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THE SORGHUM MIDGE

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INTRODUCTION

The sorghum midge is a small fly, called *Contarinia sorghicola*. The larva (maggot) of the sorghum midge feeds on the ovary (that part of the flower from which the grain develops) of the sorghum flower. This prevents seed formation and severely reduces grain yield.

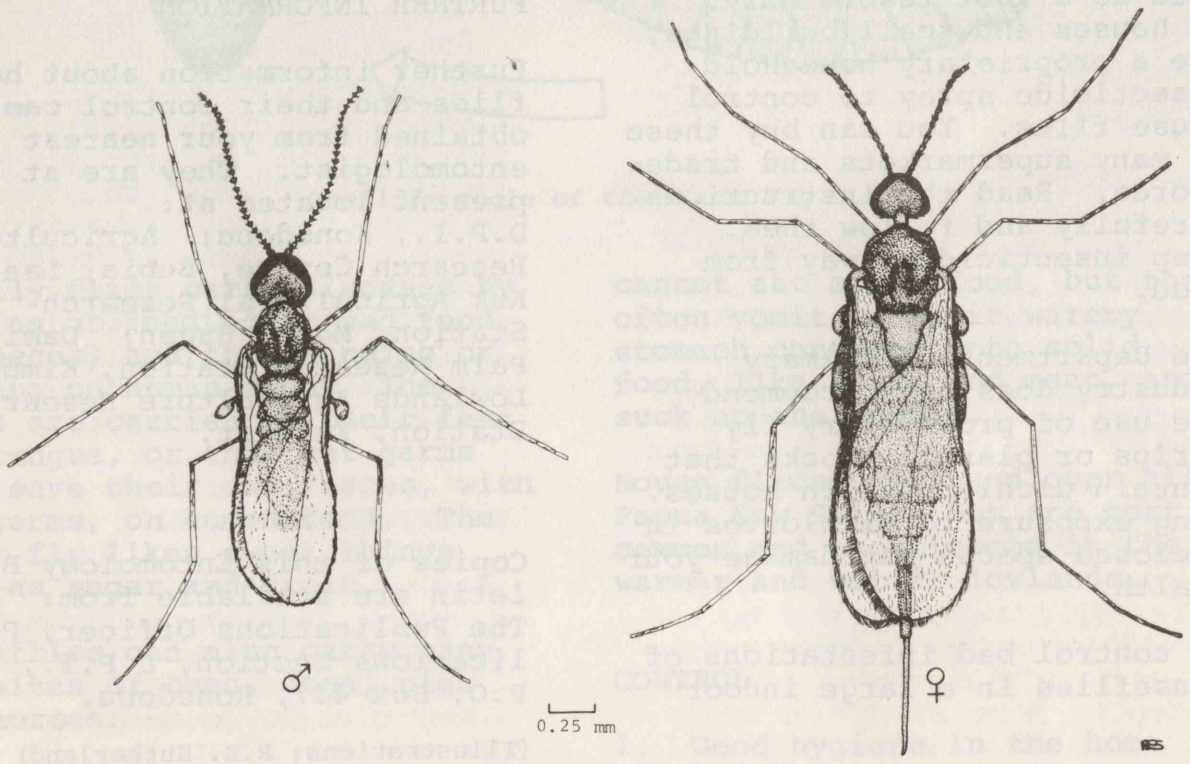
DESCRIPTION

The sorghum midge is a small, fragile fly about 2 mm long with a single pair of transparent wings and a bright orange abdomen. The abdomen of the female sorghum midge is longer and brighter coloured than that of the male.

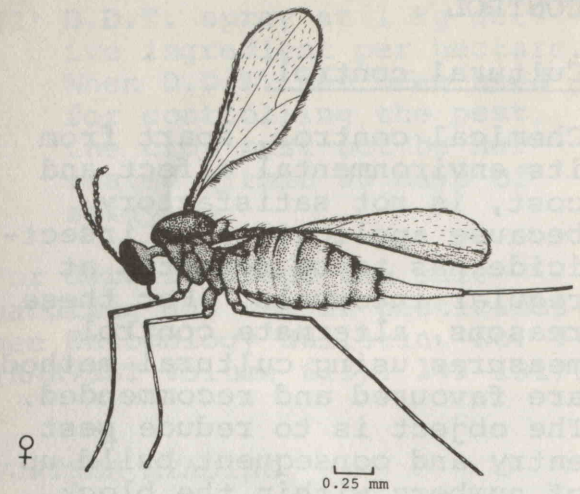
LIFE CYCLE

The females lay their eggs inside the floret (one of the small individual flowers of sorghum) when it is at the yellow flower stage. The eggs are laid singly, one per floret, though several females may visit the same floret. The female can lay up to 100 eggs.

