



Performance of Promising Sugarcane Genotypes Under Spring Planting in Central Maharashtra

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ABSTRACT

The experiment was conducted to evaluate the productivity of sugarcane genotypes for cane yield and quality parameters under two plant crops and one ratoon crop during the Suru season of 2020-21 and 2021-22 at nursery farm of Bhimashankar Sahakari Sakhar Karkhana Ltd., Pune. The results revealed that the three genotypes viz., Co 13008, PDN 15012 and CoVSI 18121 were found significantly superior over the standards Co 86032 and VSI 434 for cane and sugar yield (t/ha) while these three genotypes were found superior over the standard MS 10001 only for cane yield. The genotype Co 13008 was found superior over the standard VSI 08005 for cane yield and none of the genotype was found superior over standard CoM 0265 for cane and sugar yield. In respect to the quality parameters, the three genotypes viz., Co 11015, CoVSI 18121, PDN 15012 were recorded highest commercial cane sugar % (C.C.S.) and sucrose % than the standards Co 86032 and CoM 0265 while none of the genotype was found superior for quality parameters than standards VSI 434 and MS 10001. New sugarcane promising genotypes PDN 15012 and CoVSI 18121 were released and pre-released respectively, for commercial cultivation in Maharashtra State.

Keywords: C.C.S. %, sugarcane genotype, sucrose %.

INTRODUCTION

Sugarcane is an the important cash crop in India. The improvement in sugarcane production depends on the strategies and selection methods of any breeding programme, which mainly depends on sugarcane yield and its contributing characters. The sugarcane productivity in Maharashtra is almost stagnant though it is slightly better than the last years average productivity. There is still lot of scope for improving the productivity through concerted efforts. The development of improved sugarcane varieties is a continuous research process and many varieties have been released for commercial cultivation in the recent past. The adaptability of the varieties in different

environments is most desirable property of sugarcane with regards to yield and sucrose content in Juice (Charumati et al. 2012). Due to genotype-environment interaction, relative performance of different clones is variable under different environment (Patel, 1999). Keeping this view in mind, the present multi-location trials were planned to evaluate the performance of promising genotypes developed by Sugarcane Breeding Institute, Coimbatore; Central Sugarcane Research Station, Padegaon and VSI, Pune in Central part of the Maharashtra.

MATERIALS AND METHOD

The field experiments were laid out in a randomized block design (RBD) with two replications, having the

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plot size of six rows of six meter with 137 cm row spacing at nursery farm of Bhimashankar Sahakari Sakhar Karkhana Ltd., Pune during the spring planting of 2020-21 and 2021-22. Nine sugarcane genotypes viz., CoVSI 18121, CoVSI 19121, CoVSI 15002, VSI 16002, CoVSI 17001, Co 11015, Co 12009, Co 13008 and PDN 15012 with five standards like Co 86032, CoM 0265, VSI 08005, MS 10001 and VSI 434. The harvesting of experiments was done during 2021-22 and 2022-23. All the recommended agronomic practices were followed to ensure good crop growth. The observations were recorded on growth and quality characters.

RESULTS AND DISCUSSION

The pooled data over two plant crops and a ratoon on yield contributing and quality characters are given in (Table 1).

The mean data on cane yield showed that the three genotypes viz., Co 13008, PDN 15012 and CoVSI 18121 were found significantly superior over the standards Co 86032, MS 10001 and VSI 434 for cane yield (t/ha) while, the genotype Co 13008 was found superior over the standard VSI 08005 only for cane yield. None of the genotype was found superior to standard CoM 0265 for cane yield (Table 1).

In respect to the sugar yield (t/ha) the four genotypes viz., PDN 15012, CoVSI 18121, Co 13008 and Co 12009 were found significantly superior over the standards Co 86032 and VSI 434 for the sugar yield (t/ha) while none of the genotype was found superior over the standards VSI 08005, MS 10001 and CoM 0265 only for sugar yield character.

The data on the yield contributing character on number of millable canes /ha ('000) revealed that the standards Co 86032 recorded highest number of millable canes which followed by the genotypes VSI 16002, Co 13008, CoVSI 15002 and CoVSI 18121. The highest weight of single cane (kg) was recorded by the genotypes PDN 15012, CoVSI 18121, Co 12009 than the standards VSI 08005, Co 86032 and VSI 434. The maximum

cane diameter (cm) was recorded by the genotypes CoVSI 18121, Co 12009, Co 13008 and PDN 15012 than the standards VSI 8005, MS 10001, Co 86032 and VSI 434. The highest millable height (cm) was noted by the genotypes Co 12009, PDN 15012, CoVSI 18121, CoVSI 17001, Co 13008 and CoVSI 19121 than the standards CoM 0265, VSI 08005, Co 86032, MS 10001 and VSI 434. The tillering /ha ('000) was found highest in the genotypes Co 13008 and PDN 15012 than the standards CoM 0265, VSI 08005, Co 86032, MS 10001 and VSI 434.

