



Economic analysis of baby corn (*Zea mays*) cultivation in Haryana

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ABSTRACT

Maize (*Zea mays* L.) is used for human food as well as animal feed, and it is also widely used in starch industry. Towards diversification and value addition through cultivation of Baby corn for vegetable purpose is emerging as a highly profitable activity. Farmers can grow four crops in a year, and the production of baby corn generates employment amongst the rural poor's, from children to the elderly persons. The demand for baby corn is rapidly increasing in urban areas of India. Keeping in view the importance of baby corn from nutritional point of view and its vast potential in increasing the income of farmers and diversification of the cropping system, the present study was carried out with the objectives, viz. to study the cost and returns of baby corn cultivation and to identify the constraints in production. The present experiment was conducted in the Sonipat district of Haryana during 2016. Data regarding general particulars, cost and returns and problems faced in production of Baby corn were collected from 60 farmers through well-structured and pretested interview schedule and were analyzed using appropriate tools. The result revealed that the cost of cultivation of baby corn was ₹45707/acre, net return per acre of baby corn turned out as ₹58405 while return per rupee of investment was ₹2.28. Eighty per cent of farmers felt the problem of non-availability of standard quality and high yielding variety seeds of baby Corn.

Key words: Cost of cultivation, Net return, Production, Sonipat

Maize, popularly known as Queen of Cereals and also the corn is one of the most important cereal crops in the world (Chowti & Basavaraja 2015). Maize is the third most important cereal crop in India after rice and wheat. It accounts for around 10% of total food grain production in the country (APEDA 2016). Baby corn is a young finger like unfertilized cobs of maize (*Zea mays* L.) with one to three-centimeter emerged silk preferably harvested within 1–3 days of silk emergence depending upon the growing season. It is nutritive and its nutritional quality is at par or even superior to some of the seasonal vegetables. Besides proteins, vitamins and iron, it is one of the richest sources of phosphorus (Yadav *et al.* 2014). Currently, Thailand and China are the world leaders in baby corn production, whereas in India, considering its vast potential and prospects, baby corn is being cultivated in Meghalaya, Western Uttar Pradesh, Haryana, Maharashtra, Karnataka and Andhra Pradesh (Rani *et al.* 2017). Farmers can grow four crops in a year (Roopa & Prasannakumar 2015). The demand for baby corn is rapidly increasing in urban areas in India (Nanher *et al.* 2015). Thus, in the area adjoining cities or other urban areas (Peri urban agriculture) multiple crops of baby corn can be raised which would fetch greater income to the

farmer. Therefore, keeping in view the importance of baby corn from nutritional point of view and its vast potential in increasing the income of farmers and diversification of the cropping system, the present study was carried out with the following specific objectives i) to study the cost and returns of baby corn cultivation in the study area and to identify the constraints in production of baby corn.

MATERIALS AND METHODS

The study was carried out in Sonipat district of Haryana, since the region has vast potential for production of baby corn. Primary data were collected from sample respondents through well-structured and pre-tested interview schedule during 2016–17. Multi-stage purposive sampling techniques were used for selection of sample respondents. At the second stage, two blocks were selected on the basis of maximum area under baby corn cultivation. Finally, one village from each block was selected, from each village 30 farmers were purposively selected thus total of 60 farmers were selected for primary data collection. For computing the cost and returns of the baby corn crop; farm inputs cost, total variable as well as fixed cost and net returns from the production of Baby corn were calculated based on descriptive statistics like mean, percentages, etc.

For estimating the variable costs, the average expenditure on various inputs like human and bullock labour, tractor power, seed, manures and fertilizers, insecticides

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and pesticides, irrigation, repair and maintenance of farm implements were worked out on per acre basis. Fixed cost accounts the prevailing rental value of owned land, depreciation on farm implements, machinery and buildings. The Return over variable cost, Net return over total cost, Cost of production ₹/quintal and Return per rupee of investment were estimated using simple percentage and profitability analysis. The major constraints faced by the farmers in the production of baby corn in study area also analyzed using simple percentage analysis.

RESULTS AND DISCUSSION

Majority of the farmers are literate (94%). Educated farmers had greater likelihood of planting baby corn than illiterate farmers because educated farmers are more willing and able to grasp technological knowledge instantaneously as observed by Elum Zeld and Sekar (2015), which indirectly contributes to the profitability of the crop and the educational status of farmers is vital in correct decision making. Majority of the respondents who engaged in agriculture were belonged to the middle age group (35–50 years) in the district (46%). The yield and profitability increase as the size of holding increases. The average size of operational holding of selected farmers is 7.58 acres. Chaudhry *et al.* (2009) also reported the similar findings that large farmers were found more responsive towards the technology as well as resource oriented but the scarcity of inputs were witnessed with the small farmers resulting in their lower yield and profitability.