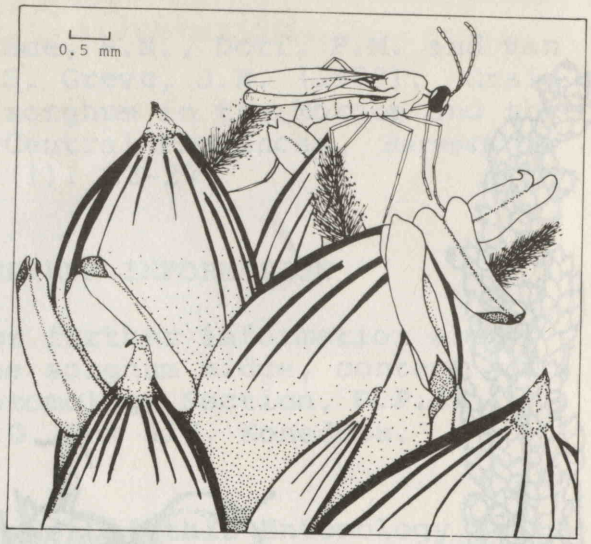
When the egg hatches, a tiny white larva emerges and feeds on the ovary within the floret.



The sorghum midge: adult male (left); adult female (right)



Adult female sorghum midge with extended ovipositor (tube for laying eggs)



Adult female sorghum midge laying eggs on a sorghum floret

The larva pupates (enters the resting stage) within the floret. At this time the body changes colour from white to orange-red and the head and legs become dark. The adult sorghum midge emerges from the top of the floret leaving its white puparium (pupal case) projecting from the top. The puparium can be seen with the naked eye.

The adults mate and lay eggs immediately after emergence. The complete life-cycle from egg to adult lasts 14-18 days in the Markham Valley. Adult females live for about two days while the males live for less than one day.

ECONOMIC IMPORTANCE

The sorghum midge is found in the Markham Valley where it breeds all year round on wild sorghums. This is most noticeable in the lower part of the valley where there is very little seasonal variation in sorghum midge numbers. The pest is found in low numbers in the Ramu Valley and the Central Province where wild sorghums are not as common as in the Markham Valley.

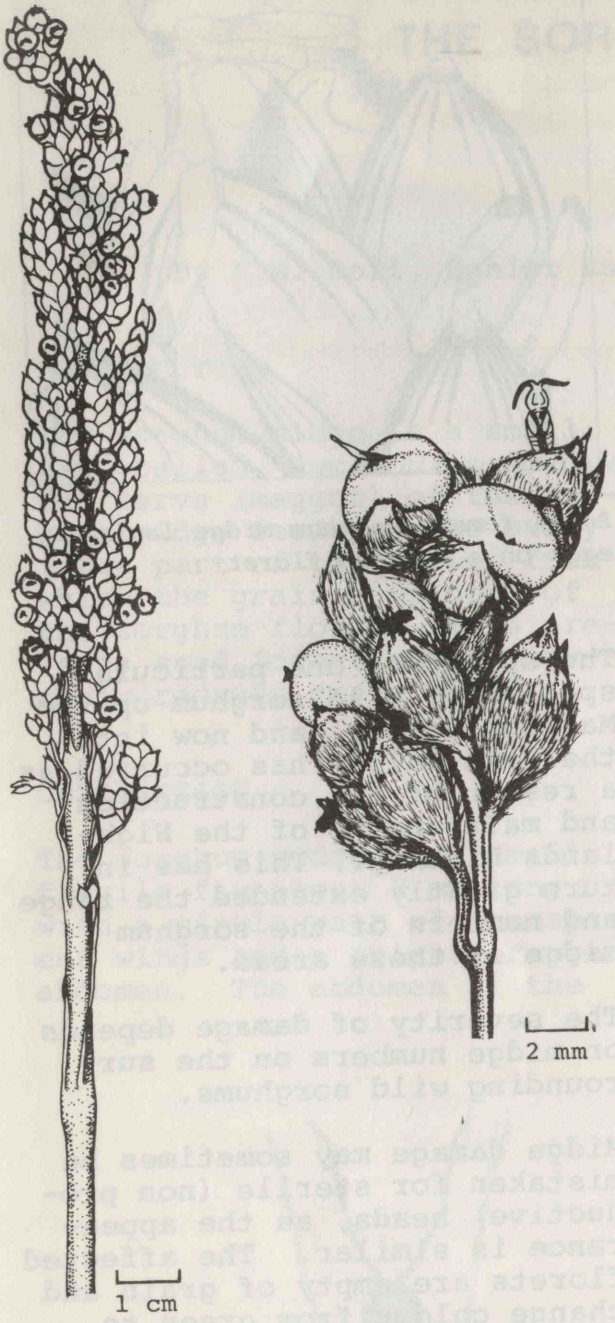
The spread of one particular species of wild sorghum up the Markham Valley, and now into the Ramu Valley has occurred as a result of the construction and maintenance of the Highlands Highway. This has in turn greatly extended the range and numbers of the sorghum midge in these areas.

