

Effect of Physiological Maturity of Sugarcane Buds on Germination

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In Bangladesh, yield of sugarcane is the lowest in the world. Many factors are responsible for lower yield of sugarcane of which lower number of millable cane in the field due to poor and uneven germination, and maturity of buds play an important role (Clements, 1940; Mukerji, 1979; Yang and Chen, 1980; Chen *et al.*, 1986). Although it is now recognized that use of under or over matured buds as planting material affect germination in sugarcane, no systematic research has been done to find out the actual physiological maturity of sugarcane buds for good germination.

In order to investigate the effect of physiological maturity of sugarcane buds on germination, a trial was conducted at Sugarcane Research & Training Institute during 1987-88 and 1988-89 cropping seasons using two commercial sugarcane varieties viz Isd 16 and L. Jaba-C. Apparently healthy two budded setts were taken from top, middle and bottom portion of sugarcane stalk considering different age-group of buds. For each group, 200 setts were planted separately under same management and environmental conditions. The trial was started from 1st September and continued upto middle of January. Data on germination was recorded at an interval of 7 d starting from 7 d after planting.

Highest germination was obtained in setts taken from top portion, while the lowest germination was obtained in setts taken from bottom portion of sugarcane stalks of both the varieties (Fig. 1, 2). The rate of germination gradually decreased from 1st October planting upto 15th November planting except top setts and beyond that date, the rate of reduction was found to be higher in the variety Isd 16 (Fig. 1). In case of variety L. Jaba-C, the rate of germination gradually decreased from 15th October planting, and continued this trend upto 1st December planting except top setts, and beyond that date, the rate of reduction was recorded higher (Fig. 2). The present results confirm the report of Clements (1940) who obtained best germination in the third internode from the top. Misra *et al.* (1987) reported higher sprouting (germination) in setts taken from upper half compared to bottom half of stalk under both heat treated and untreated conditions. The results of the present trial indicate that germination of sugarcane buds are affected by age of buds, and younger buds are always superior over aged buds. Results also indicate that germination of sugarcane buds of all three categories are equally affected by temperature. Probable reason for poor germination in setts taken from bottom half is that lower buds of the standing sugarcane become germinated sometimes during heavy rainfall in July-August-September period. Therefore it is suggested to use setts taken from upper half as planting material instead of using entire stalk during late planting season or

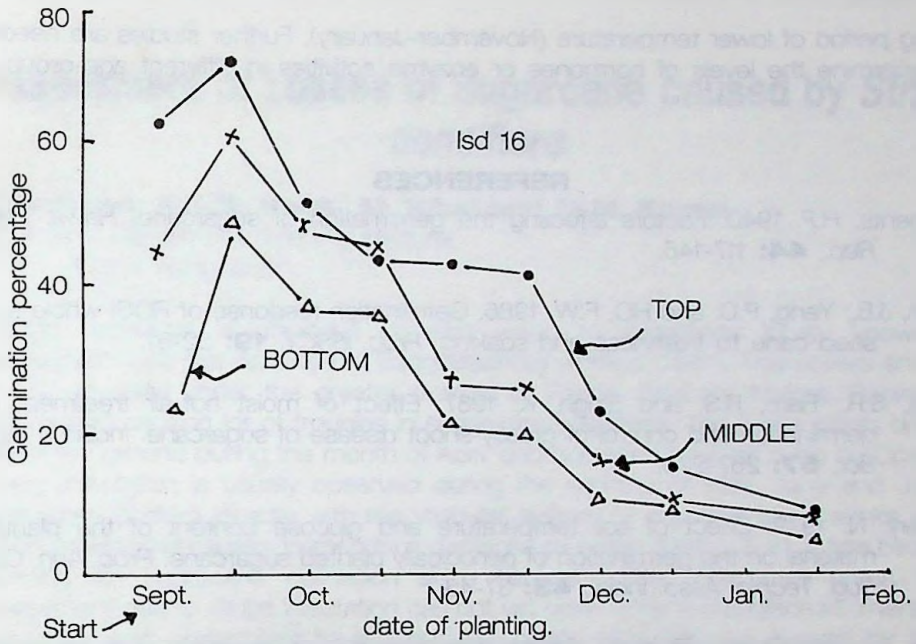


Figure 1. Effect of physiological maturity of sugarcane buds on germination (Isd 16).

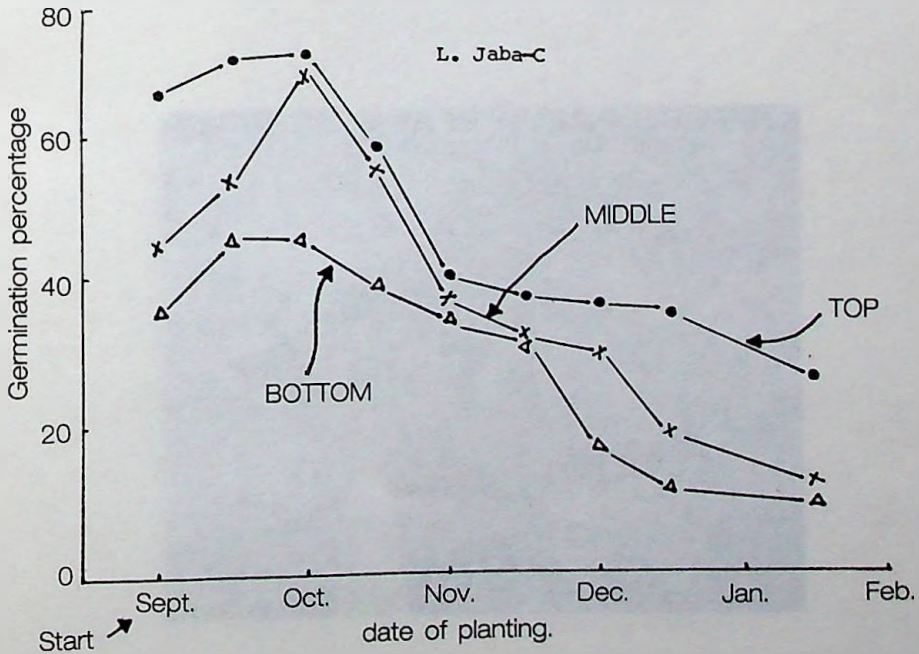


Figure 2. Effect of physiological maturity of sugarcane buds on germination (L. Jaba-C).

during period of lower temperature (November-January). Further studies are needed to determine the levels of hormones or enzyme activities in different age-group of buds.

REFERENCES

- Clements, H.F. 1940. Factors affecting the germination of sugarcane. *Hawa. Plant. Rec.*, **44**: 117-146.
- Chen, J.B.; Yang, P.C. and HO, F.W. 1986. Germination response of ROCI whole-stalk seed cane to freshness and soaking. *Proc. ISSCT*, **19**: 52-61.
- Misra, S.R.; Ram, R.S. and Singh, K. 1987. Effect of moist hot-air treatment on germination and control of grassy-shoot disease of sugarcane. *Indian J. Agril. Sci.*, **57**: 267-270.
- Mukerji, N. 1979. Effect of soil temperature and glucose content of the planting material on the germination of periodically planted sugarcane. *Proc. Ann. Con. Sug. Techn. Asso. India.*, **43**: 37-43.
- Yang, S.J. and Chen, J.B. 1980. Germination response of sugarcane cultivars to soil moisture and temperature. *Proc. ISSCT*, **17**: 30-37.