

## Comparison of different planting material with plant geometry in sugarcane variety Co-94012

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### ABSTRACT

A field experiment was conducted in January 2005 at Regional Sugarcane Research Station, Basamathnagar (MAU, Parbhani, M.S.) to study the performance different planting material with plant geometry on growth, yield and economics of sugarcane variety Co-94012. The growth parameters viz., single cane weight, cane yield and CCC yield were significantly influenced by different planting material with plant geometry. Tissue culture plantlets (1m x 1m) resulted in significantly higher single cane weight, cane yield and CCC yield than the other treatments. In case of different planting materials two eye bud, single eye bud or poly bag settling were observed economical for cultivation of sugarcane

**Key words :** Sugarcane, Planting material, Plant geometry

### INTRODUCTION

Sugarcane (*Saccharum officinarum* L.) is a most assured one time income generating commercial crop, which occupies a prime position in Indian agricultural economy for obvious reason of its profitability and economic importance as well as wider requirement of sugar products. The primary component of cane yield is stalk population and weight of individual cane. Stalk population per unit area is directly affected by planting density which changes rapidly with the close spacing or with the increase in seed rate. Thus, yield level can be increased substantially by manipulating certain cultural practices like spacing, seed rate, planting material etc. The adoption of optimum spacing, suitable planting pattern/crop geometry, sett size and sett rate will go a long way in increasing yield and quality of sugarcane.

The new technology in sugarcane planting material is of mericlones i.e., tissues culture plantlets, it has got high transplant survival rate i.e., over 80 per cent (Savangikar *et al.*, 1991). The tillering capacity of the mericlones is 6.27 compared to 1.58 for the setts (Anonymous, 1993) thus it gives more yield compared to sett planting.

The information on testing of different planting material under various planting techniques is lacking and needs to be worked out, it is, therefore, necessary to standardize the suitable planting material with spacing/plant geometry that may improve the productivity of sugarcane.

### MATERIALS AND METHODS

A field experiment was conducted during 2005 at Regional Sugarcane Research Station, Basamathnagar

(M.S.) Marathwada Agricultural University, Parbhani. The experiment was laid out in Randomised Block Design with three replications comprising eight treatments of planting material and plant geometry viz., T<sub>1</sub> – Tissue culture plantlets 1 x 1 m. (10000 plantlets/ha), T<sub>2</sub> – Tissue culture plantlets 1 x 1.5 m. (6666 plantlets/ha), T<sub>3</sub> – Ploybags settling 1 x 1 m. (10000 settling/ha), T<sub>4</sub> – Ploybags settling 1 x 1.5 m. (6666 settling/ha), T<sub>5</sub> – One eye bed sunken nursery settling 1 x 1m. (10000 settling/ha), T<sub>6</sub> – single eye beded setts 1 x 0.3m. (25000 setts/ha), T<sub>7</sub> – Two eye beded setts 1 x 0.3m. (16666 setts/ha), T<sub>8</sub> – Three eye beded setts 1 x 00 m (25000 setts/ha), The soil was clayey in texture containing low available nitrogen (159 N/ha), medium in available phosphorus (14.80 kg P<sub>2</sub>O<sub>5</sub>/ha) and high in available potassium (410.65 kg K<sub>2</sub>O/ha) with pH of 8.00. Planting was done in 2<sup>nd</sup> January 2005. Sugarcane variety Co-94012 was used for planting. The grass and net plot size was 6.0 x 5.4 m<sup>2</sup> and 5.0 x 3.6 m<sup>2</sup>, respectively. Observation on number of millable canes per hectare, single cane weight and cane yield were recorded at harvest. The data was analyzed as per procedure laid out by Panse and Sukhatme (1967).

