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Technique of evaluation in economics of rainfed blackgram and greengram production

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ABSTRACT

Blackgram (*Phaseoulus mungo* L.) and greengram (*Vigna radiata* L.) are the important pulse crops in India. Survey was conducted in Latur district of Maharashtra for the year 2004-05 to study economics of blackgram and greengram production on rainfed farms. Data were collected from 48 blackgram and 48 greengram growers. The results revealed that main product of blackgram was 9.54 q/ha while that of greengram was 9.08 q/ha. In production process, cost-'C' was found to be Rs. 10801.42/ha and Rs. 11232.88/ha in case of blackgram and greengram production, respectively. Net profit was Rs. 2766.78/ha from blackgram while that was Rs. 3701.12/ha from greengram. Output-input ratio was 1.25 and 1.33 in case of blackgram and greengram production, respectively. Cost of production of blackgram was Rs. 1089.98/q while that of greengram was Rs. 1192.38/q.

Key words : Blackgram, Greengram, Costs, Returns, Profit.

INTRODUCTION

Blackgram (*Phaseoulus mungo* L.) and greengram (*Vigna radiata* L.) have been cultivated since ancient times in India. In human diet, blackgram plays an important role by providing 24 per cent protein, 0.70 per cent calcium and 57.30 per cent carbohydrate. It is used in making *papad, dosa, idli, halwa* and *imrati*. It is used as nutritive fodder specially for milch cattle. It is used as green manuring crop. It is the richest among the various pulses in phosphatic acid. Similarly, greengram plays an important role by providing the highest digestible protein than any other pulses. It provides ascorbic acid when it is allowed to sprout. It is used in making *Khara*, dal and curry. It is also used as green manuring crop. It has the capacity to fix the atmospheric nitrogen. It also helps for preventing the soil erosion.

Blackgram and greengram are economically important crops and are cultivated in *kharif* season on rainfed farms. In India, the area under blackgram is 32.90 lakh hectares with the production of 15.90 lakh tonnes, while the area under greengram is 33.10 lakh hectares with the production of 13.70 lakh tonnes. In Maharashtra, areas under blackgram and greengram are 5.40 and 6.59 lakh hectares with the production of 2.48 and 2.80 lakh tonnes, respectively for the year 2001-02. Latur district ranks first in area as well as production of both blackgram and greengram in the state. Thus, these pulse crops are being cultivated on a commercial scale in the district. Since, no serious attempt has been made to know careful and accurate cost of cultivation, profitability and per quintal cost of production in case of blackgram and greengram crops on rainfed farms. Keeping in view above, the investigation with respect to cautious evaluation in economics of rainfed blackgram and greengram production has been undertaken.

MATERIALS AND METHODS

In relation to selection of farms, blackgram and greengram farms were selected through multistage sampling design as follows. In the first stage, Latur district of Maharashtra was purposely selected, because of its predominance in area of the pulse crops. In the second stage, Latur tehsil was also purposely selected, because of its superiority in area of both blackgram as well as greengram crops. In the third stage, eight villages were selected on the basis of the highest area under both pulse crops. In the fourth stage, from each of the selected villages, the separate lists of blackgram and greengram growers with areas of both the pulse crops in the rainfed condition were obtained. Six blackgram and six greengram farms were randomly selected from each of the villages. Thus, 48 blackgram and 48 greengram farms were selected for present investigation. In regard to collection of data, cross sectional data were collected from 48 blackgram and 48 greengram growers by personal interview method with the help of pretested schedule. Per farm data were related to different items of expenditure and return in case of both the pulse crops for the year 2004-05.

For evaluation, data were converted into per hectare basis. Statistical tools like arithmetic mean, percentage and ratio were used for estimating the results. Cost concepts like cost-'A', cost-'B' and cost-'C' were used (Dhondyal and Singh, 1999). Cost-'A' includes the items of expenditure namely hired human labour, bullock labour, machine labour, seed, fertilizers, manure, pesticides, land revenue, incidental expenditure, interest on working capital and depreciation on fixed capital. Cost-'B' includes cost-'A' plus rental value of land and interest on fixed capital. Cost-'C' includes cost-'B' plus imputed value of family labour. Man day refers to a measurement of human labour whereas female labour is equal to 0.50 man day in case of both hired and family labour because the prevailing wage rates for female and male labour were Rs. 25 and 50 per day, respectively. Bullock labour cost was evaluated by considering the hiring rate of a bullock pair for Rs. 150 per day. Threshing machine rate was Rs. 400 per hour. The rates prevailing for nitrogen, phosphorus and potash were

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Rs. 10.20, Rs. 18.75 and Rs. 8.00 per kg, respectively. Rates of above ingredients were estimated by considering the prevailing market prices of straight fertilizers. Cost of manure was evaluated at the rate of Rs. 50 per quintal. Pesticides were evaluated on the basis of their prices in the market. Interest on working capital was charged on sum of the values of items from hired human labour to incidental expenditure at the rate of 14 per cent per annum for a period of the crop. Fixed capital includes farm building and implements. Depreciation on fixed capital for one hectare was calculated by diminishing balance method at the rate of 10 per cent per annum. Rental value of land was estimated as one sixth of grass income minus land revenue. Interest on fixed capital for one hectare was calculated at the rate of 12 percent per annum.

