

Comparative Economics of Different Planting Types of Sugarcane Production in Ahmednagar District and Western Maharashtra

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ABSTRACT: Maharashtra is the leading State in India for sugarcane cultivation next only to Uttar Pradesh occupying an area of around 18 per cent with respect to total area under sugarcane crop in country in the year 2010-11. The study is based on primary data which is collected from the sample sugarcane growers by cost accounting method with the help of specially designed schedules under the Maharashtra State Sponsored Cost of Cultivation Scheme.

As compare to Ahmednagar district the human labour use was higher in Western Maharashtra. The per hectare use of bullock labour was high in Ahmednagar district as compare to Western Maharashtra in pre-seasonal (6.67 pair days). The use of manure was 171.66 quintal per hectare in case of ratoon in Ahmednagar district. In the adsali sugarcane between the Ahmednagar and Western Maharashtra, the per cent difference was observed in use of chemical fertilizers i.e. Nitrogenous, Phosphorus and Potash was 2.50, 11.30 and 54.65, respectively. The per cent gap observed in case of chemical fertilizers was excess than the recommended doses in case of suru, ratoon and adsali. In Ahmednagar district the benefit cost ratio at cost 'C' was highest in case of ratoon sugarcane (1.65), followed by adsali (1.36) and suru sugarcane (1.19). The inputs used by the sugarcane growers for all the planting types were less than recommendation except chemical fertilizers. The application of manure was very less almost on all type of sugarcane farms. More than 25 per cent output gap was observed in all the planting types.

Key words: Resource use, Difference, Gap, Cost and return.

Maharashtra is the leading State in India for sugarcane cultivation next only to Uttar Pradesh occupying an area of around 18 per cent with respect to total area under sugarcane crop in country in the year 2010-11. Maharashtra ranks first in recovery of sugar, second in production and seventh in productivity of sugarcane in the country. The productivity of the crop primarily depends on the extent of levels of resource use and total management of the crop. The inputs play a significant role in agricultural production. The labour, seed, manures, fertilizers, irrigation, plant protection and intercultural operations are the major factors responsible for the increasing yield of the crop. In general, it is noticed that most of the sugarcane growers in Western Maharashtra are not using the recommended levels of inputs. Therefore, there exists a gap between the recommended and actual use levels of inputs. The present investigation viz., "Comparative economics of different planting types

of sugarcane production in Ahmednagar district and Western Maharashtra" is an attempt to estimate yield gap as well as production of sugarcane.

METHODOLOGY

The study is based on primary data which is collected from the sample sugarcane growers by cost accounting method with the help of specially designed schedules under the Maharashtra State Sponsored Cost of Cultivation Scheme. On the basis of operational holding 67 adsali sugarcane growers, 39 pre-seasonal sugarcane growers, 38 suru sugarcane growers and 154 ratoon sugarcane growers from Western Maharashtra were selected by the three stage stratified random sampling technique. The primary data for the year 2013-14 were considered for the study. The gaps in the use levels of various inputs and outputs have been worked out. The use levels of various inputs and outputs obtained in all types of

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sugarcane cultivation were estimated by simple tabular method of analysis with the help of means, averages and percentages.

RESULT AND DISCUSSION

Per hectare resource use

The quantities of various inputs used directly affect the cost of cultivation and therefore, utilization of inputs such as human labour, bullock labour, seeds, manures, fertilizers, etc., have been studied in per hectare physical and monetary terms. In order to get an idea as to whether there is any difference in inputs used in different planting type of sugarcane. The information regarding per hectare resource use is presented in Table 1.

(i) Human labour

It can be seen from the Table 1, as compare to Ahmednagar district the human labour use was higher in Western Maharashtra. The per cent difference was 36.28, 8.59, 4.43 and 11.99 man days per hectare in adsali, pre-seasonal, suru and ratoon sugarcane, respectively.

(ii) Bullock labour

The per hectare use of bullock labour was high in Ahmednagar district as compare to Western Maharashtra in pre-seasonal (6.67 pair days). The per cent difference observed in use of bullock labour between Ahmednagar district and Western Maharashtra was 58.54, -75.99, 32.17 and 50.35 in adsali, pre-seasonal, suru and ratoon, respectively.

