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Profit Structure of Soybean, Cotton and Sorghum Cultivation in Central Narmada Valley of India

D. S. Gautam* and S. B. Nahatker*

Indo-German Extension and Research Project, Harda, M. P.

ABSTRACT

Study of Central Narmada valley reveals that cost A_1 of soybean, cotton and sorghum required 66.97%, 69.9% and 52.13% of the cost C_2. The yields of cotton, soybean and sorghum was obtained by sample farms were 8.76 qts, 7.77 qts and 7.97 qts/ha with the farm business income of Rs. 1993.43, Rs. 910.10 and Rs. 625.19 per hectare, respectively. Cotton cultivation gave the highest profit per hectare followed by soybean and sorghum. Beside these findings, policy implications have also been suggested.

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INTRODUCTION

According to approach paper the "Seventh Five Year Plan" aimed at an accelerated rate of agricultural development and self sufficiency in food, fiber and edible oils at higher levels of consumption. Confrontation of farmers with the problem of choosing optimum product combinations, determining the profitability with the increasing levels of variable input needs proper evaluation due to adoption of new agricultural technology in crop production. In Central India, cotton, soybean and sorghum crops contribute 7.1%, 84.2% and 12.4% area respectively of the country (1986-87).

Competitive situation of production of crops depends on return from production process with given resources and appropriate technology. Hence, study is directed with the resource requirements, i.e. cost structure and revenue obtained from competitive crops, viz., soybean, cotton and sorghum in Central Narmada Valley of India (Madhya Pradesh).

The objective of study was to examine the cost and profitability structure of cotton, soybean and sorghum cultivation.

MATERIALS AND METHODS

Hosangabad division of Madhya Pradesh was purposively selected for study. From the tehsils of selected district, one block Harda was selected purposively on the basis of highest acrage under sorghum, cotton and soybean cultivation in tehsil. Three villages from Harda block were selected by the method of probability proportionate sampling (proportion of area under crops to total cropped area of kharif), viz., Ramhaikala, Masavgaon and Balagaon. From the list of farmers of selected villages 90 sample farms (30 farms from each village) were randomly selected for collection of necessary data with the help of pretested schedules by adopting survey method of data

*Present address : Department of Agricultural Economics and Farm Management, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (M. P.)-482 004.

collection. The study was related to agricultural year 1987. The collected data were analysed on the basis of cost and profitability concepts as used by Gautam (1989).

TABLE 1

Cost structure of cultivation for cotton, soybean and sorghum in selected farms.

(Rs/ha)

Cost items	*Cotton*	*Soybean*	*Sorghum*
Human labour	484.56 (11.79)	316.51 (15.87)	141.50 (13.96)
Bullock labour	449.81 (10.95)	287.51 (14.42)	175.09 (17.28)
Seed	201.85 (4.91)	252.08 (12.64)	28.25 (2.79)
Fertilizers & Manures	862.63 (21.00)	332.57 (16.68)	78.79 (7.77)
Pesticides	221.67 (5.39)	60.34 (3.02)	29.72 (2.93)
Irrigation	102.79 (2.50)	—	—
Land revenue tax	13.68 (0.33)	13.35 (0.67)	10.88 (1.07)
Interest on working capital	85.30 (2.08)	26.26 (1.32)	9.66 (0.95)
Depreciation on Farm assets	132.91 (3.25)	46.81 (2.35)	54.92 (5.42)
Total Cost A_1	2555.20 (62.19)	1335.43 (66.97)	528.81 (52.18)
(ii) Cost- B_1 = Cost A_1+Interest on fixed capital	150.05 (3.65)	50.01 (2.51)	58.13 (5.74)
Total Cost B_1	2705.25 (65.84)	1385.44 (69.48)	586.94 (57.32)
(iii) Cost C_1 = Cost B_1 + imputed value of family labour	266.06 (6.47)	47.02 (2.36)	137.93 (13.61)
Total Cost C_1	2971.31 (72.32)	1432.46 (71.84)	724.87 (71.53)
(iv) Cost B_2 = Cost B_1 rental value of owned land	1137.16 (27.68)	561.38 (28.16)	288.50 (28.47)
Total Cost B_2	3842.41 (93.53)	1946.82 (97.64)	875.44 (86.39)
(v) Cost C_2 = Cost B_2 + imputed value of family labour	266.06 (6.47)	47.02 (2.36)	137.93 (13.61)
Total Cost C_2	4108.47 (100.0)	1993.84 (100)	1013.37 (100)

Figures in parentheses show the percentage to cost C_2.

Cost concepts

The cost classification as recommended by special Expert Committee on Cost Estimates[1] was used for the analysis of cost of cultivation as shown in table 1. Profitability concepts : The following profitability concepts were used to provide up to date information on profit earned from each crop.

1 Report of Special Expert Committee on Cost of Production Estimates, Ministry of Agriculture, Department of Agriculture and Cooperation, Govt. of India, 1980, New Delhi.

TABLE 2

Cost structure of production for cotton, soybean and sorghum in selected farms.

