Information Sheet

8.7 Thrips

Introduction

Sugarcane thrips *(Fulmekiola serrata (Kobus) (Thysanoptera: Thripidae))* is a minute sap-sucking insect introduced from the south-east Asian region. It is now found in many sugarcane industries in Africa, attacking mainly young sugarcane, particularly plant crops, and can be a serious pest if not managed.

History

Sugarcane thrips was first recorded as a pest in sugarcane in Java, Indonesia. There are also records from China, India, Japan, the Malay Archipelago and Taiwan. Recent records have shown that this pest has now expanded its range as far as Madagascar, Mauritius, Réunion, Barbados, Guadeloupe, Venezuela and the West Indies. The first record of its invasion in the South African sugar industry was in 2003 on young transplants used in the plant breeding programme at Mount Edgecombe; in 2004 it was found on commercial sugarcane on the Umfolozi flats. Since then, it has spread rapidly throughout the industry.

Identification

Eggs

Eggs are approximately 0.29 mm long and 0.09 mm wide, with a smooth, shiny, translucent chorion (outermost membrane). They are laid singly on the upper surface of the central leaf spindle.

Nymphs

The nymphs appear translucent after emergence, except for their red-pigmented eyes, and thereafter their body turns pale yellowish-white in colour.

Pupae

The prepupa and pupa are pale and sluggish. Prepupae do not feed and may be distinguished by their short wing pads and forwardly directed antennae. Pupae have long wing pads and backward pointing antennae.

Adults

Adults are elongated (2-3 mm in length) and darkly pigmented. Large numbers of this insect can gather in leaf spindles and feed on the sap of the young plant (Figure 1).

▲ Figure 1. Thrips in the leaf spindle of sugarcane (Inset - magnified view of thrips nymph (left) and adult (right)).

Biology

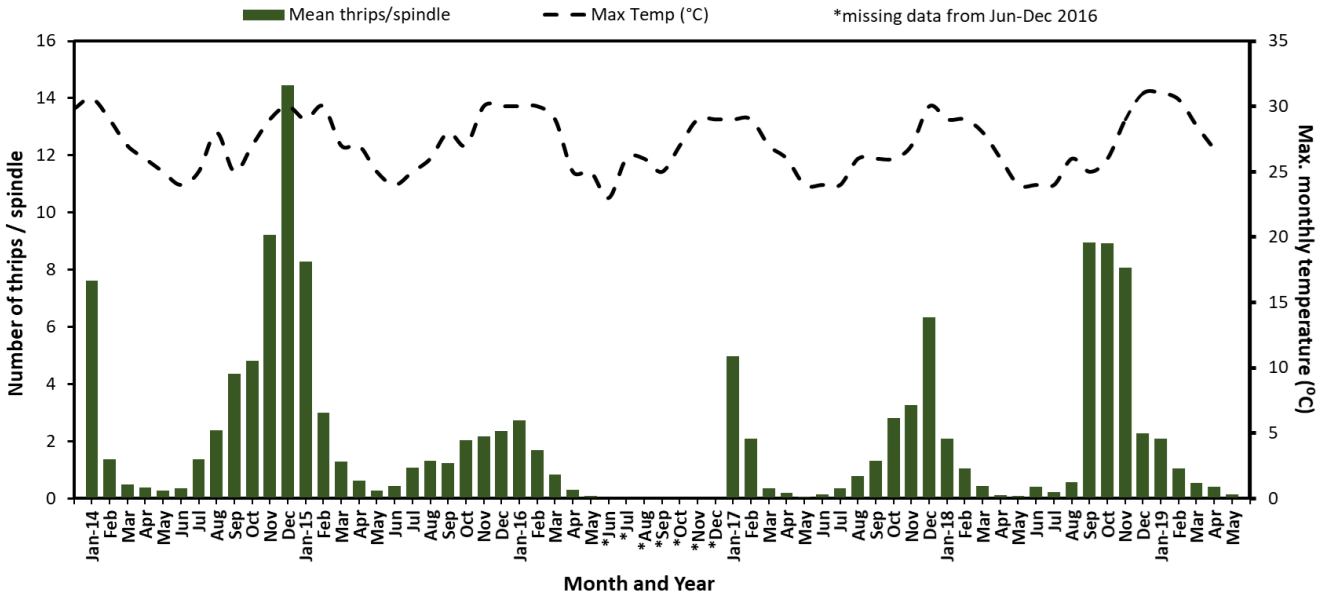
Life Cycle

Young sugarcane (1-4 months old) is particularly prone to attack by thrips. Nymphs and adults avoid sunlight and consequently live in the central leaf spindle. When disturbed, the adult makes erratic circular movements and flies away. They can also be wind-dispersed. Concealment within the leaf spindles reduces the chances of desiccation (drying out) and provides protection from predation. In the mornings and evenings, and on cloudy days, adults may move to the curled leaf margins of young leaves. The adults show a strong preference for young, tender leaves and feed as well as lay their eggs in the soft, younger leaves of the central leaf spindle. At the optimal temperature of 20- 25°C, a female can lay up to 80 eggs that develop into nymphs over an estimated five days. Nymphs feed on the leaves for about 10 days before pupation, and adults live for between 18 and 31 days. Although not determined specifically for this species in South Africa, the full life cycle would probably range between 15 and 20 days.

