

Economic analysis of capsicum cultivation under polyhouse and open field conditions in Haryana

PARVEEN KUMAR, RS CHAUHAN*, RK GROVER**

Department of Agricultural Economics

****Directorate of Human Resource Management**

CCS Haryana Agricultural University, Hisar 125004 Haryana, India

***Department of Agricultural Economics**

College of Agriculture (CCSHAU), Kaul 136021, Haryana, India

Email for correspondence: parv2509@gmail.com

ABSTRACT

An attempt was made to study the comparative economics of capsicum cultivation under polyhouse and open field conditions in Haryana. Karnal district was selected purposively on the basis of predominance of capsicum cultivation both under polyhouse and open field conditions. The primary data for the year 2013-14 were collected by personal interviews of the selected farmers with the help of a specially designed schedule. Simple statistical tools like averages and percentages were used for processing the data. The overall findings of the study revealed that the cost of cultivation of capsicum under polyhouse was higher by Rs 246564.4/acre as compared to open field conditions. At the same time the net returns under polyhouses were higher by Rs 124870/acre. The results of the study also revealed that the capsicum cultivation under polyhouses has significantly contributed to the yield.

Keywords: Polyhouse; open field; economic analysis; cost of cultivation; returns

INTRODUCTION

Capsicum, *Capsicum annuum* is also called bell pepper or sweet pepper. It is one of the most popular and highly remunerative annual herbaceous vegetable crops. Capsicum is cultivated in most parts of the world especially in temperate regions of Central and South America, European countries, tropical and subtropical regions of Asian continent mainly India and China. India contributes one fourth of world

production of capsicum with an average annual production of 0.9 MT from an area of 0.885 million hectares. It is very rich in vitamins A and C as compared to tomatoes. It has attained a status of high value crop in India in the recent years and occupies a pride place among vegetables in Indian cuisine because of its delicate taste and pleasant flavor coupled with rich content of ascorbic acid and other vitamins and minerals. The mature fruits (green, red and yellow) of sweet pepper are eaten raw or

widely used in stuffings, bakings, pizza and burger preparations. In Haryana capsicum is usually grown from August-September to March under polyhouses and in open field conditions it is grown in January and lasts up to June. In polyhouses mostly Indra and Royal-wonder varieties of capsicum are cultivated. Hybrid varieties of capsicum are generally grown in open fields.

MATERIAL and METHODS

To fulfill the specific objective of the study, simple statistical tools like averages and percentages were used to compare, contrast and interpret results properly. To collect the primary data, multistage random sampling technique was used. Karnal district was purposely selected on the basis of predominance of capsicum cultivation both under polyhouse and open field conditions. Gharaunda and Indri blocks were selected on the basis of predominance of capsicum cultivation under polyhouses and open fields. Thereafter two villages from each block were selected. Ten respondent farmers, each under polyhouses and open field conditions were randomly selected from each village thus making a total sample of 80 respondents. The primary data for the year 2013-14 were collected from the respondent farmers with the help of specially designed and pre-tested schedule through personal interview method.

RESULTS and DISCUSSION

To fulfill the objective of study, comparative economic analysis of capsicum cultivation under polyhouse and open field conditions was made on per acre basis. As shown in Table 1, cost of cultivation of capsicum under polyhouses was worked out to be Rs 101667.91. The cost structure of the variable cost shows that the highest proportion amounting to Rs 36100 (11.17%) was spent on harvesting followed by seed, plant protection, fertilizers and FYM, ridging/bed preparation, field preparation, weed control and irrigation with charges of Rs 17414.81 (5.39%), Rs 12648.15 (3.91%), Rs 10328.88 (3.20%), Rs 5611.11 (1.74%), Rs 5462.96 (1.69%), Rs 4796.29 (1.48%) and Rs 911.11 (0.28%) respectively. Similar findings were also reported by Nagalakshmi et al (2001) and Sreedhara et al (2013).

In case of open field cultivation of capsicum, the total variable cost was worked out to be Rs 43492.47. The cost structure of the total variable cost shows that the highest proportion was spent on harvesting with Rs 8468.96 (11.05%) followed by plant protection, fertilizers and FYM, weed control, field preparation, seed, irrigation and ridging/bed preparation with Rs 8413.79 (10.98%), Rs 7197.93 (9.39%), Rs 5179.31 (6.76%), Rs

4620.69 (6.03%), Rs 3068.96 (4.00%) , Rs 1565.51 (2.04%) and Rs 1386.2 (1.80%) charges respectively. Similar findings were also reported by Rajur et al (2008).

The finding of the study indicated in Table 1 shows that the total cost incurred on capsicum under polyhouse and open field conditions was Rs 323205.48 and Rs 76641.09 per acre respectively. The highest proportion in total cost of capsicum cultivation under polyhouses was incurred as depreciation and interest on fixed capital (49.65%). The share of rental value of land in cost of cultivation of capsicum under polyhouses and open fields was worked out to be 9.28 and 26.10 per cent respectively. In cost of cultivation of capsicum under polyhouses and open fields the proportion of management and risk factor were worked out to be 3.15 and 5.67 per cent respectively. The share of variable cost in total cost was worked out to be 56.75 per cent under open field conditions.

