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## Effect of different levels of pruning on yield of pomegranate (*Punica granatum* L.) cv. super Bhagwa

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**Abstract**

The present investigation entitled “Effect of different levels of pruning on yield of pomegranate (*Punica granatum* L.) cv. Super Bhagwa” was conducted on a well-established pomegranate orchard of five years age, spaced at 2.5 x 3 m at post- Gangapur, Taluka and District- Latur during 2017-2018. The experiment was laid out in a Randomized Block Design with 07 treatments viz., T<sub>1</sub> (10 cm pruning), T<sub>2</sub> (20 cm pruning), T<sub>3</sub> (10 cm pruning), T<sub>4</sub> (40 cm pruning), T<sub>5</sub> (50 cm pruning), T<sub>6</sub> (5 cm shoot tip pruning) and T<sub>7</sub> (control) with three replications. The framed experiment was concentrated to find out optimum level of pruning for getting high yield of pomegranate. The observations on yield of pomegranate were recorded. The maximum fruit weight (276.12 g) was noted under the treatment T<sub>5</sub> (50 cm pruning). The treatment T<sub>7</sub> (control) recorded significantly maximum number of fruits per tree (84.29). The maximum fruit yield per tree (17.50 kg), marketable yield per tree (15.83 kg) and yield per hectare (211.01 q), were noted under the treatment T<sub>2</sub> (20 cm pruning).

**Keywords:** Yield, pomegranate, pruning

**Introduction**

Pomegranate (*Punica granatum* L.) belong to the family punicaceae having chromosome number 2n = 16 or 18. It is one of the oldest known edible fruits and capable for growing in different agro-climates ranging from tropical to temperate regions of the world. However, it's major cultivation in tropical and sub-tropical regions. It is presumed that pomegranate was domesticated in the Middle East about 5000 years ago. Interestingly, it is considered to be one of the first five domesticated edible fruit crops along with fig, date palm, grape and olive. The scientific name *Punica granatum* is derived from the name (apple) Pomum (grainy) granatus or seeded apple. Pomegranate belongs to Punicaceae family contains a single genus Punica of two species, *Punica granatum* L. and *P. protopunica* Balf. f. The species *P. granatum* has two sub-species viz. *Chlorocarpa* and *Porphyrocarpa*.

Pomegranate is native of Iran and is extensively cultivated in Mediterranean countries like Spain, Morocco, Egypt, Afghanistan and Baluchistan. It is also grown to some extent in Burma, China, Japan, USA (California) and India. The total area under cultivation of Pomegranate in India is 246 (000 ha) and production is around 2865 (000MT) (Annon, 2018-19). In India, pomegranate is commercially cultivated in Maharashtra followed by Andhra Pradesh, Karnataka, Gujarat, Rajasthan, Madhya Pradesh, Uttar Pradesh, Tamil Nadu, Punjab and Haryana. The prominent pomegranate producing districts in Maharashtra are Solapur, Nashik, Sangli, Ahmednagar, Pune, Dhule, Aurangabad, Satara, Osmanabad and Latur. Maharashtra state accounts for 54.8 per cent of total production of the country. Among different states, Maharashtra is the main pomegranate producing state where the area under pomegranate cultivation is about 78000 hector with the production of 4.08 lakh tonnes and productivity as 5.2 tonnes per hectare (Sonawane, 2017) [1].

Pomegranate fruit contains 52 per cent edible parts of the total weight. One kilogram of pomegranate fruits yields about 452 - 500 ml of juice. The fruit juice has 15-19 percent sugar content. The edible part of pomegranate fruit is the juicy outgrowth of the seed, called aril. The parts of the fruit are a good source of Vitamin C (16 mg/100 g), Minerals (0.7 %), Calcium (10 mg/100 g), Phosphorus (70 mg/100 g), Iron (0.3 mg/100 g) and also contain considerable amount of acids, fats and carbohydrates (Bhowmik *et al.*, 2013) [3].

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## Materials and Methods

The experiment was conducted on farmer's (Yuvraj Bhosale) field at Gangapur, Taluka and District- Latur during the year 2017-18. The orchard of pomegranate having five years age old and planted at 2.5 X 3.0 m spacing. Geographically Latur district of Maharashtra state is located between 17° 52' to 18° 50' North latitude and between 76° 18' to 79° 12' East latitude with the total geographical area is 7.37 million ha. Latur is situated in the Marathwada region part of the Maharashtra state. The Latur district area comes under semi-arid and tropical region of Maharashtra state. The experiment was laid out in a Randomized Block Design with 07 treatments viz., T<sub>1</sub> (10 cm pruning), T<sub>2</sub> (20 cm pruning), T<sub>3</sub> (30 cm pruning), T<sub>4</sub> (40 cm pruning), T<sub>5</sub> (50 cm pruning), T<sub>6</sub> (5 cm shoot tip pruning) and T<sub>7</sub> (control) with three replications. The observation like fruit weight (g), total number of fruits per tree, fruit yield per tree (kg), marketable yield per tree (kg) and yield per ha (q). The statistical analysis done as per procedure given by Panse and Sukhatme (1985) [7].

## Results and Discussion

### Fruit weight (g)

The data revealed that, the fruit weight showed significantly difference among the different pruning treatments. The maximum fruit weight (276.12 g) was noted under the treatment T<sub>5</sub> (50 cm pruning), which was found statistically at par with the treatments, T<sub>4</sub> (40 cm pruning) 263.46 g and T<sub>3</sub> (30 cm pruning) 256.14 g. However, the minimum fruit weight (173.51 g) was recorded under the treatment T<sub>7</sub> (control).

