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Comparative Economics of Soybean Variety MAUS-71 Vis-à-vis JS-335 and Analysis of Production Constraints in Beed District, India

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A B S T R A C T

Soybean (*Glycine max* (L.) Merill) is a leguminous crop and belongs to family leguminoceae. It is originated in Chaina and it is a major oilseed crop in the world. Soybean is known as the "golden bean", "miracle crop" etc, because of its several uses. It is an excellent source of protein and oil. In India the area under soybean was 106.94 lakh hectares and production were 126.77 lack metric tonnes. In Maharashtra, soybean occupied an area 38.70 lakh ha area with production 48 lakh metric tonnes. The area under soybean in Beed district is 76.20 thousand hectars with the total production of 119.45 thousand metric tonnes and area under soybean in Ambajogai tahsil is 34.60 thousand hectars with total production of 61.80 thousand metric tonns in 2012-13.Multistage sampling design was adopted in selection of district, tehsil, villages and soybean growers. Soybean growers were stratified into two groups like MAUS-71 (48) and JS-335 (48).It was observed that soybean grower was giving highly important to kharif jowar crop in cropping pattern on both MAUS-71and JS-335 soybean farms. Hired human labour and machine labour were found major item of expenditure in both cases of soybean. Per hectare, net profit was Rs 35548.50 and Rs 25738.44 in MAUS-71 and JS-335 soybean. MAUS-71 was higher profitable that JS-335. Output-input ratio of MAUS-71 was 1.71 while that of JS-335 was 1.52.

Introduction

Soybean (*Glycine max* (L.) Merill) is a leguminous crop and belongs to family leguminoceae. It is originated in Chaina and it is a major oilseed crop in the world. Soybean is known as the "golden bean", "miracle crop" etc, because of its several uses. It is an excellent source of protein and oil. In India the area under soybean was 106.94 lakh hectares and production were 126.77 lack metric tonnes. In Maharashtra, soybean occupied an area 38.70 lakh ha area with production 48 lakh metric tonnes. The area

under soybean in Beed district is 76.20 thousand hectars with the total production of 119.45 thousand metric tonnes and area under soybean in Ambajogai tahsil is 34.60 thousand hectars with total production of 61.80 thousand metric tonnes in 2012-13.The shorter duration, easy cultivation and harvesting benefit in terms of improvement in fertility to undertake a soybean cultivation primarily in the north-east region of the state where the climate condition was suitable for soybean cultivation. It is important to know the cost of cultivation of crop with profitability which input factors are major one to increase the cost of cultivation as well as help to minimize the cost of cultivation by maintaining the productivity and quality. It is essential to undertake empirical study.

The main objectives of this study to examine variety-wise cost and returns in soybean production and to study variety-wise constraints and suggestion faced by soybean growers

Materials and Methods

Multi stage sampling design was adopted for selection of district, tehsil, villages as well as soybean producer of MAUS-71 and JS-335. In the first stage, Beed district was purposively selected on the basis of area under soybean production. In the second stage, Ambajogai tehsil of Beed district was selected on the basis of higher area under both soybean production varieties MAUS-71 and JS-335. In third stage, eight villages were selected from the selected tehsil on the basis of the highest area under soybean production. In the fourth stage, from each village, the separate list was prepared MAUS-71 and JS-335 varieties of soybean grower. From each of the village six farmers of MAUS-71 and JS-335 were randomly selected. Thus, from one village, twelve farmers were selected.

Analytical tools

To determine the cost and retunes in soybean cultivation was achieved by tabular analysis with cost concept of cost-A, cost-B and cost-C for crops. And to study constraints and suggestions faced by soybean growers were achieved by frequency analysis and percentage method.

Results and Discussion

Costs, returns and profitability of soybean farm

Physical inputs can be transformed into production of soybean. The input can be converted into monetary terms to know cost and production into return. With the help of costs and returns, profitability of soybean was determined.

Physical inputs and outputs used in soybean production

Per hectare physical inputs in soybean production under MAUS-71 and JS-335 were estimated and presented in table1. Use of hired human labour was the high as 35.49 man days on JS-335 soybean farm as compared to 32.54 man days on MAUS-71 soybean farm. Use of bullock labour was 10.64 pair days in MAUS-71 soybean farm and 13.33 pair days in JS-335 soybean farm. Use of machine labour was the high 13.27 hours onMAUS-71 soybean farm as compared to 10.52 hours on JS-335 soybean farm.

