SOUTH AFRICAN SUGAR INDUSTRY AGRONOMISTS' ASSOCIATION

3500/23 SUSCON GREEN TRIAL II (HVE)

Object: Evaluation of Suscon Green soil insecticide (10% chlorpyrifos granular) for control of Heteronychus licas larvae in sugarcane.

Cat.No.: 1799

This crop: Plant **Age:** Reps 1-3 11,1 months (22.10.90-25.9.91)
Rep 4 10,3 months (3.12.90-10.10.91)

Location: Hippo Valley Estates, Reps 1-3 Section 15, Block 4
Rep 4 Section 7, Field 22.

Soil type: Heavy clay derived from basalt.

Design: Randomised blocks, 4 replications.

Variety/spacing: N14 in 1,5m rows.

Fertiliser: Applied in accordance with normal estate practice.

Treatments:
1. Control
2. Dieldrin 50 WP @ 4 kg/ha product (2 kg/ha a.i.)
3. Suscon Green @ 20 kg/ha product (2 kg/ha a.i.)
4. Suscon Green @ 30 kg/ha product (3 kg/ha a.i.)
5. Suscon Green @ 40 kg/ha product (4 kg/ha a.i.)

Conduct:
1. Suscon Green applied by hand over the seedcane after planting and covered immediately to a depth of ±5cm. Covered again after first irrigation to ensure optimum depth of placement.
2. Dieldrin 50 WP applied by knapsack sprayer in a ±0,5m band across the furrows after planting; covered as above.

RESULTS

Relevant data for the plant crop are presented in the attached tables and figures.

(a) Cane yield: Germination was poor following planting of replications 1-3 during an extremely hot spell in late October, and stands were patchy and uneven, particulary in Reps 1 and 2. Furthermore there was game damage by wild pig, baboons, and monkeys throughout the trial area, particularly in rep 3, and this caused additional variability in stalk population and cane yield.

This variability is reflected in all yield parameters, and served to mask any treatment differences that may have existed.

(b) ERC% cane: There were no significant treatment effects.

(c) ERC yields: In the absence of quality responses, ERC yields reflected the same variability as cane yields and treatment differences were not significant.

(d) Stalk diameters: Stalk counts and stalk lengths also reflected high variability, largely because of erratic stands and game damage, and there were no significant treatment effects.

(e) Dead heart counts: Results from other trials in which samples of dead heart counts were taken showed that tiller mortality was of no value as an index of insecticide activity, and thus no counts of dead tillers were made in this trial.

(f) Larvae counts: Larvae counts were made on 20th June 1991, from 5 pit samples per plot, each sample comprising an area of 0,5m x 0,5m across the cane row and excavated to a depth of ±30cm.

Larvae were separated by size into 1st, 2nd, and 3rd instars, but data analysis was confined to totals of 2nd and 3rd instars as it seemed unlikely that the 1st instar larvae present were H.licas because neither adults nor eggs were recorded from any of the samples.

Larvae numbers were lower than expected and showed very high variability but they nevertheless revealed significant treatment responses. Counts from the Dieldrin treatment were actually higher than from the Controls, and the Suscon Green treatments showed an average of 54% control of larvae.

CONCLUSIONS

Although the high variability recorded in this trial tended ot mask treatment effects, differences in larvae counts were still great enough to reveal significant treatment differences.

Soil insecticides applied at planting depth are aimed at control of larvae, not only to reduce damage to the standing crop, but also in an attempt to reduce overall pest populations. The results obtained from larvae counts in this trial showed that all of the three Suscon Green treatments gave good control of larvae, and that Dieldrin was completely ineffective. The absence of any reaction to Dieldrin treatment indicated that the local H.licas population was very much more resistant to the chemical that the population at the Triangle trial site (3500/22), where some response to Dieldrin treatment was recorded.

There were no significant differences between the three Suscon Green treatments in either larvae counts or cany yields, but differences can be expected to show up in the ratoons as the higher rates should provide longer residual activity and more lasting control.

Suscon Green is now used successfully in Australia to control a range of white grub species in sugarcane, and it has also proved successful in other parts of the world in controlling soil-dwelling larvae of various beetle species. The product has been designed to remain insecticidally active in the soil for a three-year period. the release of the active ingredient (chlorpyrifos) involving a leaching process in moist soil. It is encouraging to note that it is also effective against H.licas larvae, and as a result of these and other results this product has now been temporarily registered for use on sugarcane in Zimbabwe.

The product has certain limitations, apart from its high cost, the most important being that it will only be effective if applied below the sett at planting and adequately covered to a depth of about 10cm. It is unsuitable for ratoon applicaitons because of the problem of applying it at depth (see 3500/19 results), so that its use is likely to be restricted to new plantings only.

