



ISSN (E): 2277-7695

ISSN (P): 2349-8242

TPI 2024; 13(3): 145-148

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www.thepharmajournal.com

Received: 02-01-2024

Accepted: 03-02-2024

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Comparative economics of onion seed and bulb production in Karnataka

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Abstract

Onion is one of the important vegetable crop cultivated in Karnataka. With an objective of ascertaining the economic efficiency of the crop the study conducted in Chitradurga district during the year 2021-22. A total of 60 onion seed producers and 60 onion bulb producers respondents were selected using simple random sampling technique. Comparative economics of onion seed and onion bulb production per acre is presented by using standard farm management cost concepts like Cost A, Cost B, Cost C and Farm management income measures like family labour income, farm business income and net income were estimated and compared. The Cost C represents total cost of cultivation which was higher at Rs 75793.51 in case of onion seed production compared to onion bulb production (Rs 59,356.74). With respect to planting materials bulb of desired quality in case of onion seed production formed 32.86 per cent of the total cost while it was 10.60 per cent in onion bulb production. Gross returns realized from an acre of onion seed production was highest at Rs 185300 compared to onion bulb production at Rs 86800. Net returns were arrived at by deducting Cost C from gross returns. Net returns accrued to onion growers was relatively higher at Rs. 1,09,506.49 in case of seed production compared to onion bulb production (Rs 27443.26). Family business income accrued to onion growers was relatively higher at Rs. 1,26,251.09 in case of onion seed production compared to onion bulb production (Rs 38020.59). The economic efficiency of onion seed production reflected in benefit cost ratio was higher at 2.44 compared to 1.46 in case of onion bulb production. The study enables the stakeholders in formulating of suitable policy to strengthen the scientific onion seed production.

Keywords: Comparative economics, seed production, bulb production and vegetable crop

Introduction

Onion (*Allium cepa* L) is a worldwide culinary and therapeutic spice belonging to the family Amaryllidaceae. It is an important commercial vegetable crop not only for domestic consumption but also as highest foreign exchange earner among the fruits and vegetables. In Karnataka, Chitradurga is the major onion growing districts and located in the Central Dry Zone of Karnataka (Zone IV) with average rainfall of 450-500 mm. onion is the important and commercial vegetable crop grown by small and medium land holding farmers. The district average yield of onion is 19.9 t/ha but, potential yield is around 30 t/ha, which indicates that there is scope for increasing the productivity and returns.

The comparative economics of bulb and seed production will help the farmers to understand the better way of getting higher income in the onion production. With the above background the present study was conducted to know the comparative economics of the onion production in Karnataka.

Materials and Methods

The study was conducted in the Chitradurga districts of Karnataka state during the year 2021-22. Challakere, Chitradurga, Hosadurga and Hiriyur from Chitradurga district, were purposively selected for the study as they had the highest area under onion seed production in the district. From these taluks, 3 villages from each taluk with highest area under onion seed production were selected randomly for the study. From each village 5 onion seed producing respondents and 5 onion bulb producing respondents were randomly selected for the study. Thus, a total of 60 onion seed producers and 60 onion bulb producers respondents constitute the sample. Comparative economics of onion seed and onion bulb production was estimated following Enterprise Budgeting Technique. It was hypothesized that onion seed production increases profits compare that to onion bulb production.

