

# PEST CONTROL PROBLEMS AT MAZABUKA, ZAMBIA

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## Introduction

The recording of four insect pests of sugar cane on the newly developing Nakambala Estate at Mazabuka during the current summer season (1965/66) illustrates the importance of conducting cane trials over as long a period as possible before embarking on full scale development, and of being prepared for such outbreaks when working in a new and unfamiliar environment.

Since November 1965 the following four pests causing damage to cane have occurred:

- (1) Trash Caterpillar (*Cirphis sp.*)
- (2) Top Borer (*Lepidoptera*)
- (3) Leaf Roll Caterpillar (*Marasmia trapezalis*)
- (4) Black Beetle (*Heteronychus sp.*)

The only pests of cane previously recorded in the district were:

- (a) Mole Cricket (*Grylotalpa sp.*)—A localised attack on germinating cane plants at the Kafue Pilot Polder in September, 1963, was successfully controlled by the application of 2% Dieldrin dust at 50 lbs/acre.
- (b) Top Borer (*Lepidoptera*)—Occasional very light infestation at the Kafue Pilot Polder and Nakambala Estate.

Of the recently occurring pests, Trash Caterpillar and *Heteronychus* Beetle have caused intensive damage and could possibly develop into major pests. Top Borer, though rather more widespread in 1965 than over the previous two years, has not assumed serious proportions and can still be rated as a minor pest. The same applies to *Marasmia trapezalis* the damage from which, though unsightly in appearance, is largely superficial and of short duration.

Brief descriptions of these pests, with notes on methods of control, follow below.

### 1. Trash Caterpillar (*Cirphis sp.*)

This caterpillar, a type of "army-worm", causes serious damage in young ratoon cane under a trash blanket—completely stripping the leaf blades and cutting off emerging shoots. At Chirundu Estate, in the Zambezi Valley, attacks occur annually in July and August and are most effectively controlled by dusting with 2½% D.D.T. at 50 lbs/acre. The dust is usually applied during early mornings and at dusk to take advantage of calm wind conditions, and is applied directly on to the young ratoon cane rows using small hand dusters, one labourer covering 5 acres per day.

A very serious outbreak of this pest occurred at Nakambala towards the end of November, 1965, much later in the season than anticipated. 200 acres of ratoon cane were affected and over most of this area a single application of 2½% D.D.T. dust brought about complete control; however, in the areas where the infestation commenced cane growth was set back by two months.

### 2. Top Borer (*Lepidoptera*)

Incidence of a Lepidopterous larva causing "dead heart" in both plant and ratoon canes has increased somewhat, but has not yet assumed serious proportions. No control measures have been taken so far but careful observation is being maintained and the possibility of introducing Tachinid parasites has been considered.

### 3. Leaf Roll Caterpillar (*Marasmia trapezalis*)

Almost the entire plant cane acreage of the estate became infected by caterpillars of the moth *Marasmia trapezalis* early in December, 1965. This caterpillar, which is an occasional pest of Gramineous crops, feeds on the upper surface of the leaf tips. The edges of the leaf are drawn together and stitched in place by silk threads to form a protective tunnel. The lower epidermis is left intact. The larval phase is over in about ten days and leaves the affected area looking unsightly because of the brown colour of the damaged leaf tips. Fortunately the crop does not appear to suffer any serious setback, since the damage is restricted to a few inches of the leaf tip.

A portion of the infested plant cane area was dusted with 2½% D.D.T., but this was discontinued owing to the natural termination of the attack. A slight recurrence of this pest took place towards the end of January, 1966. It has been observed that *Marasmia* is very common on areas of grass surrounding the estate.

