

# Cost, Yield, Profit Analysis of Pomegranate Variety in Dhule District (M. S.) India

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**Abstract:** Horticulture is the best way for rural economic empowerment. It is necessary for the homogeneous development of the farmers. Not only the longest growth period of fruit plants but also their specific biological and environmental requirements play a major role in their location over the earth's surface. Maharashtra state is popularly known as the 'fruit bowl' of India. (Kunthe Y. N. – 2006). The pomegranate fruit crop favors the arid and semi-arid tropical climates in India. Dhule is the leading district in growth and production of pomegranate fruit in Maharashtra. The discussion in research revealed the fast areal growth of pomegranate orchard in study area. Pomegranate crop is one of the alternatives of farming which succeed to grow in all climatic and semi-arid regions. Economics of pomegranate variety analysis of Dhule district is considered for the present study. Bhagawa is high yielding characteristics, this variety is mostly preferred by the growers i.e., found planted by as much as 248 (75.6 %) respondents. Aarakta variety of pomegranate is extremely drought tolerant. It ranked second for the preference about 18.6% respondents were found adopted this variety. Average productivity of this variety is good about 9.1 tons/ ha was harvested by respondents i.e., slightly lower than as compared to topmost Bhagawa variety (9.6 tons/ha). Ganesh is the oldest variety; only 4 orchards (0.6 %) of this variety were found and sampled during field survey. Although Mrudula is new improved variety but it was not found successful in giving the yields i.e., lowest yields (8.8 tons/ha) with poor quality of fruits were harvested.

**Index Terms:** Pomegranate, Variety, Cost, Yield, Profit Analysis and CBR

## I. INTRODUCTION

Pomegranate variety planted by grower would possess the combination of desired features such as higher yields, good size of fruits, sweet in taste, bright red aril and skin colour in order to get higher consumer preference and better prices in market. Besides, it should have resistance to biotic (insect, pests, diseases) and abiotic stresses (fruit splitting, sun scorching) for reducing production cost and yield losses. All such agronomic characteristics determine the marketability as well as profitability of the variety. In view of the above facts, the efforts are being made in the present section to examine economical aspects viz.

quality of fruits, gross yield and profitability of four pomegranate varieties commonly grown in the study region. The fundamental objective of the study is the economics of pomegranate variety through cost, yield, and profit analysis. With the help of primary and secondary data from the various sources of Dhule district.

Impact of biological and physical factors on variety of pomegranate, it determines the yield, cost and return structure of pomegranate crop is evaluated and analyzed. The study aims the pomegranate variety analysis for which the sample survey method has been used for the present paper. Micro level analysis proves that new improved high yielding varieties viz. Bhagwa and Arakta having larger consumer preference to fetch good price in market and brought better net returns to growers. The highest CBR (1:2.2) is found for Bhagwa variety. Then second higher CBR was recorded in 1:2.1 the Arakta variety is favorable for production of pomegranate. In contrast, least demand for the fruits of Ganesh and Mridula variety has resulted into net profits of growers. Even Mridula is also new variety of pomegranate but cultivation didn't find it improved regarding yield and fruit quality (Koujalgi C. et al., 2012)

## II. DEMARCATON OF THE STUDY REGION

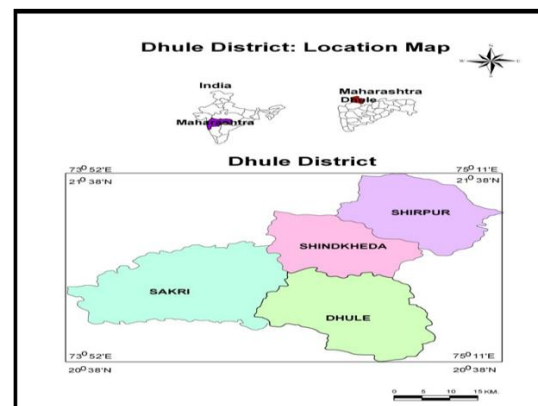


Fig.1.Lokation Map of Dhule District

The district of Dhule formerly known as west Khandesh, district headquarters since 1960. Lies between 20°38' to 21°23' North latitude and 73°47' to 75°11' East of longitude. It covers an area of 7195 square kilometers. As of 2001 Dhule had a population (2,050,862) of 1,054,031 Males constitute 51.39% of the population and 996,831 females 48.61%. Dhule district is mainly located in to the Panzara and Kan River basin area.

