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Studies on the effect of change of seed materials of Co. 419 on yield and quality of sugarcane

by

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Synopsis: Studies have been made to assess the relative effect of change of seed material on yield and quality of sugarcane and to investigate the need for change in seed materials at frequent intervals. The necessity to change the seed materials periodically was not felt significantly as they did not have any influence either on yield or quality of sugarcane.

Introduction: The usual practice with the cane growers is to utilise the immature tops of cane as seed material or the entire of short crop of 6-7 months old, cut into bits. A belief is current among the ryots that sugarcane seed material raised in a place produce a better crop when planted at another locality and the crop produced is superior to local seed. The present paper gives an account of experiments conducted at the Sugarcane Research Stations, Cuddalore, Gudiyatham and Sirugamani.

Review of Literature: Many workers from North India have reported that when the seed is grown in a particular locality year after year the vigour of the crop may be deteriorated due to various factors like climate, pests and diseases etc. So when seed is brought from outside it may show better vigour for some time, till it acclamatizes with the conditions of the locality.

A variety may deteriorate through its change of environment. Raghavan (1953) observed that a gradual change in soil condition and combination of circumstance associated with micro nutrients may be held responsible for deterioration. Arakeri and Patil (1961) reported that an increase in yield to an extent of 10-15 per cent is recorded by obtaining the seed material from Sugarcane Research Station, Padegoan and raising a crop. Barve (1950) reported that the seed from Agricultural Research Station Akluj (Sholapur) gave nearly nine per cent higher yield than the seed from Walchandnagar Factory Estate. Patwardhan (1953) mentions that Co. 419 seed from Padegaon Farm has shown equal performance with the seed of Co. 419 maintained at Coimbatore when tried both at Padegaon and Coimbatore. Govitrikar (1954) has observed at Malingar that between old seed and Padegaon Farm seed there is no significant difference in the growth and yield. Reports from Andhra and Mysore States have also indicated that the differences in cane yield and juice quality among the treatments were not significant.

Based on the findings of the above, experiments were conducted at the Sugarcane Research Station, Cuddalore (South Arcot district) Gudiyatham (North Arcot district) and Sirugamani (Trichy district).

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Materials and Methods: With a view to assess the relative effect of change of seed materials on yield and quality and to investigate the need for change in seed stock at frequent intervals, trials were laid out at the Sugarcane Research Station, Cuddalore, Gudiyatham and Sirugamani with the variety Co. 419 during the main season 1961—'62 to 1963—'64.

Two types of seed materials, one that was used from the same locality (Farm seeds) year after year and not changed periodically and the other seed material obtained from outside (Coimbatore seeds) were tested.

Results and Discussion: Periodical observations were recorded on germination, tillering, vigour, growth, susceptibility to pests and diseases.

Germination and tillering capacities of the two types of seed materials are given in Table I.

TABLE I.

	Germination Percentage				No. of tillers per germinated bud			
	1961–'62	1962–'63	1963–'64	Average	1961–'62	1962–'63	1963–'64	Average
Farm Seed:								
Cuddalore	33·8	59·0	18·8	37·2	3·5	1·2	2·8	2·5
Gudiyatham	40·0	70·0	80·8	63·6	1·1	1·5	1·0	1·2
Sirugamani	30·5	38·9	...	34·7	2·6	1·5	...	2·1
Coimbatore Seed:								
Cuddalore	38·5	63·0	19·4	40·3	3·8	1·2	3·1	2·7
Gudiyatham	47·5	70·0	71·0	62·8	1·4	1·5	1·1	1·3
Sirugamani	24·9	33·5	...	29·2	2·9	1·6	...	2·3

Though some initial better vigour was observed in favour of the seed material brought from outside (Coimbatore) not much appreciable difference in germination or tillering could be recorded between the two types of seed materials.

The consolidated data on population, yield of cane and juice quality are furnished in Table II for comparative study.

