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Comparative Performance of Different STP Techniques under Irrigated Condition

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In Bangladesh generally sugarcane is cultivated by planting three budded setts in trenches with different row spacings. This method can not ensure regular germination and very often gaps are found in the field. Such gappy and irregular germination in conventional planting results into poor number of millable stalks per unit area. The major cause of poor yield of cane has been identified to be the insufficient number of millable stalks per unit area (Khairwal and Babu, 1975; Irvine *et al*, 1980). The average yield of cane in Bangladesh is very poor compared to other developed cane growing countries like Brazil, Hawai, Mauritius, Japan, Australia etc. In order to uphold the average yield of cane many attempts had been made on the different agronomic practices that can be adopted for increasing the number of millable stalks. Spaced transplanting (STP) received considerable attention in the recent years (Rahman and Rahman, 1979; Srivastava *et al.*, 1985; Rahman *et al.*, 1987; Tang and Chen, 1974). Since 1976, considerable amount of work have been done on different aspects of spaced transplanting techniques. Different types of settlings viz. Polybag, soil bed, budchips, slip settlings (Rayungan) etc are transplanted in the field with different row and plant spacings to ensure the optimum number of initial mother plant populations under STP techniques. Therefore, this investigation has been undertaken to study the comparative performance of different STP techniques under irrigated conditions. The trial was conducted during 1987-88 crop season at the experimental farm of SRTI with variety Isd. 16. The experiment consisted of the following eight treatments.

T_1 – Rayungan (A) : Detopping standing seed cane four weeks before harvesting and making cutting having two shoots (slips) and transplanting horizontally,

T_2 – Rayungan (B) : Making single shooted cutting (slip) and transplanting vertically,

T_3 – Direct spaced planting (DSP) of two budded two setts,

T_4 – Polybag settlings (PBS),

T_5 – Soil bed (SB) single budded horizontal settlings,

T_6 – Soil bed (SB) two budded settlings,

T_7 – Conventional planting of three budded setts,

T_8 – Bud chip settlings.

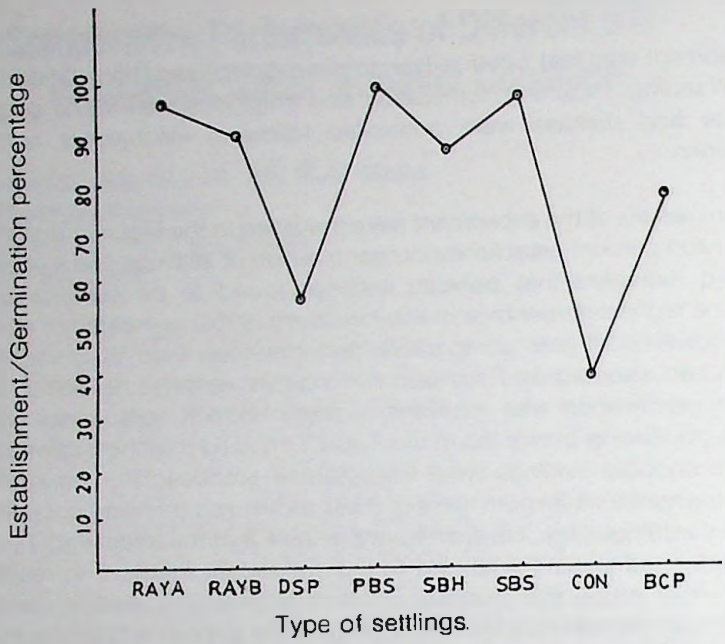
The experiment was laid out in a Randomized Completed Block Design with three replications. Weeding, mulching, fertilization and irrigations were done as per normal practice. Pests and disease were controlled following mechanical and chemical recommendations.

The salient results of the experiment were furnished in the Figure-1 and the Table-1. The figure showed percent establishment/germination of settlings/setts under different treatments and indicated that polybag settlings found to be superior as planting material with the highest percentage of establishment (98%) compared to other sources of settlings. However, almost comparable performances were observed in case of Rayungan (A) two shooted and soil bed two budded settlings (91-95%). The lowest percentage of germination was recorded in three budded setts under conventional planting. Data on tillering presented in the Table 1 showed that the treatment T_1 where Rayungan two shooted settlings were transplanted produced the maximum tillers of 144.8 x 10^3/ha where as minimum tillers of 80.87 thousands/ha were obtained from soil bed single eyed settlings (T_5). It is seen from the table that the treatments T_1, T_3, T_4, T_6, T_7 and T_8 performed equally well and found statistically identical in respect of tiller production. Further more, the mortality of tillers is directly related to the population density exhibited by the different treatments. Higher the population density, higher is the tiller mortality. Minimum tiller mortality of 23.0 percentage was recorded in the soil bed settlings whereas the maximum tiller mortality (44.4%) was obtained from Rayungan two shooted settlings. This result led the cane Agronomist and Physiologist to develop an appropriate technologies of cane production so that higher productivity could be achieved through minimizing tiller mortality. Similar results regarding tiller production and its mortality has also been reported elsewhere (Miah and Sarkar, 1982; Rahman *et al.*, 1987). Highest number of millable stalks (82.3 × 10^3/ha) were obtained from T_1

Table 1. Comparative performance of different STP techniques under irrigated condition.

Treatments/sources of planting material	Tiller (X10^3/ha)	Mortality (% of tillers)	Millable cane (X10^3/ha)	Yield (t/ha)
T_1 – Rayungan A : Two shooted settlings (slips).	144.8 a*	44.4	80.5 a	62.9 a
T_2 – Rayungan B : Single shooted settlings (slips).	98.6 bc	27.5	71.5 ab	63.0 a
T_3 – Direct spaced planting of two budded setts.	119.6 ab	39.1	72.8 ab	63.0 a
T_4 – Polybag settlings.	129.5 a	36.4	82.3 a	79.4 a
T_5 – Soil bed single budded (H) settlings.	80.5 c	23.0	61.9 b	62.4 a
T_6 – Soil bed two budded settlings.	128.0 a	37.5	80.0 a	68.0 a
T_7 – Conventional planting of three budded setts.	131.6 a	42.3	75.9 a	62.5 a
T_8 – Bud chip settlings	130.5 a	38.9	79.7 a	79.3 a

* Figures accompanied by similar letters do not differ significantly at 5% level as per DNMR test.



RAY(A) = Rayungan two shooted slip.RAY(B) = Rayungan one shooted slip.
DSP = Direct spaced planting (2 eyed). PBS = Polybag settling.
SBH = Soil bed settling (Horizontal).SBS = Soil bed two eyed settling.
Con = Conventional planting. BCP = Bud chip settling.

Figure 1. Influence of planting materials on germination of sugarcane.

treatment while the treatment T_5 gave the lowest number (61.9×10^3/ha) of millable stalks. The table further revealed that all treatments except T_5 were statistically identical in respect of millable cane production. About 32 percent higher number of millable stalks were produced by polybag settlings over the conventional planting. The yield data showed that all sources of planting material were found statistically identical, however; Polybag source of settlings (T_4) showed the best performance producing the highest yield of 79.4 t cane/ha followed by the bud chip settlings (T_8). Polybag source of settlings proved its superiority by producing about 17 t/ha higher cane yield compared to conventional planting. Considering the seed requirement and yield of cane polybag settlings as well as two eyed soil bed settlings under irrigated condition were considered to be the superior technique of sugarcane transplanting.

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