

Production and marketing of soyabean (*Glycinemax l. Merrill*) in Bundi district of Rajasthan

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Abstract

The analysis of data revealed that area under soyabean in the Rajasthan state was 797587 thousand hectares and Bundi district had 76046 thousand hectares which was 9.53 per cent of total area under soyabean in the state during the year 2007-08. Cost of cultivation was reported highest on large farms followed by medium and small farms. The major component of variable cost was machine labour, which contributed 17.95% of total variable cost, followed by material viz, seed 12.46%. The analysis of cost of cultivation showed that on an average, the total cost (cost C_2) per hectare of soyabean was Rs.18945.86 for the sample farms of the study area. The cost C_2 per hectare was highest on large farms followed by medium and small farms. However, the cost of production per quintal had a reverse trend. It was highest on small, followed by medium and large farms. The overall gross income from per hectare of soyabean cultivation was Rs. 39848.19. This was higher on large farms as compared to the medium and small farms. On an overall basis, the farm business income was Rs. 29024.05 per hectare; it was higher on large farms followed by medium and small farms. On an overall basis, the family labour income was Rs. 22927.36 per hectare. The net income was Rs.20902.33. It was more on large farms as compared to medium and small farms. The return per rupee of investment was maximum for large farms (Rs.2.21), followed by medium (Rs.2.15) and small (Rs.2.07) farms, on C_2 basis. The marketable surplus showed a tendency to increase with increase in farm size. It was maximum in case of large farms (182.87 quintals), followed by medium (85.86 quintals) and small (39.54 quintals). Due to poor holding capacity, soyabean was not stored. Therefore, there was no difference in marketable and marketed surplus of soyabean. On an average, small farmers sold 70.16 and 29.84% of the produce in regulated and local markets respectively. Medium size farmers sold 82.41% of marketed surplus in regulated market and 17.59% in the local market. The large farmers sold 91.85% in regulated market and 8.15% in local markets. The analysis of marketing channels revealed that in channels I, marketing cost incurred by producer, wholesaler, miller, and retailer was 1.80, 1.89, 12.54, and 0.64% of consumer rupee, respectively. In channel ii, the marketing cost incurred by producer, ITC, miller, and retailer was 0.91, 4.57, 10.77 and 0.83% of consumer rupee respectively. In channel iii, marketing cost incurred by producers, Tilam Sangh and retailer was 1.75, 10.64, and 1.2% of consumer rupee, respectively. In channel iv, marketing cost incurred by producers, commission agent, Tilam Sangh and retailer was 1.75, 1.14, 12.00, and 1.26% of consumer rupee, respectively. The analysis of relative share of producer per quintal of soyabean revealed that channel ii was more remunerative than channel iii, iv and i. The analysis of price spread revealed that it was highest in channel iv (32.90%) followed by channel iii (30.31%), and channel I (31.36% and channel ii (29.66%), respectively. The correlation of soyabean prices between different mandies was highly significant at one per cent level of significance, which speaks of good market intelligence in the state.

Key words: variable cost, marketing channels, producers, consumer, commission agent

Introduction

Soya bean (*Glycinemax L. Merrill*) is one of the important oilseed as well as pulse crops, which is grown mainly in kharif season. It belongs to family leguminosae, sub-family papilloideae and genus Glycine.

Soyabean has been known by various names in India such as Bhat, Bhatman, Ramkuithi, Bhut, Kaliakulth, and Garryakaly. It is called the miracle crop or Golden Bean of the 20th century and is popularly known as “Queen of Pulses”, wonder crop, farmer’s

friend and agriculture’s cindrella. It is the cheapest source of high quality protein. It is high protein food containing (42% protein as against 7% in rice, 12% in wheat, 10% in maize, 20-25% in other pulses) and also give 21% good quality oil, which is used for manufacturing vegetable oil (vanaspati ghee) and several other industrial products. In addition it contains a good amount of minerals, salt, vitamins (thiamine and riboflavin) and its sprouting grains contain a considerable amount of vitamin A and C. Soybean is

widely used in the antibiotic industry for making penicillin and drugs.