The preparatory tillage and ridging showed increasing pattern starting with margin, small, medium and large farms with highest quantity of 6.8, ₹2970/acre with 7.57%. Small farms invested more amounts per acre which is highest of all when compared to other farms though large farms have high percentage in case of sowing, seed rate and F.Y.M. In fertilizer nutrient, nitrogen value, quantity, and percentage of medium farms are more when compared to other. Phosphorous showed the increasing trend from marginal to large farms followed by marginal farms showed high value, quantity and per cent in case of potassium and zinc phosphate. Though total fertilizer invested is high for large farms, fertilizer application is high for small farms and remaining three showed constant trends. In terms of irrigation, plant protection and harvest, small farms dominated in terms of value and percentage. In case of interest on working capital, transportation costs, and variable cost, small farms took the first place surpassing the other three in value and percentage. It is identified that rental value of land, fixed cost is high for small farms but total cost is more for large farms when compared to marginal and medium farms. The comparative analysis of expenditure incurred on different items on marginal, small, medium and large farms shows that per acre expenditure incurred on harvesting, is highest in small farms followed by marginal, medium and large farms. The expenditure incurred on plant protection, management charges and risk factor were found highest on small farms and least on marginal farms. But in case of, preparatory tillage and fertilizer use, the one-acre

expenditure incurred on these items was found highest in large farms.

The average gross income per acre on large farms was highest (₹112800) as compared to medium farms (₹108400), small farms (₹100000) and marginal farms (₹95250). This may be attributed to highest production on large farms (14.2 quintals) followed by medium farms (13.5 quintals), small farms (12.4 quintals) and marginal farms (11.8 quintals). Consequently, per acre net returns over total cost shows a trend on large farms (₹67824), medium farms (₹63117), small (₹52516) and marginal farms (₹50156). Similar trend was observed in case of the return over variable cost was highest on large farms ₹86570) followed by medium farms (₹81976), small farms (₹71911) and large farms (₹69377). The costs of production per quintal on small, marginal, medium and large farms were ₹3829, ₹3821, ₹3354 and ₹ 3167 respectively. The return per rupee of investment on large, medium, small and marginal farms was ₹2.51, ₹2.39, ₹2.11 and ₹2.11 respectively (Table 1).

The major problems faced by the farmers in the production of baby corn were analyzed. The use of good quality seeds plays an important role in increasing production and quality of baby corn. In the study area 80% of farmers in Sonipat district felt the problem of non-availability of standard quality and high yielding variety seeds of baby corn. Most frequently the seeds supplied to the farmers were adulterated. Moreover, the prices of seed were reported to be very high. It is major production problem faced by the farmers. Harvesting cost is very high as compare to other crops. In the study area 60% of farmers felt the problem of relatively high harvesting cost. Value addition increased the profits to a great extent. There is a lack of awareness about value addition at farmer level. In the study area 35% of farmers felt the problem of lack of awareness about value addition at farmer level.

Irrespective of farm sizes most of the farmers have considered that insect-pests and diseases were the major problems. Due to climatic variation, indiscriminate use of pesticides, lack of knowledge about pest and disease infestation farmers have suffered and lost a sizeable portion of yield. 18 farmers out of 60 farmers constituting 30% faced the problem of insect-pest and disease due to poor quality pesticides. Due to lack of knowledge about the recommended doses of fertilizer and financial position of the farmers, most of the farmers either used less fertilizers and manures or in excess of that required. The problem of imbalance use and ignorance of the farmers about recommended doses were reported by 33% of the farmers. There is a lack in processing facility in the study area. In the study area 23% of farmers felt the problem of lack of processing facilities.

Non-availability of labour during peak harvesting operation period increased the harvesting cost. It was observed mainly after commencement of Mahatma Gandhi National Rural Employment Guarantee Assurance Scheme (MGNREGA). Most of the labours were diverted towards MGNREGA scheme covering various kind of work and

Table 1 Cost and return of baby corn On marginal, small, medium and large farms (₹/acre)

