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Economics of production and constraints in pomegranate cultivation in Vidarbha region of Maharashtra

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Abstract

Maharashtra is known as Fruit bowl of India. Pomegranate cultivation today is a highly captivating and remunerative business for farmers in India with promising monetary return from this crop has resulted in increase in area and production of pomegranate. The present investigation focused on "Economics of Production and Constraints in Pomegranate Cultivation in Vidarbha region of Maharashtra". Per hectare establishment cost is worked out to ₹ 87421.07. Per hectare overall cost of cultivation of pomegranate was worked out to ₹ 121170.33. While overall benefit – cost ratio was worked out to be 2.14. The expenditure on intercultural operations and irrigation charges showed the decreasing trend from first to third year. As the age of orchard increases, the expenditure on intercultural operations and irrigation charges decreases. The fertilizers as well as hired human labour cost increases as age of orchard increases. Similarly there was increasing trend in the case of cost item like micronutrients, growth regulators and plant protection. Major constraints in pomegranate production were high cost of inputs, non availability of skilled labour, lack of technical knowledge, high labour cost and non availability of quality planting material.

Keywords: Pomegranate, production, constraints

Introduction

Horticulture marketing define as finding out what your customers want and supplying it to them at a profit therefore involves: identifying buyers, understanding what they want in terms of products and how they want to be supplied, operating a production-marketing chain that delivers the right products at the right time and making enough profit to continue to operate (Dastagiri, 2017) ^[7].

The pomegranate might be one of the most attractive fruits with its royal crown and deep red color. However, its unique look and rich color only show the outward appearance of this super fruit. Its sweet-sour flavor and high antioxidant content are more reasons why manufacturers and consumers alike are mesmerized by the pomegranate (University of Florida: IFAS - Extension, 2013).

The total production of pomegranate is concentrated mainly in the Western Maharashtra, Karnataka, Gujarat, Andhra Pradesh, Tamil Nadu and Rajasthan in India. Maharashtra is the leading State with 82 thousands hector area under pomegranate cultivation, followed by Karnataka and Gujarat with 13.6 thousand ha and 5.8 thousand ha respectively, Andhra Pradesh and Tamil Nadu stood at fourth and fifth position with 2.8 and 0.5 thousand ha of pomegranate cultivation in India (National Horticulture Board, 2011).

India is an agricultural country where 65 Per cent population is dependent on agriculture. This forms the main source of income. Fruits have been the means food from time immemorial. Fruit culture has been practiced in India since ancient times the mughals established many mango, orchards all over the country these art later on gradually civilized into skillful and intensive forms of land utilization Fruit culture contributes to the aesthetic sides of rural home life.

Agriculture continues to be the mainstay of our economy as it occupies the central place in rural life. Horticultural industry is fast emerging and the most remunerative sector. Horticultural crops are characterized by high productivity, higher returns, higher potential for employment generation and exports, comparatively lower requirement of water and easy adaptability to adverse soil and waste land situations. Pomology (cultivation of fruits) is one of the important branch of horticulture and fruits are the man's oldest food. Indian Council of Medical Research (ICMR) has recommended the consumption of at least 92 grams of fruits per day and as much variety as the season permits. On the contrary, the per capita consumption of fruits in India is only 46 grams per day.

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This indicates the wide gap between the use and requirement of fruits. The major fruit crops grown in India are mango, banana, citrus, grapes, guava, Papaya, sapota, pomegranate, jack, ber, aonla etc.

It is well known that man cannot live on cereals or pulses alone. To supplement normal body requirements, it has been suggested by the world health organization (WHO) that a working man should take at least 60 gm of fruit per day in addition to cereals, pulses, milk, vegetables, eggs, etc. Fruits are chief source of vitamins, without which human body cannot maintain proper health and resistance to disease. They also contain minerals, salts, the deficiency of which can lead to disturbances of metabolism resulting in ill health. Many fruits are also considered to possess specific medicinal value. For all the reason, the use of fruits in our daily diet is imperative.

