

POTENTIAL OF SPACED TRANSPLANTING OF SUGARCANE

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SUMMARY

An experiment was undertaken at the experimental farm of the Sugarcane Research Institute, Ishurdi, Pabna in the 1976-1977 crop season to assess the potential of Spaced Transplanting (STP) of single-budded settlings of sugarcane as compared to the direct normal planting of three-budded setts. The study was further extended to see the effects of row-orientation with particular reference to sunlight utilization, on the ultimate productivity of sugarcane. Planting of three-budded setts was done in mid December while the transplanting of the single-budded settlings from the nursery bed to main field was done 70 days later. It was observed that the conventional planting with the three-budded setts produced significantly higher number of tillers at the early tillering stage (April) while the single-budded settlings under STP outnumbered them at the late tillering stage (June) and produced significantly higher number of millable canes at harvest. STP registered higher productivity in terms of both TCA (tons cane/acre) and TSA (tons sugar/acre) although the yield increases were not statistically significant. Row-direction was found to exert no significant effect on the ultimate cane yield.

INTRODUCTION

The yield of sugarcane in term of both TCA and TSA, is miserably poor in our country. The reasons for such poor productivity could be attributed to the dearth of high yielding or high sugar varieties on the one hand and the inefficient exploitation of the yielding potential of the existing varieties on the other. Scientist working on the physiological aspects of sugarcane are of 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 (Rostron 1971, Gloves 1972). The present day agriculture is the harvesting of the solar energy and this is most true for sugarcane. The production of sugar or sucrose is directly related to the process of photosynthesis which in turn is greatly influenced by sunlight factor provided water and nutrients are non-limiting. The net gain in the photosynthate ultimately depends on the amount of light energy available and the proportion of this light intercepted and used by the leaves. In recent years, the use of spaced transplanting/planting and row-orientation which restricts mutual shading and provides for efficient utilization of sunlight, has received considerable attention of cane scientists for obtaining higher productivity of sugarcane (Kosaka 1961, Nickell 1967, Silva 1969, Buren 1972). A closer look to our existing situation might reveal that the present level of cane yield be considerably increased if optimum number of millable healthy stalks per unit area could be ensured. Here again sunlight stands as one of the most important factors for obtaining adequate millable tiller (Buren 1972, Mac Coll 1976). Although a number of research work have been carried out in different countries on spaced transplanting of sugarcane but

practically no attempt had yet been made to investigate into the merit of this technique in our country.

The present study was therefore, undertaken to access the potential of spaced transplanting of single budded germinated settlings as compared to the conventional planting of three-budded setts with particular reference to the millability of tillers and the ultimate productivity of sugarcane.

MATERIALS AND METHODS

The experiment was conducted at the experimental farm of the Sugarcane Research Institute, Ishurdi, Pabna during the period from December 15, 1976 through February 5, 1978 with the newly evolved variety of sugarcane, BS-96. The experiment comprised of the following four treatments :

1. Conventional planting of 3 budded setts planted in 3½ ft. apart rows with South-North row direction.
2. Same as treatment No. 1 above but with East-West row direction.
3. Transplanting of single budded settlings with the spacing of 3 ft. between rows and 2 ft. between settlings and placed rectangularly.
4. Same as treatment No. 3 above but placed triangularly.

The above treatments have been denoted, here in the text, by T₀, T₁, T₂ & T₃ respectively. The planting of the 3-budded setts was done on December 15, 1976 while the transplanting of the single-budded settlings was effected on February 25, 1977. Normal doses of fertilizer viz., Urea, Triple Super Phosphate (TSP) and Muriate of Potash (MP) at the rates of 3 mds. 3 mds. and 2 mds per acre respectively were applied. Full dose of TSP and one-third quantities each of Urea & MP were applied as the basal dressing while the remaining two-thirds each of Urea & MP were applied later on in two equal splits. Intercultural operation like weeding, irrigation, mulching, earthing-up, plant protection measures, etc. were maintained as per normal practice. Data on % germination of buds (in the case of planted-cane as under treatments T₀ & T₁) and % survival of settlings (in the case of treatments T₂ & T₃) were recorded. Counts on tillers at monthly intervals starting from 1st April, 1977 through 1st June 1977 were taken. The crop was harvested on February 5, 1978 and data on millable cane per acre, recovery % sugar, yield of cane in terms of both TCA and TSA were recorded at the time of harvest. The chemical analysis of cane samples for determining % recoverable sugar was done according to the conventional Horne's Lead Sub-acetate method. The data on various parameters were statistically analysed.

RESULTS AND DISCUSSION

Some salient aspects of the experimental results are presented in table 1 & 2. Data show that the cent per cent settlings transplanted survived as compared to about 39% germination of buds obtained with the conventional planting. The requirement of seed material in the case of STP is about 24% of the conventional planting (Table 1).

Table-1. Dates of planting/transplanting, % germination, % survival of buds/settlings, and quantities of seed material used under different treatments.

Treatment	Date of		% germination of planted cane	% Survival of transplanted settlings	Quantities of seed material used/acre
	Planting	Transplanting.			
T ₀	Dec. 15, 1976	—	39.68%	—	50 mds.
T ₁	Dec. 15, 1976	—	39.09%	—	50 mds.
T ₂	—	Feb. 25, 1977	—	100%	12 mds.
T ₃	—	Feb. 25, 1977	—	100%	12 mds.

Table-2. Production of tillers, millable cane, % recovery, TCA and TSA as influenced by different treatments.

Treatment	Tillers produced per acre as on (fig. in thousands)			Millable cane per acre (1000)	% recovery	TCA	TSA
	April 1, 77	May 1, 77	June 1, 77				
T ₀	35.39	56.30	63.26	38.81	9.51	41.33	3.93
T ₁	35.47	55.28	64.15	39.48	9.41	41.97	3.95
T ₂	25.64	51.35	72.90	49.93	9.77	42.19	4.12
T ₃	25.93	53.73	73.52	50.58	10.33	42.49	4.38
L.S.D. at 1% level	1.04	—	5.61	3.15	—	—	—

As it can be seen from Table 2, conventionally planted cane with 3-budded setts produced significantly higher number of tillers at the early tillering stage (April) while at the late tillering stage (June), the single-budded settlings under STP out numberte hem by producing significantly higher number of tillers. As regards millability of tillers, STP promoted higher rates of millability of tillers by producing significantly higher number of millable canes at harvest. Results showed that STP registered higher productivity in terms of both TCA and TSA although the corresponding yield increases were not significant due to the production of comparatively thinner cane. Results further showed that row-direction had no significant effect on the yield and yield contributing characters of sugarcane. That STP promotes higher number of millable cane giving higher yields has been supported by some relevant works of scientists working in the line (Pearson 1950, Rao & Prashad 1962, Hum bert 1968, Loh and Tseng 1956, Russel 1959, Buren 1972).

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