### 4. Black Beetle (*Heteronychus sp.*)

The first noticeable attack on cane by *Heteronychus* Beetle occurred on heavy, wet Montmorillonitic soils at the Kafue Pilot Polder at the beginning of January, 1966. Towards the end of the same month it was found in a rather wet clay area on Nakambala Estate. The original outbreak at the Polder commenced in isolated pockets wherever cane was at all stunted through poor drainage, but soon afterwards it spread throughout the entire field. The adult beetles form a network of tunnels just below ground level from which they move up into the cane shoots and stems. The cane shoots are completely severed from the stool through the eating away of the centres of the stems. Stands of cane at all stages of growth are attacked and some

young ratoon stools have been damaged beyond recovery. Many mature canes were literally "felled" to the ground.

The following methods of control have been tried:

- (i) 2% Dieldrin dust at 50 lbs per acre (=1 lb active ingredient/acre).
- (ii) 2½% D.D.T. dust at 50 lbs per acre (=1.25 lb active ingredient/acre).
- (iii) 50% Dieldrin wettable powder at 4 lbs per acre (=2 lb active ingredient/acre).

The 2% Dieldrin dust was applied to the bases of the cane stools at about 50 lbs/acre. This brought about a fairly good kill, but took a week before the effect was noticeable.

The 2½% D.D.T. at 50 lbs/acre was disappointing. Although it appeared to affect the beetles more rapidly initially, the overall effect was very much inferior to that of the Dieldrin dust.

Dieldrin at 2 lbs active material per acre, using 4 lbs of 50% wettable powder in 100 gallons of water per acre, was applied by knapsack sprayer. This has proved to be the most successful method so far and has saved the situation as far as the present crop is concerned.

Further trials using a wider range of insecticides are to be conducted against this pest in case of any further outbreaks this season or in the future. It is felt that the low dusting rates of 50 lb. per acre did not give a good enough coverage and that the quantity of active material applied per acre was too low. Also, the small "shaker" type of hand applicator used, though an excellent device for leaf dusting against Lepidopterous pest (Trash Caterpillar, etc.) did not prove to be really suitable for concentrating dust around the bases of the stools. A bellows-operated knapsack duster has been obtained for use in future trials.

### Summary

*Trash Caterpillar* has been controlled cheaply and effectively by single applications of 2½% D.D.T. dust.

*Top Borer* is rated as a minor pest and no control measures have been taken so far, though the possibility of introducing Tachinid parasites has been considered.

*Leaf Roll Caterpillars* of the moth *Marasmia trapezalis* have caused some damage to cane, but are likewise at present rated as a minor pest.

*Heteronychus Beetles* have caused serious damage to cane at all stages of growth on heavy, wet soils, but have been brought under control by spraying with Dieldrin at the rate of 2 lbs active material per acre. Further insecticide trials are being carried out against this pest.

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**Dr. Dick:** Experiments in Natal have shown that a severe outbreak of trash caterpillar can cause a loss of 7 tons cane per acre. The caterpillars are well controlled by parasites, especially Tachinid flies and, if insecticides are to be used at all, they should be applied as early as possible. Once the cane has been damaged, treatment may do more harm than good since the parasites as well as the caterpillars will be killed.

The top-borer found in Natal is *Sesamia calamistis* and it is very likely that the one recorded from Maza-buka is the same. This insect is well controlled by Braconid wasp parasites and does not usually cause economic damage in South Africa.

The leaf-roller caterpillar is also well controlled by Braconid parasites and is of no real importance.

Beetles of the genus *Heteronychus*, of which *H. licas* is the most important in South Africa, are the most dangerous of the insects mentioned. The larvae, which feed on the roots of sugarcane, are probably even more harmful than the adults. Biological control appears to be ineffective and, in areas such as Swaziland where outbreaks have taken place, insecticide applications have been undertaken. Dieldrin is the most suitable insecticide available and emulsions are preferred to wettable powders since they penetrate the soil more effectively. Control is aimed at the adults which feed near the surface of the soil and are most numerous from October to January. Larvae, which occur much deeper in the soil, generally escape contact with the insecticide.

**Mr. Carnegie:** Have you tried leaving infestations of borer and trashworm untreated to find out whether biological control will take over?

**Mr. Booth:** This has not been tried.