

Effect of Enhanced N and P on the Millable Cane in Isd. 16 Grown Under Spaced Transplanting Condition

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ABSTRACT

An experiment was carried out at SRTI farm to study the effect of rate of N and P on the millability of tillers grown under spaced transplanting condition. It was observed that maximum tillering was completed by the month of May and 40-50% tillers died by the month of July. Highest number of tillers/ha was produced under spaced transplanting (single stand) condition with 165 : 195 : 110 kg/ha fertilizer doses. Highest yield of cane, sugar and purity % cane were obtained at spacing 90 cm x 60 cm (double stand) with 165 : 165 : 110 kg/ha fertilizer doses.

INTRODUCTION

Tillering is the ultimate means for the production of millable cane and yield ; it is greatly influenced by many factors among which sufficient space for the successful utilization of solar energy and fertilizer to meet mineral nutrition requirements (Anon. 1981). In order to produce satisfactory stool it is obvious that proper attention to the cultivation practices, such as time of cultivation, time and quantity of fertilizer application, time of irrigation and filling the planting furrow with soil, would be a great deal beneficial in completing the stooling of the plant cane (Loh, 1956). Tillering is greatly influenced by several factors among which three are major in promoting maximum tillering namely sunlight, nitrogen and phosphorus (Nickell, 1967). Proper spacing should give optimum solar radiation. The addition of high levels of N and P to the soil would take care of the nutrient factors. Tillering increases with the increase of favourable environmental condition and mineral nutrition. Scientists working on the physiological aspects of sugarcane are of the opinion that there is considerable scope for increasing the cane yield beyond the apparent yield limits of the existing varieties by providing adequate nutrient, water and sunlight (Rastron, 1971). The requirement of

nutrients vary with the number of tillers feeding. Using nursery raised cane plantlets for transplanting has some advantages over the conventional method of planting, in economic use of land and seed cane (Panje, 1967 ; Panje, 1968 ; Rahman *et.al.*, 1978 and Imam *et. al.*, 1982). As such, the present experiment was conducted to study the effect of rate of N and P on the millability of tillers grown under spaced transplanting condition.

MATERIALS AND METHODS

The experiment was conducted at the Sugarcane Research and Training Institute Farm following randomized complete block design with three replications. Following nine treatment combinations were used :

- P_0F_0 —Normal planting (105 cm apart rows), 125 : 125 : 110 (kg/ha) fertilizer doses.
- P_0F_1 —Normal planting (105 cm apart rows), 165 : 125 : 110 (kg/ha) fertilizer doses.
- P_0F_2 —Normal planting (105 cm apart rows), 165 : 165 : 110 (kg/ha) fertilizer doses.
- P_1F_0 —Spacing 90cm x 60cm (Single stand), 125 : 125 : 110 (kg/ha) fertilizer doses.
- P_1F_1 —Spacing 90cm x 60cm (Single stand), 165 : 125 : 110 (kg/ha) fertilizer doses.
- P_1F_2 —Spacing 90cm x 60cm (Single stand), 165 : 165 : 110 (kg/ha) fertilizer doses.
- P_2F_0 —Spacing 90cm x 60cm (Double stand), 125 : 125 : 110 (kg/ha) fertilizer doses.
- P_2F_1 —Spacing 90cm x 60cm (Double stand), 165 : 125 : 110 (kg/ha) fertilizer doses.
- P_2F_2 —Spacing 90cm x 60cm (Double stand), 165 : 165 : 110 (kg/ha) fertilizer doses.

Single stand means single-eye budded settlings on the other hand double stand means two single-eye budded settlings placed side by side. For the present investigation the variety Isd.16 was used. The size of individual plot was 10 m x 10 m. Three eyed cane setts were planted in the field on 10th November, 1981 and the transplanting of the single-budded settlings were done on 20th January, 1982 and harvested on December, 1982. The cane setts were treated by Aretan 6 prior to planting. All normal cultural practices were applied from time to time to provide right conditions for optimum growth and development of plants. Count on tillering was done in May, June, July, August and September, 1982 and expressed in thousand/ha and number of millable cane was taken after harvest. In the month of November and December, 1982 chemical analyses were carried out at an interval of 30 days taking a sample of five randomly selected stalks for each replication following Horne's Dry Lead Method (Meade, 1963). Statistical analyses of data were done on number of millable cane, yield and recoverable sugar.

RESULTS AND DISCUSSION

Highest yield of cane, sugar and purity % cane were obtained at P_2F_2 (spacing 90 cm x 60 cm, double stand, 165 : 165 : 110 kg/ha fertilizer doses) (Table 1).