An average yield of 356.48 and 136.55 quintal per acre was obtained under polyhouse and open field cultivation of capsicum respectively. Thus in open field the yield was estimated 219.93 quintal/acre less than the production under polyhouses. Also sale price received by polyhouse and open field growers was Rs 1425 and Rs 1000.1 per quintal respectively.

The data pertaining to returns from capsicum crop under polyhouse and open field conditions reveal that in case of polyhouse cultivation, gross return per acre was estimated Rs 507986.1. Return over variable cost and net returns was calculated Rs 406318.18 and Rs 184780.61 per acre respectively. In case of open field cultivation of capsicum, gross return per acre was estimated Rs 136551.7. Return over variable cost and net return was calculated Rs 93059.23 and Rs 59910.60 per acre respectively.

Total cost under polyhouse and open field conditions was worked out to be Rs 323205.48 and Rs 76641.09 per acre respectively. The reasons for higher total cost were high price of seed/seedlings, large number of labour required and depreciation and interest on fixed cost which increased the total cost of capsicum cultivation under polyhouses.

The data related to percentage difference between capsicum cultivation under polyhouse and open field conditions reveal that in case of variable cost, maximum difference was observed for seed (Rs 14345.85) which was nearly five times more as compared to open field conditions. This was followed by harvesting, ridging/bed preparation, plant protection, fertilizers and manures and field preparation with Rs 27631.04 (326.26%), Rs 4224.91

Table 1. Comparative economics of capsicum cultivation under polyhouses and open field conditions

Parameter	Polyhouse cultivation	Open field cultivation	Difference between polyhouse and open field conditions	
			Difference	%
Cost structure (Rs/acre)				
1. Field preparation	5462.96 (1.69)	4620.69 (6.03)	842.27	18.23
2. Ridging/bed preparation	5611.11 (1.74)	1386.2 (1.80)	4224.91	304.78
3. Seed	17414.81 (5.39)	3068.96 (4.00)	14345.85	467.45
4. Fertilizer and manure	10328.88 (3.20)	7197.93 (9.39)	3130.95	43.50
5. Irrigation	911.11 (0.28)	1565.51 (2.04)	-654.4	-41.80
6. Plant protection	12648.15 (3.91)	8413.79 (10.98)	4234.36	50.33
7. Weed control	4796.29 (1.48)	5179.31 (6.76)	-383.02	-7.40
8. Harvesting	36100 (11.17)	8468.96 (11.05)	27631.04	326.26
9. Subtotal (1 to 8)	93273.31 (28.86)	39901.35 (52.06)	53371.96	133.76
10. Interest on working capital	8394.59 (2.60)	3591.12 (4.69)	4803.47	133.76
11. Variable cost (9+10)	101667.91 (31.46)	43492.47 (56.75)	58175.44	133.76
12. Marketing cost	10736.59 (3.32)	4450.13 (5.81)	6286.46	141.26
13. Management charge	10166.79 (3.15)	4349.24 (5.67)	5817.55	133.76
14. Risk factor	10166.79 (3.15)	4349.24 (5.67)	5817.55	133.76
15. Depreciation and interest on fixed capital	160467.39 (49.65)	--	--	--
16. Rental value of land	30000 (9.28)	20000 (26.10)	10000	50
17. Total cost (11 to 16)	323205.48 (100)	76641.09 (100)	246564.4	321.71
Return structure				
18. Yield (quintal/acre)	356.48	136.55	219.93	161.0619
19. Sale price (Rs/quintal)	1425	1000.1	424.9	42.48575
20. Gross return (Rs)	507986.1	136551.7	371434.4	272.0101
21. Return over variable cost (Rs)	406318.18	93059.23	313259	336.6232
22. Net return (Rs)	184780.61	59910.60	124870	208.4272

Figures in parentheses indicate percentages to total cost

(304.78%), Rs 4234.36 (50.32%), 3130.95 (43.50%) and Rs 3130.95 (18.23%) respectively. The plausible reasons for such heavy differences were that in polyhouses more seedlings were planted and these were costlier also. The proportion spent on harvesting was Rs 36100 which was higher as compared to

the open field conditions (Rs 8468.96) since more number of skilled labour was used due to long harvesting period of capsicum in polyhouse as compared to open field conditions. Field preparation and bed preparation cost was also found higher in polyhouses because more agronomical practices were performed. The results

further reveal that the expenditure on irrigation and weed control was higher in case of open field by Rs 654.4 (41.80%) and Rs 383.02 (7.40%) respectively as compared to cultivation under polyhouses. This indicates that there was more infestation of weeds in case of cultivation of capsicum under open field conditions. Similarly marketing cost under polyhouses was higher by Rs 6286.46 (141.26%) as compared to open fields.

Farmers realized 145.32 per cent higher yield of capsicum under polyhouse as compared to open field conditions. The gross return, return over variable cost and net return were also higher by 272.01, 336.62 and 208.43 per cent respectively

in case of polyhouse as compared to open field conditions. Hence it can be concluded that yield of capsicum and income of farmers can be increased by adoption of polyhouse technology.

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