Bangladesh J. Sugarcane, 7 : 70 - 75. *July, 1985*

Effect of Periodical Watering in Sugarcane Marcotte

M. A. Miah, A. Awal and M. A. Karim,
Sugarcane Research and Training Institute,
Ishurdi, Pabna, Bangladesh.

ABSTRACT

An experiment on marcotting of sugarcane under natural and moist conditions was conducted to study the effect of periodical watering on number, length and weight of root, and on the survival of excised stalks. Sawdust and polythene sheets were used as rooting media and wrapping materials, respectively. Altogether, 72 stalks were marcotted and 50% of marcotted materials were moistened with water once a week and the remaining 50% kept in natural condition. Fifty percent of the marcotted stalks (equal number natural and moist conditions) were excised after three weeks and 50% after four weeks of marcotting. Periodical watering showed no significant effect on any parameter except root weight in moist condition. Results indicate that marcotting can be done without periodical watering under Bangladesh condition using sawdust as rooting media.

INTRODUCTION

Marcotting in sugarcane is an improved and essential technique which provides the breeder an opportunity to keep the excised stalks alive in water for desirable period. It has been observed that this technique is superior to solution and field technique for seed setting (Saha *et.al.* 1984). Marcotting is done to induce an above- ground system of roots on each stalk so that when the canes flower they can be cut below the rooted section and moved individually into the crossing house. At Houma (USA), sphagnum moss is used as rooting media and the marcotted stalks are watered once a week (Dunckelman, 1982) for better root development. But at SRTI water - soaked sawdust is used as rooting media in marcotting without further watering till excise. In Bangladesh, there is no report on the effect of periodical watering in marcotted stalks. Therefore, a comparative study was undertaken to determine the effect of periodical watering on root initiation, root growth, root weight and survival of the excised stalks marcotted under natural and moist conditions.

MATERIALS AND METHODS

Sawdust and transparent polythene were used as rooting media and wrapping material, respectively in marcotting. Rope was used in tyeing. The size of the polythene was 55x55cm. The variety used was Isd-16. During marcotting, sawdust was first soaked with water and then placed around the selected stalks where polythene sheets were wrapped earlier. Later on, the upper end of the polythene paper was tied with a rope. Each marcotte was made individually in each stalk about one foot above the ground level. Altogether 72 stalks were marcotted on the 20th October, 1984. Fifty percent of the marcotted stalks were moistened with water in every 7 days through a hole. After three weeks of marcotting when sufficient number of roots came out, 18 stalks from each of the two groups (natural and moist) were excised (first excise). Of 18 stalks, 9 were kept in running tap water and 9 were used for recording data on number, length and weight of roots. For this purpose, the marcotted stalks were opened and washed thoroughly in tap water. The upper two nodes were considered for counting the number of roots. All roots of the two nodes were used for taking the weight. Twenty long roots were used for length measurement. The same procedure

was followed for data collection from the remaining 36 stalks (18 for each group) which were excised after four weeks of marcotting (second excise). The duration from the placement of the excised stalks in water to the death of the flag-leaf was noted as period of survival.

The average data of all the four parameters were then statistically analysed and evaluated as per DNMR test.

RESULTS AND DISCUSSION

The mean number of roots produced by marcotted stalks at natural and moist condition showed no significant difference (Table 1). No difference was observed between first and second excise. Number of roots at second excise was significantly higher than that at the first excise of marcotting at natural condition. It was, however, insignificant at moist condition. Results also indicate that initial root development is faster in moist condition than in natural one. The results of marcotting under natural condition were partially in conformity with the findings of Miah *et. al.* (1984). The insignificant difference in number of roots proves that there was no effect of moistening on the marcotted stalks for root development.

Table 1. Mean number of roots developed in stalks marcotted under natural and moist conditions.

