International Journal of Plant & Soil Science

Volume 36, Issue 5, Page 780-791, 2024; Article no.IJPSS.114901
ISSN: 2320-7035

Effect of Pruning and Nutrient Levels on Plant Growth of Guava (*Psidium guajava*) cv. Allahabad Safeda under Meadow Orcharding Allahabad

Arun Kumar Singh [a*] and Devi Singh [a]

[a] Department of Horticulture, Naini Agricultural Institute (NAI), Sam Higginbottom University of Agriculture, Technology And Sciences (SHUATS), Prayagraj (Allahabad)-211007 (U.P.), India.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/IJPSS/2024/v36i54576

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/114901

Original Research Article

Received: 27/01/2024
Accepted: 01/04/2024
Published: 09/04/2024

ABSTRACT

A field experiment was conducted to evaluate the effect of pruning and nutrient levels on growth and yield of guava cv. Allahabad Safeda. The treatment consists of four different levels of pruning P_0: 00.0cm (Un-pruned plants/ Without Pruning), P_1: Pruned at 30cm of the shoot length, P_2: Pruned at 40cm of the shoot length and P_3: Pruned at 50cm of the shoot length and four different levels of nutrients (NPK) viz., F_1: NPK (260:320:260 g/plant) (Control), F_2: NPK (220:280:300 g/plant), F_3: NPK (300:360:300g/plant) and F_4: NPK (340:400:340g/plant). The experiment comprising 16 treatment combinations was laid out in 2-factor Factorial Randomized Block Design (f-RBD) having three replications during 2014-2015 & 2015-2016. Among the different treatments T_{16}:$P_{3(}$P3: 50cm x F_4: 340:400:340 g/plant) was best dose for optimum vegetative growth parameter *viz.,* plant height (cm), number of branches per plant, number of leaves per plant, plant spread (n-s & e-w), stem diameter (mm), stem length (cm) and days to taken new shoot emergence of guava cv. Allahabad safeda.

**Corresponding author: E-mail: aks42047@gmail.com;*

Keywords: Pruning; nutrient levels; plant growth; fruiting guava and Allahabad safeda; guava; nutrient levels; nutrient management; fruit production.

1. INTRODUCTION

"India has a wide variety of climate and soil on which a large range of horticultural crops are grown. Horticulture is the fastest growing sector within agriculture. It contributes mainly to nutrient security and has good scope for farmers to increase their income and helpful in sustaining large number of agrobased industries which generate huge employment opportunities" (Satpal *et al.,* 2011). "Under traditional planting system of guava, nutrient management practices have been standardized. Guava tree utilizes nutrients for vegetative growth and fruit production. Some amount of nutrients is fixed in plant in its annual growth. A sizeable quantity of nutrients is permanently removed in the form of fruits. These nutrients must be replenished in the form of manure and fertilizers" (Dushyant Mishra, 2014). "Guava (Psidium guajava L.) commonly known as 'Apple of Tropics' is successfully cultivated over different sets of climatic conditions due to its wide range of adaptability. In India, it is being cultivated in an area of 2.76 lakh hectares with an annual production of 42.53 lakh tonnes and a productivity of 15.3 MT/ha" (Anonymous, 2020). "The leading guava-producing states in the country are Uttar Pradesh, Bihar, Madhya Pradesh, and Maharashtra. The farmer is attracted to guava cultivation due to its lower cost of production compared to other fruit crops, moreover, its cultivation gives assured returns with little care. Due to its good nutritive value and easy availability at moderate prices, it has gained considerable fame among the consumers" [1] Guava fruit harvest peaks can deviate with prevailing weather conditions and cultural practices because flowers are produced on new growth. Irrigation [2], fertilization [3], defoliation and pruning [4,3,5] 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. Pruning technique is used to minimize the disease and insect pest attack, mostly fruit fly infestation. Pruning is very important horticultural operation leads to regulate the crop with season. It increases the yield and quality of fruit it evades the flowering and fruiting of crop and gives the better canopy structure Choudhary et al. [6]. Nitrogen, phosphorus and potassium are the major and essential nutrients for plant growth and development. Nitrogen is an essential component of amino acid, proteins, nucleic acids, porphyrins, purines and pyrimidine nucleotides, flavin nucleotides, enzyme, co-enzyme and alkaloids. Being a constituent of nucleic acids viz. Ribo Nucleic Acids (RNA) and Deoxyribo Nucleic Acids (DNA), it is responsible for the transfer of genetic code to the off-springs. Phosphorus is involved in energy transfer, photosynthesis, transformation of sugars and starch, nutrient movement within the plant and transfer of genetic characteristics from one generation to the next [7]. "Potassium plays a major role in transport of water and nutrient throughout the plant in xylem. It increases root growth and improves drought tolerance. Potassium is also responsible for activation and synthesis of protein-forming nitrate reductase enzyme" [7]. Nitrogen, phosphorus and potassium are most indispensable of all mineral nutrients for growth and development of the plant as these are the basis of fundamental constituents of all living matter [8].

