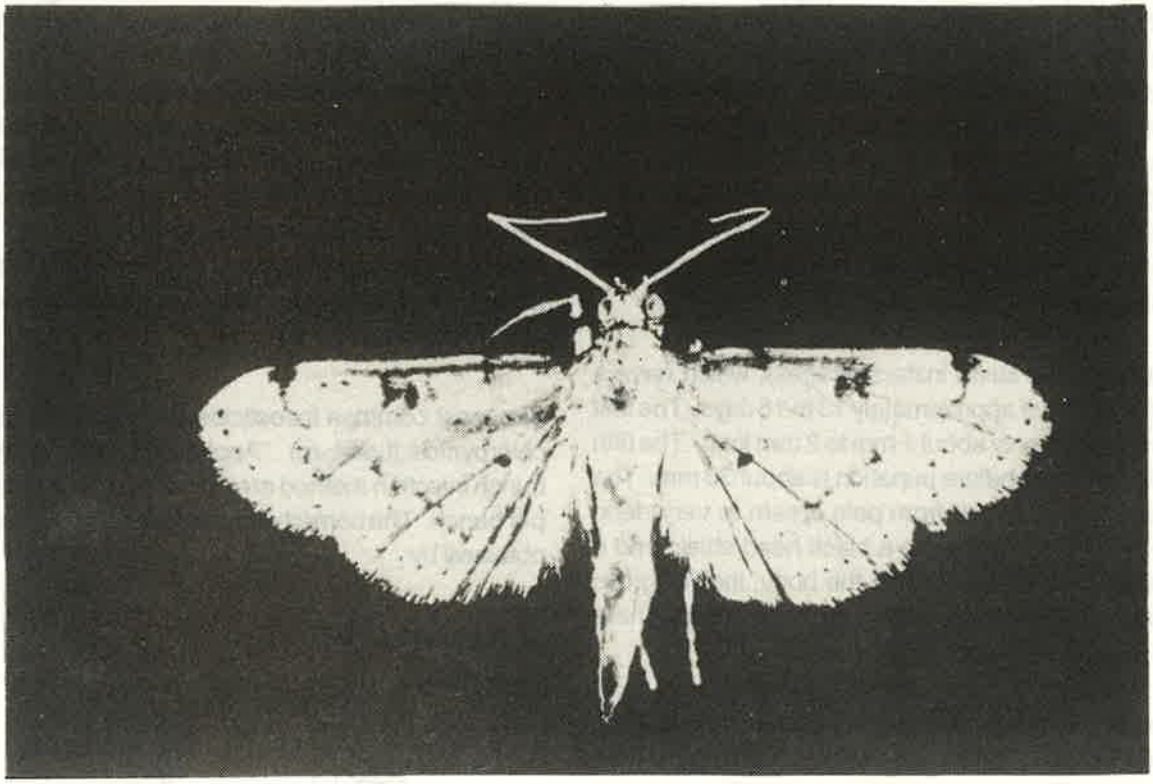

Figure 1. **Adult female banana scab moth (magnified x 10).**

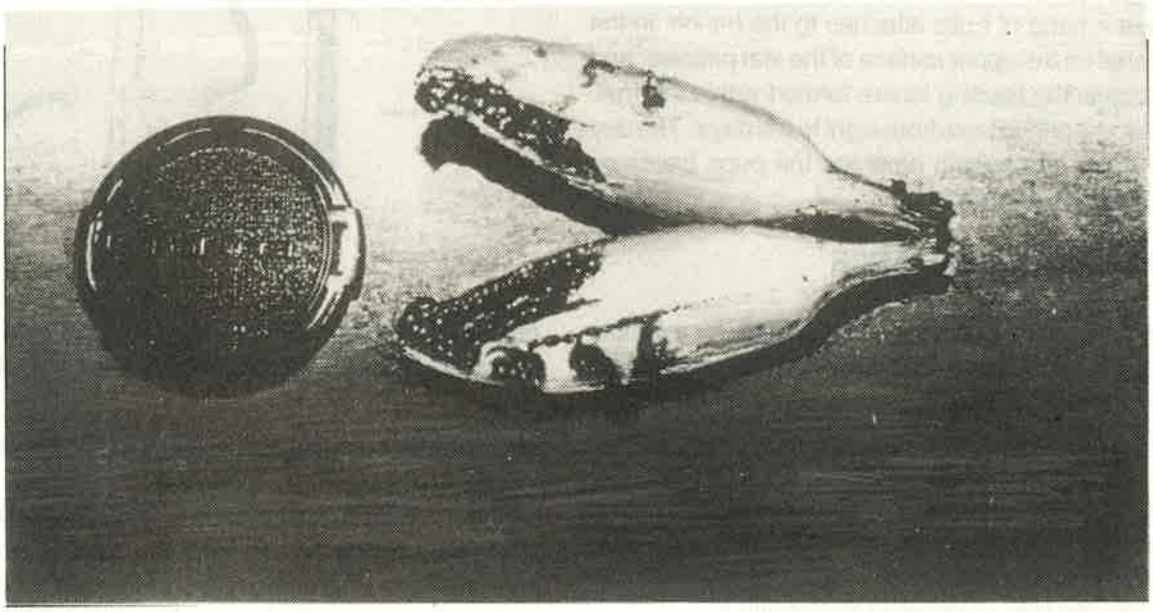

Figure 2. **Damage to bananas in New Britain caused by banana scab moth. The larvae have bored into the fruit, destroying it.**

The Islands Region does not farm bananas commercially and does not practice any form of control at present. If bananas were to be grown commercially in this region, then the bell injection of pesticide would be the recommended method of control. In Australia this method is not considered ideal because it takes a lot of time, and labour is very expensive. In Papua New Guinea labour is much cheaper, so this is not such a problem. Bell injection is also very specific, acting only on the scab moth larvae. Natural enemies of the egg and pupal stage, and of other pest species, are not exposed to the insecticide. Caution should be used however when handling any insecticide. Full details on the safe handling and use of pesticides are given in Entomology Bulletin No. 9; in Harvest Vol. 6 No. 3, pp. 149-152; and Rural Development Series Handbook No. 18.

The Islands Region also has a wide variety of natural enemies of banana scab moth. Although they do not exert significant control on their own, research should be encouraged into methods of making these species more effective control agens.

Artificial pheromones, while presenting a very promising form of control in Australia, would probably be ineffective in PNG. This is because bananas in Australia are virtually all grown in large commercial orchards. In Papua New Guinea there are many small gardens where bananas are grown and in which scab moth could mate and then reinfest commercial orchards.

No measures are necessary for scab moth control on mainland PNG, as the pest does not attack bananas. Care should be taken however to ensure that there is not an invasion of this pest from areas where it is a problem, such as the Islands Region.

(The above article first appeared as LAES Information Bulletin No. 75). ❑