Duration of marcotting	Natural	Moist	Mean
Three weeks	25.44 b *	29.00 ab	27.22 a
Four weeks	33.45 a	30.11 ab	31.78 a
Mean	29.44 a	29.56 a	

* Figures with same letter do not differ significantly at 5%level.

Table 2. Mean length (cm) of roots developed in stalks marcotted under natural and moist conditions.

Duration of marcotting	Natural	Moist	Mean
Three weeks	27.18 a*	24.53 a	25.86 a
Four weeks	25.02 a	30.43 a	27.73 a
Mean	26.10 a	27.48 a	

* Figures with same letter do not differ significantly at 5%level.

The length of roots developed at natural condition showed no difference from that at moist condition (Table 2). There was no difference in mean length between the first and second excise of marcotted stalks. Miah and Mannan (1983) and Miah *et.al.*(1984) obtained similar result for length at first and second excise of marcotting under natural condition. The insignificant difference in root length between the natural and moist condition proved no effect of watering on length after marcotting.

The mean weight of roots at moist condition was significantly higher than that under natural condition (Table 3). The average root weight of second excise was also significantly higher than that of first excise. The results thus corroborate the works of Miah and Mannan (1983) and Miah *et.al.* (1984).The higher root weight at moist condition indicates that root diameter was greater in moist condition than that in natural condition.

Stalk survival showed no significant difference between the natural and moist marcotting (Table 4) .Average stalk survival of the first excise also did not differ statistically from that of the second excise. Stalk survival in both excises at the natural and moist conditions of marcotting also

Table 3. Mean weight (g) of roots developed in stalks marcotted under natural and moist conditions.

Duration of Marcotting	Natural	Moist	Mean
Three weeks	9.31 a*	8.73 b	9.02 b
Four weeks	13.19 a	27.94 a	20.57 a
Mean	11.25 b	18.33 a	

* Figures with same letter do not differ significantly at 5%level.

Table 4. Mean survival (days) of stalks marcotted under natural and moist conditions.

Duration of marcotting	Natural	Moist	Mean
Three weeks	60.11 a*	68.89 a	64.50 a
Four weeks	64.99 a	70.00 a	67.49 a
Mean	62.55 a	69.44 a	

* Figures with same letter do not differ singnificantly at 5%level.

showed no significant difference although, apparently, the second excise showed increased number of days of survival over the first excise. The results obtained under natural condition were in partial agreement with the findings of Miah *et.al.* (1984). The insignificant difference of survival of the excised stalks of natural and moist marcotting reveals that there was no effect of watering after marcotting.