It was adaption new technology on MAUS-71 soybean farm. The use of seed was higher as 67.42 kg in case of JS-335 soybean farm as compared to 65.61 in case of MAUS-71 soybean farm. Regarding use of manures was highest i.e. 25.30 quintals on JS-335 farm as compared to MAUS-71 farm i.e. 18.09 quintals. Because the number of milch animal as well as number of bullock pair were highest in JS-335 soybean growers as compared to MAUS-71 farm that's why

application of manure was greater in JS-335 soybean farm as compared to MAUS-71 soybean farm.

Use of nitrogen, phosphorous, and potash was 38.52 kg, 57.48 kg and 31.45 kg on MAUS-71 soybean farm, respectively. While use of nitrogen, phosphorous and potash was 40.45 kg, 54.02 kg and 35.09 kg, respectively on JS-335 soybean farm. regarding use of nitrogen, phosphorus and potash were more in case of JS-335 soybean farm as compared to MAUS-71 soybean farm this was due to JS-335 soybean farm they do not know the appropriate doses of NPK that's why they apply unknowingly more fertilizer dose as compared to MAUS-71 soybean farm were as MAUS-71 soybean farm they knew improved packages of practices as well as fertilizer doses for a soybean crop or other crop due to highly educated group of MAUS-71 farm that's why using appropriate fertilizer doses requirement of soybean crop.

The use of plant protection for MAUS-71 soybean farm was found to be more which is 1.34 liters while in case of JS-335 soybean farm, it was 1.56 liters. This was also due to above reason as mention use of fertilizer doses. Use of family human labour was 19.06 man days for JS-335 soybean farm followed by 18.63 man days for MAUS-71 soybean farm. Regarding use of family human labour was highest in JS-335 as compared to MAUS-71 this was due to number of family member and family worker were more in JS-335 soybean grower s compared to MAUS-71 soybean grower that's why the use of family human labour was greater than JS-335 as compared to MAUS-71 soybean grower. It was also observed that main produce of soybean was highest 26.39 quintals on MAUS-71 soybean farm as compared to 23.08 quintals on JS-335 soybean farm. It was the favorable condition for MAUS-71 in Marathwada reason. The main produce of MAUS-71 soybean farm was highest as compared to JS-335 soybean farm. Whereas the by produce of JS-335 was higher than the MAUS-71. Even those main produce was greater MAUS-71 and less JS-335 soybean farm. This was due to MAUS-71 was improved variety as compared to JS-335. As well as vegetative growth of JS-335 was more as compare to MUAS-71 that's why the by produce JS-335 was higher as compared to MUAS-71 soybean farm.

While the by produce of JS-335 was higher 11.64 quintals as compared to MAUS-71 10.24 quintals. This was due to MAUS-71 soybean farm was improved variety as compare JS-335 that's why main produce was highest in MAUS-71 as compared to JS-335. This was due to the vegetative growth of JS-335 was more as compared to MAUS-71 that's why by produce was highest in JS-335 as compared to MAUS-71.

Cost of cultivation of soybean crop

Per hectare item wise cost and their proportionate to Cost-C with respect to MAUS-71 and JS-335 soybean production were calculated and are presented in table 2. Cost-C was highest as Rs49991.96 on MAUS-71 farm followed that of Rs. 49693.07 on JS-335 farm, respectively. The share of rental value of land was highest 28.22 per cent on MAUS-71 farm that of 25.01 per cent on JS-335 farm. Among the various items of expenditure, share of MAUS-71 soybean farm on followed by hired human labour 13.02 per cent, bullock Labour 8.51 per cent, machine labour 15.93 per cent, seeds 6.83 per cent interest on working capital 7.19 per cent and family human labour 7.45 per cent.

With compared to JS-335 soybean farm percentage expenditure on followed by rental value of land 25.01 per cent, hired human labour 14.29 per cent, bullock labour 10.73

per cent, machine labour 12.70 per cent, seeds 7.07 per cent interest on working capital 7.52 per cent and family human labour 7.67 per cent. Proportionate expenditure less than 4 per cent to other item on the entire farm was considered negligible item of expenditure.

Comparative profitability of soybean production

Per hectare profitability of soybean production under MAUS-71 and JS-335 was calculated and presented in Table 3. It was clear from the table return from main produce was highest Rs. 81851.52 in MAUS-71 soybean with compared to Rs.71223.33 JS-335 soybean farm. The return from by produce was highest as Rs 4208.19 in JS-335 farm with compared to Rs. 3688.94 in MAUS-71 soybean farm. Due to the improved variety MAUS -71 gives more yields as compared to JS-335 that's why gross return was highest in MAUS-71 as compared to JS-335 soybean farm.