Seasonal Occurrence

There is a recurring seasonal cycle in sugarcane, which appears to be closely associated with temperature. Numbers during the autumn, winter and early spring months (April to September) are generally low but increase sharply from November, peaking in summer between December and February (Figure 2). This seasonal cycle can be used to the grower's advantage by ensuring that the most susceptible growth stage of the crop is not present when thrips numbers are high (see under 'Insecticide use and planting date' below).

Research has shown that the younger the crop, the more susceptible it is to sugarcane thrips. For example, in one trial, thrips numbers on one-month-old sugarcane during the mid-summer period (December/January) reached 60 thrips/leaf spindle. By contrast, older plants (six months or more) over the same period had as few as 0.3 thrips/spindle. Consequently, planting or ratooning the crop over the mid-summer period will almost certainly lead to a heavy infestation when the crop is most susceptible to thrips. Typically, higher sugarcane thrips numbers are recovered from plant sugarcane, and from rainfed crops compared to irrigated crops.



▲ Figure 2. Seasonal cycle of thrips recorded at Umfolozi, from January 2014 to May 2019.

Host plants

While sugarcane thrips feeds primarily on sugarcane, it has been recorded on tobacco in Java. This is thought to be the only record of this pest feeding on any plant other than sugarcane.

Damage

Symptoms of sugarcane thrips damage are usually noticeable on the spindle leaves. The insect pierces the leaf tissues with its mouthparts and sucks the plant sap, usually from the upper (soft) parts of the young leaves. The damaged central leaf roll shows yellowish-white blotches when it unfurls. Afterwards, the patches turn light or dark yellow and become irregular patches or stripes, which may cover most of a seriously damaged leaf, with the outer margins of the leaf dying (Figure 3).

Injury symptoms may be confused with heat scorch, nutrient deficiency, water stress and/or herbicide-damaged leaves. A further symptom is that, often, leaf tips remain joined together and, as the leaves grow, a distinctive net-like appearance can be seen (Figure 3). Even where sugarcane is severely damaged by sugarcane thrips in its early growth stages, the symptoms diminish and may eventually disappear as the cane ages and new undamaged leaves are produced.

Under high sugarcane thrips pressure and rainfed conditions, yield reductions of 18% to 27% in tons cane/ ha and 16% to 24% in tons sucrose/ha were recorded in insecticide trials at Gingingdlovu. However, as insecticides recommended for sugarcane thrips control (see under 'Insecticide use and planting date') have also been reported to enhance plant vigour and stress tolerance, independent of their insecticidal function, some of this yield increase may be due to a direct effect of the chemical on sugarcane growth.

▲ Figure 3. Sugarcane exhibiting sugarcane thrips damage, with leaf discolouration and dead tissue (top), and joined dead leaf tips (bottom).

Control

Variety choice

Studies elsewhere have shown that varieties with rapid early growth and unfurling of the central leaf spindle incur less damage, as the microhabitat (refuge) for thrips is reduced. Where possible, select varieties that are less susceptible to sugarcane thrips infestation and damage. An up-to-date list of varieties with their resistance categories can be found on the SASRI eLibrary at www.sasri.org.za under Information Sheets/varieties.

Insecticide use and planting date

The following products are currently registered for use against sugarcane thrips:

Table 1. Available products registered for sugarcane thrips control

Product (and active ingredient)	Dosage rate	Application
Bandit® 350 SC (imidacloprid)	1-2 L product/ha	In the furrow at planting. Note: this product is registered for ground application only.
Apache® 350 SC (imidacloprid)	In furrow at planting: 1 L product/ha Foliar spray: 500 ml product/ha	As soon as the pest is noticed and when at least 3-4 green leaves are present.
Kohinor® 350 SC (imidacloprid)	1 L product/ha	Registered for application in the furrow at planting.
Bandito® GR (imidacloprid + oxamyl)	In furrow at planting: 30 kg/ha Ratoons: 30 kg/ha	In newly cut and young ratoon sugarcane apply on the soil surface on both sides of, or over, the plant rows when rainfall is expected or overhead irrigation is available. .
Allice® 20 SP (acetamiprid)	1.5 kg product/ha	Registered foliar spray for ratoon crops, as soon as the pest is noticed and after 6-8 green leaves have developed. May also be applied aerially.
Wonderland® 200 SP (acetamiprid)	1.5 kg product/ha	Registered for foliar application as soon as the pest is noticed on plant and ratoon crops. May also be applied aerially.

For more detailed information on the use of these products, please read the product labels.

Where crops will be young (especially plant crops of a susceptible variety) over summer, an insecticide can be applied in-furrow at the recommended rates to protect the crop. Alternatively, and where possible, plant either in early spring (August-September) or in autumn (March-April) to avoid having young sugarcane less than four months old during the insect's peak period in summer (see Figure 2).

For liquid formulations of imidacloprid, it is extremely important to immediately close the furrow after application to prevent its rapid breakdown by ultraviolet light. Acetamiprid is more UV tolerant and is most effective on a young crop when a targeted spray is applied to the leaf spindle and youngest leaves where sugarcane thrips reside. The granular formulation of Bandito® prevents the breakdown of imidacloprid by UV radiation.

Biological control

Sugarcane thrips is an exotic insect, therefore classical biological control (introducing a pest's natural enemies from its country of origin) is an option to consider. In some industries, thrips are suppressed by climatic factors as well as natural enemies (spiders, pirate bugs, rove beetles, earwigs and ants) that are conserved through the judicious use of insecticides combined with cultural control measures.

Iona Basdew (Biosecurity Scientist)

April 2022