It was observed that maximum tillering completed by the month of May and 40-50% tillers died by the month of July (Table 2). Number of tillers was slightly increased in the following month.

Highest number of tillers/ha was produced by P_1F_2 (spacing 90 cm x 60 cm single stand, 165 : 165 : 110 kg/ha fertilizer doses). These results agree with the results obtained by Nickell (1967) where a rapid increase in stalk population for the first 3 to 4 months was observed; between this time and harvest there is a decrease of about 50% in stalk population. Rahman and Rahman (1979) reported that conventional planting with three budded setts produced significantly higher number of tillers at the early tillering stage. It was observed that spaced planting (single stand) produced lower number of tillers at the early tillering stage but no significant difference in the number of tillers at the late stage.

Highest number of millable cane was observed at P_0F_1 (normal planting-105 cm apart rows-165 : 125 : 110 kg/ha fertilizer doses) but the results were insignificant while lowest number of millable cane per hectare was found at P_1F_2 (spacing 90 cm x 60 cm single stand, 165 : 165 : 110 kg/ha fertilizer doses). Though the treatment P_0F_1 produced highest number of millable cane/ha, it produced lowest cane yield, sugar yield and percent recoverable sugar. This might be due to the effect of spaced transplanting. Similar results were reported by Imam *et. al.* (1982). They claimed that conventional planting produced significantly higher number of millable cane per unit area.

Table 1. Effect of different treatments on the no. of millable cane, yield of cane/ha, % recoverable sugar, yield of sugar/ha and purity % cane.

Treatments	No. of millable cane/ha ('000')	Yield of cane/ha (m. ton)	Yield of sugar/ha (m. ton)	% recoverable sugar	Purity % cane
P_0F_0	151.5 a*	71.3 a	8.58 ab	12.01 b	89.07 a
P_0F_1	155.3 a	68.8 a	7.14 a	10.38 a	89.28 a
P_0F_2	151.3 a	74.8 a	9.30 b	12.40 b	90.07 a
P_1F_0	146.1 a	71.3 a	8.62 ab	12.10 b	90.60 a
P_1F_1	154.9 a	75.2 a	8.94 b	11.89 b	89.44 a
P_1F_2	145.2 a	74.0 a	9.15 b	12.37 b	89.52 a
P_2F_0	152.4 a	72.8 a	8.87 b	12.32 b	90.78 a
P_2F_1	150.6 a	73.8 a	8.69 ab	11.77 ab	90.80 a
P_2F_2	148.8 a	77.8 a	9.48 b	12.18 b	91.40 a

* Figures followed by the same letter are not significantly different at 5% level of probability as determined by the Duncan's New Multiple Range Test.

Table 2. Effect of different treatments on the production of tillers/ha.

Treatments	No. of tillers/ha produced in diff. months (fig. in thousand)				
	May	June	July	August	September
P ₀ F ₀	169.82	148.08	81.15	88.15	92.98
P ₀ F ₁	186.09	159.34	89.89	90.40	91.23
P ₀ F ₂	171.36	156.96	85.78	94.84	86.24
P ₁ F ₀	155.54	138.38	75.23	80.21	84.74
P ₁ F ₁	143.39	141.01	76.71	88.61	83.75
P ₁ F ₂	169.95	146.60	83.96	85.91	94.27
P ₂ F ₀	178.41	174.45	89.76	95.49	91.69
P ₂ F ₁	177.92	160.17	80.89	89.02	81.44
P ₂ F ₂	175.15	164.29	92.85	91.50	86.38

Highest yield of cane and sugar were found at P₂F₂ (spacing 90 cm x 60 cm double stand, 165 : 165 : 110 kg/ha fertilizer doses) where the lowest of the same were obtained at P₀F₁ (normal planting-105 cm apart rows, 165 : 125 : 110 kg/ha fertilizer doses). The cause of higher cane and sugar yield might be due to spaced planting and higher fertilizer doses. This finding is similar to that of Nickell (1967) who reported that spaced planting and addition of high levels of N and P to the soil would increase the cane and sugar yield. According to Rahman and Rahman (1979) spaced planting of sugarcane produced higher TCH, TSH and percent recoverable sugar as compared to the normal planting.

Though the highest % recoverable sugar was found at P₀F₂ (normal planting-105 cm apart rows, 165 : 165 : 110 kg/ha fertilizer doses), but there was no significant difference between the treatments. The corresponding yield of sugar resulted from cane yield and percent recovery revealed that significantly higher TCH was produced by P₂F₂ i. e., spacing 90 cm x 60 cm (double stand), 165 : 165 : 110 kg/ha fertilizer doses.

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