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**ALTERNATIVE SYMPHYLA CONTROL
MEASURES AND THEIR EFFECT ON
PLANT CANE ESTABLISHMENT**

by

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ABSTRACT

In some areas of the Herbert Valley, the 'root-pitting' damage caused by symphyla to young cane roots is severe enough to produce noticeable reductions in growth and emergence of young plant cane. Chlorpyrifos at 2 l/ha of 50% product sprayed in the drill at planting is the currently recommended control. These trials confirmed that the recommended control was still effective. A difference in susceptibility to damage was also observed. Mocap (100 g/kg ethoprophos) at 20 kg/ha applied in the drill at planting gave a similar level of control to that of the present recommendation.

BACKGROUND

Small white elongate centipede-like creatures commonly known as symphyla cause 'root-pitting' of fresh young cane roots. The animal belongs to the class symphyla. Several species are known to cause damage to cane.

The pest and the characteristic pitting of young roots that they cause can be found in many northern cane fields but the damage is usually very limited. In the Herbert, damage to plant cane can be pronounced in dry seasons when root growth has been limited by moisture. The problem is usually more severe in replant situations. The problem is reported most commonly in the Herbert from the heavy soil Seymour and Macknade Island districts. BSES Situation Reports (Calcino, 1987) estimate that 16% of the Herbert Valley canelands are affected. The blocks affected suffer retarded growth and have an unthrifty appearance.

The soil fumigant, EDB, was used initially as a control measure. With the banning of that chemical, chlorpyrifos at 2 l/ha of 50% product sprayed in the furrow at planting was

recommended after field trials as an alternative. In areas where suSCon is used for cane grub control, it is thought that the chlorpyrifos contained in that product may also give a degree of control. Farmers had been reporting control failures when the recommended control measures had been applied. These trials were set out to test once again the present recommendation and to gain preliminary information on the effectiveness of an alternative, Mocap (100 g/kg ethoprophos).

Wireworms (*Lacon variabilis*) also cause damage to emerging plant cane by burrowing into the buds and shoots. Chlorpyrifos at 1.5 l/ha of 50% product is the recommended control for wireworm in the north.

METHODS

Trial sites and designs

- I. A strip trial with eight row plots replicated three times was established on the farm of G + N Vecchio Pty Ltd, Silky Oak, Tully in a block of replant Q122. Symphyla damage was obvious in nearby ratoon blocks at the time of planting (7 August 1990). The canegrub control, suSCon blue (controlled release chlorpyrifos at 140 g/kg) was also applied in the drill at 21 kg/ha.

Treatments were:

- (a) control
- (b) Lorsban (50% chlorpyrifos) @ 2 l/ha sprayed in the furrow.

- II. (a) A small plot trial with four row plots 20 m long replicated three times was established in fallow plant Q115 on the farm of D Morzone at Bemerside north of Ingham.
- (b) Adjacent to trial II (a), a trial with single 20 m row plots of Q124 was established. Treatments in both trials planted on 7 September 1990 were:
- (a) control
 - (b) Lorsban @ 2 l/ha sprayed in furrow at planting
 - (c) Mocap @ 20 kg/ha in furrow at planting

- III. A small plot trial with six row plots 15 m long replicated four times was established in a block of replant Orpheus on the farm of J Pavetto, Macknade Island northeast of Ingham. The soil at this site was identified by Wilson and Baker (1990) as belonging to the Macknade series of river alluvial plains soils.

Treatments applied on 24 August 1990 were:

- (a) control
- (b) Lorsban @ 2 l/ha sprayed in furrow at planting
- (c) Mocap @ 40 kg/ha in furrow at planting
- (d) Mocap @ 20 kg/ha in furrow at planting
- (e) Mocap @ 10 kg/ha in furrow at planting

Application methods

At site I, the Lorsban was diluted with water to give the required rate at the planting speed and applied through a gravity fed fan jet directed onto the set as it entered the soil (refer to BSES Fact Sheet 85B, Lorsban for wireworm control).

At sites II and III, Lorsban was applied to the relevant plots using the commercial applicators fitted to the farmers planters. The Mocap treatments were applied by hand dropping a measured weight of product down a tube fitted to the planter to distribute the chemical around the sett.

Observations and measurements

On a number of occasions in the period before shoot counts were taken, the trial sites were inspected and setts dug up and examined.