India is the fifth largest producer of soya bean in the world. In terms of total oilseeds production it occupies fourth place among the major oilseeds producing countries of the world, next to USA, China and Brazil. Soya bean contributed 28% in total oil production at national level, which is 24.2 million tons during the year 1998-99. During 1986-87, about 96 million tone of soya bean was produced on over 52 million hectares of land mainly in USA, Brazil, China and Argentina, which together produced nearly 85% of the world production (FAO, 1987).

The state Rajasthan ranked third in terms of both area and production of soybean in the country with 630715 tones of production on 498619 hectares of land in the 19997-98. The productivity of crop in the state was higher (1430 kg per hectare) as compared to the national average (10.23 quintal per hectare). In Rajasthan, the area under soya bean increased to 797587 hectares with production of 1071228 tons during the year 2007-08. The main soya bean growing districts are Jhalawar(28.17%), Baran(25.09%), Chittorgarh(17.55%), Kota(15.59%), Bundi(9%) and others (4.6%). In Bundi district, the area under soya bean is 76046 hectare with production of 102919 tonnes. Soyabean crop occupied a substantial area in the Southern -Eastern parts of the state particularly in Bundi district with higher levels of production from the minimum use of inputs.

The produce of soyabean is marketed through different marketing channels involving large number of intermediaries. As a result, growers sell their produce to buyers at different prices. Hence, there is a wide variation in price of soyabean received by producer and paid by consumer. Due to this reason farmers are not getting remunerative prices for their produce, the other hand the consumers have to pay more in market. In this way the interest of producer as well as consumer is not safeguarded. Therefore, it is necessary to examine the marketing cost, margin, price spread and marketing practices used from time to time in different channels. The major objectives of the study were:

1. To study the cost structure and profitability of soyabean in the Bundi district of Rajasthan.
2. To study the marketable, marketed surplus, marketing channels, marketing cost and price spread.

Methodology

1. Selection of District:

Bundi district was selected purposively for the study because it is one of the major producing districts of soyabean cultivation in Rajasthan.

2. Selection of tehsil:

On the basis of highest area and production of

soyabean crop, Keshorai Patan tehsil of Bundi district was selected purposively for the study.

3. Selection of villages:

Two villages, Arnetha and Keshorai Patan were selected on the basis of highest area under soyabean crop in Keshorai Patan tehsil.

4. Classification of farmers:

The cumulative total method was used in the categorization of farmers in to different size of groups (small, medium and large). Farmers from top of the list representing 1/3 of total cultivated area were categorized as small farmers. Farmers representing next 1/3 of the area from the middle of the list were categorized medium farmers and the rest were large farmers.

The classification of farmers in different size holdings is given in the table below:

| Category of Farmers | Size of land holding under soyabean (ha) | Av. area under soyabean (in ha) |
|---------------------|--|---------------------------------|
| Small | <2.61 | 1.82 |
| Medium | <2.61<5.33 | 3.74 |
| Large | >5.34 | 7.30 |

5. Selection of farmers:

For the collection of primary data, a sample of 60 farmers was selected with probability proportion to number of farmers in different land size holdings.

6. Selection of market:

To study marketing channels, marketing cost and price spread Krishi Upaj Mandi Samiti (KUMS) of Bundi district was selected, and for the comparative study of market prices, major soyabean producing districts were selected on the basis of higher production of soya bean.

7. Selection of intermediaries:

Investigation regarding different marketing channels involved in soyabean marketing was done by selecting a random sample of such intermediaries as wholesaler, miller, commission agents, ITC, Tilam Sangh, retailer and at least five intermediaries from each group were selected randomly, to study marketing channels, cost involved and price spread.

Collection of data:

Both primary and secondary data were used for the study.

1. Analysis of data:

The collected data were analyzed by using various statistical tools to achieve objectives of the study:

(a) Cost of cultivation

To achieve first objective of the study, cost structure in cultivation of soyabean on different size of farms was studied. The cost of cultivation of soyabean was worked out by using various cost

concepts.

$$\text{Cost of Production} = \frac{\text{Cost of cultivation/ha}}{\text{Quantity of main product/ha}}$$

(b) *Income measures*

Following income measures were used to fulfill the first objective i.e. to work out profitability of soyabean cultivation in study area.