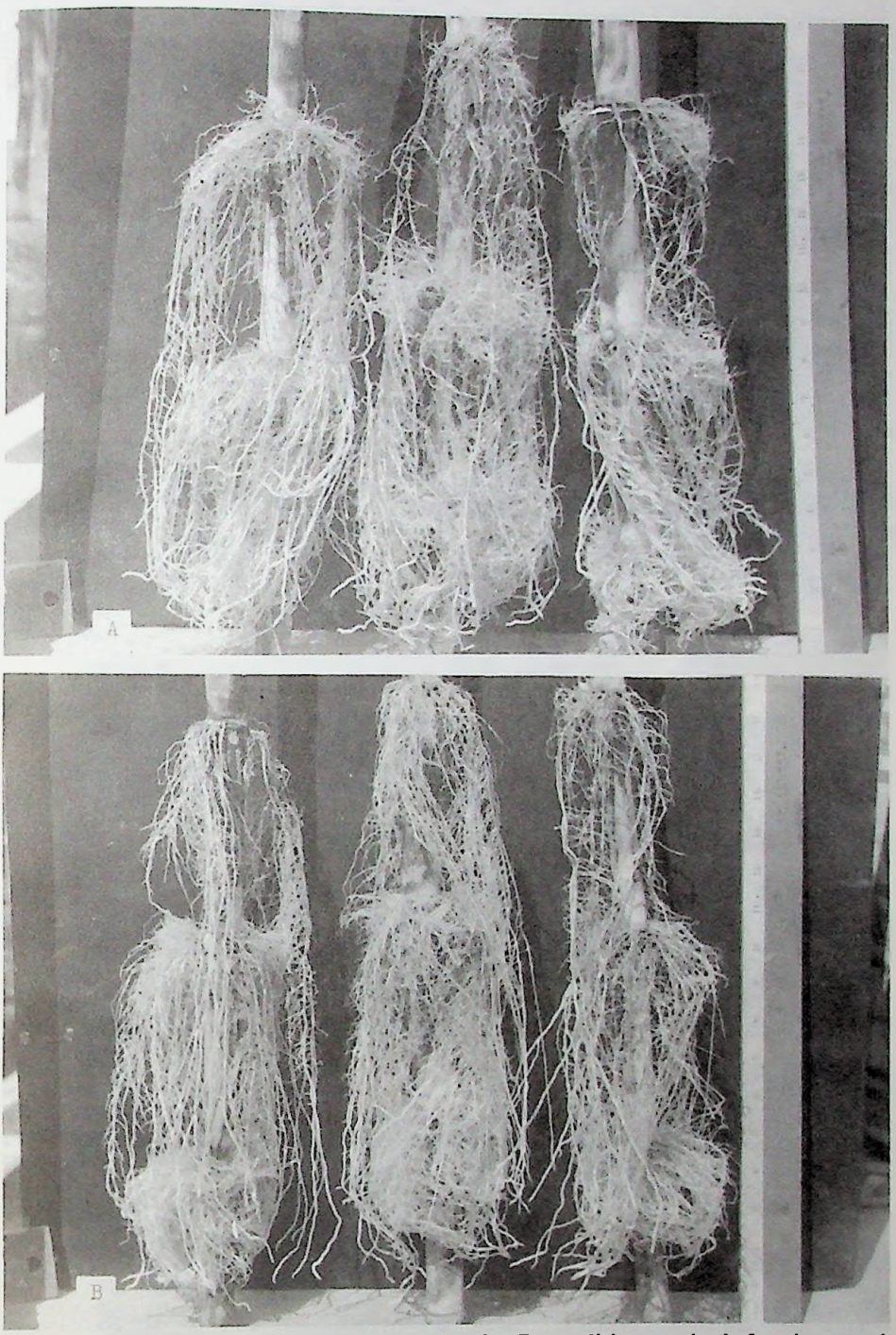

Figure 1. Root development at natural (A) and moist (B) conditions excised after three weeks of marcotting.

