

PERFORMANCE OF SUGARCANE VARIETIES IN KERALA

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The average yield of sugarcane and sugar recovery are very low in Kerala when compared with those of neighbouring states. The three sugar factories in the state run less than 90 days in an year with the occasional exception for the Chittur Co-operative Sugar Mills which gets supply of the canes from Tamil Nadu. These sick factories can be improved only if sufficient quantities of canes are supplied to run for a minimum period of five months in an year. Land suitable for sugarcane cultivation in this state is very scarce and hence more area cannot be brought under cultivation. The only possibility is to increase the present average yield of 58 tonnes per hectare to at least 100 tonnes obtained in the neighbouring states. This can be achieved only by the introduction of high yielding varieties of sugarcane and adopting scientific methods of sugarcane cultivation.

Many varieties of sugarcane suitable for cultivation in this state were tested during the last decade. The three varieties now recommended for cultivation in the state are Co. 997, Co. 785 and Co. 449. Co. 997 is the most popular variety of the region which gives an average yield of 60 tonnes/ha.

With a view to identifying a variety suitable for the river bank areas of Kerala superior to Co. 997 and to obtain an average yield of 100 tonnes/ha, a varietal trial with twelve varieties was conducted at the Sugarcane Research Station, Thiruvalla.

Materials and Methods

Nine varieties of sugarcane brought from other states and three locally cultivated varieties were put in a 12 x 3 randomised block design during 1977-78. The performance of these varieties for the first and second ratoons was also studied in 1978-79 and 1979-80 seasons. The varieties tested are Co. 62174, Co. 62175, Co. 6602, FR. 66-17, Co. 6415, Co. 1254, Co. 7106, Co. 775, Co. 7302, Co. 785, Co. 449 and Co. 997.

Three budded setts at the rate of four setts per metre were planted in furrows taken 90 cm apart in plots of 12 x 5.4 sq. m. Fertilizers were applied at the rate of 165 kg N, 82.5 kg P₂O₅ and 82.5 kg K₂O per hectare in three split doses as recommended for the crop in the Package of Practices Recommendations by the Kerala Agricultural University. The first and second interculturalings were done on the 45th and 90th day of planting and final earthing up on the 150th day for the plant and second ratoon crop.

Germination counts were made on the 45th day after planting or harvesting and recorded in thousands per hectare to make a comparative study of the plant and ratoon crops.

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The number of millable canes and yield of cane were recorded at the time of harvest and quality was tested at 12 months maturity for Brix, Pol and purity in December-January every year.

Results and Discussions

Germination:

The varieties exhibited wide variation in germination during the three seasons studied (Table 1). In the plant crop, the maximum value of 98.10 thousands/ha. was recorded by Co. 62175 and the minimum by Co. 6415. But in the first ratoon crop, the maximum number of 136.83 was recorded by Co. 449 and minimum by Co. 6415. In the second ratoon crop also the maximum and minimum were recorded by the above two varieties respectively and the mean values for the three seasons confirmed that Co. 449 has the maximum germination capacity among the 12 varieties studied. Co. 6415 recorded the lowest germination in all the three seasons and when the values of the seasons put together. The variety Co. 62175 which recorded the maximum germination in the plant crop failed to do so in the ratoon crops and showed a gradual decline in germination which is an indication that the crop has to be gap filled properly for maintaining an optimum population. Even though this variety is found to be poor in germination in the initial stages, it is made good at later stages when sufficient moisture and nutrients are provided.

Millable canes:

The number of millable canes expressed as thousands per hectare (Table 2) also showed wide variation among the varieties studied. In the plant crop, the maximum millable cane was recorded by Co. 62174 and minimum by Co. 6415. The variety which recorded the maximum value in the plant crop showed a gradual decline in the ratoon crops indicating that Co. 62174 is a poor ratooner as far as this character is concerned. The variety Co. 6415 was found to be the least adaptive from the germination itself. The Co. 62175 which recorded the maximum germination in the plant crop failed to put forth maximum millable canes, but was superior to the local varieties Co. 785 and Co. 449 but inferior to Co. 997. In the first and second ratoons Co. 997 and Co. 449 performed better over Co. 62175 in respect of this character but were not superior when the critical difference is considered indicating that the number of millable canes obtained from Co. 62175 is on par with the locally cultivated varieties Co. 997 and Co. 449. Co. 62175 was found to be better over Co. 785 in all the three seasons and when the seasons were considered together. The varieties like Co. 6602, FR. 66-17, Co. 1254, Co. 7106 are not considered here since the yields obtained were very low.