A perusal of the data reveals that the results do not show any substantial difference in the performance of the seed material brought from outside either in yield of cane and juice quality or in sugar per acre during 1961—'62 and 1962—'63 seasons at all the centres. During 1963—'64 season an increase in yield of 7·6 tonnes of cane for Coimbatore seed materials was obtained at Cuddalore which was not significant. At Gudiyatham increase in yield of 3·3 tonnes of cane was recorded for Farm seed which was also not statistically significant.

TABLE II.

	Yield of cane in tonnes per acre		Population per acre		Pol per cent		Purity per cent		C. C. S. per cent		C. C. S. in tonnes per acre	
	C. S.	F. S.	C. S.	F. S.	C. S.	F. S.	C. S.	F. S.	C. S.	F. S.	C. S.	F. S.
I Central Sugarcane Research Station, Cuddalore.												
1961—'62	70·1	69·1	36,900	38,000	18·3	17·9	88·0	86·8	12·8	12·1	9·0	8·4
1962—'63	59·9	58·7	39,300	37,000	18·7	18·8	92·3	93·2	13·6	13·7	8·1	8·0
1963—'64	36·5	28·9	26,200	33,200	18·2	18·3	92·3	92·7	13·1	13·3	4 8	3·9
Average	55·5	52·2	37,500	36,100	18·4	18·3	90·7	90·9	13·2	13·0	7·3	6·8
II Sugarcane Research Station, Gudiyatham :—												
1961—'62	31·8	32·3	32,100	37,000	18·6	18·5	88·7	88·9	13·3	13·4	4·2	4·3
1962—'63	36·6	39·0	36,500	36,100	17·4	18·3	89·4	88·6	12·4	13·0	4·5	5·1
1963—'64	36·8	40·1	34,200	37,500	19·2	19·5	92·7	93·0	14·0	14·2	5·2	5·7
Average	35·1	37·1	34,300	36,900	18·4	18·8	90·8	90·2	13·2	13·5	4·6	5·0
III Sugarcane Research Station, Sirugamani :—												
1961—'62	30·7	26·5	23,800	22,800	16·6	16·2	87·6	86·1	11·8	11·4	3·6	3·0
1962—'63	21·2	21·7	25,400	29,800	17·9	17·6	88·9	89·6	12·8	12·6	2·7	2·7
1963—'64	...	...	...	Not conducted	...	...	...	...	...	...	...	...
Average	25·9	24·1	24,600	26,300	17·3	16·9	88·3	87·9	12·3	12·0	3·2	2·9

C. S. = Coimbatore Seed.

P. S. = Farm Seed.

C. C. S. = Commercial Cane Sugar.

At the time of harvest particulars in respect of length, girth, number of internodes and weight of individual cane were also recorded at all the stations and the average of the same for three seasons are presented in Table III.

TABLE III.

Particulars	Cuddalore		Gudiyatham		Sirugamani	
	C. S.	F. S.	C. S.	F. S.	C. S.	F. S.
1. Length of cane in cm.	250	260	248	240	249	246
2. Girth of cane in cm.	2·7	2·6	2·7	2·6	2·8	2·7
3. No. of internodes	27	26	23	22	20	19
4. Weight of individual cane in kg.	1·4	1·6	1·6	1·5	1·2	1·0

C. S. = Coimbatore seed. F. S. = Farm seed.

Reviewing the above mill yard data also there was not much appreciable difference between the two types of seed materials used at all the centres.

Summary and Conclusion: The work done on change of seed material in Sugarcane in all the Research Stations in Madras State reveal that the Farm seed material is in no way significantly inferior when compared to the performance of the crop grown out of seed materials brought from outside. If at all there is any increase in yield by resorting to change of seeds, it would be only very little and the same will be compensated by incurring the expenditure towards transport charges.

Hence the necessity to change the seed materials periodically from one place to another does not seem to be essential to obtain maximum out-turn of yield of cane as well as sugar per acre.

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