



ISSN (E): 2320-3862
ISSN (P): 2394-0530
NAAS Rating 2017: 3.53
JMPS 2017; 5(3): 355-357
© 2017 JMPS
Received: 25-03-2017
Accepted: 23-04-2017

Tiryak Kumar Samant
Scientist Agronomy, Angul
(OUAT), At-Panchamahala, P.o-
Hulurisingha, Dist- Odisha,
India

Bud chip method: A potential technology for sugarcane (*Saccharum officinarum*) cultivation

Tiryak Kumar Samant

Abstract

The study was carried out through front line demonstration during *rabi* season of 2013-14 to promote the Bud chip method of sugarcane cultivation in Angul district under mid central table land zone of Odisha. The demonstration results showed that the improved practice of bud chip method recorded 39.7 % higher cane yield (129.2 t ha^{-1}), production efficiency ($421.8 \text{ kg ha}^{-1} \text{ day}^{-1}$) and extension gap (36.7 t ha^{-1}) than farmer's practice of conventional method. The same also produced higher tillers plant⁻¹ (17.3) and number of millable canes clump⁻¹ (14.2) with survival 93.2%. The improved practice also recorded the higher gross return of Rs. 271320 ha⁻¹, B:C ratio (3.86) and profitability (Rs. 609.6 ha⁻¹ day⁻¹) with additional net return of Rs.190080 ha⁻¹ over local check of conventional method which can effectively be replaced in the existing farming situation for higher productivity and profitability.

Keywords: bud chip, cane yield, economics, extension gap, sugarcane

1. Introduction

Sugarcane (*Saccharum officinarum*) is one of the commercial crops cultivated by planting portions of cane stalk known as seed cane or cane set. For commercial cultivation, a huge quantity of cane stalk cuttings of 6-8 t/ha having 3-bud pieces is required. One of the major expenditure in sugarcane production is the seed cane, the planting material which is required in huge quantity [1]. Now-a-days the method bud chip technology in sugar cane has become popular in comparison to the traditional method of planting, where two or three bud sets are used. Using bud chip settlings with application of improved production technology for nursery management, settling transplanting methods and time, plant spacing, weed control, nutrient requirement, irrigation scheduling and optimum time of cane harvesting, good cane yield of 100 t/ha can be realized at farmer's field. Farmers can increase their income as well as increase sugarcane yield using bud chip settlings with good management practices [2]. In Odisha with a total coverage of 35340 hectare which is only 0.4 % of the total cultivable area of the state. Area under sugarcane crop in Angul district of the state is 70 hectare with a productivity of 58.6 t ha^{-1} which is 23 % less than that of state [3]. Keeping in view such problems and objectives, farmer's participatory field demonstration was conducted to study the effect of bud chip method on growth, yield, economics in sugarcane planting.

2. Materials and Methods

2.1 Experimental site, year and climate

The study was carried out through front line demonstrations during *rabi* season of 2013-2014 in *Balijharan* village of Chhendipada block of Angul district under mid central table land zone of Odisha with the active participation of farmers after different extension approaches through regular field visit & interpersonal communication made by the scientists of Krishi Vigyan Kendra, Angul. The experimental site lies in $84^{\circ} 16'$ to $85^{\circ} 23'$ E longitude and $20^{\circ} 31'$ to $21^{\circ} 41'$ N latitude and average elevation of 300 m above sea level. The mean maximum and mean minimum temperature registered in the year was 41.0°C and 16°C during May and February respectively. Total 1436 mm rainfall received during the cropping period which is 3% more deviation from the normal rainfall.

2.2 Initial soil status

The soil of the study area was slightly acidic in reaction (pH-5.3 to 5.8), loam in texture with medium organic carbon content(0.50 to 0.56%), medium in nitrogen (275 to 281 kg ha⁻¹), low in phosphorus (9.0 to 10.0 kg ha⁻¹) and medium in potassium(171 to 177 kg ha⁻¹).

Correspondence

Tiryak Kumar Samant
Scientist Agronomy, Angul
(OUAT), At-Panchamahala, P.o-
Hulurisingha, Dist- Odisha,
India

2.3 Procedures

Five farmers were selected and they were supplied with input like Pro-tray and polythene sheet. The sugarcane crop (variety-CO 62175) was raised during 2nd week of February' 2013 and harvested during 2nd week of January' 2014 with recommended package of practices in 0.4 ha by the farmer during the year. The farmer's practices involved conventional method of sugarcane planting. The improved practice included collection of eye (5500/acre) with help of bud chipper from 7-9 month sugarcane setts, seedling raising in pro tray half filled with coconut coirs and tightly covered by black polythene for 5 -7 days, transplanting 25-35 days old seedling in main field with spacing (5×2) ft and agronomic management practice which produce more shoot and tillers. Thus, reduced the plant mortality and expenses and enhances the cane yield.

2.4 Calculations

Observations on different yield parameters were taken and economic analysis was done by calculating cost of cultivation, gross return, net return and B: C ratio. Final crop yield (cane) were recorded and the gross return were calculated on the basis of prevailing market price of the produce. Production efficiency value was calculated with using formula by [4]. Extension gap as calculated by the formula suggested [5].

Extension gap = Demonstration yield-Farmers yield.

2.5 Statistical analysis

Tabular analysis involving simple statistical tools like mean was done by standard formula to analyses the data and draw conclusions and implications [6].

