

Studies on Performance of Rejuvenated Plants and Fresh Plants of Guava c. v. Hisar Safeda

Satpal Baloda*, Jeet Ram Sharma, Mukesh Kumar, Surender Singh and Arvind Malik

Department of Horticulture, CCS Haryana Agricultural University, Hisar-125004

*Corresponding Author E-mail: s_baloda@rediffmail.com

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ABSTRACT

The present investigation entitled, “Studies on performance of rejuvenated plants and fresh plants of guava cv. Hisar Safeda” was carried out at experimental orchard, Department of Horticulture, CCS Haryana Agricultural University, Hisar during the year 2012-16. There were two treatments i.e. heading back and fresh plantation. Heading back of unproductive guava plants at the level of 0.5 m, 1.0 m and 1.5 m from point of emergence of main limbs was done during the month of January, 2012. New plants were planted in the month of February, 2012. Among different heading back treatments, plants headed back at 0.5 m level produced maximum fruit yield (30.70 kg/plant) whereas the yield from fresh plantation was 38 kg/plant at the age of four years. Maximum fruit size, fruit weight, TSS, ascorbic acid was recorded in new plantation, however, acidity was recorded minimum. Although in the first bearing after rejuvenation and fresh plantation the yield is higher in the rejuvenated plants but increase in yield was faster in fresh plantation in the ensuing seasons. It was also observed that the plant declining could not be stopped by rejuvenation in old plants. Hence, new plantation was observed better option.

Key words: Guava, Hisar Safeda, Rejuvenation, Yield, Quality parameters.

INTRODUCTION

Guava (*Psidium guajava* L.) belongs to family Myrtaceae, called as the “Apple of the tropics” and “Poor man’s apple”, is one of the most important fruits in India. It is native to Central America. It was introduced to the India in 17th century by Portuguese. Guava is considered to be one of the nutritionally valuable crops. In India, it is the fifth most important fruit crop after banana, mango, citrus and papaya with an area (268.2 thousand hectare), production (3667.9 thousand MT) and productivity

(13.7MT/ha). Maharashtra leads in area under guava cultivation (40.0 thousand hectare) whereas Madhya Pradesh leads in terms of production (841.1 thousand MT) and productivity (37.6 MT/ha)⁷. In Haryana it occupies 11.2 thousand hectare area with 152.2 thousand metric tonnes production and productivity of 13.59 MT/ha¹. The major guava producing districts of Haryana are Hisar, Sirsa, Fatehabad, Jind, Jhajjar, Sonapat, Karnal, Yamuna Nagar, Mewat and Ambala⁷.

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Guava is one of the most familiar fruit crops of Northern India because of its high adaptability to wide range of climate and soil condition along with fruiting more than once in a year. It is rich source of vitamin C, calcium, fair in phosphorus and iron in addition to relished flavor, delicious taste. It can ensure food and nutritional security by supplying quality fruits for human consumption⁶.

The declining yield pattern from old guava orchard over the years is the major cause of shifting the interest of farmers towards other crops and cropping system. The majority of orchards became old and senile characterized by intermingling, overcrowded, infestation of insect and disease in branches and trunk, more wood mass and thin shoots in canopy adversely influences bearing quality fruits. The fruits of guava are borne on new wood 9-11 months old and any treatments that encourage new growth influence the fruiting directly. In addition, researches established that the fruiting potential of guava is largely governed by canopy architecture, density and photosynthetic efficiency². The Indian farmers are advocated for rejuvenation of old senile orchards to allow new shoots on tree, elimination of infected branches, increase light penetration on floor for field crops along with higher fruit yield, but this technology did not play a significant role in conversion of old guava orchard into new one.

MATERIAL AND METHODS

The studies were carried out during 2012-16 at the experimental orchard, Department of Horticulture, CCSHAU Hisar. There were two treatments i.e. heading back and fresh plantation. Heading back of unproductive guava plants at the level of 0.5 m, 1.0 m and 1.5 m from point of emergence of main limbs was done during the month of January, 2012, whereas fresh plantation was done in the month of February, 2012. Each treatment was replicated thrice with single tree as experimental unit in randomized block design. The data on growth and yield was studied during the experimental period. The quality parameters like TSS, acidity and ascorbic acid

were estimated by following the standard procedure. The application of manure and fertilizer and spray scheduled was followed as per package and practices.

