Bangladesh J. Sugarcane, **8**: 67 -69. July, 1986

Effectiveness of Sulphur-coated Urea on Sugarcane

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Surface application of urea is a common practice in sugarcane. Ammonia volatilization loss from application of soluble nitrogen fertilizers on the alkaline soils could be considerable (Prasad, 1976). The National Fertilizer Development Centre, Tennesse Valley Authority (TVA) has developed a slow release nitrogen fertilizer, sulphur-coated urea (SCU) with a view to increase the efficiency of urea fertilizer by reducing leaching,volatilization and other losses of nitrogen and by supplying nitrogen to the growing plant in amounts sufficient for maximum growth during the entire crop cycle (Mays, 1970 ; Sanchez *et. al.*, 1973). Sulphur-coated urea has already attracted the attention of the researchers as a slow-release nitrogen fertilizer and research works are being conducted throughout the world on various crops. No such work on SCU has so far been conducted in Bangladesh on sugarcane. As such an experiment was carried out at SRTI farm to compare the relative efficiency of urea and sulphur-coated urea on sugarcane.

The investigation was undertaken during crop year 1983-84. The experiment was laid out in a randomized block design with four replications. Following nine treatments were used :

T_0 : Control (No Nitrogen).
T_1 : 95 kg N/ha from urea + 40 kg elemental S/ha.
T_2 : 110 kg N/ha from urea + 46 kg elemental S/ha.
T_3 : 125 kg N/ha from urea + 52 kg elemental S/ha.
T_4 : 140 kg N/ha from urea + 58 kg elemental S/ha.
T_5 : 95 kg N/ha from sulphur-coated urea.
T_6 : 110 kg N/ha from sulphur-coated urea.
T_7 : 125 kg N/ha from sulphur-coated urea.
T_8 : 140 kg N/ha from sulphur-coated urea.

Nitrogen and sulphur content in the sulphur coated urea used in the experiment was 36 % and 15 % respectively. The study included variety lsd-2/54. Each plot size was 10m x10m. Thirty three-budded assorted setts were planted/line. The end to end method of planting was followed. For all the treatments the dose of phosphorus (as Tripple Super Phosphate) and Potassium (as Muriate of Potash) was kept constant at the level of 125 kg P_2O_5 and 110 kg K_2O per hectare respectively. Full dose of TSP, half of MP and one-third each of urea and SCU were applied at planting. After 110 days of planting one-third of urea and SCU were again applied. The rest of urea, SCU and MP were applied at 180 days after planting. Data were recorded on germination, tillering, number of millable cane and yield of cane. Ten randomly selected canes were taken as samples from the experimental plots and the samples were analysed for percent

recovery of sugar by Horne's Dry Lead Method (Meade, 1963). The collected data were statistically analysed and the significance of mean difference were adjusted as per LSD (Steel and Torrie,1960).

The results of the experiment has been shown in Table. 1. The table shows significant difference between untrearted control and treated where urea or SCU was applied in respect of number of tillers, millable canes, TCH and TSH. The table also shows significant difference between comparable treatments of urea and sulphur-coated urea with an exception in a treatment where 140 kg N + 58 kg elemental S/ha and 140 kg N/ha from sulphur-coated urea were applied. However, germination of sugarcane did not enhance due to application of either urea or sulphur-coated urea. These results are in accordance with that of Uchida *et.al.* (1974), who reported that SCU increased cane sugar yield compared to normal urea. The increase of cane yield due to SCU application might be due to slower and steady release of mitroen from SCU allowing the crop to use nitrogen for an extended period. This view is supported by the report of Dalal (1974). He obtained the agronomic advantages due to slow-release characteristics of sulphur-coated urea over soluble nitrogen sources for production of several crops.

Table 1. Effect of urea and sulphur coated urea on different growth parameters of sugarcane.

Treatment	Germination (%)	No. of tillers/ (x 10^3/ha)	No. of millable cane (x 10^3/ha)	Yield TCH	Recovery (%)	Yield TSH
T_0	38.07	100.15	74.28	59.53	9.06	5.38
T_1	38.32	110.45	86.78	64.93	9.11	5.91
T_2	39.70	100.72	92.50	70.31	9.25	6.50
T_3	41.93	120.88	100.44	73.93	9.55	6.96
T_4.	40.59	110.73	100.02	71.34	9.46	6.74
T_5	40.44	120.79	100.10	72.09	9.46	6.81
T_6	42.52	120.88	100.65	76.50	9.60	7.34
T_7	46.96	130.07	100.67	77.40	9.64	7.46
T_8	40.00	110.65	96.96	71.09	9.43	6.70
LSD ((.05)		1.57	1.61	1.16	0.14	0.13

These results indicate that SCU is advantageous over soluble granular urea mixed with elemental sulphur for sugarcane under the conditions of the present experiment and needs further experimentation.

ACKNOWLEDGEMENTS

The authors express thier grqtitude to Dr. M.A.S. Miah and Dr. A.B.M. Mafizur Rahman for their guidance in conducting this work.The authors are also grateful to Mr. M.J. Hoque and Mr. M.A. Ghafur for their help at different stages of this work.

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