### III. OBJECTIVE AND HYPOTHESIS

- To comparative study pomegranate fruit variety in Dhule district.
- To analysis the economics of pomegranate variety through cost, yield, and profit

As per the various pomegranate fruit variety is considered, Pomegranate fruit variety is uneven yield, and profit to Farmers.

### IV. DATA COLLECTION AND RESEARCH METHODOLOGY

The entire geo-economic analysis in present study is based on the empirical data collected from various offices as well as through intensive field work, survey, interviews and discussions made with the pomegranate growers. The interview of growers was the only source to work out for the purpose of geo-economic analysis (Madhi Babaei, et al.,2012).

Since the study aims the geographical analysis the sample survey method has been used for the present research. The stratified random sampling method has been adopted for the selection of the villages and sample growers and data analyses have been done. Out of total, 5% villages and pomegranate growers having highest acreage area under pomegranate crop per tehasils were selected for the field survey. On the basis of cultivation pomegranate land holding the growers were out of sample growers, 50% were small growers, 30% medium and 20% were large land holders. The data analyzed with help of statistical techniques and all other information is represented by charts and graphs. The result of primary data analysis is summarized in the form of suggestions and conclusions.

### V. RESULTS AND DISCUSSION

Recently in study area, the pomegranate farms have come up with plantation of above improved varieties. Although the selection of particular variety is a vital decision of grower but commercialization of pomegranate crop also depends upon development of new improved varieties that would fetch better prices in the market. It resulted in developing promising selections of three new improved varieties of pomegranate viz. Arakta, & Mrudula as well as internationally demanded 'Bhagawa'. These four varieties are recommended for growing in agro-climatic conditions of Maharashtra. Since pomegranate variety planted by grower would possess the combination of desired features such as higher yields, good size of fruits, sweet in taste, bright red aril and skin colour in order to get higher consumer preference and better prices in market (. S. M. Patil et al.,1998)

Besides, it should have resistance to biotic (insect, pests,

diseases) and abiotic stresses (fruit splitting, sun scorching) for reducing production cost and yield losses. All such agronomic characteristics determine the marketability as well as profitability of the variety. In view of the above facts, the efforts are being made in the present section to examine economical aspects viz. quality of fruits, gross yield and profitability of four pomegranate varieties commonly grown in the study region. With this aim of study, the sampled orchards were grouped according variety of pomegranates planted by the respondents as given in table no.1.

Table No. I: Distribution of Sample Growers According to Pomegranate Variety

Sr No	Pomegranate Variety	No. of respondents				% of respondents
		Small	Medium	Large	Total	
1	Bhagawa	122	75	51	248	75.6
2	Aarkta	37	15	09	61	18.6
3	Ganesh	00	00	02	2	0.6
4	Mrudula	05	08	04	17	5.2
	Total	164	98	66	328	100

Source: Computed by researcher from field survey

An examination of table no.1 reveals that pomegranate varieties vary in reproductive capabilities so gross yield and its quality changed from one variety to another. Similarly, (Pratibha Tewari et al.,2014) able indicates pomegranate variety adopted by grower plays very crucial role in governing grade wise production discussed in detail as below.

Table No. 2 Variety Wise Yield and Quality Break up of Pomegranate Produce

Sr. No.	Pomegranate Variety	Quality breaks up of produce (tons/ha.)				Total production (tons/ ha.)
		Grade I	Grade II	Grade III	Grade IV	
1	Bhagawa	4.9	2.1	1.5	1.1	9.6
		51.0%	21.9%	15.6%	11.5%	100.0%
2	Aarkta	4.1	2.6	1.2	1.2	9.1
		45.1%	28.6%	13.2%	13.2%	100.0%
3	Ganesh	7.1	3.2	1.3	0.6	12.2
		58.2%	26.2%	10.7%	4.9%	100.0%
4	Mrudula	3.1	2.9	1.9	0.9	8.8
		35.2%	33.0%	21.6%	10.2%	100.0%
Regional Average		4.35	5.2	2.1	1.2	0.8
		50.32 %	55.9%	22.6%	12.9%	8.6%

