SOUTH AFRICAN SUGAR INDUSTRY AGRONOMISTS' ASSOCIATION

3500/24 EFFECTS OF LARVAE ON GROWTH

Cat.No.:1800

TERMINAL REPORT

Object: To evaluate the effects of *Heteronychus licas* larvae on growth and yield of sugarcane in pots

Location: ZSA Experiment Station pot trial.

Soil type: PE.1 sandy clay loam derived form paragneiss.

Design: Randomised blocks, 5 replications.

Variety: NCo376.

Fertilizer: Nothing in soil at planting; nitrogen top-dressed as required.

Treatments: This was an exploratory trial aimed at creating different larvae populations by introducing varying numbers of *H.licas* eggs per treatment as follows:

1. Control, no eggs introduced.
2. 30 *H.licas* eggs per plot.
3. 60 " " " "
4. 90 " " " "
5. 120 " " " "
6. 150 " " " "
7. Control, no eggs introduced.

Conduct:

1. Pots were planted on 19 December, 1990, and eggs were introduced in early February, 1991, by spreading them ±3cm deep in moist soil around tillers.
2. The cane was cut at ground level on 18th September and weighed before. and after trashing.
3. The pots were emptied and screened, and all larvae, pupae, and adults were collected and counted.

RESULTS

The method used of introducing different egg numbers per pot in order to create varying larvae population treatments was used to avoid the problem of collecting and handling larvae in the field for direct introduction to the pots, as it was anticipated that this would lead to considerable mortality.

To test the method, 50 eggs were introduced in late February into each of 10 pots containing young growing sugarcane, and the pots were emptied 2 months later to determine larvae populations. Larvae numbers per pot varied considerably, ranging from 12 to 35 with an average of 20, thus indicating that the method had some merit but that resulting larvae numbers would be considerably lower than the numbers of eggs introduced.

At the time of harvest of pots in mid-September there was still no sign of beetle emergence under field conditions, but the presence of mature beetles in many of the pots when they were emptied and screened indicated that the artificial environment provided by the pots stimulated earlier maturity and emergence. Many adults must have flown away and not been accounted for, and thus the pots were harvested too late to record the numbers of larvae that had originally been present in the pots.

Results are presented in the table below, which shows mean H.licas counts per pot (adults, pupae, and larvae), trashed stalk weights, and stalk numbers. In spite of varying numbers of insects in the pots at the time of assessment, there were no significant differences between treatments in weights of trashed cane or in stalk numbers per pot. This was not surprising in view of the excessive root growth in the pots, which was considered adequate to support a heavy population of larvae without restricting water and nutrient uptake for normal plant growth.

TREATMENTS	H.licas per pot	Stalk wt kg/ha	Stalks per pot
1 (Controls)	1,1	4,94	13,6
2 (30 eggs/pot)	4,0	4,88	12,2
3 (60 eggs/pot)	9,8	5,32	13,2
4 (90 eggs/pot)	13,4	5,20	12,8
5 (120 eggs/pot)	8,4	5,00	12,6
6 (150 eggs/pot)	14,2	5,20	13,8
Trial mean	7,43	5,07	13,11
Significance	***	N.S.	N.S.
S.E. Plot ±	5,30	0,66	1,15
S.E. Mean ±	2,37	0,29	0,52
C.V.%	71,36	12,98	8,88

CONCLUSIONS

It is not possible to evaluate the effects of larvae on growth and yield under field conditions, and these results indicate that pot trials are unlikely to provide the answers either. Apart from the fact that harvest was too late for larvae counts, the profuse proliferation of roots after 10 months in the pots was such that it seemed unlikely that the presence of actively feeding larvae, regardless of numbers, would have had any effect on top growth. Perhaps the method would have more merit if the pots were harvested sooner, before the development of excessive root growth and when accurate counts of larvae populations would be possible, but it is unlikely that any results obtained could be related to the effects of larvae on growth and yield under field conditions.

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