Crops	*Cost* A_1	*Cost* B_1	*Cost* C_1	*Cost* B_2	*Cost* C_2
Cotton	279.68	296.82	327.19	428.63	457.00
Soybean	147.87	154.31	160.36	226.56	232.61
Sorghum	36.46	43.76	61.09	80.01	97.33

Interest on working capital was calculated @ 12.5% for half of the duration of the crop.
Interest on fixed capital was calculated @ 10% and allocated according to gross acreage.
Rental value of owned land was calculated @ 1/4 of the gross income from the crop.

(i) Net Farm Income : Defined as, Gross income-Cost C_2.

(ii) Family labour income : Defined as, Gross income cost B_2.

(iii) Farm Investment Income : Defined as, Net farm income + Interest on fixed capital + rental value of owned capital.

(iv) Farm business income : It is defined as, Gross income-cost A_1.

RESULTS AND DISCUSSION

I Cost of cultivation

The per hectare cost structure of crops is given in Table 1. From the table it was seen that the over all cost i.e., cost C_2 was maximum for cotton (Rs. 4108.47) followed by soybean (Rs. 1993.84) and sorghum (Rs. 1013.37). However, in terms of operational cost i.e. cost A_1, it also followed the same trend but percentage breakup showed that out of total cost soybean required maximum i.e., 66.97 per cent followed by cotton 62.9 per cent and sorghum 52.18 per cent. This might be due to higher expenditure on hired human labour for post harvest operation of soybean i.e., nearby 16 per cent of the total cost. The major cost items for three crops are rental value of owned land, which is nearby 28 per cent for all the crops followed by expenditure on fertilizers and manures for cotton (21.00%) and soybean (16.68%) and expenditure on bullock labour (17.28%) in case of sorghum. The expenditure on human labour was highest for soybean (15.87%), followed by sorghum (13.98%) and cotton (11.79%). The higher percentage expenditure on imputed value of family labour (13.61%) in case of sorghum revealed that the use of family labour was higher in sorghum production as compared to soybean and cotton. The higher value of owned land reflected towards higher prices of the crop in the market, because rental value of land estimated as 1/4 of the gross income from the crop. This was also reported by Gautam *et al.* (1990).

II Cost of production

The cost per quintal is given in the table 2 for all the three crops, which shows that the per quintal cost was highest for cotton, followed by soybean and jowar, at all cost concepts. The overall cost (Cost C_2) was estimated to be Rs. 457.00 for cotton, Rs. 232.61 for soybean and Rs. 97.33 for sorghum. This suggested that

the farm harvest price/support price must be higher than the cost to meet out the all operational and overhead costs. The operational cost A_1 was estimated at Rs. 279.68, Rs. 147.87 and Rs. 36.46/q for cotton, soybean and sorghum respectively. The per quintal cost B_2 increased significantly over cost C_1 for cotton & soybean. It indicates that rental value of land for these two crops had a significant contribution in the cost.

III Profitability

Table 3 shows the profitability of soybean, cotton and sorghum per unit of area and per unit of productivity.

TABLE 3

Profitability of cotton, soybean and sorghum in selected farms.

Crops	*Yield (q/ha)*	*Gross* income*	*Farm business income*	*Farm investment income*	*Family labour income*	*Net farm income*
Cotton	8.76	4548.63	1993.43	1727.37	706.22	440.16
		(507.25)	(227.57)	(185.19)	(80.62)	(50.25)
Soybean	7.77	2245.53	910.10	863.08	298.71	251.69
		(265.00)	(117.13)	(87.08)	(38.44)	(32.39)
Sorghum	7.97	1154.00	625.19	487.26	278.56	140.63
		(115.00)	(78.54)	—	(35.00)	(19.67)

* included return from by-product.

Fugures in parentheses given the profit per quintal.

From the table it was observed that the cotton was the most profitable crop as compared to soybean and sorghum. The farm business income was Rs. 1993-43 per ha for cotton, followed by Rs. 910.10 per ha for soybean and Rs. 625.19 per ha for sorghum, the per quintal figures for the same crops were Rs. 227.57, Rs. 117.13 and Rs. 78.54 respectively. However, the net farm income per ha was only Rs. 440.16 for cotton, Rs. 251.69 for soybean and Rs. 140.63 for sorghum revealed that the overhead cost like interest on fixed capital and rental value of land was much higher than other cost items. For increasing profitability from these crops and reducing overhead cost the intensitive farming should be adopted so that the overhead cost will be allocated to more acreage and thereby net farm income can increase. The per quintal net farm income was only Rs. 50.25 for cotton while it was low for soybean (Rs. 32.39) and still lower for sorghum (Rs. 17.67). Again this indicated that for increasing profitability per hectare, productivity of crops should be increased at lowest marginal cost of production. This was also suggested by Lavania and Dixit (1968).

Policy Implication

(a) The cash component involved in the production of cotton and soybean substantially goes up, therefore, it needs upward revision of existing scale of crop loan by nationalised and cooperative banks of Central India.

(b) Production efficiency of cotton, soybean and sorghum can be increased by adoption of improved techniques.

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