Fruits and vegetables are the prime sources of vitamins and minerals without which human body cannot maintain proper health to resist the diseases, their role in improving the environment and aesthetic value is an added advantage. Important fruits grown in India are mango, banana, citrus, guava, apple, pine apple, grape, pomegranate and ber. Today, India ranks first in the world with respect to production, having global share of 10.1 percent. According to ICMR a balanced diet should have 90 gram of fruits per head per day. However, on an average, Indian diet has only 46 gram of fruits (Kaul, 1990). It is a matter of concern and calls for efforts to boost fruit production. India are endowed with wide agro climatic conditions that offer immense scope for cultivation of various kinds of fruit crops. This provides an excellent platform for the country to emerge as a leading producer of fruit crop. In India, the total area under fruit crops was 1.12 million hectares in 1951-52 and increased to 6.13 million ha and the production of fruits has also increased from 11.7 million tonnes in 1950 to 59.29 million tonnes in 2007-08 and in 2011-2012 it was 6.6 million hectares and 75.8 million tones.

Indian scenario

According to the data published by National Horticulture Board of India there is undersized decrease in the area of pomegranate cultivation in India from 109.00 thousand ha in 2008-09 to 107.00 thousand ha in 2010-11, similarly, the production has decreased from 807.00 thousand tones to 743.00 thousand tones during the same period.

Position of pomegranate in Maharashtra

Maharashtra is known as Fruit bowl of India. The best quality of Pomegranates which is produced in India is called 'Bhagawa'.

The commercial local varieties of pomegranate are Dholka, Alandi, Muskat, Ganesh, Bhagwa, Mrudula and Arakta. The flesh of dholka is pinkish white, seeds are soft but juice is more acidic, Muskat has slight pinkish flesh, soft seeds and good sized fruits. The flesh of Bhagwa is red and seeds are also red. This variety popular in sangola in solapur district. Cheema (1954) evolved a superior variety namely Ganesh (GBG.1) by method of seedling selection from the seedling selection from the seedling raised from the seed of Alandi variety. Ganesh variety possesses pink, flesh, soft seeds and sweet agreeable taste by the cultivators in Maharashtra and popular in Solapur, Satara, Buldhana and Pune district. Pomegranate is an important fruit crop of Maharashtra. It is cultivated in an area of 43151 ha with a total production of 431510 tones producing about 85 percent of total Indian

production, there by leading in pomegranate production in the country. Within Maharashtra, production of pomegranate is mainly concentrated in western Maharashtra region and marathwada region. The variety Ganesh, bhagwa (Red Ruby) cultivated in Maharashtra is suitable for export purposes. At present fair amounts of pomegranate takes place from the state in reefer containers by sea.

Patil and Sanghavi (1977), Patil and Karale (1990) characterized three flowering seasons in pomegranate under Maharashtra condition, though flowering could observed all the year around under irrigated conditions. They are

- i. June-July (Mrig bahar) coinciding with the break of Monsoon.
- ii. February-March (Ambia bahar) and
- iii. September-October (Hast bahar)

Importance of pomegranate in human life

Pomegranate is being rated as one of lifes miracle foods. Pomegranate is derived from latin word pomum ("apple") and granatus ("seeded"). This has influenced the common name for pomegranate in many languages (e.g. germen granatapel, seeded apple). The pomegranate has been held sacred by many of the world's major religions. It has been revered through the ages for its medicinal properties.

Objectives

1. To study the economics of pomegranate production of selected pomegranate growers.
2. To study the constraints in pomegranate production.

Methodology

The present study is undertaken with the aim to study the economic analysis of production and marketing of pomegranate in Washim district. The object of any scientific investigation is to draw the useful conclusion in the light of objective of the study. In order to arrive the meaningful conclusion it is essential to the investigator to adopt appropriate method and procedure. Keeping this in view, this chapter has been devoted to explain the methodology adopted, to fulfill the objectives of the study.

Sampling Techniques

Data for the present study were collected from Washim district. The selection of tahsils was purposely made taking into consideration the availability of data and concentration of pomegranate in the district. The sampling technique adopted for this study was two stage random sampling. The selection of area considered as primary unit and selection of farmer as secondary unit.

Source of data

Study is based on primary data collected from selected farmers and Washim market. Farmers from villages under consideration will be selected randomly. The survey method was use to collect data. The specially designed schedule were filled through personal interview of the selected farmers.

A. Selection of Area

Washim district of Maharashtra state was selected for the study of economic analysis of production and marketing of pomegranate. For this study two tahsils viz., Mangrulpir and Manora from washim district were selected. Three villages were selected from each tahsil. 90 farmers from these villages were selected for the study.

B. Selection of farmers

Selection of pomegranate cultivators was based on number of years of establishment of orchard. Three groups were made as group I (1 to 3 years) included 47 farmers, group II (3.1 to 8 years) included 36 farmers and group III (Above 8 years) included 7 farmers.

