

Influence of Thomaskali-R a complex fertilizer on sugarcane

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Fertilizer and fertilizer management play a vital role for crop production. Crop response to fertilizer nutrients may be influenced by fertilizer characteristics, fertilizer management practice and nature of the crop environment (Ahmed, 1991). Fertilizer technologies are rapidly developing around the world contributing to more cost effective, efficient and profitable use of fertilizer. One of the technologies developed is the production and use of multinutrient fertilizers. Research and field trials conducted over the years in various countries with different crops confirmed that performance of complex/compound fertilizer like NPK, DAP towards yield increase of crop was much higher than those raised with fertilizers having single nutrient. The production and use of higher quantity homogeneous granular NPKS showed some increase during the last decade (Schultz, 1990). However much less work has been done to estimate the effect of complex fertilizer on crop production specially on sugarcane under Bangladesh environmental conditions. Therefore, an investigation was carried out to determine the effects of Thomaskali-R a complex fertilizer on yield and yield contributing parameters of sugarcane.

The field experiments were conducted at SRTI and JSM Farm in 1987-88 planting season and at SRTI, JSM & RSM farm in 1988-89 planting season. The new complex fertilizer Thomaskali-R contains 10%, P_2O_5 , 20% K_2O , 3% MgO , 23% CaO and micronutrients like Zn, B, Mn, Cu, and SiO_2 , in trace amounts. The sugarcane variety Isd 16 was used as test crop at SRTI and RSM farm and the variety Isd 2/54 at JSM farm. The experiment was set up following RCB design with four replications. The treatments were as follows:

- T₀ - Recommended rate of NPK (i.e. 125 kg N, 37 kg P 92 kg K/ha) (check)
- T₁ - 625 kg Thomaskali - R/ha
- T₂ - 125 kg N/ha+625 kg Thomaskali-R/ha
- T₃ - T₀ + 625 Kg Thomaskali-R/ha
- T₄ - Recommended NP + 625 Kg Thomaskali-R/ha
- T₅ - 125 Kg N ha⁻¹ +9.25 kg P/ha+625 kg Thomaskali-R/ha

The results of the field experiments have been presented in the Table 1 and 2. Thomaskali-R did not show any effects on germination in first year in all locations but in the second year, treatment with Thomaskali-R @ 625 kg/ha along with recommended

NPK produced maximum germination at SRTI and RSM farm. Application of Thomaskali-R along with N 125 kg/ha significantly produced maximum number of tillers in all locations in the second year. Production of millable cane was insignificant. Yield of cane was significantly influenced in both the year in all the locations and the highest yield of 98.8 TCH was recorded at SRTI farm in the second year when the crop received Thomaskali-R 625 kg/ha along with N 125 kg/ha. These results agree with the finding of Ahmed *et al.* (1989), where they reported higher yield of both plant and ratoon cane with complex fertilizer. However, differences were found insignificant in respect of recovery and sugar yield.

Table 1. Effects of Thomaskali-R on different growth parameters of sugarcane (Crop year 1987-88).

Location	Treatments	Germination (%)	Tiller (000/ha)	Millable cane (000/ha)	Yield (TCH)	Recovery (%)	Yield (TSH)
SRTI	T _c	25.2 a	119.4 a	82.4 a	73.2 b	12.17 a	8.9
	T ₁	27.0 a	112.5 a	77.1 a	63.8 c	11.42 a	7.2
	T ₂	24.0 a	132.8 a	89.0 a	81.0 a	11.75 a	8.5
	T ₃	24.0 a	117.5 a	72.8 a	75.9 ab	11.67 a	8.8
	T ₄	24.0 a	125.1 a	82.5 a	76.6 ab	11.69 a	8.9
	T ₅	26.6 a	121.9 a	78.4 a	72.6 b	11.83 a	8.6
JSM	T ₀	35.0 a	165.6 ab	83.9 a	66.2 a	8.90 ab	5.8
	T ₁	33.4 a	113.1 c	75.3 a	45.1 b	8.34 c	3.7
	T ₂	37.1 a	155.3 b	83.8 a	66.7 a	8.70 bc	8.8
	T ₃	38.2 a	174.1 a	85.9 a	69.6 a	8.90 ab	6.2
	T ₄	39.3 a	159.8 ab	84.2 a	61.5 a	8.82 b	5.4
	T ₅	38.1 a	158.4 b	83.3 a	64.3 a	9.29 a	5.9

Figures accompanied by the same letters are not significantly different at 5% level of probability as per DNMR test.

Table 2. Effects of Thomaskali-R on different growth parameters of sugarcane (Crop year 1988-89).

Location	Treatments	Germination (%)	Tiller (000/ha)	Millable cane (000/ha)	Yield (TCH)	Recovery (%)	Yield (TSH)
SRTI	T ₀	40.7 a	129.4 a	73.0 a	96.3 ab	10.87 a	10.4
	T ₁	31.9 b	90.8 c	56.5 b	52.4 c	10.98 a	5.7
	T ₂	39.0 a	137.3 a	81.6 a	98.8 a	10.95 a	10.8
	T ₃	40.5 a	112.0 b	77.0 a	92.9 ab	10.98 a	10.2
	T ₄	40.1 a	114.7 b	73.6 a	87.4 b	10.88 a	9.5
	T ₅	35.4 ab	111.3 b	74.0 a	93.4 ab	10.48 a	9.8
JSM	T ₀	21.3 ab	111.3 ab	64.2 a	70.0 ab	7.42 b	5.1
	T ₁	19.2 b	98.9 b	56.4 b	64.8 ab	7.73 ab	5.0
	T ₂	22.1 a	126.2 a	64.3 a	72.9 a	8.33 ab	6.0
	T ₃	19.9 b	121.1 a	63.4 a	70.9 ab	8.71 a	6.1
	T ₄	21.3 ab	117.2 ab	62.3 ab	72.0 a	8.64 a	6.1
	T ₅	20.5 b	115.1 ab	63.2 ab	58.1 b	8.83 a	5.0
RSM	T ₀	37.3 b	107.8 b	88.3 a	76.3 a	9.36 b	7.4
	T ₁	35.7 b	95.2 b	80.9 a	57.2 b	10.35 a	6.2
	T ₂	40.0 ab	141.2 a	96.1 a	79.2 a	9.98 ab	7.9
	T ₃	45.0 a	135.4 a	91.6 a	77.5 a	10.18 ab	7.8
	T ₄	43.8 a	127.4 a	89.6 a	78.2 a	10.15 ab	7.9
	T ₅	41.7 a	139.4 a	91.8 a	76.5 a	9.95 ab	7.6

Figures accompanied by the same letters are not significantly different at 5% level of probability as per DNMR test.

The results of the experiments sought for further study to find out the actual requirement of Thomaskali-R with other commercial fertilizers for sugarcane production.

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