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Effect of pruning intensities on yield of guava (*Psidium guajava* L.) cv. LUCKNOW 49

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ABSTRACT : An investigation on the effect of pruning intensities on yield of guava cv. Lucknow 49 was undertaken at 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. 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 yield and yield attributes like fruit weight and fruit yield per tree 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 yield of guava cv. LUCKNOW 49 was more pronounced in season II when compared to season I. In conclusion, pruning 30 cm of apical shoots during mid March can be recommended for commercial fruit production with enhanced yield in guava cv. LUCKNOW 49.

KEY WORDS : Pruning, Pruning intensities, Quality attributes

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Guava (*Psidium guajava* L.) is an important fruit crop in many tropical and subtropical regions and is native to Tropical America stretching from Mexico to Peru. It has adapted in India so well that it appears to be an Indian fruit. Guava is the fourth largest fruit crop grown in India. Guava is an evergreen fruit species well adapted to a wide range of soil and agro climates and is acclaimed as 'Super fruit' owing to its high nutritional and nutraceutical profile (Singh *et al.*, 2015). Guava is one of the richest natural sources of vitamin C containing two to five times more than oranges and ten times more than tomato. It also contains a fair source of vitamin A, riboflavin, thiamine and minerals like calcium, phosphorus and iron. Guava fruit is a favourite dessert, very delicious and is consumed in different ways.

Guava is a pruning responsive crop. Pruning of guava

trees is highly desirable to maintain their vigour and productivity as well as to improve fruit size. Studies have reported that the time and level of pruning influence growth, flowering and yield of guava. With this background the present study was carried out to find out the effect of pruning intensities on yield of guava cv. LUCKNOW 49.

RESEARCH METHODS

The study was carried out on five years old guava trees of the cultivar Lucknow 49. The experiment consisted of nine pruning treatments along with a control which were replicated thrice. Five trees were used for each treatment. 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 yield attributes viz., days taken for flower initiation, fruit set percentage, fruit weight and fruit yield per tree. The data were statistically analysed as applicable to Factorial Randomized Block Design (Panse and Sukhatme 1978).

RESEARCH FINDINGS AND DISCUSSION

A precise examination of the data in Table 1 revealed that earliness in flowering (54.12 days) was noticed in

Treatments	Days taken for flower initiation			Fruit set percentage		
	S ₁	S ₂	Mean	S ₁	S ₂	Mean
T ₁	59.70	60.87	60.28	70.93	80.36	75.07
T ₂	54.46	57.88	56.17	72.81	86.91	79.75
T ₃	52.81	55.44	54.12	73.94	88.57	80.36
T ₄	73.12	76.17	74.64	63.86	64.50	69.72
T ₅	67.79	69.29	68.54	64.92	77.22	70.06
T ₆	63.58	65.17	64.37	69.67	78.67	74.17
T ₇	86.65	95.85	91.25	57.18	66.84	63.01
T ₈	71.99	92.14	82.06	59.75	69.10	64.18
T ₉	63.59	80.43	72.01	61.92	74.52	65.21
T ₁₀	89.57	99.28	93.92	55.53	55.95	55.74
S Mean	68.79	75.58	-	65.25	74.26	-
	S.E. ±	C.D. (P=0.05)		S.E. ±	C.D. (P=0.05)	
T	0.30	0.82		0.21	0.43	
S	0.13	0.27		0.17	0.34	
T x S	0.43	0.86		0.31	0.62	

Treatments	Fruit weight (g)			Fruit yield tree ⁻¹ (kg)		
	S ₁	S ₂	Mean	S ₁	S ₂	Mean
T ₁	141.03	142.86	142.04	16.57	22.53	19.51
T ₂	152.22	157.87	155.04	20.97	28.50	24.74
T ₃	163.23	167.85	165.54	22.43	31.54	26.98
T ₄	116.04	137.91	127.47	15.40	18.65	17.02
T ₅	128.50	147.90	138.20	16.57	20.45	17.07
T ₆	132.92	135.50	134.21	13.73	21.37	17.55
T ₇	101.88	112.96	103.45	10.60	12.69	11.64
T ₈	104.72	122.94	108.92	12.24	14.01	13.12
T ₉	117.95	125.01	121.48	10.21	15.40	12.80
T ₁₀	77.58	94.97	98.78	7.21	8.82	8.01
S Mean	124.01	134.41	-	14.30	19.39	-
	S.E. ±	C.D. (P=0.05)		S.E. ±	C.D. (P=0.05)	
T	1.60	3.21		0.244	0.48	
S	0.7	1.40		0.34	0.69	
T x S	2.31	4.60		0.53	1.07	

T_3 (pruning 30 cm of apical shoots during mid March) while longer duration to initiate flowering was recorded in the unpruned trees (T_{10}). Among the seasons earliness in flowering was noticed in season I (68.79) when compared to season II in which 75.58 days was required for flower initiation. Interaction between treatments and seasons revealed significant differences in the days taken for flower initiation. Earlier flower initiation (52.81 days) was recorded in T_3S_1 followed by T_2S_1 which took 54.46 days for flowering. Longer duration (99.28 days) to initiate flowering was observed in $T_{10}S_2$. Since flowering in guava occurs on current season's growth, pruning helps in getting new fruiting units and thus increase the number of flowers per shoot. Similar findings have been observed by Dhahiwal *et al.* (2000) and Dalal *et al.* (2004) in guava. The perusal of data in Table 1 clearly indicated that various pruning treatments influenced the fruit set percentage significantly. Among the treatments, fruit set percentage was highest (80.36) in T_3 (pruning 30 cm of apical shoots during mid March) followed by T_2 (pruning 20 cm of apical shoots during mid March) with a fruit set percentage of 79.75. The fruit set percentage was highest (74.26) in season II when compared to season I in which a fruit set percentage of 65.25 was observed. Significant effects were observed with regard to interaction between pruning treatments and seasons. The fruit set percentage was highest (88.57) in T_3S_2 . This might be due to the fact that pruning leads to increased removal of apical shoots and as a result, early new growth and better availability of photosynthetic solar radiation to leaves leads to causing alternation in IAA activities, which ultimately enhance flowering and fruit set. Similar results were obtained by Mohammed *et al.* (2006) and Singh (2010) in guava.