Table 1: Tahsilwise distribution of selected pomegranate cultivators

S. No.	District	Tahsil	No. of selected growers	Percentage
1.	Washim	1.Mangrulpi Tahsil	45	50.00
		2.Manora Tahsil	45	50.00
		Total	90	100

Method of data collection

All the relevant data required for working out establishment cost, cost of cultivation of pomegranate, marketing and constraints faced by pomegranate growers was collected by survey method with help of schedule designed specially for the purpose. Collection of data was done by personal interview of all selected pomegranate growers. Information pertaining to input structure, expenditure and yield were collected for the year 2011-2012. For the purpose of estimating production cost of Pomegranate only Group II and Group III has been considered.

Analysis of data

Analytical tools

For cost and return analysis

The standard cost concept i.e. cost 'A', cost 'B', cost 'C' were used. This analytical part of research work is mainly confirmed to:

- Estimation of cost 'A', cost 'B', and cost 'C'.
- Cost of production of pomegranate.
- Net returns over cost 'A', cost 'B', and cost 'C'.
- cost benefit ratio.

a) Establishment cost

Establishment cost is the cost incurred for establishment during first year. While maintenance cost incurred from second year to the bearing stage (upto 3rd year) was worked out.

b) Cost of production

Cost of production was divided into indirect cost and direct cost.

Indirect cost

Indirect costs include the rental value of land, annual share of establishment cost, interest on fixed and working capital, depreciation and repair charges.

Direct cost

Direct cost includes all pockets out expenses.

Cost 'B' was worked out which include all the cost both fixed and variable i.e. direct and indirect cost.

Cost 'C' was worked out by adding family labour charges.

Cost of cultivation and marketing of pomegranate was studied as per following three groups made on the basis of age of pomegranate.

Table 2: Distribution of selected pomegranate growers in different groups.

S. No.	Groups	No. of growers	Total area (ha)	Average Area (ha)
1.	Group I	47 (52.22)	33 (53.63)	1.09
2.	Group II	36 (40)	20 (32.45)	0.84
3.	Group III	7 (7.7)	8.53 (13.86)	0.52
	Total	90 (100)	61.53 (100)	

(Figures in parenthesis indicate percentage to total)

Group 1 - Up to 3 Years, Group 2 -3.1 to 8 Years and Group 3 -Above 8 Years

Cost 'A'

It is an actual paid out cost by cultivator in the form of cash and kind. It approximates the actual expenditure incurred by the farmers. This cost includes the expenditure on following items.

Cost A

It is actual paid out cost by cultivator. Cost A includes expenses on all variable item as follows.

- Hired human labour
- Bullock labour (own/hired)
- Machine charges
- Manures
- Seed
- Fertilizers
- Plant protection measures
- Supervision charges
- Irrigation charges
- Land revenue
- Depreciation cost
- Repairing cost
- Interest on working capital @ 6 per cent per annum.

Cost 'B'

If the amount invested in purchase of land would have been put in some other long term enterprise or in a bank, it would have yielded some return or interest. But due to the investment of the amount in purchase of land, the farmer has to part with the return or interest that he would have otherwise gained. And as such, this lost is considered as cost, it is called as rental value of land. Similarly, the hypothetical interest that the capital invested in farm business would have earned if invested alternatively, is also considered as cost. It is called interest on fixed capital. Rental value of land and interest on fixed capital represent imputed cost which are added to cost A.

Cost 'B' = Cost A + rental value of land + Interest on owned fixed capital + Amortization Cost

Cost 'C' = cost B + imputed value of family labour.

Hired human labour

The hired human labour both male and female was evaluated on the basis of actual wage rates paid to them for various operations.

Bullock labour

- Owned bullock labour was evaluated on the basis of hiring out rates, prevailing in the village for bullock pairs, from time to time.
- In case of hired bullock labour the actual hiring rate from time to time were considered.

Machinery charges

a) The owned machine labour was evaluated on the basis of the hiring out rate prevailing in the village for the machine from time to time.

Manures

In case of purchased farm yard manure (FYM), it was charged at actual price paid by the cultivator and manure prepared on own farm was evaluated at prevailing market rate in the locality.

Fertilizers

The cost of fertilizers was worked out on the basis of actual expenses incurred by the farmers for purchasing it including the transportation costs.

