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INSECT PESTS OF WINGED BEAN 1. *LEUCOPTERA* – A LEAF MINER

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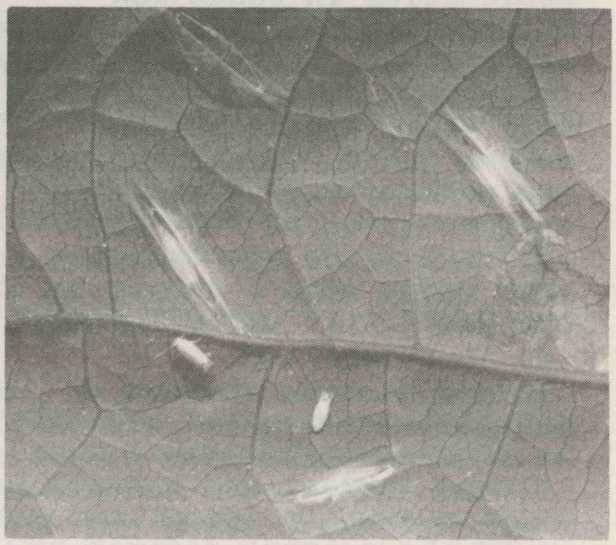
INTRODUCTION

Winged beans *(Psophocarpus tetragonolobus)* do not suffer seriously from insect attack when grown in traditional mixed gardens. However, when they are grown as a monoculture both in the lowlands and the highlands a number of damaging insects are found. One of these is a moth, *Leucoptera psophocarpella* - a leaf miner.



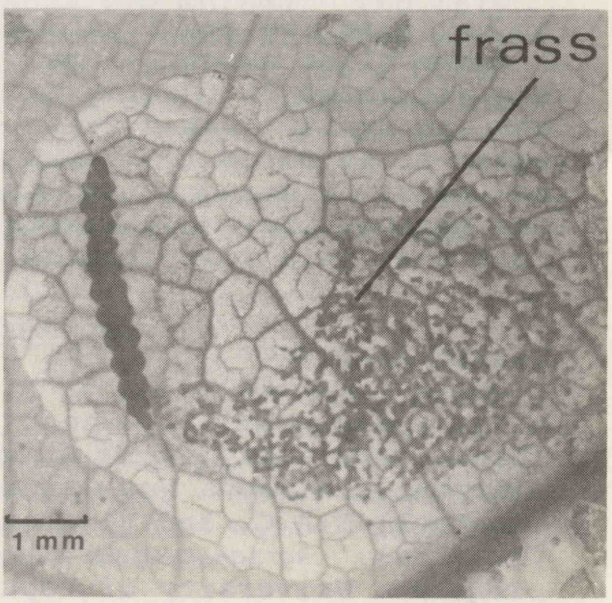
Adult Leucoptera *and their cocoons (pupal cases) on the underside of a winged bean leaf*

DESCRIPTION AND BIOLOGY

The adult insect is a small white moth. It lays its eggs on the underside of a winged bean leaf. The eggs are very small, about 0.2 mm long, and not easily seen with the naked eye.

The tiny larva (caterpillar) develops within the egg and hatches by chewing through the floor of the egg. It then eats through the epidermis (skin) of the leaf and makes its way into the leaf itself. There it forms a tunnel (or mine) by eating the juicy soft middle tissue of the leaf.

There are four larval instars (stages). The growing larva gradually eats more and more of the leaf tissue until the shape of the tunnel changes into a circular blotch. The faeces (dung) of the larva remains in the tunnel. This is called frass.



A Leucoptera *larva in its tunnel or mine*

Finally the larva is ready to pupate (enter the resting stage) and change into the adult moth.

It leaves its tunnel by chewing a crescent-shaped slit in the upper surface of the leaf. The larva crawls to the edge of the leaf and suspends itself on a fine silk thread. After several minutes it pulls itself up to the lower surface of the leaf. Here it spins a cocoon in which it pupates.

The life cycle from egg to adult takes 21 days in the lowlands. It may be longer in the highlands.

Part of a winged bean crop which shows heavy damage to the leaves caused by Leucoptera *larvae*

ECONOMIC IMPORTANCE

This insect usually infests a crop without being noticed. This is because the first instar caterpillar makes a very small tunnel which runs alongside a vein in the leaf and is not very obvious. However, the numbers of *Leucoptera* in a winged bean crop can increase very rapidly because of the short life cycle. Therefore, during the 3-4 months required for the crop to mature, the damage done can be serious.

The skin of each deserted tunnel dries and turns brown and so forms a characteristic blotch. For this reason *Leucoptera* has been called the blotch miner. When many larvae have mined a leaf the damage becomes very obvious.

It is not yet known how much winged bean yields are reduced by this leaf destruction.

Detail of a leaf showing the obvious blotches of dead leaf tissue left by the tunnelling larvae

CONTROL

Chemical control

There are no recommendations for the control of *Leucoptera* at present.

Biological control

Two parasitic wasps, known to attack the larvae of *Leucoptera*, are being studied. These may prove to be useful in the biological control of *Leucoptera*.

FURTHER READING

Bradley, J.D. and Carter, D.J. (1982). A new lyonetiid moth, a pest of winged bean. *Systematic Entomology 7:* 1-9.

Brough, E.J. and Arura, M. (1981). The life history of the blotch miner *Leucoptera psophocarpella* (Lepidoptera: Lyonetiidae) and the damage it causes to the winged bean *Psophocarpus tetragonolobus*. *Science in New Guinea* 8 (3): 171-180.

Lamb, K.P. (1978). Insect and mite pests of winged bean *(Psophocarpus tetragonolobus)* and their control. In Singh, S.R., Ajibola Taylor, T. and Van Emden. H.F. (Eds). *Insect Pests of Grain Legumes and Their Ecology*. Academic Press, London.

FURTHER INFORMATION

For further information about *Leucoptera*, contact your nearest D.P.I. entomologist or didiman. Entomologist are based at:

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