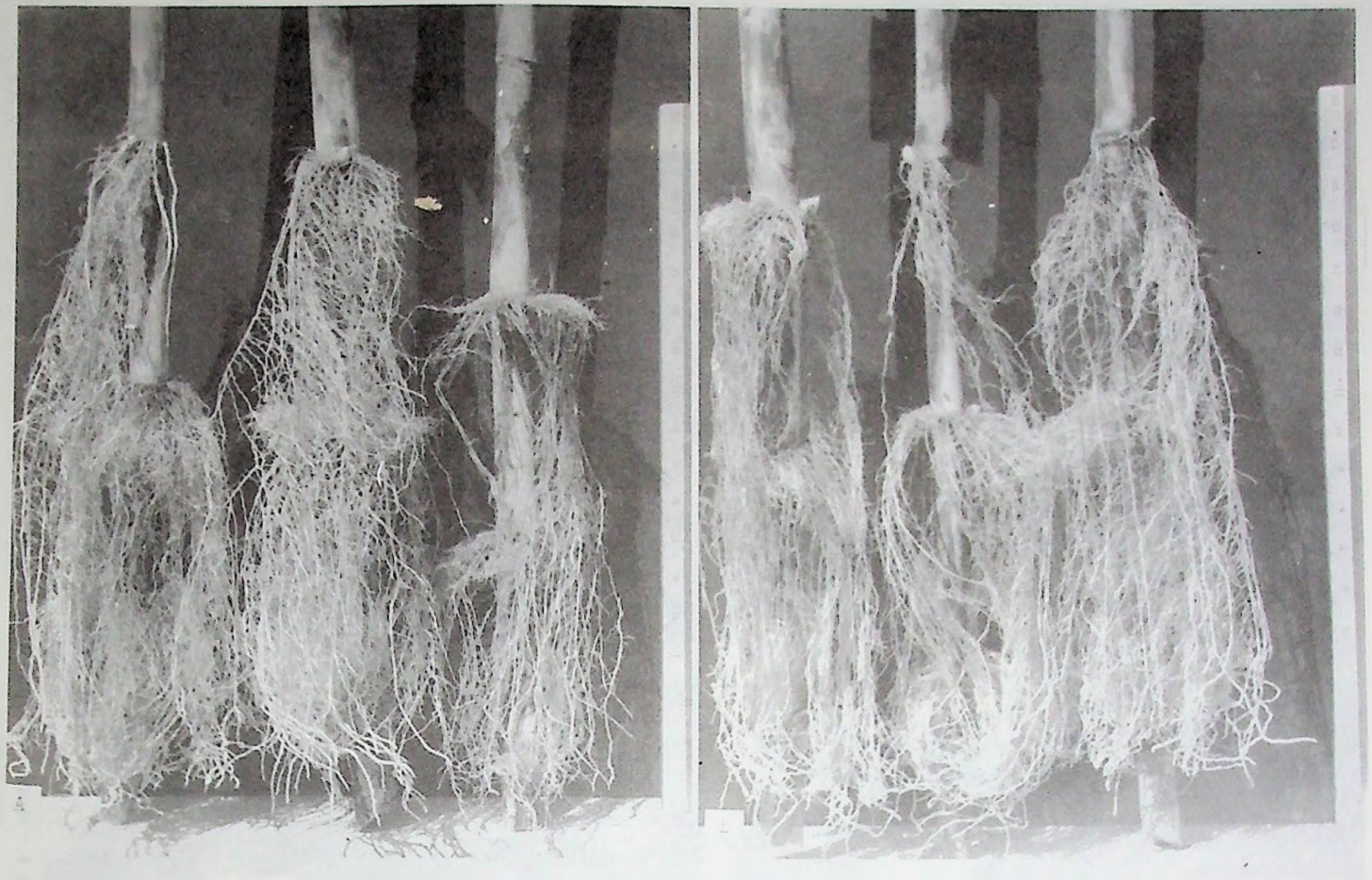

Figure 2. Root development at natural (A) and moist (B) conditions excised after four weeks of marcotting.

This work suggests that there was no effect of moistening on marcotted canes excised after three and four weeks of marcotting (Fig. 1 and 2) and marcotting can be done without periodical watering under Bangladesh condition while sawdust is used as rooting media.

REFERENCES

Dunckelman, P. H. and Legendre, B. L. 1982. Guide to Sugarcane Breeding in the temperate zone. Agricultural Research Service. Agricultural Reviews and Manuals. Southern Series No. 22. U. S. Department of Agriculture, P. O. Box 53326, New Orleans, LA 70153, pp. 12-23.

Miah, M. A and Mannan, Sk. A. 1983. Studies on the effect of wrapping material, rooting media and duration in marcotting of sugarcane. *Bangladesh J. Sugarcane*, **5**: 41-47.

Miah, M. A. : Mannan, Sk. A. ; Awal, A. and Karim, M. A. 1984. Effect of time of marcotting and excising of sugarcane root development and stalk survival. *Bangladesh J. Sugarcane*, **6** :12-18.

Saha, S. R. ; Miah, M. A. and Mannan, M. A. 1984. Comparative study on the effectiveness of field, marcotte and solution techniques in sugarcane hybridization. *Bangladesh J. Sugarcane*, 6:8–11.