2. MATERIALS AND METHODS

An experiment entitled "Effect of pruning and nutrient levels on Plant Growth of Guava (*Psidium guajava*) cv. Allahabad Safeda under meadow Orcharding Allahabad" was conducted at Horticultural Research Farm, Central Orchard, Department of Horticulture, Sam Higginbottom University of Agriculture, Technology and Sciences (SHUATS), Prayagraj (Allahabad), U.P., India. The heading back in this experiment was carried out at 1 year age of new planted of guava at spacing of 2m x 1m. The treatment consists of four different levels of pruning P_0: 00.0cm (Un-pruned plants/ Without Pruning), P_1: Pruned at 30cm of the shoot length, P_2: Pruned at 40cm of the shoot length and P_3: Pruned at 50cm of the shoot length and four different levels of nutrients (NPK) viz., F_1: NPK (260:320:260 g/plant) (Control), F_2: NPK (220:280:300 g/plant), F_3: NPK (300:360:300g/plant) and F_4: NPK (340:400:340g/plant). The experiment comprising 16 treatment combinations was laid out in 2-factor Factorial Randomized Block Design (f-RBD) having three replications. The observations were recorded for its change in vegetative growth parameters like increase in plant height (cm), number of branches per plant, number of leaves per plant, plant spread (n-s & e-w), stem diameter (mm), stem length (cm) and days to taken new shoot emergence. The means

List 1. Treatment details

S. No.	Treatment Symbol	Treatment Combination
1	P_0:F_1	00.0cm (Without Pruning)+ NPK (260:320:260 g/plant) Control
2	P_0: F_2	00.0 cm (Without Pruning)+ NPK (220:280:300 g/plant)
3	P_0: F_3	00.0 cm (Without Pruning)+ NPK (300:360:300g/plant)
4	P_0: F_4	00.0 cm (Without Pruning)+ NPK (340:400:340g/plant)
5	P_1: F_1	Pruned at 30cm of the shoot length+ NPK (260:320:260 g/plant) Control
6	P_1: F_2	Pruned at 30cm of the shoot length+ NPK (220:280:300 g/plant)
7	P_1: F_3	Pruned at 30cm of the shoot length+ NPK (300:360:300g/plant)
8	P_1: F_4	Pruned at 30cm of the shoot length+ NPK (340:400:340g/plant)
9	P_2: F_1	Pruned at 40cm of the shoot length+ NPK (260:320:260 g/plant) Control
10	P_2: F_2	Pruned at 40cm of the shoot length+ NPK (220:280:300 g/plant)
11	P_2: F_3	Pruned at 40cm of the shoot length+ NPK (300:360:300g/plant)
12	P_2: F_4	Pruned at 40cm of the shoot length+ NPK (340:400:340g/plant)
13	P_3: F_1	Pruned at 50cm of the shoot length+ NPK (260:320:260 g/plant) Control
14	P_3: F_2	Pruned at 50cm of the shoot length+ NPK (220:280:300 g/plant)
15	P_3: F_3	Pruned at 50cm of the shoot length+ NPK (300:360:300g/plant)
16	P_3: F_4	Pruned at 50cm of the shoot length+ NPK (340:400:340g/plant)

of all the treatments of the observations were analysed statistically by ANOVA using OPSTAT software and the significance of the results are verified.

Factor A: Pruning Intensities (LEVELS OF PRUNING)

P_0 : 00.0cm (Un-pruned plants/ Without Pruning)
P_1 : Pruned at 30cm of the shoot length
P_2 : Pruned at 40cm of the shoot length
P_3 : Pruned at 50cm of the shoot length

Factor B: Nutrient levels (NPK)

F_1 : NPK (260:320:260 g/plant) (Control)
F_2 : NPK (220:280:300 g/plant)
F_3 : NPK (300:360:300g/plant)
F_4 : NPK (340:400:340g/plant)

