

Effect of Vesimax on Sugarcane Yield

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Liquid fertilizers in the form of solution or suspension containing with or without micronutrients have been prominently used to increase crop yield in most technologically advanced nations of the world. They are applied to the soil or on foliage by means of aircrafts, fluid applicator or through irrigation water. The advantages of liquid fertilizers over the solid ones are lower production cost and hence cheaper products, less bulk and lower transportation cost, more efficient in application and more incorporation of trace elements. It is also possible to mix them with herbicides and insecticides before application (Nnadi and Iwuafor, 1980). Singh & Yadav (1983) reported that 2-5 percent increased juice extraction may be obtained by application of K either through foliar or partly soil and partly foliar application at a later stage of crop growth.

Recently a biochemical liquid fertilizer named Vesimax (Agromax) has been introduced by INTRACO (Bangladesh) Limited, and is trying to promote the use of this fertilizer in different crops in Bangladesh for augmenting yield. Vesimax has been found to increase the yield of citrus, papaya, tobacco, tea, pineapple, banana and avogada (Anon., 1987). In Nigeria, efficacy of vesimax on cane yield has been reported by Oworu (1987). No work with vesimax have been done on sugarcane in Bangladesh. In addition to normal NPK fertilizer rates, attempt has been made to evaluate the efficacy of vesimax as a liquid fertilizer on yield contributing parameters of sugarcane.

The trial was conducted at Sugarcane Research & Training Institute farm during 1987-88 and 1988-89 crop seasons. Three eyed sugarcane (variety: Isd. 16) setts were planted at one metre row distance. The setts were treated for five minutes with vesimax (50 ml vesimax, diluted with ten litres of water) before planting the setts in end to end method. In addition, vesimax treated plots also received foliar spray at different rates. The experiment was laid out in RCB design in four replications with the following treatments.

- T₁: Recommended dose of NPK fertilizer only @ 125-125-110 kg N, P₂O₅ and K₂O per hectare respectively).
- T₂: Recommended dose of NPK fertilizer+vesimax (625 ml /ha diluted with 490 litres of water).
- T₃: Half of recommended doses of NPK fertilizer+vesimax (625 ml/ha diluted with 490 litres of water).
- T₄: Vesimax only as a liquid fertilizer (625 ml./ha diluted with 490 litres of water).

The chemical composition of vesimax include the ingredients of trace minerals (S, MgO, CaO, Mn, Cu, Zn, B, Amino acid, Mo, Co and I) and vitamins (B₂, B₆, B₁₂, E, Niacin and Panthothenic) was sprayed by power sprayer as foliar application at two months intervals starting from 45 days after planting. Full TSP, one third of Urea and half of MP fertilizers were applied as basal dose. One third urea, was applied as top dressing 90 days after planting. The rest of Urea and MP were applied as second top dressing during earthing up. Necessary cultural practices were done as per requirements.

Table 1. Effect of vesimax on growth and yield of sugarcane.

Treatments	Germination (%)	Tiller (10^3ha^{-1})	Millable Cane ($\times 10^3\text{ t ha}^{-1}$)	Yield (TCH)	% increase in yield over NPK	Recoverable sucrose (%)	Yield of sugar (TSH)
T ₁ : Recommended dose of NPK fertilizer only	38.6 a	156.4 ab	113.4 ab	99.9 a	—	10.0 a	10.0
T ₂ : Recommended dose of NPK fertilizer +vesimax.	41.2 a	172.9 a	116.8 a	104.9 a	(+) 4.89	10.5 a	10.9
T ₃ : Half of recommended dose of NPK fertilizer+vesimax.	41.3 a	164.1 ab	105.5 a	87.5 a	(-) 12.44	10.3 a	9.0
T ₄ : Vesimax only as a liquid fertilizer.	36.9 a	116.3 b	87.3 c	63.1 b	(-) 36.86	10.5 a	6.6

It is revealed from the Table 1 that vesimax has no influence on germination of cane setts, although slightly higher percentage of germination (41.2 & 41.3%) were recorded in vesimax treated setts coupled with NPK fertilizer compared to only vesimax treatment or only recommended rates of fertilizer use. The result showed that spraying vesimax on sugarcane has beneficial effect on growth, tiller, millable cane, yield, recovery and ultimate sugar yield when used along with full doses of recommended fertilizer. However, use of only vesimax produced the lowest yield of cane and sugar (Table 1). Application of vesimax with full recommended rate of NPK produced higher yield (104.5 t/ha) over only full recommended rate of fertilizers, and were also superior to the other treatments. Only NPK at the recommended rate produced 99.9 t/ha cane yield. On the other hand 87.6 t/ha cane yield was found in half of recommended rate of fertilizer+vesimax treated plots. This indicates that about 5 t/ha higher cane yield was produced when vesimax was applied along with full recommended rate of NPK fertilizer only. This result is in disagreement with Oworu (1987) who reported that the highest values (75.6 and 76.8 t/ha) were obtained in two crops from the agromax (same chemical composition of vesimax) treated plots which were about three times higher than the control plots (26.2 and 22.9 t/ha) for both the crops. Application of vesimax along with 100% recommended rates of NPK increased 3% millable cane and 4.9% yield of cane.

The recoverable sucrose was higher where vesimax was used compared to only fertilizer treated plots. This may be due to higher photosynthetic activity in vesimax treated plots. When vesimax was applied at the start of grand growth period the improvement in the form of dark green leaf and elongation of stalk was observed in the general appearance and growth. This was in agreement with the finding of Oworu (1987) who reported that higher weight of TVD leaves in the agromax treatments may be associated with higher chlorophyll content in the leaves. This may also explain the higher sucrose content of the vesimax treated plots. From the above results it may be concluded that vesimax has the properties to increase cane yield, but it can not be used as substitute of any of the fertilizer recommended for sugarcane. The vesimax might be an accelerator of absorbing the essential nutrients. Vesimax may be used at the start of tillering and grand growth stage of sugarcane along with full recommended rate of fertilizer for increasing the yield of sugarcane. However, further research is required for firm conclusion.

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