Regarding evaluation of main products, net market prices received by farmers for blackgram and greengram were prevailing to be Rs. 1380/q and Rs. 1600/q, respectively. The value of by-product was Rs. 100/q in case of both the crops. Gross return or gross income refers to a sum of values of main product and by-product of the crop. Farm business income includes net profit, imputed value of family labour, interest on fixed capital and rental value of land. It also refers to gross return minus cost-'A'. Family labour income includes net profit plus imputed value of family labour. It also refers to gross return minus cost-'B'. Net profit is the reward to an entrepreneur. It is also known as pure profit. It may be positive or negative. It also refers to gross return minus cost-'C'. In monetary terms, output means gross return while input means total cost or cost-'C'. Output-input ratio refers to gross return divide by cost-'C'. Cost of cultivation refers to per hectare production expenditure at farm level and that is denoted by cost-'C' with respect to both main product and by-product. Cost of production refers to per quintal production expenditure at farm level with respect to only main product of the crop. Cost of production per quintal is equal to cost-'C' minus value of by-product and dividing through by quantity of main product.

RESULTS AND DISCUSSION

Physical inputs of both blackgram and greengram, their main and by-product yields per hectare were calculated and are presented in Table 1. It is evident from table that the use of hired human labour was 31.48 and 29.22 man days on blackgram and greengram farms, respectively. Similarly use of imputed family labour was 23.52 and 25.45 man days on blackgram and greengram farms, respectively. Per hectare use of bullock labour was 15.15 pair days on blackgram farm while that was 16.39 pair days on greengram farm. The use of machine labour was negligible on both the farms. Use of seed was 14.07 and 14.35 kg on blackgram and greengram farms, respectively. Use of phosphorus was the highest of 38.49 kg followed by nitrogen (23.00 kg) and potash (11.65 kg) on blackgram farm. Similarly, use of phosphorus was also the highest of 39.51 kg followed by nitrogen (22.27 kg) and potash (12.01 kg) on greengram farm. Manure application was 14.17 and 16.20 q on blackgram and greengram farms, respectively.

It is also evident from table 1 that per hectare yield of main product of blackgram was 9.54 q followed by that of greengram (9.08 q). Similarly, yield of by-product of blackgram was 4.03 q/ha while that of greengram was 4.06 q/ha. It was inferred that in case of main products, productivity of blackgram was slightly greater than that of greengram. Tuteja (2002) recorded that yield of blackgram was higher (773 kg/ha) than that of greengram (709 kg/ha).

Per hectare cost of cultivation of blackgram and greengram as well as share of each item of cost were calculated and are presented in Table 2. It was observed that cost-'C' as cost of cultivation of blackgram was Rs.

Table 1 : Per hectare physical inputs and outputs of blackgram and greengram on rainfed farms

Particular	Unit	Blackgram farm (unit/ha)	Greengram farm (unit/ha)
INPUT			
1. Hired human labour	Man day	31.48	29.22
2. Bullock labour	Pair day	15.15	16.39
3. Machine labour	Hour	1.31	0.84
4. Seed	kg	14.07	14.35
5. Nitrogen	kg	23.00	22.27
6. Phosphorus	kg	38.49	39.51
7. Potash	kg	11.65	12.01
8. Manure	q	14.17	16.20
9. Sprays of pesticides	No.	0.34	0.83
10. Family human labour	Man day	23.52	25.45
OUTPUT			
1. Main product (grain)	q	9.54	9.08
2. By-product (straw)	q	4.03	4.06

Table 2 : Per hectare cost of cultivation of blackgram and greengram on rainfed farms

Items of cost	Blackgram farm		Greengram farm	
	(Rs. / ha)	Per cent	(Rs. / ha)	Per cent
1. Hired human labour	1574.00	14.57	1461.00	13.00
2. Bullock labour	2272.50	21.04	2458.50	21.89
3. Machine labour	524.00	4.85	336.00	2.99
4. Seed	281.40	2.60	315.70	2.81
5. Fertilizers	1049.48	9.72	1064.04	9.47
6. Manure	721.68	6.68	810.00	7.21
7. Pesticides	93.20	0.86	163.40	1.46
8. Land revenue	30.22	0.28	31.06	0.28
9. Incidental expenditure	248.60	2.30	252.47	2.25
10. Interest on working capital @ 14%	317.10	2.94	321.63	2.86
11. Depreciation on fixed capital @ 10%	128.18	1.19	131.20	1.17
12. Cost-'A' (item 1 to 12)	7240.36	67.03	7345.00	65.39
13. Rental value of land	2231.25	20.66	2457.94	21.88
14. Interest on fixed capital @ 12%	153.81	1.42	157.44	1.40
15. Cost-'B' (Item 12+13+14)	9625.42	89.11	9960.38	88.67
16. Family human labour	1176.00	10.89	1272.50	11.33
17. Cost-'C' (Item 15+16)	10801.42	100.00	11232.88	100.00