1. Gross income: value of output (both main and by product) evaluated at harvest prices.

$$GI = Q_m \times P_m + Q_b \times P_b$$

Where,

G I = gross income in rupees

Q_m = quantity of main product

P_m = price of main product

Q_b = Quantity of by product

P_b = Price of by product

2. Farm business income: Gross income – Cost A₁ (cost A₂ in case of tenant operated land)

3. Family labor income: Gross income- Cost B₂

4. Net income: Gross income- Cost C₂

5. Returns to management: Gross income- Cost C₃

6. Returns per rupee of investment =

$$\frac{\text{Gross Income } \frac{G.I.}{ha}}{\text{Total Cost } \frac{\text{cost } C_2}{ha}}$$

(a) *Marketing cost:*

To study the price spread in marketing of soyabean, the marketing costs and margins were worked out as under:

Total cost of marketing was calculated as under:

$$C = C_f + C_{m1} + C_{m2} + C_{m3} + \dots + C_{mi}$$

Where,

C = total cost of marketing

C_f = Cost borne by the farmer in marketing of his produce, and

C_{mi} = cost incurred by the ith middleman in the process of buying and selling.

(b) *Gross Margin:*

Absolute margin earned by a middleman was calculated as under:

$$\text{Absolute margin} = P_{ri} - (P_{pi} + C_{mi})$$

Where,

P_{ri} = Total value of receipts (sale price)

P_{pi} = Total purchase value of goods (purchase price), and

C_{mi} = Cost incurred in marketing.

(c) *Producer's share in consumer rupee:*

The producer share in consumer rupee was worked out as under:

$$P_s = \frac{P_f \times 100}{P_c}$$

Where,

P_s = Producer share in consumer rupee,

P_f = Price of the produce received by the farmer, and

P_c = Price of the produce paid by the consumer

Results and Discussion

(A) *Cost structure and profitability of soyabean:*

It is evident from the Table 1 on an average; the total cost per hectare of soyabean was Rs.18945.80

Table 1: Costs incurred in the cultivation of soyabean

| Particular | Size of holding | | | Weighted average |
|---------------------------------------|---------------------|---------------------|---------------------|---------------------|
| | Small | Medium | Large | |
| (A) Variable cost | | | | |
| (1) Labor | | | | |
| Hired labor | 629.00 (3.35) | 776.83 (4.08) | 952.67 (4.79) | 691.49 (3.65) |
| Family labor | 2400.40 (12.78) | 1381.82 (7.25) | 684.01 (3.44) | 2025.03 (10.69) |
| Bullock labor | 107.40 (0.57) | 12.66 (0.07) | 10.67 (0.05) | 78.76 (0.42) |
| Machine labor | 3359.25 (17.89) | 3419.96 (17.99) | 3637.83 (18.30) | 3399.89 (17.95) |
| (2) Material/input | | | | |
| FYM | 599.94 (3.19) | 750.00 (3.93) | 800.00 (4.02) | 650.00 (3.43) |
| Fertilizers | 925.48 (4.93) | 1057.75 (5.55) | 1138.04 (5.73) | 973.17 (5.14) |
| Seed | 2325.25 (12.38) | 2418.89 (12.69) | 2485.45 (12.50) | 2359.91 (12.46) |
| Seed treatment | 48.10 (0.26) | 95.64 (0.34) | 86.43 (0.43) | 55.45 (0.29) |
| Weedicides | 1155.00 (6.15) | 1256.25 (6.59) | 1395.00 (7.02) | 1199.03 (6.33) |
| Plant Protection Material | 174.60 (0.93) | 180.63 (0.95) | 190.33 (0.96) | 177.36 (0.94) |
| Irrigation charges (canals/ tubewell) | 170.25 (0.91) | 192.50 (1.01) | 224.08 (1.13) | 180.05 (0.95) |
| Miscellaneous | 176.78 (0.94) | 263.75 (1.38) | 298.20 (1.50) | 205.42 (1.08) |
| Interest on working Capital | 423.23 (2.25) | 485.96 (2.55) | 568.18 (2.86) | 450.71 (2.38) |
| Total variable cost (TVC) | 1249.6 (66.53) | 12262.6 (64.33) | 12470.9 (62.73) | 12446.3 (65.69) |
| (B) Fixed assets | | | | |
| Depreciation | 328.00 (1.75) | 456.29 (2.39) | 674.87 (3.40) | 388.34 (2.05) |
| Interest on fixed Capital | 2342.12 (12.47) | 2728.12 (14.31) | 3115.80 (15.68) | 2496.69 (13.18) |
| Rental value of Own land | 3600.00 (19.17) | 3600.00 (18.99) | 3600.00 (18.11) | 3600.00 (19.0) |
| Land Revenue | 15.00 (0.08) | 15.00 (0.08) | 15.00 (0.08) | 15.00 (0.08) |
| Total Fixed Cost | 6285.12 (35.72) | 6799.41 (35.67) | 7405.67 (37.16) | 6499.59 (34.31) |
| Total Cost (TVC+ TFC) | 18779.7 (100.00) | 19062.1 (100.00) | 19876.6 (100.00) | 18945.9 (100.00) |