Source: Computed by researcher from field survey

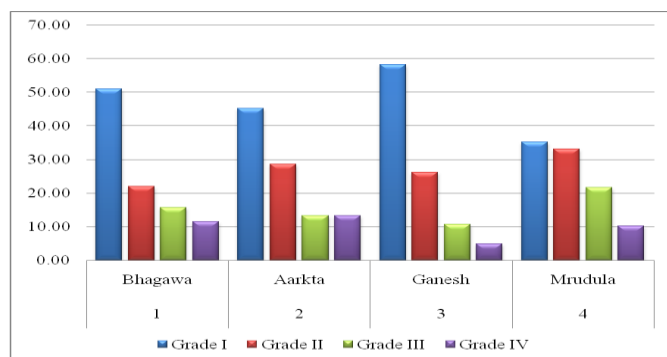


Fig.2. Variety wise Yield and Quality Break up of Pomegranate Produce.

#### A. Bhagawa

The 'Bhagawa' variety presently under commercial cultivation is known by different names viz. 'Shendari', 'Ashtagandha', 'Mastani', 'Jai Maharashtra', and 'Red Daina' in various parts of Maharashtra. Because of high yielding characteristic, this variety is mostly preferred by the growers i.e., found planted by as much as 248 (75.6 %) respondents obviously covered maximum area under cultivation of the sampled orchards. So, as it gives superior yields in case of better management. Highest average yields 9.6 tons/ha was obtained from this variety. The fruits of Bhagawa variety are popular for bigger size of fruits so also found superior with respect quality attributes. It yielded utmost proportion 51 % of Grade I fruits, 21.9% of Grade II and lower proportion of III and IV grade fruits when compared to regional averages (table no.2).

Although Bhagawa variety but it is heavy yielder but main disadvantage is that it requires more financial inputs. Since it takes maximum period for maturity 180 -190 days (6-7 months) whereas Ganesh, Mridula & Aarkta matures within 4-5 months.

#### B. Aarkta

The Aarkta is an early maturing soft seeded variety pre-released in the year 1989 by MPKV, Rahuri (M. S.) in the name of 'Phule Aarkta'. The Aarkta pomegranate set crops within 1½ years from plantation whereas bhagawa takes period of 2½ years. This variety of pomegranate is extremely drought tolerant. It ranked second for the preference about 18.6% respondents were found adopted this variety. Average productivity of this variety is good about 9.1 tons/ ha was harvested by respondents i.e., slightly lower than as compared to topmost Bhagawa variety (9.6 tons/ha). Although it sets heavy crop loads but indicated poor performance with respect to quality attributes. The variety produce medium to large sized fruits. And usually, average weight of fruit is 225 - 375 gm. As compared to regional averages, the lower percentages of Grade I (45.1%) and Grade II (28.6 %) fruits while higher percentages of Grade III and IV (13.2 %) respectively fruits were harvested from Aarkta variety orchards.

Comparatively, it is early maturing variety and fruits can be harvested in 4 to 5 months (120 to 150 days). The fruits of any pomegranate variety are usually plucked in 4-5 installments but interval between two installments is least for this variety i.e., 7-10

days. So that also minimizes the expenses on pesticide sprays and irrigation. Moreover, low suckering tendency (vegetative growth) of Aarkta variety trees also lowers down the labour cost on pruning. The fruits possess enviable fruit characters such as bright ruby or dark red skin, large rose-pink arils, high juice content, small sized soft seeds and high sugars content. It makes this variety popular for table purpose as well as processing especially pomegranate juice.