In respect to the quality characters, commercial cane sugar % and sucrose % at harvest the standards VSI 434 and MS 10001 recorded highest commercial cane sugar % and sucrose % followed by the genotypes Co 11015, CoVSI 18121 and PDN 15012 than the standards Co 86032 and CoM 0265 respectively.

Previously, regular efforts have been made to identify high yield with high sugar quality yielding varieties by (Charumati et al. 2012); (Singh et al. 2011); (Patel et al. 1999) and (Sandhu 2009).

CONCLUSION

From this study, it can be concluded that the amongst all the eleven genotypes, three genotypes viz., Co 13008, PDN 15012 and CoVSI 18121 were identified as a promising genotypes. The further evaluation of these genotypes on large scale could contribute to the sustainable growth of the sugarcane industry in the region. The genotypes PDN 15012 and CoVSI 18121 were released and pre-released respectively, for commercial cultivation in Maharashtra State.

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Table 1 : Mean performance promising sugarcane genotypes in spring planting

Sr. No.	Genotypes	Cane yield (t/ha)				CCS (t/ha)				C.C.S. %			
		I Pl.	II Pl.	R	Mean	I Pl.	II Pl.	R	Mean	I Pl.	II Pl.	R	Mean
1	CoVSI 18121	152.19	134.19	134.27	140.22	22.74	19.67	19.50	20.64	14.95	14.64	14.52	14.70
2	CoVSI 19121	129.82	122.09	105.82	119.24	17.64	16.84	14.95	16.48	13.59	13.80	14.10	13.83
3	CoVSI 15002	133.46	128.54	123.56	128.52	17.73	17.98	17.05	17.59	13.29	14.03	14.16	13.83
4	VSI 16002	130.36	120.56	110.81	120.58	16.70	16.24	14.38	15.77	12.82	13.47	12.64	12.97
5	CoVSI 17001	127.05	132.14	132.89	130.69	17.49	18.06	19.30	18.29	13.78	13.70	14.54	14.01
6	Co 11015	114.78	119.65	89.91	108.11	17.27	18.42	13.27	16.32	15.05	15.40	14.74	15.06
7	Co 12009	138.42	130.71	128.75	132.63	19.69	18.63	18.29	18.87	14.24	14.26	14.19	14.23
8	Co 13008	155.01	141.71	135.90	144.21	21.80	19.82	18.75	20.12	14.07	13.97	13.80	13.94
9	PDN 15012	154.09	138.05	136.33	142.82	23.02	20.41	19.27	20.90	14.94	14.79	14.14	14.62
10	Co 86032	122.51	118.12	115.05	118.56	17.82	16.84	16.02	16.90	14.55	14.26	13.91	14.24
11	CoM 0265	152.79	137.44	130.36	140.20	21.06	19.11	17.83	19.34	13.78	13.90	13.66	13.78
12	VSI 08005	142.38	130.09	127.52	133.33	21.69	18.77	18.72	19.73	15.23	14.43	14.68	14.78
13	MS 10001	136.80	128.09	119.45	128.11	20.91	19.52	18.63	19.69	15.29	15.23	15.60	15.37
14	VSI 434	99.73	116.19	88.75	101.56	15.12	18.45	14.03	15.87	15.17	15.83	15.83	15.61
	SEm±	4.87	5.23	4.83	3.73	0.70	0.84	0.78	0.67	0.13	0.27	0.34	0.20
	CD at 0.05 %	14.16	15.20	14.05	10.85	2.04	2.45	2.26	1.95	0.37	0.79	0.99	0.57
	CV %	6.25	7.05	6.98	5.06	6.27	7.89	7.84	6.35	1.53	3.28	4.14	2.36

(I Pl: I Plant; II Pl.: II Plant and R: Ratoon)

Table 1 : (contd.)...