KEC/Nov'91
vdr

3500/23: PLANT CROP HARVEST DATA 1991

TREATMENT MEANS

TREATMENTS	Cane t/ha	ERC % cane	ERC t/ha	Stalks/ ha/1000	Stalk lgth (m)	Stalk diam(cm)
Control	82,85	12,29	10,21	136,23	1,38	2,40
Dieldrin 4 kg/ha	85,35	12,31	10,49	134,36	1,49	2,38
Suscon Green 2 kg/ha	90,10	12,35	11,04	140,24	1,48	2,38
Suscon Green 3 kg/ha	79,27	12,22	9,69	138,00	1,31	2,43
Suscon Green 4 kg/ha	89,46	12,19	10,85	140,26	1,59	2,38
Trial mean	85,41	12,27	10,45	137,82	1,45	2,39
Significance	-	-	-	-	-	-
L.S.D. (P = 0,05)	-	-	-	-	-	-
S.E.plot ±	11,44	0,49	1,22	21,52	0,14	0,12
S.E.treat mean ±	5,72	0,24	0,61	10,76	0,07	0,06
C.V.%	13,39	3,97	11,64	15,62	9,68	4,89

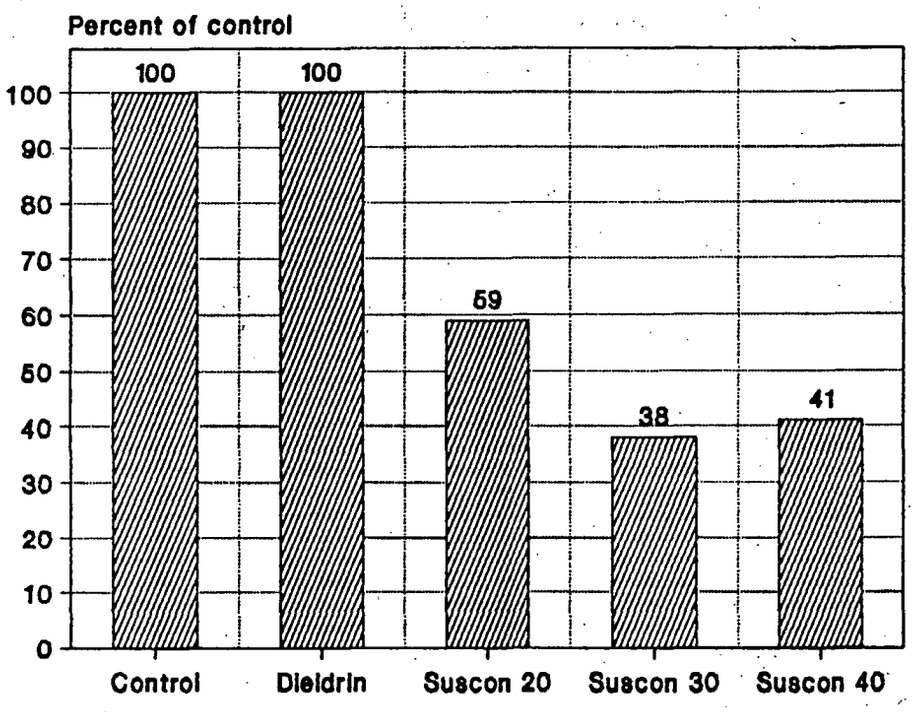
3500/23: LARVAE COUNTS FROM SOIL SAMPLES

TOTALS OF 2nd and 3rd INSTAR LARVAE (Sampled 20.6.91)

TREATMENT	Means per sample (X)	Data trans- formed /(X+1)	Larvae as % of control	Percent reductio of larvae
Control	1,70	1,60	100,00	0,00
Dieldrin @ 2kg/ha	2,75	1,89	161,76	-61,76
Suscon @ 20 kg/ha	1,00	1,39	58,82	41,18
Suscon @ 30 kg/ha	0,65	1,28	38,24	61,76
Suscon @ 40 kg/ha	0,70	1,28	41,18	58,82
L.S.D. P = 0,05	1,48	0,43		
P = 0,01	N.S	N.S		
Trial mean	1,36	1,49		
S.E. Single plot ±	0,96	0,28		
S.E. Treat mean ±	0,48	0,14		
C.V. %	70,57	18,65		

3500/23: SUSCON GREEN TRIAL II (HVE)

2nd & 3rd INSTAR LARVAE AS % OF CONTROL



PERCENT REDUCTION OF LARVAE POPULATIONS