Table 2: Cultivation of soyabean on sample farms

| Particulars | Size of holding | | | Weighted Average |
|--------------------------------|-----------------|----------|----------|------------------|
| | Small | Medium | Large | |
| Gross Income | 38945.48 | 40920.75 | 43950.81 | 39848.19 |
| Farm Business Income | 28508.27 | 29568.64 | 31474.06 | 29024.05 |
| Net Income | 20165.77 | 21858.70 | 24074.25 | 20902.33 |
| Return to management | 18287.80 | 19952.50 | 22086.59 | 19007.74 |
| Return per rupee of Investment | 2.07 | 2.15 | 2.21 | 2.10 |

Table 3: Marketing cost of channel I

| Particulars | Rs./qu. | % share in consumer rupee |
|---|---------|---------------------------|
| Net price received by producer | 1593.25 | 68.64 |
| Loading Cost | 2.50 | 0.11 |
| Unloading cost | 2.00 | 0.09 |
| Transportation | 17.25 | 0.74 |
| Gunny Bags | 20.00 | 0.86 |
| Total cost | 41.75 | 1.80 |
| Sale price of producer/ Purchase price of Wholesaler | 1635.00 | 70.44 |
| Cost incurred by wholesaler | | |
| Mandi tax @ (1.6 percent) | 26.16 | 1.13 |
| Weighing | 0.75 | 0.03 |
| Loading cost | 2.00 | 0.09 |
| Unloading Cost | 1.50 | 0.06 |
| Transportation | 13.50 | 0.58 |
| Total Cost | 43.91 | 1.89 |
| Net margin of wholesaler | 83.26 | 3.59 |
| Sale price of wholesaler/ Purchase price of miller | 1762.17 | 75.92 |
| Cost incurred by miller | | |
| Sale tax @ (4 percent) | 70.49 | 3.04 |
| Commission @ (2 percent) | 35.24 | 1.52 |
| Loading cost | 2.50 | 0.11 |
| Unloading cost | 2.00 | 0.09 |
| Transportation | 9.25 | 0.40 |
| Loss during processing @ (1.5 kg / qtl) | 26.43 | 1.14 |
| Processing cost | 145.15 | 6.25 |
| Total cost | 291.06 | 12.54 |
| Net margin of miller | 120.13 | 5.18 |
| Sale price of miller/ purchase price of retailer | 2173.36 | 93.64 |
| Cost incurred by retailer | | |
| Loading cost | 2.50 | 0.11 |
| Unloading cost | 2.00 | 0.09 |
| Transportation | 15.00 | 0.64 |
| Total Cost | 19.50 | 0.84 |
| Net margin of retailer | 128.14 | 5.52 |
| Sale price of retailer/ Purchase price of consumer | 2321.00 | (100) |

on different size of farms. It was Rs.18779.71 on small, Rs.19062.05 on medium and Rs.19876.56 on large farm. Within the variable cost components, machine and labor was the most important in case of all the category farms.

It is evident from the Table 2 that overall average gross income per hectare of soyabean cultivation was Rs.39848.19 on sample farms. It was Rs.38945.48, Rs.40920.75 and Rs.43950.81 on small, medium and large farms respectively. It increased with the increase in size of land holding mainly because of better use of inputs on medium and large farms respectively. The overall net income for soyabean cultivation was Rs. 20902.33 per hectare. The net income also increased with the increase in size of holding.

