

SHORT COMMUNICATION

EVALUATION OF PROMISING SUGARCANE VARIETIES FOR YIELD AND QUALITY IN ALFISOLS

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Abstract

Seven promising sugarcane varieties were tested for their adaptability to Alfisols in an experiment conducted at the Agricultural Research Station, Utukur, Kadapa district, Andhra Pradesh, during 2007-08 and 2008-09. The data on yield attributes, viz. number of millable canes, cane length and cane diameter and juice quality parameters, viz. sucrose %, CCS % and sugar yield were recorded at harvest. The results indicated that two varieties, namely 2003V46 and 99V30 exhibited good performance for cane and sugar yield in the given environment and were identified to be suitable for commercial cultivation in Alfisols of Kadapa district and recommended to farmers in this area.

Key words: Sugarcane, Alfisols, cane yield, sucrose, sugar yield

Introduction

Regardless of pronounced developments in sugarcane research and expansion in sugar industry, low productivity is being recorded in the Indian subcontinent (Kulkarni et al. 2010), in addition to low sugar recovery and high cost of production. One of the solutions suggested to overcome this problem is planting of improved cane varieties (Chattha and Ensunullah, 2003; Chattha et al. 2006; Kadam et al. 2007). The success of a variety depends upon its adaptability to specific agro-climatic conditions of

the region to realize maximum yield. The selection of variety alone improves the cane yield in the range of 28-60 per cent (Kathiresan et al. 2001). In the present study, adaptive testing of sugarcane varieties was carried out to select a suitable variety for Alfisols of Kadapa district in the South Indian State of Andhra Pradesh, where sugarcane is a major crop cultivated in about 2.13m ha with a production of 157.8 m tonnes and productivity of 74.55 t/ha.

The study was conducted at the Agricultural Research Station, Utukur, Kadapa district, during 2007-08 and 2008-09. Seven promising sugarcane varieties were tested for their adaptability to Alfisols in an experiment laid out in Randomized Block design with three replications and a plot comprising of six rows of six meter length spaced 80 cm apart. A seed rate of 40,000 three budded setts/ha was followed. The soils of the experimental site were characterized by sandy clay loam with neutral pH, normal EC, low available nitrogen, medium available phosphorus and high available potassium. Recommended dosage (224:112:112 kg/ha) of N: P₂O₅: K₂O fertilizers were applied. Phosphorus and potassium were applied as basal dose at the time of planting, whereas nitrogen was applied in two equal splits at 45 and 90 days after planting. All other agronomic practices, viz. weed control, earthing up, propping, etc were carried out as per recommendation. Irrigations were given as and when necessary through drip system. The data on yield attributes, viz. number of millable canes, cane length and cane diameter recorded at harvest in the test plots were converted to quantity per hectare. Five canes were randomly selected from each plot for juice analysis at 10 months age. Juice quality parameters, viz. sucrose %, CCS % and sugar yield were recorded at harvest by following standard procedures (Spencer and Meade, 1963). Data collected for two seasons were pooled and analyzed statistically (Panse and Sukhatme, 1978).

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The results of the study revealed significant differences in yield components among different varieties (Table 1). The variety Co 8013 exhibited the maximum number of millable canes (NMC) followed by 2003V46, while the varieties Co 6907 and 2000V2 produced less number of canes and all other varieties were at par. Plant height and cane girth are known to be the major contributing factors for high cane yield (Rao et al. 1992, Naidu et al. 2007). Analysis of these two characters showed that the

varieties 2000V2 and 87A298 recorded higher cane length followed by 2003V46. Maximum cane diameter was in Co 6907 followed by 99V30 and 2003V46. All other varieties produced thinner canes. Significant difference in cane yield was observed among varieties. The variety 2003V46 remained on the top with maximum cane yield followed by 99V30 whereas the variety 2000V2 recorded the lowest cane yield.

Table 1. Yield attributes of different sugarcane varieties in Alfisols (Mean of 2007-08 & 2008-09)

Variety	NMC ('000/ha)	Cane length (cm)	Cane diameter (cm)	Cane yield (t/ha)
99V30	78.23	218	2.6	113.35
2003V46	82.33	275	2.5	123.22
Co 7219	74.10	225	2.4	95.67
Co 8013	86.29	239	2.3	94.11
Co 6907	69.42	232	3.1	102.44
87A298	76.23	282	2.3	100.00
2000V2	72.11	289	2.2	86.59
GM	76.96	251	2.5	102.19
S.Em \pm	2.21	1.39	0.03	2.95
CD@ 5%	6.85	4.5	0.09	8.96

Table 2. Juice quality parameters of promising sugarcane varieties in Alfisols (Mean of 2007-08 and 2008-09)

Variety	Sucrose (%)	CCS (%)	CCS yield (t/ha)
99V30	17.25	8.6	10.17
2003V46	18.98	8.8	10.84
Co 7219	17.13	7.77	7.43
Co 8013	13.73	6.21	5.84
Co 6907	16.48	8.49	8.69
87A298	15.71	8.57	8.57
2000V2	12.53	6.36	5.50
GM	15.97	7.83	8.15
S.Em \pm	1.21	0.23	0.18
CD@ 5%	3.83	0.73	0.56

Yanam et al. (1997) observed that juice quality mainly depends on the genetic nature of the variety. In the present study, the highest juice sucrose % was recorded for the variety 2003V46 followed by 99V30 while the lowest was in 2000V2 (Table 2). Commercial cane sugar per cent (CCS%), the factor of prime importance both for millers and breeders (Nadeem *et al.* 2008), showed significant

differences among the varieties. Maximum CCS % was observed in the variety 2003V46 followed by 99V30. The varieties Co 6907 and 87A298 were on par whereas the variety 2000V2 recorded the lowest CCS%. Sugar yield, the function of cane yield and corresponding recoverable sugar %, was the highest for 2003V46 and 99V30. The clone 2000V2, which produced the lowest NMC, cane yield and sucrose

%, also recorded the lowest sugar yield of 5.50 t/ha. The good performance for cane yield and sugar yield exhibited by the two varieties 2003V46 and 99V30 in the given environment indicated their suitability for commercial cultivation in Alfisols and can be recommended to farmers in Kadapa district characterized by this type of soils.

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