Value of seedling (planting material)

In case of such purchased seedlings, it was charged at actual price paid by the cultivator and the seedling prepared from own seed material was evaluated at the prevailing market rate in the locality.

Irrigation charges

In case of irrigation charges the electric bill paid by cultivator was considered and the proportionate charges were considered on the basis of area under individual crop.

Plant protection

This includes the actual cost paid for the insecticide, fungicide etc.

Land revenue

It includes actual land revenue paid by the growers for the total land holding. The land revenue by gross cropped area of respective crop.

Depreciation

Depreciation of farm implements, machinery farm buildings, irrigation structure and livestock (only draft animal) was calculated by straight line method and proportionate charges were considered on the basis of area under the individual crop. Depreciation was calculated by following formulae.

$$\text{Amount of annual Depreciation} = \frac{\text{Purchase price of asset} - \text{Junk value}}{\text{No. of useful years (Expected life)}}$$

Establishment cost per year

The Pomegranate plants are planted in the field. They are required carefully attention till bearing stage. Establishment period is the period which include from planting as well as maintenance up to bearing. The cost required for various expensive items in the whole establishment period is called Total cost of production. The commercial production of Pomegranate starts after 3 years. The farmer has to incur expenditure on preparatory tillage, planting material, interculturing, maturing and irrigation etc. The cost incurred for 3 years. In the establishment cost of and orchard i.e. cost incurred for establishment during first year and maintenance cost incurred from second year up to bearing was worked out. The cost of establishment of pomegranate will be worked out on the basis of the data to be generated from the sample selected for the purpose. The life period of Pomegranate is about 20 years from the first commercial bearing. Therefore the entire establishment of orchard is proposed to be

distributed over the productive life period of the orchard i.e. 20 years. In this case calculation of amortized value was done by decreasing plan method. This amortization value is to be calculated by mean of formulae given below.

$$\text{Amortized cost (a)} = \frac{Ar(1+r)^n}{(1+r)^{n-1}}$$

Where,

A=Establishment

r =Rate of Interest

n =Remaining life of orchard.

Miscellaneous charges

Items which are not included above, but the actual expenses incurred, were added to miscellaneous charges.

Interest on working capital

The interest on working capital was charged at rate of 6 per cent per annum.

Rental value of land

It was estimated at the rate of 1/6th of total produce. It is calculated by following formulae

$$\text{Rental value of land} = 1/6 \times \text{gross income}$$

Interest on fixed capital

The interest on average value of fixed assets (excluding land) such as farm building, implements, machinery, draft animal, irrigation structure and equipments are charged were considered on the basis of area under the individual crop.

Input value of family labour

Wages for the work done by the family male and female labour are imputed on the basis of average wage rate prevailing in the locality.

Measures of income**Gross income**

Gross income is the total value of both main and byproduct calculated by using farm harvest price.

Farm business income

The difference between gross income and cost A (profit at cost A)

Family Labour income

The difference between gross income and cost B (profit at cost B) represent the income to the farmers on account of his own and family labour.

Net income or profit

The difference between gross income and cost C (profit at cost C) represent the net income.

Input output ratio

B:C ratio will be worked out with reference to cost A, cost B, and cost C.

$$\text{Cost - Benefit Ratio at cost A} = \frac{\text{Gross Income (C)}}{\text{Cost A (C)}}$$

$$\text{Gross Income (C)}$$

$$\text{Cost - Benefit Ratio at cost B} = \frac{\text{Gross Income (₹)}}{\text{Cost B (₹)}}$$

$$\text{Cost - benefit ratio at cost C} = \frac{\text{Gross Income (₹)}}{\text{Cost C (₹)}}$$

$$\text{Cropping intensity} = \frac{\text{Gross cropped area}}{\text{Net cropped area}} \times 100$$

Cropping intensity

It is calculated by following formulae

Results and discussion

I. Cost of establishment of pomegranate orchard

The per hectare use of different inputs for establishing the pomegranate orchards is presented in Table 2.