The result revealed that, gross return was highest as Rs. 85540.45 in MAUS-71 soybean farm followed by Rs. 75431.51 in JS-335 soybean farm. It was clear that, farm business income, family labour income and net profit was Rs. 54310.57, Rs. 39275.04 and Rs.35548.50 in MAUS-71 soybean farm, respectively. On the contrary, farm business income, family labour income and net profit were Rs. 42940.35, Rs.29549.85 and Rs. 25738.44 in JS-335 soybean farm, respectively. It inferred that MAUS-71 soybean production was more profitable than JS-335 soybean production. It was observed that farm business income, family labour and net profit were more in MAUS-71 soybean farm as compared to JS-335 soybean farm. It was due to the improved variety and use of improved packages of practices that's why farm business income, family labour income and net profit were highest or more in MAUS-71 as compared to JS-335 soybean farm.

It was clear that; output-input ratio was higher as 1.71 in MAUS-71 soybean farms than that of 1.52 in JS-335 soybean farm. It was due to total cost of production i.e. cost- C were at par or equal but the production was greater in MAUS-71 as compared to JS-335 that's why input-output ratio higher in MAUS-71 as compared to JS-335 soybean farm. It implied that, when 1 rupee spent on MAUS-71and JS-335 soybean production, it would lead to give the return of Rs. 1.71 and Rs. 1.52 from soybean production, respectively.

Per quintal cost of soybean production was higher as Rs. 1971.01 in JS-335 soybean farm, while that was Rs. 1754.30 in MAUS-71 soybean farm. The per quintal soybean production was more in JS-335 soybean farm as compared to MUAS-71. This was due to total cost of production i.e. cost- C at par or similar whereas main produce was greater in MAUS-71 as compared to JS-335 that's why per quintal cost of production was higher in JS-335 as compared to MAUS-71 soybean farm. These results were conformity with the results obtained by Saraf, 1991 and Rajput and Varma, 2000.

Constraints and suggestions of soybean growers

Constraints faced by soybean growers

Constraints faced by soybean grower were calculated in frequency and percentage form and are presented in Table 4 the result revealed that the high cost of soybean seed was expressed by 91.66 per cent in soybean growers. Germination was not satisfactory which expressed by 47.91per cent of soybean growers. It is important to lack of credit facilities was also severe problem which was expressed by 59.37 per cent in soybean

growers. Followed by lack of technical problem which was expressed by 56.25 per cent soybean grower, Incidence of armyworm of soybean was major problem which was reported by 61.45 per cent, Bursting of pods after maturity was expressed by 60.41per cent. Non-availability of required fertilizer in time problem was expressed by 44.79 per cent and Non-availability of labour in time was found to be major problem which was expressed by 64.58 per cent.

Suggestions to overcome the constraints of soybean growers

Suggestions of soybean growers were calculated in the form of frequency, percentage and rank are presented in Table 5 to keep the advance. Stock of required fertilizer and soybean seed with multipurpose co-operative society was suggested by 50.00 per cent. Provision of mechanization for sowing, weeding and harvesting was suggested by 72.91 per cent soybean growers. Reform in the scale of finance by DCC banks paid the actual cost of cultivation was suggested by 82.29 per cent.

Reduce in soybean seed cost was suggested by 85.41 per cent. Provision of good germination seed to farmer. It was suggested by 51.04 per cent. In next order, cheap availability of seeds, Timely controlling attack of pests and disease infection, Early harvesting of soybean crop after drying of pods and Involvement of family members in soybean cultivation was suggested by 70.83 per cent, 60.41 per cent and 79.16per cent of soybean growers.

Table.1 Per hectare physical inputs and output in MAUS-71 and JS-335 Soybean production

Particulars	Unit	Soybean farm	
		MAUS-71	JS-335
Input			
1. Hired human labour	man day	32.54	35.49
2. Bullock labour	pair day	10.64	13.33
3. Machine labour	Hours	13.27	10.52
4. Seed	Kg	65.61	67.42
5. Manure	Q	18.09	25.33
6. Nitrogen	Kg	38.52	40.45
7. Phosphorous	Kg	57.48	54.02
8. Potassium	Kg	31.45	35.09
9. Plant protection	Lit	1.34	1.56
10. Family human labour	man day	18.63	19.06
Output			
11. Main produce	Q	26.39	23.08
12. By-produce	Q	10.24	11.64