In the present study, the fruit weight and fruit yield showed significant variations among the pruning treatments (Table 2). The fruit weight (165.54 g) was highest in fruits harvested from 30 cm pruned shoots during mid March (T_3) when compared to control (T_{10}). The fruit weight was highest (134.41g) in season II when compared to season I in which a fruit weight of 124.01 g was observed. Interaction between the treatments and seasons revealed significant differences in fruit weight. The fruit weight was highest (167.85 g) in T_3S_2 while the least fruit weight (77.58 g) was observed in $T_{10}S_1$ (control). Highest yield (26.98 kg/tree) was observed in T_3 (pruning 30 of cm of apical shoots during mid March) followed by T_2 (pruning 20 cm of apical shoots during

mid March) with a fruit yield of 24.74 kg/tree. The fruit yield per tree exhibited significant differences among the seasons. Highest fruit yield (19.39 kg/tree) was recorded in season II when compared to season I (14.30 kg/tree). Interaction between the treatments and seasons also revealed significant differences for fruit yield per tree. The highest fruit yield (31.54 kg/tree) was observed in T_3S_2 while the least fruit yield (7.21 kg/tree) was recorded in $T_{10}S_1$ (control). Adhikari and Kandal (2015) also reported that there was a significant increase in fruit size and fruit weight with an increased level of pruning. The results of the present study are in conformity with the findings of Sundarajan and Muthuswamy (1996) and Thakare *et al.* (2016) in guava and Balasubramanyan *et al.* (1997) in pomegranate. Pruning can be used to stimulate new growth and influence fruiting in guava. Several workers have reported increased yield, fruit size and qualitative attributes of guava as a result of pruning at different periods. This improvement is attributed to better light penetration into fruit bearing portions of the tree canopy. Pruning has its physiological effects basically due to changes in the partitioning of the reserves. It changes sink preference for allocation of photosynthates. Depending upon the time of the year, the extent and frequency of pruning, some sites of accumulation will disappear and others will be created. As a result, changes in seasonal fluctuations of reserves can appear as well (Clair *et al.*, 1999).

Conclusion:

From the results of the present study it is clear that the fruit yield of guava for commercial production can be manipulated easily by horticultural practices like pruning under location specific environmental conditions. Therefore, it can be concluded that pruning 30 cm of apical shoots during mid March can be recommended for commercial fruit production with enhanced yield in guava cv. LUCKNOW 49.

REFERENCES

- Adhikari, Shiva and Kandel, Tanka Prasad (2015). Effect of time and level of pruning on vegetative growth, flowering, yield and quality of guava. *Internat. J. Fruit. Sci.*, **15**(3): 290-301.
- Balasubramanyan, S. Anbu, S. Bangarusamy and Chokalingam, P. (1997). Effect of pruning and training on growth, yield and quality of pomegranate in black soil under rainfed conditions. *South Indian. Hort.*, **25**(6): 271- 273.

- Clair, M.D., Le Disquet, I. and Bory, G. (1999).** Pruning stress changes in the tree physiology and their effects on the tree health. *Acta Hort.*, **496** : 317- 324.
- Dalal, S.R., Gonge, V.S. and Mohariya, A.D. (2004).** Standardization of pruning intensity in old guava trees cv. Lucknow 49. *Adv. Pl. Sci.*, **7** (1): 283-286.
- Dhaliwal, G.S., Rattanpal, H.S. and Gill, H.S. (2000).** Effect of time and severity of pruning on cropping and physico-chemical properties of Sardar guava. *Haryana J. Hort. Sci.*, **29** (1/2): 17-20.
- Mohammed, Suleman, Sharma, J.R., Kumar, Ranjeet and Gupta, R.B. and Singh, Sultan (2006).** Effect of pruning on growth and cropping pattern in guava cv. LUCKNOW- 49. *Haryana J. Hort. Sci.*, **35** (3 & 4): 211-212.
- Panse, V.G. and Sukhatme, P.V. (1978).** *Statistical methods for agricultural workers*. ICAR, New Delhi, India, pp.328.
- Singh, G. (2010).** *Practical manual in canopy management in fruit crops*. Department of Agriculture and Co-operation, Ministry of Agriculture, Government of India, Krishi Bhawan, New Delhi, India.pp.42.
- Singh, V.K., Ravishankar, H., Singh, Anurag and Soni, Manoj Kumar (2015).** Pruning in guava (*Psidium guajava*) an appraisal of consequent flowering phenology using modified BBCH scale. *Indian J. Agric. Sci.*, **85**(11) : 1472-1476.
- Sundararajan, S. and Muthuswamy, S. (1996).** Effect of pruning on fruit size and weight in certain varieties of guava. *South Indian Hort.*, **14**: 63- 64.
- Thakre, Madhubala, Lal, Shant, Uniyal, Shweta, Goswami, Amit Kumar and Prakash, Pratibha (2016).** Pruning for crop regulation in high density guava (*Psidium guajava* L.) plantation. *Spanish J. Agric. Res.*, **14**(2): e0905.

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