Table 2: Per hectare cost of establishment of pomegranate orchard (ha⁻¹)

S. No	Particulars	I st year	II nd year	III rd year	Total
1	Preparation of land	4513 (8.30)	-	-	4513 (4.6)
2	Digging and filling of pits	6713.3 (12.34)	-	-	6713.3 (6.8)
3	Planting material	2315.56 (4.26)	-	-	2315.56 (2.35)
4	Transplanting	3115 (5.73)	-	-	3115 (3.16)
5	Manures and fertilizers	10754.9 (19.77)	11745.9 (54.5)	12245.9 (53.89)	34737.7 (35.20)
6	Irrigation charges	2124 (3.90)	1980 (9.2)	2480 (10.91)	6584 (6.7)
7	Drip irrigation	17000 (31.25)	750.25 (3.48)	1269.35 (5.59)	19019.6 (19.27)
8	Intercultural operations	6091.1 (11.20)	5591.5 (25.93)	5091.1 (22.40)	16773.7 (17.00)
9	land revenue and cesses	100 (0.18)	100 (0.46)	100 (0.44)	300 (0.30)
10	Interest on working capital @ 6 %	1678.5 (3.1)	1400 (6.5)	1539.25 (6.8)	4614.75 (4.7)
11	Total Establishment cost	54405.36 (100)	21567.65 (100)	22725.56 (100)	87421.0 (100)

Table 2 showed that the per hectare cost of establishment of pomegranate orchard was worked out to the ₹ 87421.07. This cost was total expenditure on pomegranate orchard from first to third year. The establishment cost for first year was ₹ 54405.36 in which major expenditure incurred was on drip irrigation (31.35 %) manures and fertilizers (19.77 %) which was followed by digging of pits (12.34 %), intercultural operation (11.20 %), preparation of land (8.30 %) and planting material (4.26 %) respectively. The establishment cost of second year and third year (can be called as maintenance cost) was worked out to ₹ 21567.65 and ₹ 22725.56 respectively. The major expenditure items in this cost was manures and fertilizers followed by intercultural operations and preparation of land, respectively. The major expenditure at second year was done on manures and fertilizers, intercultural operations and irrigation charges which were accounted to ₹ 11745.9, ₹ 5591.5 and ₹ 1980, respectively.

It was observed from table 2 that the expenditure on intercultural operations and irrigation charges showed the decreasing trend from first to third year. As the age of orchard increases, the expenditure on intercultural operations and irrigation charges decreases.

II. Labour utilization for maintenance of pomegranate

Per hectare operation wise labour utilization for maintenance of pomegranate orchard is given in Table 3.

Table 3 reveals that the total labour days required to do various operations for maintenance of pomegranate orchard in

case of Group II was 82 days, 25.5 days, 45.1 days and 28.3 days of hired male, hired female, family male and family female labours, respectively. The total labour requirement of Group II was 126.8 days and 53.8 of male and female, respectively.

In case of Group III labour utilization was 59.94 days, 18.63 days, 29.2 days and 20.31 days of hired male, hired female, family male and family female labours, respectively. The total labour requirement of Group III was 222.64 days and 75.33 of male and female, respectively.

At overall level, per hectare total labour required for maintenance of pomegranate orchard was 308.69 man days out of which maximum man days were required for plucking the fruits 89.04 mandays, for watching 55.2 mandays, for weeding 20.7 man days and for preparation of market 64.85 mandays, respectively.

III. Cost of cultivation of pomegranate orchard

Cost of cultivation of pomegranate was calculated by using standard cost concepts and same is presented in Table 4. From Table 4 it was observed that at overall level per hectare total cost i.e. Cost 'C' worked out to ₹ 121170.33, while it was ₹ 132427.4 and ₹ 109913.27 in case of Group II and Group III respectively. Among the items of costs, the expenditure on hired human labour was ₹ 18950 and ₹ 13851 in Group II and Group III, respectively. At overall level it was worked out to ₹ 16400.5.

Table 3: Per hectare operation wise labour utilization of pomegranate orchard (Figures in labour days)

S. No.	Operations	Group II						Group III				Total				Total	%		
		Hired labour		Family labour		Total labour		Hired labour		Family labour		Total labour		Hired labour				Family	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F			M	F
1	Application of manure	6	0	4.3	0	10.3		4.6	0	2.3	0	6.9	0	4.6	0	2.3		17.2	5.6
2	Application of fertilizers	5.8	12.5	3.3	3.2	9.1	15.7	4.9	8	2.1	2	7	10	17.7	35.1	10.1	9.4	41.8	13.5
3	Weeding				11.3	0	11.3				9.4	0	9.4	0	0	0	33.4	20.7	6.71
4	Supervision	30		0		30.2	0	25				25	0	89.2	0	0	0	55.2	17.88
5	Pruning	6.8		5.4		12.2	0	4.4		3.3		7.7	0	19.5	0	14.9	0	19.9	6.45
6	Plucking	21	6.2	20.6	7.4	41.3	13.6	11.34	4.6	12.9	5.3	24.24	9.9	55.94	19	57.8	20.9	89.04	28.8
7	Preparation for market	12	6.8	11.5	6.4	23.7	13.2	9.7	6.03	8.61	3.61	18.31	9.64	35.7	21.23	32.7	17.5	64.85	21.0
	Total	82	25.5	45.1	28.3	126.8	53.8	59.94	18.63	29.2	20.31	89.15	38.9	222.64	75.33	118	81.2	308.69	100