Yield of cane:

The analysis of yield data (Table 3) shows that the variety Co. 62175 is superior to all others in all the three seasons. In the plant crop this variety produced an average yield of 160.09 tonnes/ha which is 49.5% more than that of the popular variety Co. 997. In the first and second ratoon crops also, Co. 62175

Table 1
Germination—Mean values (in 1000/ha)

Treatment	Plant crop	I ratoon	II ratoon	Mean
Co. 997	81.07	84.88	93.16	86.36
Co. 785	56.48	57.10	60.96	58.18
Co. 449	90.48	136.83	176.13	134.48
Co. 62174	89.04	104.48	123.51	105.68
Co. 62175	98.10	99.79	85.49	94.46
Co. 6602	94.75	123.92	163.58	127.42
ER. 66-17	75.87	106.17	136.52	106.19
Co. 6415	41.26	43.21	35.24	30.90
Co. 1254	72.38	115.69	153.03	113.70
Co. 7106	83.90	117.44	142.75	114.69
Co. 775	43.16	62.76	47.79	51.23
Co. 7302	66.51	97.69	153.76	105.98
C. D. (0.05)	—	—	—	16.59

Table 2
Number of millable canes, mean values (in 1000/ha)

Treatment	Plant crop	I ratoon	II ratoon	Mean
Co. 997	120.56	107.96	134.72	121.08
Co. 785	98.89	83.80	109.44	97.38
Co. 449	105.09	123.24	117.50	115.28
Co. 62174	122.59	101.57	96.85	107.01
Co. 62175	107.41	93.80	127.13	109.44
Co. 6602	119.44	101.39	112.69	111.17
FR. 66-17	101.67	111.20	129.35	114.07
Co. 6415	79.63	73.98	38.52	64.04
Co. 1254	113.52	129.17	123.61	122.10
Co. 7106	122.04	110.65	129.67	102.59
Co. 775	86.48	71.94	58.52	72.31
Co. 7302	111.48	82.78	129.63	107.96
C. D. (0.05)	—	—	—	18.45

Table 3
Yield of cane, tonnes/ha

Treatment	Plant crop	I ratoon	II ratoon	Mean
Co.997	107.00	59.47	72.50	79.64
Co.785	96.30	48.49	64.22	69.69
Co.449	105.20	59.19	71.25	79.94
Co.62174	116.40	61.10	69.95	82.50
Co.62175	160.09	72.80	96.00	109.64
Co.6602	102.09	46.33	64.17	71.11
FR.66-17	65.20	46.05	56.52	60.52
Co.6415	97.50	43.41	40.93	64.20
Co. 1254	111.40	53.35	62.59	75.80
Co.7106	106.60	59.44	80.44	82.33
Co.775	74.60	48.49	45.64	56.65
Co.7302	93.00	60.49	78.33	77.14
C. D. (0.05)	—	—	—	14.15

excelled all other varieties in its yielding ability and was superior to the popular variety Co. 99 by 22% and 32.4% respectively. The analysis of pooled yield of all the three seasons also showed that Co. 62175 recorded an increased yield of 37.6% over the standard the Co. 997, even though this check variety recorded more number of millable canes. This increase in cane weight is due to the increased length and girth of canes. Due to this increased length, girth and heavy top weight, the variety is found to lodge when propping was not done. The top buds are found to sprout prematurely when lodging occurs and hence propping and stripping of old leaves are essential for this variety. It may be mentioned here that this variety has been released for cultivation in Andhra Pradesh, Karnataka and Maharashtra.

Sugar content

The data presented in Table 4 give a comparative assessment of the yield of commercial cane sugar (CCS) from different varieties. The variety Co. 62175 produced for the plant crop 17.497 tonnes/ha, as against the check variety Co.997 which yielded 12.165 tonnes/ha. When the average of three seasons was considered Co. 62175 has produced the maximum CCS of 12.433 tonnes/ha as against 9.325 tonnes for Co.97. It can thus be seen that the remarkable increase in commercial cane sugar is chiefly brought by the increase in tonnage. The slight increase or decrease in the sucrose content which is not statistically significant does not deserve consideration since the varieties flower by November under the conditions prevailing in the state. Due to the increased yield of Co. 62175, the factories can always expect a higher output of commercial cane sugar per hectare. The variation in the sucrose percentage in all the varieties for the different cropping seasons may be due to seasonal influences.

