

Article history :

Received : 22.08.2017

Revised : 03.11.2017

Accepted : 10.11.2017

Influence of time and intensity of pruning on quality of guava (*Psidium guajava* L.) cv. LUCKNOW 49

■ ASWATHY SURESH AND ARUMUGAM SHAKILA¹

Members of the Research Forum

Associated Authors:

¹Department of Horticulture, Faculty of Agriculture, Annamalai University, ANNAMALAINAGAR (T.N.) INDIA
Email : kiransharaj@gmail.com

Author for correspondence :

ASWATHY SURESH

Department of Horticulture, Faculty of Agriculture, Annamalai University, ANNAMALAINAGAR (T.N.) INDIA
Email : ponnumkm@gmail.com

ABSTRACT : The present investigation on influence of time and intensity of pruning on quality of guava (*Psidium guajava* L.) cv. LUCKNOW 49 was conducted at the orchard of the Department of Horticulture, Annamalai University, Tamil Nadu. Five years old guava trees of the cultivar Lucknow 49 were taken for this investigation. Different pruning levels and time of pruning viz., pruning 10 cm, 20 cm, 30 cm of apical shoots during mid March, mid April, mid May comprised the treatment combinations. The effect of different treatments were evaluated based on their influence on the quality attributes viz., TSS, ascorbic acid content, acidity, total sugar content. Among the various pruning treatments, it was observed that pruning 30 cm of apical shoots during mid March proved to be the best in increasing the quality of fruits followed by 20 cm level of pruning during mid March. The results of the present study indicate that the effect of various pruning treatments on the quality of guava cv. LUCKNOW 49 was more pronounced in season II when compared to season I.

KEY WORDS : Pruning, Pruning intensities, Quality attributes

HOW TO CITE THIS ARTICLE : Suresh, Aswathy and Shakila, Arumugam (2017). Influence of time and intensity of pruning on quality of guava (*Psidium guajava* L.) cv. LUCKNOW 49. *Asian J. Hort.*, 12(2) : 189-192, DOI : 10.15740/HAS/TAJH/12.2/189-192.

Guava (*Psidium guajava* L.) is an ever green fruit species well adapted to a wide range of soil and agro climates and acclaimed as 'super fruit' owing to its high nutritional and nutraceutical profile. It is quite hardy and a prolific bearer. Guava is the fourth largest fruit crop grown in India. Guava is considered as one of the most delicious fruit and in India it occupies an area of 25.42 lakh hectares with a production of 40.46 lakh metric tonnes and productivity of 12 metric tonnes per hectare. In Tamil Nadu, it is cultivated in an area of 10,045 hectares with a production of 92,500 tonnes. Guava contributes 4.0 per cent share in both area and production of fruits in India (Anonymous, 2016). Pruning in guava has achieved a great importance, since pruning is necessary for building a strong frame work of the tree

in early years and for maintaining vigour, yield, productivity and quality of fruits in the later years. A light pruning is considered necessary to encourage new shoots after the harvest. However, the improvement of quality of guava vary greatly depending on the time of pruning and level of pruning. Hence, the present investigation was undertaken to study the possibilities of increasing the quality of guava cv. LUCKNOW 49.

RESEARCH METHODS

The trial was conducted in Factorial Randomized Block Design (FRBD) and the experiment consisted of nine pruning treatments along with a control which were replicated thrice. All the trees were maintained under uniform cultural practices during the entire course of the

investigation. The details of the treatment are, T₁ - Pruning 10 cm of apical shoots during mid March, T₂ - Pruning 20 cm of apical shoots during mid March, T₃ - Pruning 30 cm of apical shoots during mid March, T₄ - Pruning 10 cm of apical shoots during mid April, T₅ - Pruning 20 cm of apical shoots during mid April, T₆ - Pruning 30 cm of apical shoots during mid April, T₇ - Pruning 10 cm of apical shoots during mid May, T₈ - Pruning 20 cm of apical shoots during mid April, T₉ - Pruning 30 cm of apical shoots during mid April, T₁₀ - control. The effect of different treatments were evaluated based on their influence on the quality attributes viz., total soluble solids, ascorbic acid, acidity and total sugar content in two consecutive seasons. The data were statistically analysed as applicable to Factorial Randomized Block Design (Panse and Sukhatme, 1978).