Item	Marginal farms			Small farms			Medium farms			Large farms			Overall		
	Quantity	Value (₹)	(%)	Quantity	Value (₹)	%age (%)	Quantity	Value (₹)	(%)	Quantity	Value (₹)	(%)	Quantity	Value (₹)	(%)
Preparatory tillage	5.7	2600	5.77	5.6	2560	5.33	6	2765	6.98	6.8	2970	7.57	5.9	2724	5.95
Sowing		1188	2.64		1191	2.48		1135	2.86		1140	2.90		1164	2.54
Ridging		525	1.17		602	1.25		668	1.69		680	1.73		619	1.35
Seed (Kg)	10	5350	11.88	10	5498	11.44	10	5415	13.67	10	5210	13.27	10	5368	11.73
FYM (q)	23.33	700	1.55	36.66	1106	2.30	20	608	1.53	30.33	910	2.32	27.66	831	1.82
Fertilizer nutrient (kg)															
Nitrogen	70.9	881	1.96	82.86	1030	2.14	84.29	1048	2.64	83.6	1039	2.65	80.41	1000	2.19
Phosphorous	24.84	1121	2.49	24.84	1121	2.33	24.38	1126	2.84	25.58	1154	2.94	24.4	1131	2.47
Potassium	10.34	194	0.43	7.94	149	0.31	5.70	107	0.27	7.73	145	0.37	7.94	149	0.33
Zinc phosphate	7.52	188	0.42	4.44	111	0.23	4.96	124	0.31	5.84	143	0.36	5.68	142	0.31
Total fertilizer invested		2384	5.29		2411	5.02		2405	6.07		2481	6.32		2420.75	5.29
Fertilizer application		513	1.14		300	0.62		300	0.76		300	0.76		353	0.77
Irrigation	7.12	2138	4.75	7.86	2359	4.91	7.25	2175	5.49	6.8	2040	5.20	7.26	2178	4.76
Hoeing		413	0.92		530	1.10		559	1.41		545	1.39		512	1.12
Plant protection		583	1.29		1559	3.24		1054	2.66		890	2.27		1022	2.23
Harvesting		8625	19.15		9055	18.84		8470	21.38		8200	20.89		8588	18.77
Miscellaneous		100	0.22		100	0.21		100	0.25		100	0.25		100	0.22
Total (1-13)		25119	55.78		27271	56.73		25654	64.75		25466	64.87		25878	56.56
Interest on working capital		753.57	1.67		818.13	1.73		769.62	1.95		763.98	1.92		776.34	1.7
Variable cost (a)		25873	57.45		28089	58.46		26424	66.70		26230	66.79		26654	58.26
Transportation charges		913	2.03		1186	2.47		1108	2.80		785	2.00		998	2.18
Management charges		2587	5.74		2809	5.84		2642	6.67		2622	6.68		2665	5.82
Risk factor		2587	5.74		2809	5.84		2642	6.67		2622	6.68		2665	5.82
Rental value of land		13125	29.14		12591	26.19		12467	31.46		12717	32.40		12725	27.81
Fixed cost (b)		19212	42.66		19395	40.35		18859	47.60		18746	47.76		19053	41.64
Total cost (a+b)		45085	100		47484	100		45283	100		44976	100		45707	100

Table 2 Cost of production of baby corn

Particular	Marginal farms		Small Farms		Medium Farms		Large Farms		Overall	
	Quantity	Value (₹)	Quantity	Value (₹)	Quantity	Value (₹)	Quantity	Value (₹)	Quantity	Value (₹)
<i>Production</i>										
A. Main product	11.8	88500	12.4	93000	13.5	101250	14.2	106500	12.97	97313
B. By product		6750		7000		7150		6300		6800
Gross return		95250		100000		108400		112800		104113
Return over variable cost		69377		71911		81976		86570		77458
Net return over total cost		50156		52516		63117		67824		58405
Cost of production ₹/q		3821		3829		3354		3167		3523
Return per rupee of investment		2.11		2.11		2.39		2.51		2.28

hence, the labour scarcity was there as the agriculture labours shifted to MGNREGA and were not inclined to work on agricultural fields due to tardy nature of agricultural operations. In the study area 23% of farmers in Sonipat district felt this problem. The average gross income per acre on large farms (₹112800) was highest as compared to medium farms (₹108400), small farms (₹100000) and marginal farms (₹95250). This may be attributed to highest production on large farms (14.2 quintals) followed by medium farms (13.5 quintals), small farms (12.4 quintals) and marginal farms (11.8 quintals). Consequently, per acre net returns over total cost showed a trend on large farms (₹67824), medium farms (₹63117), small (₹52516) and marginal farms (₹50156). Whereas, the return over variable cost was highest on large farms (₹86570) followed by medium farms (₹81976), small farms (₹71911) and marginal farms ₹69377). The costs of production per quintal on small, marginal, medium and large farms were ₹3829, ₹3821, ₹3354 and ₹3167 respectively. The return per rupee of investment on large, medium, small and marginal farms was ₹2.51, ₹2.39, ₹2.11 and ₹ 2.11 respectively (Table 2). Looking into the prices of the produce and cost of production, growing of baby corn was found more profitable to large farmers of Sonipat. The use of good quality seeds plays an important role in increasing production and quality of baby corn. In the study area 80% of farmers in Sonipat district felt the problem of non-availability of standard quality, high yielding variety seeds of baby Corn. Harvesting cost was also very high as compare to other crops. In the study area 60% of farmers felt the problem of relatively high harvesting cost.

Adequate scientific storage facilities should be provided to the producer so as to spread the sale throughout the year with minimum losses and thereby avoiding slump in prices during post-harvest period. Producers should be provided credit facilities against the produce stored to meet their immediate financial commitments. Co-operatives need to be encouraged to play an important role in the marketing of baby corn especially for the small farmers

who have poor retention capacity and should provide adequate finance to construct storage. Evolution of new varieties suitable for different growing periods with longer keeping quality and appropriate for processing need to be introduced. This will reduce the seasonality characteristics of arrivals and prices.

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