Table 4: Cost of cultivation of pomegranate orchard (ha⁻¹)

S. No.	Particulars	Group II			Group III		Overall	
		Units	Quantity	Value	Quantity	Value	Quantity	Value
1	Hired Human Labors							
	i) Male	Days	82	16400 (12.38)	59.94	11988 (10.90)		14194 (11.64)
	ii) Female	Days	25.5	2550 (1.92)	18.63	1863 (1.69)		2206.5 (1.80)
	Total	Days	107.5	18950 (14.30)	78.57	13851 (12.60)		16400.5 (13.45)
2	Bullock labour							
	i) Hired	Days	1.57	710 (0.53)	1.82	760 (0.69)	1.69	735 (0.61)
	ii) Own	Days	2.1	746.66 (0.56)	2.28	797.22 (0.72)	2.19	771.94 (0.64)
3	Manures	Cls	2.06	2394 (1.80)	1.98	1068 (0.97)	2.02	1731 (1.38)
4	Fertilizers	Kg	9.68	7707.00 (5.81)	14.42	7716.29 (7.02)	12.05	7711.64 (6.41)
5	Micronutrients	ppm		400.33 (0.30)		428.11 (0.38)		414.22 (0.34)
6	Growth regulators			415.42 (0.31)		426.11 (0.38)		420.76 (0.34)
7	Irrigation Charges	Freq.		903.33 (0.68)		971.43 (0.88)		937.38 (0.78)
8	Land Revenue	`		100 (0.07)		100 (0.09)		100 (0.08)
9	Depreciation	`		429.32 (0.32)		311.66 (0.28)		370.49 (0.3)
10	Working capital			20200.23 (15.25)		12628.51 (11.48)		16414.37 (13.36)
11	Interest on working capital @ 6%	`		2196.02 (1.65)		757.71 (0.68)		1476.86 (1.16)
12	Plant protection	`		5688.88 (4.29)		6565.43 (5.97)		6127.15 (5.13)
	COST 'A'			60841.19 (45.94)		46381.47 (42.19)		53611.33 (44.06)
13	Rental value of land 1/6 th of gross produce	`		44444.44 (33.56)		41614.28 (37.86)		43029.36 (35.51)
14	Interest on fixed capital @ 10 %	`		2266.67 (1.71)		1622.86 (1.47)		1944.76 (1.32)
15	Amortization cost	`		13025.10 (9.83)		12423.66 (11.30)		12724.38 (10.56)
	COST 'B'			120577.40 (91.05)		102042.27 (92.83)		102343.17 (91.94)
16	Family human Labours							
	Male	Days	45.1	9020 (6.71)	29.2	5840 (5.31)		7430 (6.01)
	Female	Days	28.3	2830 (2.13)	20.31	2031 (1.84)		2430.5 (1.98)
	COST 'C'			132427.4 (100)		109913.27 (100)		121170.33 (100)
17	Yield (qtls)	Qtls		55.26		74.57		64.91
18	Per quintal cost of production	`		2071.91		1473.96		1772.93

(Figures in parentheses indicate percentage to the cost 'C')

Table 5: Economics of pomegranate orchard (₹/ha.)