Sr. No.	Genotypes	Sucrose (%)				Weight of Single Cane (Kg)				No. of millable canes/ha (000 ⁻¹)			
		I Pl.	II Pl.	Mean	R	I Pl.	II Pl.	Mean	R	I Pl.	II Pl.	Mean	R
1	CoVSI 18121	20.80	20.54	20.54	20.28	1.98	2.12	2.08	2.15	77.78	76.35	71.07	75.07
2	CoVSI 19121	19.14	19.43	19.44	19.76	1.72	2.05	1.79	1.60	73.30	65.90	67.62	68.94
3	CoVSI 15002	18.89	19.71	19.48	19.85	1.68	1.90	1.73	1.62	83.17	79.76	69.34	77.42
4	VSI 16002	17.97	18.91	18.24	17.85	1.64	1.65	1.61	1.55	82.51	78.53	72.96	78.00
5	CoVSI 17001	19.31	19.69	19.54	19.62	1.74	1.87	1.75	1.65	68.36	64.38	60.99	64.58
6	Co 11015	20.96	21.48	21.04	20.69	1.51	1.62	1.53	1.46	60.18	60.25	58.20	59.54
7	Co 12009	19.82	19.98	19.91	19.92	1.88	2.03	1.90	1.78	71.76	71.34	64.30	69.13
8	Co 13008	19.61	19.64	19.51	19.28	1.66	1.96	1.75	1.62	85.03	76.68	70.61	77.44
9	PDN 15012	20.71	20.65	20.41	19.86	2.24	2.20	2.18	2.11	68.05	74.49	68.58	70.38
10	Co 86032	20.25	20.04	19.95	19.56	1.48	1.65	1.50	1.37	83.95	78.90	75.45	79.43
11	CoM 0265	19.12	19.34	19.17	19.05	1.96	2.02	1.95	1.86	77.31	79.47	71.69	76.16
12	VSI 08005	21.11	20.44	20.66	20.42	1.84	1.93	1.84	1.76	78.24	77.69	72.54	76.16
13	MS 10001	21.24	21.26	21.39	21.67	1.99	2.05	1.95	1.80	69.13	71.40	68.32	69.62
14	VSI 434	21.25	22.04	21.68	21.76	1.42	1.49	1.41	1.31	59.41	62.78	58.74	60.31
	SEm±	0.16	0.31	0.20	0.41	0.07	0.05	0.04	0.06	3.09	2.81	2.48	1.61
	CD at 0.05 %	0.46	0.89	0.57	1.19	0.21	0.15	0.12	0.17	8.97	8.16	7.20	4.67
	CV %	1.37	2.63	1.69	3.54	7.10	4.82	4.03	5.97	7.21	6.69	6.32	3.89

(I Pl: I Plant; II Pl.: II Plant and R: Ratoon)

Table 1 : (contd.)...

Sr. No.	Genotypes	Cane diameter (cm)				Millable height (cm)				Tillering at 120 days ('000)			
		I Pl.	II Pl.	R	Mean	I Pl.	II Pl.	R	Mean	I Pl.	II Pl.	R	Mean
1	CoVSI 18121	3.35	3.38	3.30	3.34	246.00	250.00	268.55	254.85	153.55	159.30	141.79	151.54
2	CoVSI 19121	3.13	3.10	3.00	3.08	247.89	240.22	244.44	244.19	148.76	139.41	130.12	139.43
3	CoVSI 15002	3.13	2.98	2.95	3.02	223.33	214.78	223.67	220.59	158.95	146.06	136.15	147.05
4	VSI 16002	3.20	2.95	2.99	3.05	231.00	219.67	230.45	227.04	145.99	137.73	124.62	136.11
5	CoVSI 17001	3.23	2.83	3.10	3.05	252.01	260.45	241.33	251.26	139.81	136.89	119.18	131.96
6	Co 11015	2.96	3.29	2.82	3.02	227.67	221.33	223.67	224.22	135.18	137.56	114.89	129.21
7	Co 12009	3.27	3.30	3.08	3.22	256.67	250.00	277.56	261.41	144.75	154.85	128.95	142.85
8	Co 13008	3.22	3.25	3.20	3.22	246.22	241.89	257.78	248.63	167.13	164.68	159.15	163.65
9	PDN 15012	3.19	3.09	3.05	3.11	256.45	252.00	264.34	257.59	159.87	163.11	145.49	156.16
10	Co 86032	3.15	3.12	3.02	3.10	229.55	218.56	230.11	226.07	155.24	161.19	141.58	152.67
11	CoM 0265	3.26	3.29	3.20	3.25	243.67	232.00	238.56	238.08	158.49	159.16	149.01	155.55
12	VSI 08005	3.03	3.05	2.91	3.00	239.89	231.78	241.22	237.63	155.55	162.12	146.17	154.61
13	MS 10001	3.12	3.10	3.00	3.07	232.22	223.67	221.11	225.67	146.60	148.69	140.16	145.15
14	VSI 434	2.94	2.81	2.69	2.81	220.22	214.22	209.56	214.67	125.46	129.58	112.40	122.48
	SEm±	0.06	0.06	0.09	0.06	7.21	6.30	4.83	3.92	3.86	2.99	4.36	2.45
	CD at 0.05 %	0.18	0.19	0.25	0.16	20.97	18.32	14.05	11.38	11.21	8.69	12.67	7.12
	CV %	3.41	3.61	5.02	3.13	5.22	4.67	3.48	2.85	4.46	3.45	5.59	2.93

(I Pl: I Plant; II Pl.: II Plant and R: Ratoon)

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