Marketing Channels:

The following marketing channels were used by the farmers in marketing of soyabean in the study area:

Channel – I :

Producer→Wholesaler →Miller→ Retailer →Consumer

Channel – ii :

Producer→Indian Tobacco Company → Retailer
→Consumer

Channel – iii :

Producer→Tilam Sangh →Miller→ Retailer
→Consumer

Channel – iv :

Producer→Comission Agent→Tilam Sangh → Retailer
→Consumer

Marketing cost of channel I

It is evident from the Table 3 that the total cost incurred by producer was Rs.41.75 per quintal of soyabean which was Rs.1.80 per cent of consumer rupee. Cost incurred by miller was Rs.291.06 per quintal of soyabean which was 12.54 per cent of consumer rupee. The farmer share in consumer rupee was 68.64 percent.

Marketing cost of channel II

The Table 4 indicates that the cost incurred by producer was Rs.21.75 per quintal of soyabean, which was 0.91% of consumer rupee. Cost incurred by

Table 4: Marketing cost of channel II

| Particulars | Rs./Qu | % share in consumer rupee |
|---|---------|---------------------------|
| Net price received by producer | 1674.25 | 70.33 |
| Cost incurred by producer | | |
| Loading cost | 2.50 | 0.11 |
| Unloading cost | 2.00 | 0.08 |
| Transportation cost | 17.25 | 0.72 |
| Total cost | 21.75 | 0.91 |
| Sale price of Producer/ Purchase price of I.T.C. | 1696.00 | 71.24 |
| Cost incurred by I.T.C. | | |
| Sale tax @ (4 percent) | 67.84 | 2.85 |
| Weighing | 0.75 | 0.03 |
| Cost of gunny bags | 20.00 | 0.84 |
| Loading cost | 2.50 | 0.11 |
| Unloading cost | 2.00 | 0.08 |
| Transportation | 15.75 | 0.66 |
| Total Cost | 108.84 | 4.57 |
| Net margin of I.T.C. | 74.84 | 3.14 |
| Sale price of I.T.C./ Purchase price of miller | 1879.68 | 78.96 |
| Cost incurred by miller | | |
| Sale tax @ (4 percent) | 75.19 | 3.16 |
| Loading Cost | 2.50 | 0.11 |
| Unloading Cost | 2.00 | 0.08 |
| Transportation | 9.25 | 0.39 |
| Loss during Processing @ (1.15 kg/ qtl) | 28.20 | 1.18 |
| Processing Cost | 139.25 | 5.85 |
| Total cost | 256.39 | 10.77 |
| Net margin of miller | 91.46 | 3.84 |
| Sale price of miller/ purchase price of retailer | 2227.53 | 93.57 |
| Loading cost | 2.50 | 0.11 |
| Unloading cost | 2.00 | 0.08 |
| Transportation cost | 15.25 | 0.64 |
| Total cost | 19.75 | 0.83 |
| Net margin of retailer | 133.22 | 5.60 |
| Sale price of retailer/ Purchase price of consumer | 2380.50 | (100) |

retailer was Rs.19.75 per quintal of soyabean which was 0.83 per cent of consumer rupee. The farmer share was 70.33 percent in consumer rupee.

Marketing cost of channel III

The marketing cost in channel iii indicates that the total cost incurred by producer was Rs.41.75 per quintal of soyabean was 1.75 per cent of consumer rupee (Table 5). Cost incurred by retailer was Rs.29.95 per quintal of soyabean, which was 1.26 per cent of consumer rupee. The farmer share in consumer rupee was 69.67 per cent.