(iii) Machine power

In Ahmednagar district the per hectare utilization of machine power was observed more (i.e. 42.97 hrs.) in case of suru planting. The use of machine power was more in all planting type of sugarcane in Western Maharashtra as compared to Ahmednagar district. The machine power i.e. use of tractors was mostly for the operation of ploughing and harrowing of the plot.

(iv) Manure

The use of manure was 171.66 quintal per hectare in case of ratoon in Ahmednagar district. In

Table 1
Per hectare Resource use leveles of sugarcane(2013-14)

Sr. No.	Particulars	Adsali		Pre-sea		Suru		Ratoon	
		A.nagar	W.M.	A.nagar	W.M.	A.nagar	W.M.	A.nagar	W.M.
1	Total Human labour (Days)	249.13	390.95	324.37	354.85	285.77	299.02	176.13	200.13
	a. Male	168.98	212.82	206.04	204.99	188.31	180.97	107.78	121.16
	b. Female	80.15	178.13	118.33	149.86	97.46	118.05	68.35	78.97
2	Bullock power (pair days)	1.65	3.98	6.67	3.79	3.88	5.72	2.85	5.74
3	Machine power in hrs.	39.06	43.36	30.00	41.03	42.97	42.93	10.27	10.43
4	Seed (Kgs)	6891.33	5953.91	5000.00	5667.58	5468.75	5677.27	0.00	0
5	Manures (Qtls.)	83.18	67.06	0.00	51.37	77.90	56.60	171.66	16.48
6	Fertilizers (Kgs)								
	N	409.22	419.71	260.00	364.27	371.87	293.84	274.21	263.29
	P	211.28	238.29	87.50	220.90	282.25	189.01	143.77	151.64
	K	103.16	227.46	137.50	231.55	141.18	154.50	120.17	143.41
7	Irrigation Charges (Rs.)	14370.35	15655.11	8248.53	11578.34	10041.37	12615.47	9055.80	11022.72

Difference and per cent Difference

Sr.no.	Particulars	Adsali		Pre-sea		Suru		Ratoon	
		Diff.	% Diff.	Diff.	% Diff.%	Diff.	% Diff.	Diff.	% Diff.
1	Total Human labour (Days)	141.82	36.28	30.48	8.59	13.25	4.43	24.00	11.99
	a. Male	43.84	20.60	-1.05	-0.51	-7.34	-4.06	13.38	11.04
	b. Female	97.98	55.00	31.53	21.04	20.59	17.44	10.62	13.45
2	Bullock power (pair days)	2.33	58.54	-2.88	-75.99	1.84	32.17	2.89	50.35
3	Machine power in hrs.	4.30	9.92	11.03	26.88	-0.04	-0.09	0.16	1.53
4	Seed (Kgs)	-937.42	-15.74	667.58	11.78	208.52	3.67		
5	Manures (Qtls.)	-16.12	-24.04	51.37	100.00	-21.30	-37.63	-155.18	-941.63
6	Fertilizers (Kgs)								
	N	10.49	2.50	104.27	28.62	-78.03	-26.56	-10.92	-4.15
	P	27.01	11.33	133.40	60.39	-93.24	-49.33	7.87	5.19
	K	124.30	54.65	94.05	40.62	13.32	8.62	23.24	16.21
7	Irrigation Charges (Rs.)	1284.76	8.21	3329.81	28.76	2574.10	20.40	1966.92	17.84

Ahmednagar district the use manure was found more in all planting type of sugarcane except pre-seasonal. The per cent difference observed in use of manure was -24.04, 100, -37.63 and -941.63 in adsali, pre-seasonal, suru and ratoon, respectively.

(vi) Fertilizers

In the adsali sugarcane between the Ahmednagar and Western Maharashtra, the per cent difference was observed in use of chemical fertilizers i.e. Nitrogenous, Phosphorus and Potash was 2.50, 11.30 and 54.65, respectively. In pre-seasonal sugarcane the per cent difference found maximum in the use of phosphorus i.e.60.39. Excess use of nitrogen and phosphorus was found higher in Ahmednagar district than Western Maharashtra in suru sugarcane planting type. The per cent difference in the use of Nitrogen, Phosphorus and Potash was -4.15, 5.19 and 16.21, respectively in ratoon sugarcane.

Per hectare input and output gap of Ahmednagar district in sugarcane cultivation

The agricultural universities and institutes recommended the input use for higher production of the crops. This differs from the actual use of inputs by the farmers. The per hectare resource use gap in different type of sugarcane of Ahmednagar district is presented in Table 2.