10801.42/ha while that of greengram was Rs. 11232.88/ ha. It was inferred that cost of cultivation of greengram was numerically higher than that of blackgram under rainfed condition. Expenditure incurred on cost-'A' was Rs. 7345.00/ha on greengram farm while that was Rs. 7240.36/ ha on blackgram farm. Similarly, cost-'B' (Rs. 9960.38/ha) of greengram was also higher than that of blackgram (Rs. 9625.42/ha). In case of blackgram, among individual items of cost, bullock labour showed the highest share of expenditure (21.04 per cent) followed by rental value of land (20.66 per cent) hired human labour (14.57 per cent) family human labour (10.89 per cent), fertilizers (9.72 per cent) and manure (6.68 per cent). Similarly in case of greengram, bullock labour showed the highest proportionate expenditure of 21.89 per cent followed by that of rental value of land (21.88 per cent), hired human labour (13.00 per cent), family human labour (11.33 per cent), fertilizers (9.47 per cent) and manure (7.21 per cent). In both the cases, the share of remaining items of expenditure was found to be less than 5 per cent. These results are conformity with

Table 3 : Per hectare profitability of blackgram and greengram on rainfed farms

Particular	Blackgram farm (Rs. / ha)	Greengram farm (Rs. / ha)
1. Return from main product (grain)	13165.20	14528.00
2. Return from by-product (straw)	403.00	406.00
3. Gross returns (Item 1+2)	13568.20	14934.00
4. Cost –'A'	7240.36	7345.00
5. Cost –'B'	9625.42	9960.38
6. Cost –'C'	10801.42	11232.88
7. Farm business income (Gross return minus cost -'A')	6327.84	7589.00
8. Family labour income (Gross return minus cost -'B')	3942.78	4973.62
9. Net profit (Gross return minus cost -'C')	2766.78	3701.12
10. Output-Input Ratio (Gross return divided by cost-'C')	1.25	1.33
11. Per quintal cost of production (Cost-'C' minus value of by-product and dividing through by quantity of main product)	1089.98	1192.38

the results obtained by Gangwar and Pandey (1982), Mruthyanjaya and Kumar (1988), Rindhe (1996) and Singh *et al.* (1989) regarding cost of cultivation of blackgram and greengram crops.

Per hectare gross return, farm business income, family labour income and net profit, output-input ratio and per quintal cost of production of main product were calculated and are presented in Table 3. It is obvious that gross return from blackgram was Rs. 13568.20/ha while that from greengram was Rs. 14934.00/ha. Farm business income was Rs. 7389.00/ha on greengram farm followed by Rs. Rs. 6327.84/ha on blackgram farm. Family labour income was found to be Rs. 4973.62/ha and Rs. 3942.78 on greengram and blackgram farms, respectively. Net profit from greengram was Rs. 3701.12/ha which was higher than that from blackgram (Rs. 2766.78/ha). Output-input ratio was higher (1.33) on greengram farm followed by that of 1.25 on blackgram farm. It was implied that investment in cultivation of both the pulse crops was worthwhile on rainfed farms. Cost of production of blackgram was Rs. 1089.98/q while that of greengram was Rs. 1192.38/q. The results are conformity with the results obtained by Bhatia (1991), Kennedy *et al.* (1990) and Varadrajn (1986) regarding profitability of blackgram as well as greengram crops.

REFERENCES

Bhatia, M.S. (1991). Economic constraints in increasing pulses production. *Agric. Situ. India*, **43(5)** : 279-284.

Dhondyal, S.P. and Singh, G.N. (1999). Costs and returns on crop enterprises, PP. 199-251. In : *Production Economics and Farm Management*, Aman Publishing House, Madhu Market, Meerut.

Gangwar, A.C. and Pandey, R.N. (1982). Stagnation in production of pulses : An economic analysis. *Agric. Situ. India*, **41(5)** : 283-287.

Kennedy, G., Ram, R.R. and Nivasulu, R.S. (1990). Economic analysis of major pulses in Gunter district, Andhra Pradesh, *Agric. Situ, India*, **45(3)** : 173-181.

Rindhe, N.T. (1996). Comparative economics of farming systems in Buldhana district of Maharashtra State. M.Sc. (Agri.) Thesis, Marathwada Agricultural University, Parbhani, 106 P.

Singh, A.J., Sethi, K. , Kaur, K. A. and Sekhon, S. (1989). A study into production behaviour of pulses in India with special reference to Punjab State. *Agric. Situ. India*, **44(9)** : 707-713.

Varadrajan, S. (1996). Prospects for pulses in Tamilnadu. *Agric. Situ, India*, **41(8)** : 641-646.

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