RESEARCH FINDINGS AND DISCUSSION

The data on quality characters presented in Table 1 revealed that the mean highest TSS (10.71) and ascorbic acid content (195.60) was noticed in T₃ (pruning 30 cm of apical shoots during mid March), while the least values for the quality characters were observed in the control (T₁₀). The TSS content of fruits showed significant differences among the seasons. TSS content was highest (9.14 °Brix) in season II

when compared to season I in which a TSS of 7.34 °Brix was observed. Interaction between the treatments and seasons for the highest TSS (11.11 °Brix) was recorded in T₃S₂ followed by T₂S₂ in which a TSS of 10.54 °Brix was recorded. This might be due to the fact that pruned branches give rise to new vegetative flush and the stored nutritional accumulates were utilized for enhancing the fruit quality. These results are in line with the findings of Lotter and Lotter (1990) in guava. The pruning treatments exhibited significant variations in the ascorbic acid content of fruits. Among the treatments, ascorbic acid content was highest (195.60 mg/100g) in T₃ (pruning 30 cm of apical shoots during mid March) followed by T₂ (pruning 20 cm of apical shoots during mid March) with a value of 188.14 mg/100g. The lowest ascorbic acid content (149.49 mg/100g) was observed in T₁₀ (control). The fruits harvested from severely pruned trees recorded the highest level of ascorbic acid content while the unpruned control trees bore fruits with lowest ascorbic acid content. The fruit quality of second season crop also showed a similar trend as that observed in first season crop. These results confirm the findings of Mishra and Pathak (1998) and Dubey *et al.* (2002) in guava.

From the data presented in Table 2 it can be

Treatments	Total soluble solids (°Brix)			Ascorbic acid content (mg/ 100g)		
	S ₁	S ₂	Mean	S ₁	S ₂	Mean
T ₁	8.46	10.03	8.76	178.83	182.27	180.55
T ₂	9.45	10.54	9.99	186.38	189.90	188.14
T ₃	10.32	11.11	10.71	193.36	197.85	195.60
T ₄	7.05	8.53	7.34	164.86	166.29	165.58
T ₅	7.84	8.85	8.18	172.15	173.80	172.97
T ₆	8.24	9.72	9.13	174.97	177.21	176.09
T ₇	5.82	7.37	7.22	154.29	156.45	155.37
T ₈	6.20	7.95	6.69	158.78	163.58	161.18
T ₉	6.23	8.21	7.30	160.97	165.86	163.41
T ₁₀	4.63	5.42	5.39	147.58	151.40	149.49
S Mean	7.34	9.14	-	169.52	172.15	-
	S.E. ±		C.D. (P=0.05)	S.E. ±		C.D. (P=0.05)
T	0.08		0.17	0.95		1.90
S	0.06		0.13	0.54		1.08
TxS	0.15		0.30	1.34		2.69

observed that the acidity of fruits was least (0.12%) in T₃ (pruning 30 cm of apical shoots during mid March) followed by T₂ (pruning 20 cm of apical shoots during mid March) with a value of 0.14 per cent, while the highest acidity (0.27%) was recorded in T₁₀ (control). The acidity of fruits was least (0.19%) in season II when compared to season I in which a value of 0.20 per cent was observed. The interaction between treatments and seasons also recorded significant variations for acidity content in fruits. The data from the Table 2 revealed that T₃S₂ recorded the least acidity (0.12%), while the highest value of acidity (0.28 %) was recorded T₁₀S₂. Total sugar content showed significant differences among the treatments. Highest total sugar content (8.34%) was recorded in T₃ followed by T₂ with a value of 8.12 per cent. The least total sugar content (4.71%) was recorded in the T₁₀ (control). In season II, the total sugar content was highest (7.08%) when compared to season I (6.96%). Significant effects were observed with regard to interaction between the treatments and seasons for the total sugar content in fruits. The highest total sugar content (8.48%) was observed in T₃S₂, while the least total sugar content (4.61%) was observed in T₁₀S₁ (control). Total sugar content of

fruits increased with an increase in the level of pruning in both the seasons. Unpruned trees recorded lower content of total sugars in fruits. The increased total sugar content in fruits might be due to the effect of high temperature received during flowering and fruit formation and at the time of fruit ripening and also due to the degradation of polysaccharides into simple sugars by metabolic activities, conversion of organic acids into sugars and loss of moisture as opined by Lakpathi *et al.* (2013). These findings are in agreement with the results obtained by the investigations of Lal (2002), Kindo (2005) and Sah (2013) in guava. Highest quality fruits during winter season in severely pruned trees in summer may be due to increased accumulation of metabolites which rendered better fruit quality due to diversion of synthesized food materials as opined by Chandra and Govind (1995) in guava, Purbiati and Yuniastui (1992) in mango, Dhilion (2004) in grapes and Pandey *et al.* (1998) in ber.