Enterprise budgeting technique is the statement of costs, returns and profit associated with an enterprise. The costs were further divided into variable and fixed costs. Variable costs included expenditure incurred on hired human labour, hired machine labour and hired bullock labour, seeds, planting material cost, FYM, fertilizers, plant protection chemicals, interest on working capital worked out at the rate of interest of 7.00 per cent apportioned for the crop duration of six months. Fixed costs included depreciation on fixed assets used in onion seed and bulb production apportioned on per acre basis. Depreciation was estimated using straight line method considering purchase price, junk value and useful life of the asset. Information on Land revenue was collected from the revenue department and accordingly accounted in the cost of cultivation. Rental value of land was accounted considering the prevailing rental value in the selected sample villages of the study. Interest on fixed capital was worked out at 12.00 per cent per annum and apportioned for the crop duration of six months. The total cost of cultivation was arrived at by summation of variable costs and fixed costs. Gross return was estimated by multiplying output with prevailing market price. Net returns or profit was arrived at by deducting total costs in Gross returns. To ascertain the economic efficiency of onion seed and bulb production, benefit cost ratio was estimated by taking the ratio of gross returns and total cost of cultivation.

Results and Discussion

Comparative economics of onion seed and onion bulb production per acre is presented in Table 1. Standard farm management cost concepts like Cost A, Cost B, Cost C and Farm management income measures like family labour income, farm business income and net income were estimated and compared in Table 1. The Cost C represents total cost of cultivation which was higher at Rs 75793.51 in case of onion seed production compared to onion bulb production (Rs 59,356.74). Of the total cost, human labour inclusive of hired and family men and women labour cornered major chunk at 17.04 per cent and 23.63 per cent in case of onion seed and onion bulb production, respectively. Family labour of 5.66 man-days and 4.88 woman days were required in case of onion seed production which was relatively lower compared to onion bulb production (7.66 man-days and 6.22 woman days). The expenditure on machine labour was relatively higher in case of onion bulb production at 9.31 per cent compared to onion seed production (5.82%). With respect to planting materials bulb of desired quality in case of onion seed production formed 32.86 per cent of the total cost while it was 10.60 per cent in onion bulb production. The expenditure made on FYM and chemicals fertilizer accounted to 17.25 per cent and 21.94 per cent in case of onion seed and onion bulb production, respectively. The expenditure on plant protection chemicals was meager and hovers around two to three per cent in both the cases. Among the fixed cost, rental value cornered major chunk at 16.17 per cent and 9.08 per cent in case of onion seed and onion bulb production, respectively.

Gross returns realized from an acre of onion seed production was highest at Rs. 185300 compared to onion bulb production at Rs 86800. Net returns were arrived at by deducting Cost C from gross returns. Net returns accrued to onion growers was relatively higher at Rs. 1,09,506.49 in case of seed production compared to onion bulb production (Rs 27443.26). If onion bulb and onion seed productions were viewed as family

business, then the income accrued to family was arrived at by estimating family business income. Family business income was calculated by negating Cost A from gross returns. Family business income accrued to onion growers was relatively higher at Rs 1,26,251.09 in case of onion seed production compared to onion bulb production (Rs 38020.59). The economic efficiency of onion seed production reflected in benefit cost ratio was higher at 2.44 compared to 1.46 in case of onion bulb production.

In order to ascertain the comparative profitability of onion seed and onion bulb production, comparative economics of the same was worked out using standard farm management cost concepts and income measures. The total cost of cultivation (Cost C) was found to be higher at Rs 75,793.51 in case of onion seed production compared to onion bulb production (Rs 59356.74). The requirement of quality planting material was found to be the prime reason for higher cost of cultivation in case of onion seed production. Onion seed production required bulb as the planting material while onion bulb production can be taken up using either seed or bulb as planting material. Vast majority of sample farmers used seeds as the planting material in onion bulb production. The requirement of bulb per acre was hardly 3kg costing about Rs 2000 per kilogram, whereas onion seed production required bulb of 20.56 bags each bags comprising of 50 kg bulbs. The cost of 50 kg of bulb was Rs 2000. The difference in cost of planting material has widened the difference in cost of cultivation between onion bulb and onion seed production. The other reason would be the rental value of land which was Rs 12240.55 in case of onion seed production while it was Rs 5500 in case of onion bulb production. The rental difference was due to the very nature of bulb enterprise. Onion seed production has got more commercial value compared to onion bulb production in the eyes of farmers who leases out their farm.