S. No.	Groups	Cost of cultivation at (₹/ha.)			Gross Income (₹/ha.)	Net income at (₹/ha.)			Input output ratio		
		Cost 'A'	Cost 'B'	Cost 'C'		Cost 'A'	Cost 'B'	Cost 'C'	Cost 'A'	Cost 'B'	Cost 'C'
1	Group II	60841.19	120577.70	132427.4	266666.66	205825.47	146088.96	134239.26	4.38	2.21	2.01
2	Group III	46381.47	102042.27	109913.27	250285.71	203904.24	148243.44	140372.44	5.39	2.45	2.27
3	Overall	53611.33	102343.17	121170.33	258476.18	204864.85	147166.14	137305.85	4.88	2.33	2.14

At overall level the major cost items were fertilizers accounted to ₹ 7717.64 which was 6.41 per cent of total cost of cultivation. The next item of expenditure was plant protection ₹ 5688.88 and ₹ 6565.43 in Group II and Group III, respectively. At overall level plant protection expenditure was 6127.15 accounted to 5.13 per cent. At overall level hired and owned human labour combine accounted to ₹ 16400.5 which accounted to 13.45 per cent. The micronutrient and growth regulator accounted to ₹ 414.22 and ₹ 420.76 which accounted to 0.34 per cent and 0.34 per cent respectively. Land revenue and depreciation was worked out to ₹ 100 and ₹ 370.49 accounted to 0.08 per cent and 0.3 per cent, respectively. Interest on working capital, rental value of land and interest on fixed capital was worked out to ₹ 1476.86, ₹ 43029.36 and ₹ 1944.76 which accounted to 1.16 per cent, 35.51 per cent and 2.94 per cent, respectively.

From above discussion we can conclude that in cost of cultivation of pomegranate, the fertilizers as well as hired human labour cost increases as age of orchard increases. Similarly there was increasing trend in the case of cost item like micronutrients, growth regulators and plant protection.

IV. Economics of pomegranate orchard

The per hectare gross returns of pomegranate in Group II and

Group III was ₹ 266666.66 and ₹ 250285.71, respectively. And at overall level, the per hectare gross returns was found to be ₹ 258476.18. The net returns obtained from pomegranate at cost 'C' was ₹ 134239.26 and ₹ 140372.44 per hectare from Group II and Group III, respectively and at overall level it was ₹ 137305.85 per hectare.

The benefit cost ratio indicates the return from each rupee investment in pomegranate cultivation. The result revealed that the return at cost 'A' highest in Group III i.e. 5.39 and at Group II it was worked out to 4.38. B:C ratio at overall level at cost 'A' was 4.88. At overall level B:C ratio at cost 'B' was 2.33. B:C ratio at cost 'C' was highest in Group III as compared to Group II i.e. 2.27. At overall level B:C ratio at cost C was 2.14.

V. Constraints in production

The quality and quantity of production depends upon the proper use of inputs. Inputs are vital factor in any production process. High cost of these inputs is major constraints which were accounted to 94.44 at overall level. While for Group I, II and III it was 100, 86.11 and 100 per cent respectively. Non availability of skilled labour for various operations in production process was another major constraint at overall level which accounted to 32.22 per cent.

Table 6: Constraints faced by pomegranate growers in production

S. No.	Particulars	Group I (N=47)	Group II (N=36)	Group III (N=7)	Total
1.	High cost of inputs	47 (100)	31 (86.11)	7 (100)	85 (94.44)
2.	Non availability of skilled labour	25 (54.32)	27 (75)	3 (42.85)	55 (61.11)
3.	Lack of Technical knowledge	38 (80.85)	31 (86.11)	7 (100)	76 (84.44)
4.	High labour cost	42 (89.36)	33 (91.66)	7 (100)	29 (32.22)
5.	Non availability of quality planting material	29 (61.70)	-	-	29 (32.22)

Lack of technical knowledge about production process was the constraints faced by 84.44 per cent growers at overall level. In Group I, II and III it were 80.85 per cent, 86.11 per cent and 100 per cent, respectively. Non availability of quality planting material was another constraint expressed by 61.70 per cent growers in Group I.

Conclusions

1. Per hectare establishment cost for pomegranate orchard is worked out to be 87421.07.
2. Per hectare overall cost of cultivation of pomegranate was worked out to ` 121170.33 while overall benefit – cost ratio was worked out to 2.14.
3. The expenditure on intercultural operations and irrigation charges showed the decreasing trend from first to third year. As the age of orchard increases, the expenditure on intercultural operations and irrigation charges decreases.
4. In the cost of cultivation of pomegranate, the fertilizers as well as hired human labour cost increases as age of orchard increases. Similarly there was increasing trend in the case of cost item like micronutrients, growth regulators and plant protection.
5. Major constraints in pomegranate production were high cost of inputs, non availability of skilled labour, lack of technical knowledge, high labour cost and non availability of quality planting material.

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