The severity of damage depends on midge numbers on the surrounding wild sorghums.

Midge damage may sometimes be mistaken for sterile (non productive) heads, as the appearance is similar. The affected florets are empty of grain and change colour from green to brown. In ripening sorghum heads midge damage can be separated from sterile heads by looking for white puparia (pupal cases) on the floret left by the emerging adult midges.

Sorghum midge damage can be detected by squeezing the partially green floret between thumb and forefinger. If midge attack has occurred an orange-red fluid will appear.

The presence of a small hole at the side of the floret also



Left: A sorghum head showing typical damage by sorghum midge.
Right: A sorghum spikelet showing filled and unfilled grain. Note the tiny pupal case on the empty floret.

indicates midge damage. The hole is made by a tiny wasp parasite of the sorghum midge larva as it emerges from the damaged floret.

Sorghum that has been attacked by the midges shows partial grain formation in the heads.

CONTROL

Cultural control

Chemical control, apart from its environmental effect and cost, is not satisfactory because application of insecticide has to be repeated at regular intervals. For these reasons, alternate control measures using cultural methods are favoured and recommended. The object is to reduce pest entry and consequent build up of numbers within the block. The cultural methods recommended are:

1. Turn and plough in all sorghum remnants after harvest.

2. Follow recommended crop aggonomic practice to ensure the crop flowers over as short a period as possible.

3. If more than one variety is used, sowing should be timed, such that they flower at the same time.

4. Slash wild sorghum species around the edge of the crop.

5. Inspect for adult midges around the edge of the crop every morning during the yellow flower stage as plants on the margin are the first to be attacked.

Chemical control

Chemical control should only be used when cultural methods have failed to minimise invasion and counts of adult midges reach four per flower head.

Chemicals recommended are:

(1) Carbaryl spray at 1 kg active ingredient per hectare. Care must be taken when using carbaryl as it has a phytotoxic (burning) effect on certain varieties of sorghum.

(2) D.D.T. spray at 1 kg active ingredient per hectare. When D.D.T. has been used for controlling the pest, the crop must not be harvested within 30 days of spraying.

For details about the safe handling and use of pesticides see Entomology Bulletin, No. 9 (HARVEST Volume 6(3): 149-151).

FURTHER READING

Ironside, D.A. (1979). Insect pests of grain sorghum - part 1. *Queensland Agricultural Journal* 105, No 4.

Vance, P.N., Dori, F.M. and van S. Greve, J.E. (1979). Grain sorghum in the Morobe and the Central Provinces. *Harvest* 5, (1): 22-27.

FURTHER INFORMATION

For further information about the sorghum midge, contact the Entomology Section, D.P.I., P.O. Box 417, Konedobu.

Copies of this Entomology Bulletin are available from: The Publications Officer, Publications Section, P.O. Box 417, Konedobu.

(Illustrations: R.E. Sutherland)