### RESULTS AND DISCUSSION

The results obtained from the present investigation are summarized below :

#### Yield:

Single cane weight, cane yield and CCS (t/ha) were influenced significantly due to different planting material (Table 1). Significantly higher single cane weight was recorded by Tissue culture plantlets planted at 1m x 1m and 1m x 1.5m spacing. Tissue culture plantlet (1x1 m) recorded significantly higher cane yield (110.5 t/ha) than

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**Table 1 : Mean cane yield, CCS (t/ha) and other yield contributing characters as influenced by planting material and planting geometry in sugarcane variety Co-94012**

Treatments	Millable cane ('000'/ha)	Single cane wt. (kg.)	Cane yield (t/ha)	CCS (t/ha)
T <sub>1</sub> - TCP 1x1m	93.54	1.183	110.50	14.89
T <sub>2</sub> - TCP 1x1.5m	87.38	1.133	98.80	12.84
T <sub>3</sub> - Ploybag 1x1m	90.60	1.053	94.90	12.39
T <sub>4</sub> - Ploybag 1x1.5m	85.58	1.067	91.30	12.23
T <sub>5</sub> - Sunckenbed 1x1m	82.15	1.017	83.10	11.19
T <sub>6</sub> - Single eye bed	81.39	1.067	86.30	11.70
T <sub>7</sub> - Two eye bed	81.40	1.067	86.68	11.55
T <sub>8</sub> - Three eye bed	87.32	1.000	85.83	11.44
S. E. ±	6.67	0.043	4.72	0.63
C.D. (P=0.05)	NS	0.131	14.29	1.91
G. mean	86.17	1.073	92.18	12.28

NS-Non significant

**Table 2: Economics of sugarcane influenced by different planting material 2005-06**

Treatment	Planting material (Unit/ha)	Unit cost (Rs)	Cost of material (Rs/ha)	Total cost of cultivation (Rs)	Yield (t/ha)	GMR (Rs/ha)	NMR (Rs/ha)	C:B ratio
T <sub>1</sub> -TCP 1x1m	10000	4	40000	80000	110.50	105450	25450	1.32
T <sub>2</sub> -TCP 1x1.5m	6666	4	26664	66700	98.80	94050	27350	1.41
T <sub>3</sub> -Polybag 1x1m	10000	1.50	15000	55000	94.90	90250	35250	1.64
T <sub>4</sub> -Polybag 1x1.5m	6666	1.50	9999	50000	91.30	86450	36450	1.73
T <sub>5</sub> -Suncken bed 1x1 m	10000	0.7	7000	47000	83.10	78850	31850	1.68
T <sub>6</sub> -Single eye bud	25000	0.2	5000	45000	86.30	81700	36700	1.82
T <sub>7</sub> -Two eye bud	16666	0.4	6666	46700	86.68	82650	35950	1.77
T <sub>8</sub> -Three eye bud	25000	0.6	15000	55000	85.83	81700	26700	1.48

Fixed cost of cultivation Rs.40000/ha. Price of cane Rs.950/tonne GMR: Gross Monetary Returns NMR: Net Monetary Returns

other plant material. The cane yield differences were non significant among the rest of the treatments under study. The CCS (t/ha) recorded by TCP (1x1m) was significantly superior over other planting material. The cane yield recorded by sunken bed settling (1x1m) was lowest (83.1 t/ha). These findings are in conformity with the results of Nigade *et al.* (2004) and Raghu *et al.* (2006).

#### **Economics of different planting material :**

The cost of planting material, cost of production and monetary returns presented in Table 2. Among different planting material, cost of single eye bud was lowest *i.e.* Rs. 5000/ha, while it was highest in TCP material (1x1 m) *i.e.* Rs. 40000/ha, cost of poly bag settling (1x1 m) was Rs.15000/ha while suncken bed Rs. 7000/ha. The cost of conventional planting of 3 eye bud was also higher (Rs.15000/ha) than two eye bud (Rs.6666/ha). Thus the major role of planting material in cost of cultivation was observed.

Highest GMR of Rs. 1,05,450/-was recorded by TCP (1x1 m) with lowest NMR of Rs. 25400/ha. Poly bag

settling (1x1.5m), single eye bud material and two eye bud material recorded more NMR and C : B ratio.

From above investigation two eye bud, single eye bud or poly bag settling were observed economical for sugarcane cultivation. TCP seedling and 3 eye bud material have additional cost which could not compensated with additional output.

#### **Acknowledgement :**

Authors are grateful to Agronomist, R.S.R.S., Basamathnagar, Dist. Hingoli (MS) for providing necessary facilities.

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*Received : July, 2009; Accepted : September, 2009*