

SOUTH AFRICAN SUGAR INDUSTRY AGRONOMISTS' ASSOCIATION

6300/8: PHOSPHATE AND POTASH TRIAL

Cat.No.: 1819

Object: To evaluate six methods of determining phosphate and potash needs in ratoon cane.

This crop: Fourth ratoon Age: 12,0 months (16.5.90 to 15.5.91)

Location: ZSA Experiment Station, Field D7 - 12

Variety / Spacing: NCo376 in 1,5 rows

Irrigation: Overhead

Fertilizer: (1) Nitrogen (as ammonium nitrate)  
160 kg/ha applied half at 4 weeks, half at 8 weeks  
(2) Phosphate Nil  
(3) Potash Nil

Treatments: These will be decided on and imposed at a later date.

Rainfall: 423,2 mm Irrigation: 1369 mm

RESULTS

In order to deplete reserves of P and K in the soil to levels where responses to their applications may be obtained, five crops have been grown on the land with adequate applications of nitrogen fertilizer but without any added phosphate or potash. The trial has however been yielded as if treatments had been applied and the results have been statistically analysed.

Harvest data in all crops grown to date did not show any significant differences between plots allocated the six treatments yet to be applied, thus proving that the trial site has acceptable uniformity.

Soil phosphate is now accurately deficient (i.e. less than 12 ppm available  $P_2O_5$ ) in all plots and responses to applied phosphate can be expected if treatments are imposed. The situation with soil potassium is different with only fifteen plots in the marginal to deficient range (i.e. 0,20 m.e.% K to 0,35 m.e.% K) where responses to applied K can start to be anticipated. The other twenty one plots range from an adequate level of 0,35 m.e.% K to a rich status of 0,78 m.e.% K. In contrast foliar K % dry matter levels at 22 weeks were all below the critical levels of 1,05% in all plots except three ranging from 0,63% to 1,28%.

Treatments may be imposed after the next harvest (5R) as it appears very unlikely that it will be possible to deplete soil K levels to deficient ranges within a reasonable period. As a result the trial may end up in practice being more of a P trial only rather than one testing both P and K applications. Mean cane yield in the fourth ratoon was 108,50 tonnes per hectare.

Table 1 with relevant data is attached.

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Plant to 4R means

CROP	CANE YIELD (t/ha)	ERC YIELD (t/ha)	ERF YIELD (t/ha)	ERC% CANE	ERF% CANE	SOIL PHOSPHATE (ppm P <sub>2</sub> O <sub>5</sub> )	SOIL POTASSIUM (m.e. % K)	FOLIAR P % DRY MATTER	FOLIAR K % DRY MATTER
PLANT	136,58	16,98	19,92	12,75	14,76	38	0,49	0,22	0,93
1R	130,94	16,65	18,41	12,71	14,07	11	0,47	0,17	1,03
2R	118,85	15,30	16,75	12,89	14,11	7	0,44	0,21	0,99
2R	110,86	14,59	16,17	13,17	18,16	11	0,75	0,19	0,75
4R	108,50	13,79	15,35	12,69	14,14	4	0,42	0,14	0,82