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Optimization of Productive Tillers in Sugarcane

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Tillers are structural and functional growth unit of sugarcane giving the ultimate yield. Sugarcane has a vast tillering potential as is evident from a record observation of 70 tillers emerged from a single bud (Nickel, 1977). All tillers produced do not turn into ultimate millable stalks resulting loss of photosynthate. Earlier studies elsewhere showed that 20-61 percentage of tillers die as a result of both inter and intra plant/clump competition for light, nutrients, and moisture (Anon. 1981; Miah and Sarkar, 1982; Shrivastava *et al.*, 1985). Tiller removal and defoliation reduced shoot mortality and increased ultimate cane and sugar yield (Anon. 1978; Miah and Sarkar, 1981; 1982; Signh, and Singh, 1984). In addition to this, earthig up has been shown to increase yield and quality of cane (Pawar *et al.*, 1983). However, much less has been done to estimate the yield and tiller removal and tiller suppression by earthing up on ultimate cane yield and sugar recovery under Bangladesh environmental conditions. Therefore, an investigation was carried out to determine the effect of tiller removal and suppression of tiller production by earthing up on ultimate millable cane production, yield, and sugarcane quality.

A trial was conducted at Sugarcane Research & Training Institute farm comprising 7 treatments with 3 replications. Variety Isd 16 was used for this investigation as a test crop. Recommended doses of fertilizer were applied, and necessary intercultural operations were done. Treatments were as follows :

T_0= Check (No tiller removal and no earthing up).
T_1= Suppression of tiller production by earthing up in April.
T_2= Suppression of tiller production by earthing up in mid June.
T_3= T_1+T_2
T_4= Tiller removal in April leaving 10 healthy tillers per clump.
T_5= Tiller removal in June leaving 10 healthy tillers per clump.
T_6= T_4+T_5

Tiller removal and earthing up were done carefully as per schedule for each treatment. Chemical analysis for sucrose percenatge was done at harvest. Millable cane count and yield of cane were also done at harvest. Results obtained were analysed statistically.

The results of the experiment has been presented in the Table 1. Significantly higher tiller mortality was recorded in the check compared to rest six treatments. Lowest mortality was recorded in the treatment where tiller removal was done twice in April and in June. This result is in agreement with the findings of Singh and Singh (1984) who obtained 55-61 percentage reduction of tiller mortality with 50 percentage tiller removal. No significant differences were recorded in respect of number of millable

Table 1. Effects of tiller removal and suppression of tiller by earthing up on the yield parameters and sugar percentage.

Treatments	Tiller mortality (%)	No. of millable cane (000/ha)	Yield (ton/ha)	Stalk wt. (kg)	Sugar percentage
T_0	39.83	75.72	70.23	0.93	10.36
T_1	28.79**	79.94	74.17	0.93	10.49
T_2	30.64**	76.39	70.22	0.84	10.68
T_3	26.77**	77.50	80.33	1.04	11.49**
T_4	24.29**	74.72	77.00	0.98	11.47**
T_5	31.27**	77.39	71.44	0.93	11.16**
T_6	22.30**	75.06	80.95	1.08	11.51**
LSD (5%)	4.41	—	—	—	0.68
LSD (1%)	6.17	—	—	—	0.95

*Significant at 5% Level.
** Significant at 1% Level.

canes, yield and stalk weight although more than ten ton/ha higher cane yield was obtained in both the treatments where tiller production was suppressed by earthing up or tiller removal was done twice in the month of April and June. Miah and Sarkar (1982) obtained higher yield due to 50 percentage leaf removal and tying up of tillers. Highest stalk weight was obtained in the treatments where tiller production was suppressed by earthing up and tiller removal was done twice in the month of April and June (Table 1). Significantly higher sucrose percentage was also obtained in these treatments. These results indicate that tiller removal or tiller suppression by earthing up have positively contributed to stalk weight and sucrose accumulation and storage, and ultimate yield through reducing mortality and better use of photosynthate. Therefore, it is concluded that removal or suppression of late tillers may increase cane yield, stalk weight and sucrose percentage, and suggested to cut away or suppression of late tiller production by earthing up in April and June to increase cane yield and quality. However, further works are needed to know actual time, severity and frequency of tiller removal/suppression of tiller production by earthing up.

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