Table 4

The content and quality of sugar from different varieties

Treatment	Brix %				Pol. %			
	Plant crop	I ratoon	II ratoon	Mean	Plant crop	I ratoon	II ratoon	Mean
Co.997	18.04	17.74	19.46	18.41	16.04	16.11	17.23	16.46
Co.785	17.04	19.24	17.77	18.02	15.83	16.06	15.24	15.71
Co.449	18.74	19.73	17.96	18.82	17.01	17.63	16.24	16.97
Co.62174	18.64	16.84	18.10	16.86	15.08	15.04	16.01	15.38
Co.61175	16.84	18.64	18.00	17.82	15.24	16.24	16.33	15.94
Co.6602	18.24	17.54	19.29	18.35	15.22	15.40	17.57	16.06
FR.66-17	17.54	18.88	18.36	18.29	15.01	16.20	16.42	15.88
Co.6415	17.84	20.58	19.40	19.27	15.23	18.15	17.37	16.91
Co.1254	18.54	20.54	19.06	19.38	17.30	18.01	17.59	17.63
Co.7106	15.94	20.54	19.10	18.52	13.26	18.50	17.21	16.34
Co.775	18.41	17.28	17.86	17.85	15.93	15.50	15.75	15.73
Co.7302	21.74	19.14	17.86	19.35	18.72	17.51	15.86	17.36
C.D.(0.05)	Not sig.				Not sig.			

Table 4 Continued

Plant crop	Purity, %			C, C. S., tonnes/ha			
	I ratoon	II ratoon	Mean	Plant crop	I ratoon	II ratoon	Mean
89.84	84.80	90.66	88.43	12.165	6.886	8.830	9.325
83.95	88.84	88.24	87.01	11.103	5.285	6.768	7.658
89.76	89.21	92.19	90.38	12.855	7.428	8.298	9.704
91.49	87.41	86.01	88.30	11.640	6.537	7.911	8.802
90.58	89.47	91.98	90.67	17.497	8.270	11.260	12.433
91.83	87.99	90.83	90.22	10.545	5.017	8.117	8.014
88.84	90.95	89.15	89.64	6.761	5.162	6.601	6.711
90.90	88.97	85.65	88.51	13.669	5.556	5.063	8.515
91.25	90.45	90.26	90.65	14.460	6.748	7.992	9.611
89.68	89.36	91.22	90.08	9.562	7.863	9.902	9.467
87.12	87.90	89.35	88.12	8.273	5.362	5.070	6.282
88.51	86.24	91.44	88.73	12.080	7.579	8.804	9.449
Not sig.				3.012			

Summary

With a view to evolving cane varieties superior to the local promising ones under cultivation in the river bank areas of Kerala, a varietal trial with 12 varieties was conducted at the Sugarcane Research Station, Thiruvalla during the year 1977-79.

Co. 62175 excelled all other varieties in germination in the plant crop, but not in the ratoon crops.

Co. 997 is found to be better than other varieties in number of milialle canes. But this number has contributed for yield.

Co.62175 is the highest yielder among the twelve varieties studied. The increase in yield over the most popular variety Co. 997 is 45.4%, 22%, 32.4% for the plant crop, first ratoon, second ratoon respectively. The mean percentage increase over all the seasons is 37.6%.

The increase in cane yield of this variety is due to the increased length and girth of canes.

There is no significant difference in Brix, Pol and purity between the varieties.

Co. 62175 can be recommended for commercial cultivation on the river banks of Kerala.

സംഗ്രഹം

കേരളത്തിലെ നദീതീരപ്രദേശങ്ങളിൽ പ്രചാരത്തിലുള്ള Co 997 എന്ന ഇനം കരിമ്പിനേക്കാൾ അധിക വിളവു നൽകുന്നതും പഞ്ചസാര ഉൽപ്പാദനത്തിൽ കുറവില്ലാത്തതുമായ ഒരു പുതിയ ഇനം കരിമ്പ് കൃഷിക്കാർക്കുനൽകുന്നതിനായി 1977-1979 കാലയളവിൽ തിരുവല്ല കരിമ്പുഗവേഷണ സ്ഥലത്ത് നടത്തിയ പരീക്ഷണങ്ങളിൽ Co 62175 എന്ന ഇനം കരിമ്പ് ഉൽപ്പാദനശേഷിയിൽ വളരെ മെച്ചമാണെന്നു കാണുകയുണ്ടായി. പഞ്ചസാരയുടെ അളവിൽ മറ്റിനം കരിമ്പിനങ്ങളോടൊപ്പം ഈ ഇനം മെച്ചമാണെന്നു തെളിയിച്ചിട്ടുണ്ട്. കേരളത്തിലെ മണ്ണിനും കാലാവസ്ഥയ്ക്കും പറ്റിയ Co 62175 എന്ന ഇനം കരിമ്പ് കൃഷിക്കാർക്ക് അധികവിളവിനു വേണ്ടി ശുപാർശചെയ്യാവുന്നതാണ്.

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