Increase in fruit weight might be due to utilization of whole photosynthates among fewer fruit in severe pruned trees. Similar results are reported by Hiremath *et al.* (2018) [6] in pomegranate and Choudhary and Dhakare (2018) [4] in custard apple.

### Total number of fruits per tree

The total number of fruits per tree was significantly increased by different pruning treatments. Among the different treatments, T<sub>7</sub> (control) recorded the maximum number of fruits per tree (84.29), which was at par with the treatments, T<sub>6</sub> (5 cm shoot tip pruning) 80.10, T<sub>1</sub> (10 cm pruning) 76.13 and T<sub>2</sub> (20 cm pruning) 72.69. The minimum number of fruit per tree (54.03) was recorded by treatment T<sub>5</sub> (50 cm pruning).

Pomegranate bears on the spurs as well as current shoots so due to the availability of more bearing area (spurs) in unpruned plant due to non-removal of bearing area might have increased the number of fruits per plant. Number of fruits decreased with increase in intensity of pruning. Similar result was reported by Hiremath *et al.* (2018) [6] in pomegranate cv. Super Bhagwa.

### Fruit yield per tree (kg)

The data revealed that, the fruit yield per tree was significantly influenced due to different pruning treatments. The maximum fruit yield per tree (17.50 kg) was recorded under treatment T<sub>2</sub> (20 cm pruning), which was followed by treatments, T<sub>3</sub> (30 cm pruning) 16.73 kg, T<sub>1</sub> (10 cm pruning) 16.21 kg and T<sub>4</sub> (40 cm pruning) 15.97 kg. The minimum fruit yield per tree (14.62 kg) was recorded under treatment T<sub>7</sub> (control).

The highest yield obtained (17.50 kg/tree) by treatment T<sub>2</sub> (20 cm pruning) intensity and minimum yield (14.62 kg/tree) was recorded in treatment T<sub>7</sub> (control) no pruning. This might be due to the availability of more metabolite and retention of sufficient size of bearing shoot after pruning under treatment T<sub>2</sub> 20 cm pruning intensity. Similar results were reported by Prakash *et al.* (2012) [8] in guava, Dahapute *et al.* (2018) [5] in custard apple and Bhuva *et al.* (2018) [2] in pomegranate.

### Marketable yield per tree (kg)

The data revealed that, the significantly maximum average marketable yield (15.83 kg) was recorded under treatment T<sub>2</sub> (20 cm pruning), which was followed by treatments, T<sub>3</sub> (30 cm pruning) 14.91 kg and T<sub>1</sub> 10 cm pruning) 14.32 kg. The lowest average marketable yield (12.11 kg) was recorded under treatment T<sub>7</sub> (control).

The maximum yield (15.83 kg/tree) obtained in treatment T<sub>2</sub> (20 cm pruning) intensity while, the minimum yield was recorded in treatment T<sub>7</sub> (control) no pruning. This might be due to the availability of more metabolite and retention of sufficient size of bearing shoot after pruning, removal of diseased affected and damaged fruits.

### Yield per ha (q)

The data revealed that, the significant differences was observed among the various pruning treatments for yield per ha (q). Among the different treatments involved, the maximum average yield per ha (211.01 q) was recorded by the treatment T<sub>2</sub> (20 cm pruning) followed by treatments, T<sub>3</sub> (30 cm pruning) 198.75 q and T<sub>1</sub> (10 cm pruning) 190.88 q yield per ha. The treatment T<sub>7</sub> (control) recorded the minimum yield per ha (161.42 q).

This might be due to the availability of more metabolite and retention of sufficient size of bearing shoot after pruning under treatment T<sub>2</sub> (20 cm pruning) intensity. Similar results reported by Prakash *et al.* (2012) [8] in guava.

## Conclusion

The results of present investigation showed that, the effect of different levels of pruning have got significant influence on yield of pomegranate. On the basis of overall results obtained, it can be concluded that the treatment T<sub>2</sub> (20 cm pruning) was found effective for obtaining maximum yield of pomegranate fruits.

**Table 1:** Effect of different level of pruning on yield characters of pomegranate cv. Super Bhagwa

Sr. No.	Treatment	Fruit weight (g)	Total No. of fruits/tree	Fruit Yield/tree (Kg)	Marketable Yield (Kg)	Average Yield/ha (q)
1	T <sub>1</sub> -10 cm pruning	213.02	76.13	16.21	14.32	190.88
2	T <sub>2</sub> -20 cm pruning	240.79	72.69	17.50	15.83	211.01
3	T <sub>3</sub> -30 cm pruning	256.14	65.33	16.73	14.91	198.75
4	T <sub>4</sub> -40 cm pruning	263.46	60.63	15.97	13.79	183.82
5	T <sub>5</sub> -50 cm pruning	276.12	54.03	14.91	12.65	168.62
6	T <sub>6</sub> -5 cm shoot tip pruning	194.32	80.10	15.56	13.06	174.08
7	T <sub>7</sub> -without pruning (control)	173.51	84.29	14.62	12.11	161.42
	S.E ±	11.34	4.02	0.50	0.65	8.55
	C.D at 5% level	34.95	12.38	1.54	2.00	26.36

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