Human labour inclusive of hired and family men and women labour cornered major chunk at 17.04 per cent and 23.63 per cent of total cost of cultivation in case of onion seed and onion bulb production, respectively. Onion bulb production was observed to be more labour intensive compared to onion seed production as onion bulb production required labour to perform operations like sowing, bed preparation, application of FYM, ear thing-up, application of chemical fertilizer, weeding, application of plant protection chemicals, harvesting, DE necking, grading and packing. Harvesting, DE necking, Grading are the labour intensive special operations in onion bulb production. In case of onion seed production, human labour was required to perform operations like planting of bulbs, application of FYM, application of chemical fertilizers, one or two weeding, one or two herbicidal application, application of plant protection chemicals, irrigation using drip, harvesting (5-6 members), drying and winnowing. Harvesting and planting were found labour intensive. Similar results have been obtained by Prakash Keruru *et al.* (2020).

The expenditure on machine labour was relatively higher in case of onion bulb production at 9.31 per cent compared to onion seed production (5.82%) due to additional machine hour required for performing deep sloughing of black soil.

The expenditure made on FYM and chemicals fertilizer accounted to 17.25 per cent and 21.94 per cent in case of onion seed and onion bulb production, respectively. The onion seed growers opined that application of relatively more

quantity of FYM for seed production not only improves physical, chemical and biological properties of soil but also enable them to realize better seed yield through increased mineralization of available soil nutrients. Chemical fertilizer viz., urea, DAP, complex fertilizer and micro nutrients usage was also found to be relatively higher in case of onion seed production as compared to onion bulb production since onion seed growers are not ready to lose any chance of getting better seed yields.

The expenditure on plant protection chemicals was meager hovering around two to three per cent of the total cost of cultivation in both the cases. The incidence of pests and diseases depends on the prevailing climatic conditions, the cultivar/ hybrid/ land race/ high yielding varieties chosen by the farmers, the management practices adopted by the farmers. Purple blotch, leaf blight are the major diseases and thrips and mite infestation are the major insects causing harm

under both the situations. Among the fixed cost, rental value cornered major chunk at 16.17 per cent and 9.08 per cent in case of onion seed and onion bulb production, respectively. Similar results have been obtained by Prakash Keruru *et al.* (2020).

Gross returns realized from an acre of onion seed production was highest at Rs 185300 compared to onion bulb production at Rs 86800. The prevailing price is the prime factor causing differences in realization of gross returns. From the preceding discussion, it could be inferred that onion seed production is more profitable compared to onion bulb production. As onion seed production involves more of market and weather risks compared to onion bulb production, the prospective farmers who wish to absorb above mentioned risks could reap higher returns. Risk lovers always realize greater income compared to risk averters who satisfy with lower returns.

Table 1: Comparative economics of onion seed and onion bulb production per acre is presented below

