

3500/13 PEARL SCALE : EFFECTS ON GROWTH

TERMINAL REPORT

Cat. 1433

Object: An exploratory trial to study the effect of various pearl scale populations on the growth and yield of sugarcane in pots.

Planted: Five single-eyed setts were planted in each pot on 14th October, 1982.

Terminated: One pot from each treatment was harvested, and pearl scales counted, on 20th April, 1983. Scale counts were done on two pots per treatment on 8th September, 1983, and the remaining pots were harvested on 19th September 1983 to measure growth differences.

Location: ZSA Experiment Station.

Soil type: PE.1 sandy clay loam derived from gneiss.

Design: 12 pots per treatment.

Variety: NCo 376.

Fertiliser: Phosphate mixed with the soil before potting; nitrogen top-dressed as required.

Irrigation: Hand watered as required.

Treatments: Heavily infested stools were collected from commercial fields on Hippo Valley Estate and adult females were separated out, counted, and introduced into the planted pots on 25th and 26th October, 1982. Treatments as follows:

- 0 : No adults added (screened top-soil was used for filling the pots but it was not sterilised so some cysts may have been present)
- 100 : Approximately 100 adult females added to each pot
- 250 : " 250 " " " " " "
- 500 : " 500 " " " " " "

In each case the numbers of females were counted and an extra 10% added to cover mortality resulting from handling.

2/RESULTS.....

## RESULTS

The separation of the scale cysts from the roots and soil in the pots proved to be a mammoth task, as was counting them thereafter. For this reason only 3 pots per treatment were screened for cyst counts, with the remainder used for growth measurements only.

Relevant data are presented in the attached table.

(a) Scale populations: Cyst counts in the control pots were very variable, with 26, 276, and 1980 recorded in the 3 pots that were checked.

In the "treated" pots, cyst numbers were considerably less variable. Each adult gave rise to approximately 40, 30, and 20 cysts in the 100, 250 and 500 treatments respectively, indicating a strong competitive effect for root space in the confined pots.

(b) Growth effects: It was apparent from an early stage that scale populations were suppressing growth, with cane in the control pots growing more vigorously than in the other treatments, which showed no visible differences. This was ultimately confirmed by the growth measurements, with all parameters affected by scale to a greater or lesser extent.

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## CONCLUSIONS

Results highlighted the need to sterilise soil before potting so as to ensure absence of scale in the controls. Further work of a similar nature is planned to try and determine the scale population at which growth first becomes affected, and new trials will include very much lower scale numbers.

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GROWTH DATA SUMMARIES

	TREATMENT				L.S.D.		S.E. treat. mean $\pm$	C.V. %
	CONTROL	100	250	500	5%	1%		
<u>GROWTH DATA (12 POTS)</u>								
Average stalk length (m)	1,308	0,938	0,943	0,886	0,166	0,222	0,058	19,80
Average mass per stalk (g)	341	244	206	198	40	54	14	19,84
Average stalk mass per pot (kg)	2,200	1,430	1,298	1,292	0,254	0,339	0,089	19,85
Gross mass per pot (kg)	2,590	1,797	1,676	1,672	0,240	0,321	0,084	15,09
Average no. internodes per stalk	17,9	16,1	14,7	14,3	1,6	2,2	0,6	12,41
Average internode length (cm)	7,37	5,77	6,37	6,16	0,76	1,02	0,27	14,47
<u>SCALE DATA (3 POTS)</u>								
Average no. cysts per pot	761	4 065	7 266	10 893				
Average wt. cysts per pot (g)	4,8	27,3	37,4	55,8				
Average wt. per 1 000 cysts (g)	6,4	6,7	5,2	5,2				