It is seen from the Table 2 that in all planting type, the per cent gap observed in case of chemical fertilizers was excess than the recommended doses in case of suru, ratoon and adsali. The other inputs were under utilized by the farmers in the study area. Hence, there was no single farmer found to use the recommended doses of inputs. The per cent gap in manure use was maximum (100 %) in ratoon sugarcane. Therefore, the gap in output was observed from 16 to 52 per cent in all the planting types.

Per hectare input and output gap of Western Maharashtra in sugarcane cultivation

It is seen from the Table 3 that in all planting type, the per cent use observed in case of chemical fertilizers was excess than the recommended doses in case of all planting type. There was no single farmer found to use the recommended doses of inputs. The per cent gap in manure use was maximum (83.52 %) in ratoon sugarcane. Therefore, the gap in output was observed from 17 to 25 per cent in all the planting types.

Table 2
Per hectare resource use gap for sugarcane in Ahmednagar district (2013-14)

Sr. No.	Resource use	Adsali			
		Recommended	Actual	Gap	% Gap
1	Palnting material (Ton)	7.5	6.80	0.70	9.33
2	Manures (Qtls.)	200	83.18	116.82	58.41
3	Nitrogen (Kg)	400	409.22	-9.22	-2.31
4	Phosphorus (Kg)	170	211.28	-41.28	-24.28
5	Potash (Kg)	170	103.16	66.84	39.32
6	Output (qtls)	1854.1	872.35	981.75	52.95
<i>Pre-sea</i>					
1	Palnting material (Ton)	7.5	5.00	2.50	33.33
2	Manures (Qtls.)	200	0.00	200.00	100.00
3	Nitrogen (Kg)	340	260.00	80.00	23.53
4	Phosphorus (Kg)	170	87.50	82.50	48.53
5	Potash (Kg)	170	137.50	32.50	19.12
6	Output (qtls)	1495.8	1250.00	245.80	16.43
<i>Suru</i>					
1	Palnting material (Ton)	7.5	5.46	2.04	27.20
2	Manures (Qtls.)	200	77.90	122.10	61.05
3	Nitrogen (Kg)	250	371.87	-121.87	-48.75
4	Phosphorus (Kg)	115	282.25	-167.25	-145.43
5	Potash (Kg)	115	141.18	-26.18	-22.77
6	Output (qtls)	1379.2	1129.69	249.51	18.09
<i>Ratoon</i>					
1	Palnting material (Ton)	0	0.00	0.00	0.00
2	Manures (Qtls.)	100	171.66	-71.66	-71.66
3	Nitrogen (Kg)	250	274.21	-24.21	-9.68
4	Phosphorus (Kg)	115	143.77	-28.77	-25.02
5	Potash (Kg)	115	120.17	-5.17	-4.50
6	Output (qtls)	1176.9	915.76	261.14	22.19

Table 3
Per hectare resource use gap for sugarcane in Western Maharashtra (2013-14)

Sr. No.	Resource use	Adsali			
		Recommended	Actual	Gap	% Gap
1	Palnting material (Ton)	7.5	5.90	1.60	21.33
2	Manures (Qtls.)	200	67.06	132.94	66.47
3	Nitrogen (Kg)	400	419.71	-19.71	-4.93
4	Phosphorus (Kg)	170	238.29	-68.29	-40.17
5	Potash (Kg)	170	227.46	-57.46	-33.80
6	Output (qtls)	1854.1	1375.46	478.64	25.82
<i>Pre-sea</i>					
1	Palnting material (Ton)	7.5	5.60	1.90	25.33
2	Manures (Qtls.)	200	51.37	148.63	74.32
3	Nitrogen (Kg)	340	364.27	-24.27	-7.14
4	Phosphorus (Kg)	170	220.90	-50.90	-29.94
5	Potash (Kg)	170	231.55	-61.55	-36.21
6	Output (qtls)	1495.8	1227.53	268.27	17.93
<i>Suru</i>					
1	Palnting material (Ton)	7.5	5.60	1.90	25.33
2	Manures (Qtls.)	200	56.60	143.40	71.70
3	Nitrogen (Kg)	250	293.84	-43.84	-17.54
4	Phosphorus (Kg)	115	189.01	-74.01	-64.36
5	Potash (Kg)	115	154.50	-39.50	-34.35
6	Output (qtls)	1379.2	1039.85	339.35	24.60
<i>Ratoon</i>					
1	Palnting material (Ton)	0	0	0.00	0.00
2	Manures (Qtls.)	100	16.48	83.52	83.52
3	Nitrogen (Kg)	250	263.29	-13.29	-5.32
4	Phosphorus (Kg)	115	151.64	-36.64	-31.86
5	Potash (Kg)	115	143.41	-28.41	-24.70
6	Output (qtls)	1176.9	925.49	251.41	21.36