SL. No	Onion seed production per acre				Onion bulb production per acre			
	Particulars	Quantity	Rate (Rs)	Total cost (Rs)	Particulars	Quantity	Rate (Rs)	Total cost (Rs)
1	Hired men labour (Mandays)	12.66	400	5064.00 (6.64%)	Hired men labour (Mandays)	8.46	400	3384 (5.59%)
2	Hired women labour (woman days)	17.42	250	4355.00 (5.71%)	Hired women labour (woman days)	25.22	250	6305 (10.42%)
3	Bullock labour (Pair days)	1	750	750 (0.98%)	Bullock labour (Pair days)	1.46	1000	1460 (2.41%)
4	Machine labour (hours)	3.46	1100	4406.00 (5.77%)	Machine labour (hours)	4.44	1000	5640 (9.32%)
5	Planting material (50 kg bag)	20.56	1210	24877.60 (32.60%)	Planting material (50 kg bag)	3.21	2000	6420 (10.82%)
6	FYM (in 1 tractor load)	1.38	5500	7315.00 (9.59%)	FYM (1 tractor load)	1.12	5500	6160 (10.38%)
7	Urea (50kg bag)	1.37	276.88	379.33 (0.50%)	Urea (50kg bag)	2.23	276.88	617.44 (1.04%)
8	Complex fertilizer (50kg bag)	2.76	1512	4173.12 (5.52%)	Complex fertilizer (50kg bag)	2.66	1512	4021.92 (6.78%)
9	Micro nutrients (5kg bag)	1.02	1100	1122.00 (1.48%)	Micro nutrients (5kg bag)	1.21	1100	1331 (2.24%)
10	Herbicides (kg or liter)	1.67	276.19	461.24 (0.61%)	Herbicides in (kg or liter)	1.11	276.19	306.57 (0.52%)
11	Growth regulator (liter)	1.01	552.13	557.65 (0.74%)	Growth regulator in (liter)	1.03	552.13	568.69 (0.96%)
12	Pesticides (100ml packet)	1.69	1488.11	2514.91 (3.32%)	Pesticides (100ml packet)	1.78	1488.11	2648.83 (4.46%)
13	Fungicides (200g packets)	1.24	252.00	312.48 (0.41%)	Fungicides (200g packets)	2.21	252.00	556.92 (0.94%)
14	Land revenue			50 (0.07%)	Land revenue			50 (0.08%)
15	Depreciation			489.00 (0.65%)	Depreciation			2614 (4.40%)
16	Interest on working capital @7% per annum appertained for 6 months			2221.59 (2.93%)	Interest on working capital @7% per annum appertained for 6 months			1983.03 (3.34%)
17					Transportation cost			4712 (7.94%)
	Cost A (summation of 1 to 16)	59048.91 (77.91)	Cost A (summation of 1 to 17 particulars)	44007.22 (80.50)				
18	Rental value of land			12240.55 (16.15%)	Rental value of land			5500 (9.27%)
19	Interest on fixed capital @12% per annum appertained for 6 months			1020.05 (1.35%)	Interest on fixed capital @12% per annum appertained for 6 months			458.33 (0.77%)
20	Cost B (Cost A+18+19)			72309.51 (95.40%)	Cost B (Cost A+18+19)			54737.74 (92.22%)
21	Family men labour	5.66	400	2264 (2.99%)	Family men labour	7.66	400	3064 (5.16%)
22	Family women labour	4.88	250	1220 (1.61%)	Family women labour	6.22	250	1555 (2.62%)
23	Total family labour			3484 (4.60%)	Total family labour			4619 (7.78%)
24	Cost C (Cost B+22)			75793.51	Cost C (Cost B+22)			59356.74
25	Gross returns	Gross returns						
26	Main product onion seed yield in quintals	2.18	85000	185300.00	Main product onion seed yield in quintals	62	1400	86800
27	Farm business income (GR-Cost A)			126251.09	Farm business income (GR-Cost A)			38020.59
28	Family labour income (GR-Cost B)			112990.49	Family labour income (GR-Cost B)			32062.26
29	Net returns (GR-Cost C)			109506.49	Net returns (GR-Cost C)			27443.26
30	Benefit cost ratio			2.44	Benefit cost ratio			1.46

Conclusion

The study revealed that the Net returns accrued to onion growers was relatively higher at Rs 1,09,506.49 in case of seed production compared to onion bulb production (Rs 27443.26). Family business income accrued to onion growers was relatively higher at Rs 1,26,251.09 in case of onion seed

production compared to onion bulb production (Rs 38020.59). The economic efficiency of onion seed production reflected in benefit cost ratio was higher at 2.44 compared to 1.46 in case of onion bulb production. Hence, the seed production proved to be economically efficient compared to bulb production. To reduce the cost of cultivation there is need for improving the

participatory approaches cooperative marketing, training on seed production to enhance the technical knowledge farmers and efficient use of inputs.

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