

Effect of Elemental Sulphur on the Yield and Sugar Content of Sugarcane

S. C. Saha, S. B. M. F. Rahman and M. A. A. Sarkar
Sugarcane Research and Training Institute
Ishurdi, Pabna, Bangladesh.

ABSTRACT

An experiment was conducted at the Sugarcane Research and Training Institute Farm, Ishurdi, during 1981-82 crop season to evaluate the effect of elemental sulphur on the yield and sucrose content of sugarcane. Highest germination, maximum number of tillers and millable cane per hectare, highest yield of cane and sugar were obtained under the treatment where 50 kg sulphur/ha along with normal doses of N, P, K fertilizers (125 : 125 : 110 kg/ha) were applied.

INTRODUCTION

Increased yield of sugarcane has been obtained from the application of N, P and K and more investigations have been carried out on these nutrients (Mathur, 1975). Recently sulphur deficiency in sugarcane throughout the cane growing countries of the world has been recognised and this has focussed greater attention on the importance of this element in plant nutrition (Sedl, 1968). Little emphasis has been given to the factor of sulphur deficiency in the soil as a contributing factor to sugarcane yield decline (Bonnet, 1965). Removal of sulphur in the cane crop is generally in excess of inputs, so that eventually there may be need to consider increasing the level of sulphur in fertilizer mixture (Anon, 1982). Therefore, an experiment was undertaken to study the effect of sulphur on the yield and sucrose content of sugarcane.

MATERIALS AND METHODS

The experiment was conducted at the Sugarcane Research & Training Institute (SRTI) Farm during the crop season 1981-82 following randomized complete block design with three replications. The variety was Isd-16.

The treatments were as follows :

- T₀ — No sulphur (control).
- T₁ — 25 kg sulphur/ha.
- T₂ — 50 kg sulphur/ha.
- T₃ — 75 kg sulphur/ha.
- T₄ — 100 kg sulphur/ha.

The size of each plot was 10m x 10m. Equal number of three budded assorted setts were planted with row spacing of 105 cm. The end to end method and recommended doses of fertilizer (N-125 kg/ha, P-125 kg/ha, K-110 kg/ha) were used along with different doses of elemental sulphur for different treatments. Plantation was made on the 3rd December, 1981. All normal cultural practices were done as and when necessary for optimum growth and development of the plants. The experiment was harvested on the 10th December, 1982. Data collected throughout the experiment were on germination of eye buds, number of tillers and millable canes, recovery, cane and sugar yield. Chemical analysis for percent recovery were carried out by taking samples of ten randomly selected stalks for each replication following Horne's Dry Lead Method (Meade, 1963). The collected data were statistically analysed and the significance of mean differences were adjusted as per Duncan's New Multiple Range Test (Steel and Torrie, 1960).

RESULTS AND DISCUSSION

Some salient aspects of the experimental results are presented in Table 1. Highest percent germination, tillers, millable cane, yield of cane and sugar and

Table 1. Effect of sulphur on some yield contributing factors of sugarcane.

Treatments	% Germination	No. of tillers/ha ('000')	Millable cane/ha ('000')	Tons cane/hectare (TCH)	% Recovery	Tons sugar/ha (TSH)
T ₀ (No Sulphur)	31.90 a*	176.5 a	84.97 ab	75.84 a	11.30 a	8.58 a
T ₁ (25 kg S/ha)	30.25 a	171.7 a	85.60 ab	76.12 a	11.94 b	9.08 a
T ₂ (50 kg S/ha)	33.70 a	177.9 a	89.30 b	80.74 a	11.62 ab	9.39 a
T ₃ (75 kg S/ha)	23.56 a	154.0 a	88.50 b	71.77 a	11.55 ab	8.28 a
T ₄ (100 kg S/ha)	32.20 a	174.5 a	82.20 a	77.74 a	11.70 ab	9.10 a

*Figures followed by same letters in column do not differ significantly at 5% level of probability.

percent recovery were obtained in the treatment where 50 kg sulphur/hectare was applied along with recommended doses of N, P and K fertilizers.

The highest germination (%) of sugarcane buds and the number of tiller production were obtained in the treatment T₂, where 50 kg sulphur/ha was applied. These results agree with the results obtained by Mathur (1975) where application of Spartina (containing 11.5% sulphur) resulted in an increase in the germination (%) and tiller production.

Cane yield was increased with the application of sulphur. The finding corroborated with the observation of Sedl (1968), Bonnet (1965), Saroha and Singh (1980) and

the findings at SRTI (SRTI Annual Report, 1979-80). This might be due to application of sulphur which resulted the increase of the nitrogen level in the soil. Similar observation was found by Yonemitsu (1967) in Hawaii.

Highest number of millable cane was found following application of 50 kg sulphur/ha at the time of plantation. similar results were reported by Humbert (1968).

Highest quantity of sugar per hectare (TCH) and percent recoverable sugar were obtained under the treatment where 50 kg elemental sulphur per hectare was applied. These results agree with the results of Yonemitsu (1967). The results discussed above indicate that the application of 50 kg sulphur/ha along with recommended doses of N, P and K fertilizer (125:125:110) may increase the germination (%), tiller and millable cane production, recovery (%) and yield of cane (TCH) and sugar (TSH).

REFERENCES

- Anonymous, 1982. 82nd Annual Report, Bureau of Sugar Experiment Station, Australia, p. 19.
- Bonnet, J.A. 1965. Sulphur deficiency in the sheath related to sugarcane yield decline in a Puerto Rico soil. *Proc. ISSCT*, 12 : 244-253.
- Humbert, R.P. 1968. The growing of sugarcane. Elsevier Publishing Co., New York, p. 779.
- Mathur, B.S. 1975. Effect of micronutrients on sugarcane and its quality. *Indian Sugar*, 25 (3) : 179-181.
- Meade, G.P. 1963. Polarimetry in Sugar Analysis. Cane Sugar Handbook. 9th Edition. John Wiley Sons. Inc., New York. p. 845.
- Saroha, M.S. and Singh, H.G. 1980. Interrelationship between iron and sulphur in the prevention of chlorosis in sugarcane on alkaline calcareous soils. *Indian J. Agric. Sci.* 50 (1) : 34-40.
- Sedl, J.M. 1968. Sulphur nutrition of sugarcane. *Proc. QSSCT*, 35 : 131-136.
- SRTI Annual Report - 1979-80. Sugarcane Research and Training Institute, Ishurdi, Pabna. p. 37.
- Steel, R.G.D. and Torrie, J.H. 1960. Principles and procedures of Statistics. McGraw Hill. New York., p. 481.
- Yonemitsu, I. 1967. Sulphur requirements of sugarcane. Hawaiian Sugar Tech. Rpt., 26th Annual Conference. pp. 24-29.