RESULTS AND DISCUSSION

The data in the Table (1) revealed that there was significant decrease in fruit weight with increasing severity of heading back. Heading back at level of 0.5 m produced maximum fruit weight was 87.73 g and 95.70 g followed by heading back at level of 1 m during winter and rainy season, respectively. However, maximum fruit weight (98.27 g and 107.50 g) was observed in the fresh plantation during both the seasons. Maximum fruit length and breadth was also found in the fresh plantation during both the seasons. Yield was affected significantly by all the heading back levels. Regarding level of heading back, plants headed back at 0.5 m level recorded the higher yield. However, maximum yield (38 kg) was observed in the fresh plantation. The yield in severe heading back was lower due to reduced number of fruits. Level of heading back did not have marked effect on TSS of fruit.

However, TSS was observed maximum in fruits harvested from fresh plantation, (Table 2). This may be ascribed to the fact that pruned trees have higher leaves: fruit ratio in relation to the control trees thereby TSS may be increased due to more metabolites synthesis. This result of present study regarding TSS was in line with the work of Dhaliwal⁴ and Dubey⁵ in guava. Acid content did not differ significantly with different heading back levels. However, acidity in new plantation was recorded low. A significant increase in ascorbic acid content of fruits was observed with increasing severity of heading back. Maximum ascorbic acid content was found in fruits harvested from fresh plantation and minimum was in control. The reason behind the maximum ascorbic acid content could be the increased translocation of photosynthates from leaves to the fruits. Similar observations were also reported by Dhaliwal and Kaur³ and Singh and Dhaliwal⁸ in guava.

Table 1: Yield of guava as influenced by heading back at different heights

Treatments (Heading back)	Fruit weight (g)		Fruit length (cm)		Fruit breadth (cm)		Yield (kg/plant)		
	Rainy season	Winter season	Rainy season	Winter season	Rainy season	Winter season	Rainy season	Winter season	Total
0.5 m	87.73	95.70	5.90	6.80	5.45	5.53	16.00	12.70	30.70
1.0 m	86.53	93.66	6.23	6.66	5.41	5.43	14.50	9.20	23.70
1.5 m	83.37	93.00	6.26	6.63	5.25	5.25	9.10	6.50	15.60
Control (unpruned trees)	84.76	86.37	6.12	6.73	5.52	5.60	6.50	4.80	11.30
Fresh plantation	98.27	107.50	6.37	6.97	5.60	5.70	11.00	9.00	38.00
CD at 5%	1.24	1.39	0.25	0.20	0.12	0.11	2.30	1.40	3.60

Table 2: Quality of guava as influenced by heading back at different heights

Treatments (Heading back)	TSS (%)		Acidity (%)		Ascorbic acid (mg/100g)	
	Rainy season	Winter season	Rainy season	Winter season	Rainy season	Winter season
0.5 m	9.72	10.03	0.48	0.40	155.64	196.27
1.0 m	9.80	10.03	0.49	0.43	164.80	191.10
1.5 m	9.78	9.83	0.44	0.41	176.20	192.86
Control (unpruned trees)	9.67	9.93	0.43	0.42	158.0	183.60
Fresh plantation	10.12	10.60	0.45	0.39	182.0	201.33
CD at 5%	0.24	0.35	0.01	0.02	8.46	4.54

CONCLUSION

Guava plants headed back at 0.5 m level produced maximum fruit yield (30.70 kg/plant). Yield of fresh plantation was 38 kg/plant. The fruits of new plantation were of better quality having maximum fruit size, fruit weight, TSS, ascorbic acid, however, acidity was recorded minimum. Three plants died due to guava wilt. Hence, it was observed from the study that the rejuvenation of old and declining trees is unable to stop plant decline. Therefore, the fresh plantation in place declining trees was found better.

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