Conclusion:

The results of the present investigation revealed that pruning can be followed in guava to improve the quality. Pruning 30 cm of apical shoots during mid March can be recommended for commercial fruit production with

Table 2 : Effect of pruning on quality characters in guava cv. LUCKNOW 49

Treatments	Acidity %			Total sugar content (%)		
	S ₁	S ₂	Mean	S ₁	S ₂	Mean
T ₁	0.18	0.15	0.16	7.66	7.74	7.60
T ₂	0.16	0.13	0.14	8.11	8.13	8.12
T ₃	0.13	0.12	0.12	8.32	8.48	8.34
T ₄	0.23	0.25	0.24	6.84	6.88	6.86
T ₅	0.20	0.16	0.18	7.17	7.32	7.24
T ₆	0.19	0.17	0.18	7.41	7.46	7.54
T ₇	0.23	0.26	0.24	6.30	6.54	6.50
T ₈	0.21	0.23	0.22	6.65	6.69	6.65
T ₉	0.20	0.19	0.19	6.81	6.84	6.68
T ₁₀	0.27	0.28	0.27	4.82	4.61	4.71
S Mean	0.20	0.19	-	6.96	7.08	-
	S.E ±	C.D. (P=0.05)		S.E ±	C.D. (P=0.05)	
T	0.001	0.002		0.01	0.03	
S	0.006	0.012		0.08	0.01	
TxS	0.026	0.004		0.02	0.05	

enhanced quality in guava cv. LUCKNOW 49.

REFERENCES

Anonymous (2016). Indian Horticulture Database (NHB). Ministry of Agriculture, Government of India, Gurgaon, Haryana, India. www.nhb.gov.in/2015-2016.

Chandra, R. and Govind, S. (1995). Influence of time and intensity of pruning on growth, yield and fruit quality of guava under high density planting. *Tropi. Agric. Sci., (Trinidad)*, **72** (2):110-113.

Dhillon, W.S. (2004). Standardization of pruning intensity in grape cv. PERLETTE. *Haryana J. Hort. Sci.*, **33** (3 & 4): 172-174.

Dubey, A.K., Singh, D.B., Singh, Barche S. and Dalal, M. (2002). Deblossoming in summer season flowering in guava. *Indian J. Hort.*, **4**: 35-36.

Kindo, P. (2005). Studies on various methods of crop regulation in guava (*Psidium guajava* L.) cv. PANT PRABHAT. M.Sc. Thesis, G.B. Pant University of Agriculture and Technology, Pantnagar, Udham Singh Nagar, UTTARAKHAND (INDIA).

Lakpathi, G., Raj Kumar, M. and Chandra Sekhar, R. (2013). Effect of pruning intensities and fruit load on growth, yield and quality of guava (*Psidium guajava* L.) cv. ALLAHABAD

SAFEDA under high density planting. *Internat. J. Curr. Res.*, **5** (12):4053-4090.

Lal, R.L. (2002). *Planting system cum- high density planting.* Biennial Research Report, Lucknow, CISH, pp. 106-107.

Lotter, J.D. and Lotter, J. (1990). Vegetative and reproductive habit of guava (*Psidium guajava* L.) cv. FAN RETIEF. *Acta Hort.*, **275**: 229-237.

Mistra, H.K. and Pathak, R.A. (1998). Effect of shoot pruning on crop regulation in guava (*Psidium guajava* L.) cv. L- 46. *Prog. Hort.*, **30** (1/2): 78-81.

Pandey, R.C., Pathak, R.A. and Singh, I.S. (1998). Effect of pruning intensity on vegetative and reproductive growth in ber (*Zizyphus mauritiana* L.). *Indian J. Hort.*, **55** (4): 306-313.

Panse, V.G. and Sukhatme, P.V. (1978). *Statistical methods for agricultural workers.* ICAR, New Delhi, India, pp.328.

Purbiati and Yuniastui (1992). Influence of pruning intensity on light penetration in high density orchards of mango trees. *Fruit (Paris)*, **61** : 117-123.

Sah, Hariom (2013). Response of time of shoot pruning in meadow orchard of guava (*Psidium guajava* L.) cv. PANT PRABHAT. Ph.D. Thesis, G.B. Pant University of Agriculture and Technology, Pantnagar, Udham Singh Nagar, UTTARAKHAND (INDIA).

★ ★ ★ ★ ★ ^{12th} Year
★ ★ ★ ★ ★ of Excellence ★ ★ ★ ★ ★