Marketing cost of channel IV

Table 5: Marketing cost of channel III

| Particulars | Rs./Qu | % share in consumer rupee |
|--|---------|---------------------------|
| Net price received by producer | 1658.50 | 69.67 |
| Cost incurred by producer | | |
| Loading cost | 2.50 | 0.11 |
| Unloading cost | 2.00 | 0.08 |
| Transportation | 17.75 | 0.72 |
| Cost of gunny bags | 20.00 | 0.84 |
| Total cost | 41.75 | 1.75 |
| Sale price of producer/ purchase price of Tilam Sangh | 1700.25 | 71.41 |
| Cost incurred by Tilam Sangh | | |
| Sale tax @ (4 percent) | 68.01 | 2.86 |
| Loading cost | 2.00 | 0.08 |
| Unloading cost | 1.50 | 0.06 |
| Transportation | 18.50 | 0.78 |
| Loss during processing @ (1.5 kg/ qtl) | 25.50 | 1.07 |
| Weighing | 0.75 | 0.03 |
| Processing cost | 137.25 | 5.77 |
| Total cost | 253.51 | 10.65 |
| Net margin of Tilam Sangh | 161.95 | 6.80 |
| Sale price of Tilam Sangh/ Purchase price of retailer | 2115.71 | 88.88 |
| Cost incurred by retailer | | |
| Loading cost | 2.50 | 0.11 |
| Unloading cost | 2.00 | 0.08 |
| Transportation | 25.45 | 1.07 |
| Total cost | 29.95 | 1.26 |
| Net margin of retailer | 234.84 | 9.86 |
| Sale price of retailer/ Purchase price of consumer | 2380.50 | (100) |

The marketing cost in channel iv indicates that the total cost incurred by producer was Rs.41.75 per quintal of soyabean which was 1.75 percent of consumer rupee (Table 6). Cost incurred by retailer was Rs. 29.95 per quintal of soyabean which was 1.26 per cent of consumer rupee. The farmer share in consumer rupee was 67.10 per cent.

Relative share of producer in different channels:

It is evident from the Table 7 that the highest share of producer in consumer was 70.33% in channel ii, followed by 69.67 percent in channel iii, 68.64 per cent in channel I and 67.10% in channel iv, respectively production, storage and transportation, while also taking care of price fluctuation.

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Table 6: Marketing cost of channel IV

| Particulars | Rs./Qu | % share in consumer rupee |
|--|---------|---------------------------|
| Net price received by producer | 1597.25 | 67.10 |
| Cost incurred by producer | | |
| Loading cost | 2.50 | 0.11 |
| Unloading cost | 2.00 | 0.08 |
| Transportation | 17.25 | 0.72 |
| Cost of gunny bags | 20.00 | 0.84 |
| Total cost | 41.75 | 1.75 |
| Sale price of producer/Purchase price of Commission agent | 1639.00 | 68.85 |
| Cost incurred by commission agent | | |
| Mandi tax @ (1.6 percent) | 26.22 | 1.11 |
| Weighing | 0.75 | 0.03 |
| Total cost | 26.97 | 1.14 |
| Net margin of commission agent | 20.18 | 0.85 |
| Sale price of commission agent/purchase price of Tilam Sangh | 1686.15 | 70.83 |
| Cost incurred by Tilam Sangh | | |
| Sale tax @ (4 percent) | 67.45 | 2.83 |
| Commission @ (2 percent) | 33.72 | 1.42 |
| Loading cost | 2.00 | 0.08 |
| Unloading cost | 1.50 | 0.06 |
| Transportation | 18.50 | 0.78 |
| Loss during processing @ (1.5 kg / qtl) | 25.29 | 1.06 |
| Processing cost | 137.25 | 5.77 |
| Total cost | 285.71 | 12.00 |
| Net margin of Tilam Sangh | 143.85 | 6.04 |
| Sale price of wholesaler/purchase price of retailer | 2115.71 | 88.88 |
| Cost incurred by retailer | | |
| Loading cost | 2.50 | 0.11 |
| Unloading cost | 2.00 | 0.08 |
| Transportation | 25.45 | 1.07 |
| Total cost | 29.95 | 1.26 |
| Net margin of retailer | 234.84 | 9.86 |
| Sale price of retailer/Purchase price of consumer | 2380.50 | (100) |

Table 7: Relative share of producer in different channels:

| Channels | Price paid by consumer | Sale price of producer | Marketing cost | Net share |
|----------|------------------------|------------------------|-----------------|--------------------|
| I. | 2321.00 (100.00) | 1635.00 (70.44) | 41.75 (1.80) | 1593.25 (68.64) |
| II. | 2380.50 (100.00) | 1696.00 (71.24) | 21.75 (0.91) | 1674.25 (70.33) |
| III. | 2380.50 (100.00) | 1700.258 (71.41) | 41.75 (1.75) | 1658.50 (69.67) |
| IV. | 2380.50 (100.00) | 1639.00 (68.85) | 41.75 (1.75) | 1597.25 (67.10) |

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