Per hectare costs and returns in Ahmednagar district

From the Table 4 the per hectare gross income received was Rs. 274999.99, Rs. 192492.44, Rs. 249812.49 and 201363.66 for adsali, pre-seasonal, suru and ratoon sugarcane, respectively. The per hectare profit at cost 'C' was the highest in case of ratoon planting (Rs. 79274.65) followed by adsali (Rs. 72264.83) and suru sugarcane (Rs. 40673.86). The benefit cost ratio at cost 'C' was highest in case of ratoon sugarcane (1.65), followed by adsali (1.36) and suru sugarcane (1.19). The benefit cost ratio in all planting types were observed more than unity therefore the cultivation of sugarcane is viable economic proposition in the area under study.

Table 4
Per hectare costs, return, gross income, and B.C.ratio for sugarcane in Ahmednagar district(2013-14)

Sr. No.	Particulars	Size groups				
		Unit	Adsali	Pre-sea	Suru	Ratoon
1	Total cost					
	i) Cost 'A'	Rs.	122812.07	117741.73	134954.27	64940.73
	ii) Cost 'B'	Rs.	173953.50	156002.44	182712.52	107180.04
	iii) Cost 'C'	Rs.	202735.16	179242.19	209138.63	122089.01
2	Profit at					
	i) Cost 'A'	Rs.	152187.92	74750.71	114858.22	136422.93
	ii) Cost 'B'	Rs.	101046.49	36490.00	67099.97	94183.62
	iii) Cost 'C'	Rs.	72264.83	13250.25	40673.86	79274.65
3	Production	Qtls	1250.00	872.35	1129.69	915.76
4	Gross income	Rs.	274999.99	192492.44	249812.49	201363.66
5	B:C ratio					
	i) Cost 'A'		2.24	1.63	1.85	3.10
	ii) Cost 'B'		1.58	1.23	1.37	1.88
	iii) Cost 'C'		1.36	1.07	1.19	1.65

Per hectare costs and returns in Western Maharashtra Table 5 showed that in Western Maharashtra the per hectare profit at cost 'C' was the highest in case of ratoon planting (Rs. 76967.43). The benefit cost ratio at cost 'C' was the highest in case of ratoon sugarcane (1.59), followed by adsali (1.26), pre-seasonal (1.25) and suru (1.23) sugarcane.

Table 5
Per hectare costs, return, gross income, and B.C.ratio for sugarcane in Western Maharashtra(2013-14)

Sr. No.	Particulars	Unit	Size groups			
			Adsali	Pre-sea	Suru	Ratoon
1	Total cost					
	i) Cost 'A'	Rs.	162673.08	149503.27	124165.54	75000.12
	ii) Cost 'B'	Rs.	220554.16	199340.79	167925.82	115429.88
	iii) Cost 'C'	Rs.	245301.17	221734.79	189635.20	129889.13
2	Profit at					
	i) Cost 'A'	Rs.	147095.17	126627.01	108193.28	131856.44
	ii) Cost 'B'	Rs.	89214.09	76789.49	64433.00	91426.68
	iii) Cost 'C'	Rs.	64467.08	54395.49	42723.62	76967.43
3	Production	Qtls	1375.46	1227.53	1039.85	925.49
4	Gross income	Rs.	309768.25	276130.28	232358.82	206856.56
5	B:C ratio					
	i) Cost 'A'	1.90	1.85	1.87	2.76	
	ii) Cost 'B'	1.40	1.39	1.38	1.79	
	iii) Cost 'C'	1.26	1.25	1.23	1.59	

CONCLUSION

The inputs used by the sugarcane growers for all the planting types were less than recommendation except chemical fertilizers. The application of manure was very less almost on all type of sugarcane farms. More than 25 per cent output gap was observed in all the planting types. Therefore, the study adhocate that, all the farmers should use judicious and balanced use of all the inputs for getting better output of sugarcane.

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