3. Results and Discussion

3.1 Cane Yield

Results of front line demonstration (Table 1) indicated that the improved practice of bud chip method of sugarcane planting recorded cane yield 129.2 t ha⁻¹ which was 39.7 % higher than farmer's practice of conventional method. This might be owing to higher tiller and mill able canes production

[7]. Similar results were also obtained by [8].

3.2 Survival (%), Tiller plant⁻¹, Number of millable canes clump⁻¹

The improved practice of bud chip method produced (Table 1) higher tillers plant⁻¹(17.3) and number of millable canes clump⁻¹ (14.2). The data also revealed that percentage of survival was higher (93.2%) in bud chip method than conventional method. This was in agreement with the findings of [9].

3.3 Production efficiency and Extension gap

The production efficiency (Table 1) was higher in improved practice (421.8 kg ha⁻¹ day⁻¹) in comparison to local check due to more cane yield. The improved practice of bud chip method also showed higher extension gap (36.7 t ha⁻¹). Latest production technologies will subsequently change this alarming trend of galloping extension gap [10]. The new improved technologies will eventually lead to the farmers to discontinue the traditional method and to adopt new technology [11].

3.4 Economics

The improved practice of bud chip method of sugarcane planting recorded (Table 2) higher gross return of Rs. 271320 ha⁻¹, B:C ratio (3.86) and profitability(Rs. 609.6 ha⁻¹ day⁻¹) with additional net return of Rs.190080 ha⁻¹ over local check of conventional method. Higher B: C ratio (3.86) was observed in improved practice due to higher net return as compared to local check (2.34) attributed to more cane production. The variation in net return and benefit-cost ratio may be attributed to the variation in the price of agri inputs and produce [9, 12].

4. Conclusion

Thus, the existing farmer's practice of conventional method can effectively be replaced by bud chip method in sugarcane in the existing farming situation for higher productivity and profitability.

Table 1: Effect of Bud chip method of sugarcane planting on yield attributes and yield

	Survival (%)	Number of tillers plant ⁻¹	Number of millable canes clump ⁻¹	Yield (t ha ⁻¹)	% of increase in grain yield over local check	Production efficiency (kg ha ⁻¹ day ⁻¹)	Extension gap (t ha ⁻¹)
Improved practice (Bud chip method)	93.2	17.3	14.2	129.2	39.7	421.8	36.7
Farmers practice (Conventional method)	68.4	9.2	8.5	92.5	-	280.3	-

Table 2: Effect of Bud chip method of sugarcane planting on cost of cultivation, gross return, net return, B: C ratio and profitability

	Cost of cultivation (Rs ha ⁻¹)	Gross return (Rs ha ⁻¹)	Net return (Rs ha ⁻¹)	B:C ratio	Profitability (Rs ha ⁻¹ day ⁻¹)
Improved practice (Bud chip method)	70150	271320	201170	3.86	609.6
Farmers practice (Conventional method)	83160	194250	111090	2.34	336.6

*Sale price of sugarcane Rs.2100/t for the year 2013-14

5. Acknowledgement

The author is thankful to the Director, ICAR-Agriculture Technology Application Research Institute (ATARI), Zone-VII, Jabalpur for providing support towards conducting the front line demonstration

6. References

1. Sahoo HK. Effect of planting methods on yield and economics of sugarcane. National symposium on

Management option farm productivity and livelihood security under changing climate, Odisha chapter, ISA, 2014, 221-222.

2. Jain R, Chandra A, Srivastava AK, Solomon S. Bud chip technology for rapid seed multiplication and improving cane yield, Indian Farming, 2014; 63(10):2-3.

3. Anonymous. Odisha Agriculture Statistics 2013-14. Directorate of Agriculture and Food production. Govt. of Odisha, 2014.

4. Tomar S, Tiwari AS. Production and economics of different crop sequences. *Indian Journal of Agronomy*, 1990; 35(1/2):30-35.
5. Samui SK, Maitra S, Roy DK, Mondal AK Saha D. Evaluation on front line demonstration on groundnut (*Arachis hypogea* L.). *Journal of Indian Society Coastal Agricultural Research*. 2000; 18: 180-183.
6. Gomez KA, Gomez AA. Statistical procedures for agricultural research. *Johnwiley and Sons*, New York, 1984.
7. Mohanty K, Das PP, Nanda SS. Introducing SSI (Sustainable Sugarcane Initiative) technology for enhanced cane production and economic returns in real farming situations under East coast climatic conditions of India. *Sugar Tech.*, March, Link springer.com, 2014.
8. Singh R, Singh W, Choudhary A. Nursery raising with high density sugarcane transplanting. *Indian Farming*, 2014; 64(1):31-34.
9. Kapur R, Duttamajumdar SK, Krishna Rao K. A breeder's perspective on the tiller dynamics in sugarcane. *Current science*, 2011; 100:183-189.
10. Samant TK. Evaluation of front line demonstration on rice (Manaswini). *Agriculture Update*, 2014; 9(3):311-315.
11. Sharma P, Khar S, Kumar S, Ishar A, Prakash S, Mahajan V *et al.* Economic impact of front line demonstrations on cereals in Poonch district of Jammu and Kashmir. *Journal of Progressive Agriculture*. 2011; 2:21-25.
12. Chandrasekaran R, Suveetha M, Pradhan BJ, Sampathkumar T, Muralidharan S. Sugarcane cultivation through sustainable sugarcane initiation. *Indian Farming*, 2014; 63(10):22-25.