#### C. Ganesh

As stated earlier, this variety was released by Dr. Cheema in 1970 at 'Ganeshkhind' in Pune (M.S.) so named as 'Ganesh'. Basically, it expanded pomegranate cultivation all over the Maharashtra from 1971. But now Ganesh became old variety in the study area and replaced by new improved Bhagawa and Aarkta varieties. Since later varieties are found more profitable by cultivators than former (Ravikumar K. et al.,2011). As it is the oldest variety, only 4 orchards (0.6 %) of this variety were found and sampled during field survey. As well as these orchards were more than 15 years old as against 10 years average life span of pomegranate orchards in study region. Those old trees were fully developed and possessed good resistance capacity against biotic and abiotic stresses as compared to younger ones. Therefore, highest average yields (12.2 tons/ ha) were harvested from sampled orchards of Ganesh variety. In addition to it, table 6.12 reveals that the yields of Ganesh variety also satisfied the quality aspect i.e., it contained higher share of Grade I (58.2%) and Grade II (26.2%) fruits and lower percentages of Grade III (10.7%) and Grade IV (4.9 %) fruits as compared to regional averages.

As stated above sampled orchards were more than 15 years old in age, the saplings, organic manures, drip irrigation kits and other orchard equipment's were purchased at cheap rates. The fruits are medium to large size with smooth surface and yellowish red in colour, seeds are soft with white to pinkish in colour and juice is sour sweet in taste. However, Ganesh variety fruits have low demand for in the market compared to new improved Bhagawa and Aarkta varieties. The fruits fetched minimal prices; ultimately it dropped down net profits.

#### D. Mrudula

This variety is a hybrid of Ganesh X Gul-e-shah red varieties released by MPKV, Rahuri in the year 1994. It has all the characters of Ganesh variety except the arils are dark red in colour in Ambe & Mrig bahar while it is pink during the hasta bahar. Although it is new improved variety but it was not found successful in giving the yields i.e., lowest yields (8.8 tons/ha) with poor quality of fruits were harvested. As Compared to regional averages, yields of this variety contained lowest share of Grade I (35.2%) and Grade II (33 %) fruits in contrast highest share of Grade III (21.6%) and Grade IV (10.2%) fruits. It is early maturing (120 to 150 days) fruits of Mrudula variety are medium sized, smooth skin, dark red in color, blood red arils with very soft seeds, juicy, sweet in taste and high T.S.S. content. The average fruit weight is 250 -300 grams. But usually demand for fruits of this variety is limited so they were sold at lowest value in market.

Overall, above micro level analysis proves that new improved high yielding varieties viz. Bhagawa and Aarkta having

larger consumer preference so fetched good prices in market and brought better net returns to growers. In contrast, least demand for the fruits of Ganesh and Mridula variety has resulted into lowering down net profits of growers. Even Mridula is also new variety of pomegranate but cultivators didn't find it improved regarding yields fruit quality (Raj Ganguly et al.,2009).

### CONCLUSION

It could be concluded that investment in pomegranate orchard was economically feasible and financially viable in the study region. Netreturn is the earning power of money invested on pomegranate during its life span. The cost benefit analysis revealed that the net return was nearly double of the gross cost of capital invested in pomegranate enterprise. Therefore, investment on pomegranate orchard is a financially sound, profitable and in attractive prepositions." Micro level analysis proves that new improved high yielding varieties viz. Bhagwa and Arakta having larger consumer preference to fetched good price in market and brought better net returns to growers. The highest CBR (1:2.2) was found for Bhagva variety. Then second higher CBR was recorded in 1:2.1 the Arakta variety was favorable for production of pomegranate. In contrast, least demand for the fruits of Ganesh and Mridula variety has resulted into net profits of growers. Even Mridula is also new variety of pomegranate but cultivation didn't find it improved regarding yield and fruit quality.

All pomegranate varieties viz. Ganesh, Mridula, Arakta and Bhagawa have been found susceptible to the wilt disease. There is a need to develop of new pomegranate varieties resistant against the wilt disease. The research institutes should work in the direction. More research work is required to develop such resistant varieties. Because, it is not only the matter of disease resistant but also the suitable environmental conditions for its growth. It is possible to achieve success by utilizing biotechnological tools such as *molecular breeding, cloning of plants and micro-propagation*. Therefore, the development of disease resistant variety would receive centre stage in prioritization of pomegranate research programs.

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