At site I shoot counts were taken, on 11 October 1990, 62 days after planting by taking 20 1.8 m long transects at random from the centre two rows of each plot. At site II, shoot counts from the centre 10 m of each row were taken, on 17 October 1990, 40 days after planting. At site III shoot counts were taken from the middle 10 m of the centre two rows of each plot, on 17 October 1990, 54 days after planting.

Measurement of yield using a harvester and weighing tipper bin was planned at site III. Unfortunately the trial was harvested contrary to the farmers instructions and the data was lost.

Growing conditions

At sites I and III where replanting was undertaken, conditions for germination and early sett growth were not ideal. Farmers found it difficult in the short period between harvest and replanting to prepare a fine seedbed on wet heavy soils. The many cultivations required in land preparation dried out the soil and the lack of moisture and poor sett to soil contact gave poor plant cane establishment. At site III spray irrigation was applied to assist germination. Some of the between block variation can be attributed to uneven soil tilth and irrigation.

Soil conditions at site II were good and generally good germination occurred.

Data analyses

Analyses of variance were conducted on shoot count data from each site using the Statistix computer package. Normality of the data was checked using the Wilk-Shapiro test.

RESULTS

The results of shoot counts are presented in Table 1.

Points to note are:

- (a) At site I, symphyla damage was not found when setts were dug. The lack of response to Lorsban also indicates that symphyla were not causing damage.

- (b) At site II, the two varieties responded differently to symphyla attack. Both symphyla damage to roots and wireworm damage to buds was found in control plots. Both Mocap and Lorsban gave similar levels of control in the more susceptible variety, Q124.
- (c) Only symphyla damage to new roots in control plots was found at site III. Although between replicate variation caused difficulties with detection of significant differences, Mocap at 10 and 20 kg/ha and Lorsban at 2 l/ha all gave higher shoot populations than the control.

Table 1

The effect of symphyla control measures on shoot counts at 3 sites

Treatment	Shoots/ha
Site I G + N Vecchio, Silky Oak, Tully	
Control	30 600 No significant diff
Lorsban @ 2 l/ha	29 800
Site II (a) Q115 - D Morzone, Bemerside, Ingham	
Control	36 100 No significant diff
Lorsban @ 2 l/ha	42 200
Mocap @ 20 kg/ha	39 500
Site II (b) Q124 - D Morzone, Bemerside, Ingham	
Control	21 500 Significant diff
Lorsban @ 2 l/ha	34 700 @ 1% level
Mocap @ 20 kg/ha	36 200 lsd = 4 100
Site III J Pavetto, Macknade Island, Macknade	
Control	28 200 Significantly diff
Lorsban @ 2 l/ha	34 900 @ 7% level
Mocap @ 40 kg/ha	31 600 lsd = 4 900
Mocap @ 20 kg/ha	35 500
Mocap @ 10 kg/ha	33 900

Uneven land preparation and irrigation lead to large between plot variation at site III. A limited analysis using data from control, Lorsban and Mocap @ 10 kg/ha gave a significant lsd (5%) of 4 900.

DISCUSSION

Researchers have often found that higher shoot populations do not necessarily translate into higher yields but farmers certainly express concern when a shoot population they consider inadequate is present soon after emergence. These trials showed that the presently recommended Lorsban treatment can improve emergence and that Mocap may have potential as an alternative control measure.

At site I there was no difference in shoot counts between treated and untreated plots. Good emergence occurred in both treatments. This result could be attributed to:

- (a) an absence of symphyla in the plant cane which seems unlikely as obvious damage was found in neighbouring ratoon crops.
- (b) the chlorpyrifos contained in suSCon applied to both treatments may have controlled the symphyla.
- (c) germination and early growth at the site may have been sufficiently vigorous to compensate for the damage.

The differing results at site II suggest that there are varietal differences in response to symphyla damage. Farmers have also found that Q124 is more susceptible to poor strikes.

At site III, the highest rate of Mocap, 40 kg/ha, may have had a phytotoxic effect as the average shoot population was lower than at the other two lower rates. The product literature warns of such effects. The data suggests that Mocap at 10 kg/ha in the drill will give similar control to the presently recommended Lorsban spray.

With Lorsban costing \$40/ha at presently used rates there is scope for alternative control measures. Mocap is one possible alternative.

REFERENCES

Calcino, D V (1987). Macknade Situation Report. BSES Internal Rept.

Wilson, P R and Baker, D E (1990). Soils and agricultural land suitability of the wet tropical coast of North Queensland: Ingham area. Land Resources Bulletin. QDPI, Brisbane.