Table.2 Per hectare cost of cultivation of MAUS-71 and JS-335 soybean

Sr. No. Particulars	Soybean growers			
	MAUS-71		JS-335	
	Rs/ha	Per cent	Rs/ha	Per
1. Hired human labour	6507.64	13.02	7098.76	14.29
2. Bullock labour	4254.55	8.51	5331.22	10.73
3. Machine labour	7963.64	15.93	6310.27	12.70
4. Seed	3416.67	6.83	3514.57	7.07
5. Manure	2351.82	4.70	3293.55	6.63
6. Fertilizer	2460.64	4.92	2422.73	4.88
7. Plant protection	370.45	0.74	467.74	0.94
8. Land revenue	146.97	0.29	141.81	0.29
9. Incidental charge	164.70	0.33	172.33	0.35
10. Interest on working capital	3592.82	7.19	3737.89	7.52
11. Cost-A (item 1 to 10)	31229.88	62.46	32491.16	65.43
12. Rental value of land	14109.77	28.22	12430.11	25.01
13. Interest on fixed capital (11%)	510.89	1.02	541.02	1.09
14. Depreciation on capital assets	414.87	0.83	419.67	0.84
15. Cost-B (item 11 to 14)	46265.41	92.55	45881.66	92.33
16. Family human labour	3726.55	7.45	3811.41	7.67
17. Cost-C (item 15 to 16)	49991.96	100.00	49693.07	100.00

Table.3 Per hectare profitability of variety MAUS-71 and JS-335 soybean production (Rs/ha)

Sr. No. Particulars	**Soybean farm**	
	MAUS-71	**JS-335**
1. Returns from main produce	81851.52	71223.33
2. Returns from by produce	3688.94	4208.19
3. Gross returns (item 1+2)	85540.45	75431.51
4. Cost-A	31229.88	32491.16
5. Cost-B	46265.41	45881.66
6. Cost-C	49991.96	49693.07
7. Farm business income (Gross returns minus Cost-A)	54310.57	42940.35
8. Family labour income (Gross returns minus Cost-B)	39275.04	29549.85
9. Net profit (Gross returns minus Cost-C)	35548.50	25738.44
10. Output-input ratio (Gross return divided by Cost-C)	1.71	1.52
11. Per quintal cost of production (Cost-C minus by produce value divided by main produce)	1754.30	1971.01

Table.4 Constraints of soybean growers

Constraints	Frequency (n=96)	Per cent	Rank
1. High cost of soybean seed	88	91.66	I
2. Non-availability of labour on time	62	64.58	II
3. Incidence of army worm	59	61.45	III
4. Bursting of pods after maturity	58	60.41	IV
5. Lack of credit facilities	57	59.37	V
6. Lack of technical knowledge	54	56.25	VI
7. Germination was not satisfactory	46	47.91	VII
8. Non-availability of required fertilizer	43	44.79	VIII

Table.5 Suggestion to overcome the constraints of soybean growers

Suggestions	Frequency n =96	Per cent	Rank
1. Reduce the soybean seed cost on use Owen preparation seed	82	85.41	I
2. Reform in the scale of finance by DCC bank	79	82.04	II
3. Involvement of family members in soybean cultivation.	76	79.16	III
4. Provision for sowing and harvesting through mechanization	70	72.91	IV
5. Provision of training in regard to IPM and other technology	68	70.83	V
6. Provision of good quality seed	58	60.41	VI
7. Early harvesting of soybean crop after drying of pods	49	51.04	VII
8. Provision of quality-controlled seed and fertilizer on time	48	50.00	VIII

It was concluded that main produce of soybean was highest 26.39 quintals on MAUS-71 soybean farm as compared to 23.08 quintals on JS-335 soybean farm. It was the favorable condition for MAUS-71 in Marathwada reason. The main produce of MAUS-71 soybean farm was highest as compared to JS-335 soybean farm. Whereas the by produce of JS-335 was higher than the MAUS-71. Even those main produce was greater MAUS-71 and less JS-335 soybean farm. The result revealed that, gross return was highest as Rs. 85540.45 in MAUS-71 soybean farm followed by Rs. 75431.51 in JS-335 soybean farm. It was clear that, farm business income, family labour income and net profit was Rs. 54310.57, Rs. 39275.04 and Rs.35548.50 in MAUS-71 soybean farm, respectively. It was clear that; output-input ratio was higher as 1.71 in MAUS-71 soybean farms than that of 1.52 in JS-335 soybean farm.

Constraints faced by soybean grower were revealed that the high cost of soybean seed was expressed by 91.66 per cent in soybean growers and Non-availability of labour in time was found to be major problem which was expressed by 64.58 per cent. Suggestions to overcome the constraints of soybean growers were concluded reduce the soybean seed cost on use Owen preparation seed and Involvement of family members in soybean cultivation.

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