3. RESULTS AND DISCUSSION

The data pertaining to the effect of different levels of pruning (P0: Without pruning), (P1: 30cm), (P2: 40cm) & and (P3: 50cm) and Nutrient (NPK) (F1: 260:32 0:260), (F2: 220:280:300), (F3: 300:360:300) & (F4: 340:400:340)/g/plant on vegetative growth of Guava (*Psidium guajava*) cv. Allahabad Safeda were statistically analyzed for test of significance of the results. The data presented in the Tables 1, 2, 3, 4, 5, 6 and 7 showed that various pruning level and application of nutrient and their interaction combinations result into significant increase in plant height (cm), number of leaves per plant, plant spread (n-s & e-w), stem diameter (mm), stem length (cm) and days to taken new shoot emergence during pruning time May – June, September – October and (January –February) of experiment. Results of pruning intensities showed significant effect on number of leaves per plant, plant spread (n-s & e-w), stem diameter (mm), stem length (cm) and days to taken new shoot emergence of guava. As far interaction effect between different levels of pruning intensities *viz.,* P0: Without pruning, P1: 30cm, P2: 40cm & and P3: 50cm and different of levels of nutrients NPK *viz.,* F1: 260:320:260, F2: 220:280:300, F3: 300:360:300 & F4: 340:400:340, showed significant effect on plant height (cm), number of leaves per plant, plant spread (n-s & e-w), stem diameter (mm), stem length (cm) and days to taken new shoot emergence during pruning time May – June, September – October and January – February of experiment. However, significantly maximum plant height (135.41, 168.72 and 220.89) was recorded in treatment T_{16}: P_3:F_4 (P3: 50cm x F_4: 340:400:340 g/plant) followed by T_{15}:P_3: F_3, T_{14}:P_3: F_2 and T_{13}:P_3: F_1. Whereas the minimum plant height (110.49, 141.02 and 162.14 cm) was found with T_5:$P_1$30cm: x $F_1$260:320:260 and T_9:P_2 40cm x $F_1$260:320:260

g/ plant during pruning time May – June, September – October and January – February of experiment. In the present investigation, it was observed that early pruning result in more plant growth vice versa late pruning decrease the shoot growth. Similar findings were reported by Basu *et al.,* (2007) and Singh et al. [9] Singh et al. [9] further concluded that pruning might shift the allocation of metabolites from rainy season crop in favour of increased vegetative growth due to flower and fruit let removal as a result of pruning. Thus, the vegetative growth of guava seems to respond to variation in month of pruning operation. With an increase in severity of pruning the increase in plant height was less. Kumar and Rattanpal (2010) stated that this may be due to the fact that pruned trees were unable to make up the loss of growth caused by severe pruning in this short period. Similar views were reported by Mahesh et al. [10] and Kohli *et al.,* (2017) in guava. However, significantly maximum number of branches per plant (5.10, 6.36 and 8.23) was recorded in treatment T_{16}: P_3:F_4 (P_3: 50cm x F_4: 340:400:340 g/plant) followed by T_{15}:P_3: F_3, T_{14}:P_3: F_2, T_{12}:P_2: F_4 and T_9:P_2: F_1. Whereas the minimum number of branches per plant (3.45, 4.76 and 6.65) was found with T_1:P_0 without pruning x F_1 260:320:260g/plant and T_5:$P_1$30cm: x $F_1$260:320:260 during pruning time May – June, September – October and January – February of experiment. However, significantly maximum number of leaves per plant (119.64, 153.20 and 184.94) was recorded in treatment T_{16}: P_3:F_4 (P3: 50cm x F_4: 340:400:340 g/plant) followed by T_{15}:P_3: F_3, T_{12}:P_2: F_4, T_{11}:P_2: F_3 and T_{14}:P_3: F_2. Whereas the minimum number of leaves per plant (88.83, 123.45 and 159.60) was found with T_1:P_0 without pruning x F_1 260:320:260g/plant and T_5:$P_1$30cm: x $F_1$260:320:260 during pruning time May – June, Septemer – October and January – February of experiment. However, significantly maximum plant spread (cm) (N-S & E-W) (77.12, 87.91 and 104.85) was recorded in treatment T_{16}:P_3:F_4(P3: 50cm x F_4: 340:400:340 g/plant) and T_{12}:P_2 40cm x F_4 340:400:340 g / plant followed by T_{15}:P_3: F_3, T_{14}:P_3: F_2 and T_{13}:P_3: F_1. Whereas the minimum plant spread (cm) (N-S & E-W) (43.34, 58.34 and 73.06) was found with T_1:P_0 without pruning x F_1 260:320:260g/plant, T_5:$P_1$30cm: x $F_1$260:320:260g / plant and T_4:P_0 wihtout pruning F_4 340:400:340 g/plant during pruning time May – June, Septemer – October and January – February of experiment. The results of the present investigation depict that early and lower level of pruning enhanced the canopy spread in E-W direction. However, the interaction effect between time and intensity of pruning showed nonsignificant effect on the canopy spread in East-West direction. Increase in the canopy spread may be due to the increase in shoot length leading to increase in canopy spreading Meena *et al.,* (2016). he results of the present findings are in line with the findings of Mahesh et al. [10] who stated that mild pruning (25% of the length shoot) initiated towards the end of summer with plants getting sufficient period of rest followed by pruning and irrigation resulted in profuse growth. These findings corroborate with views of Sundarajan and Muthuswamy (1966) who opined that mild pruning by tipping had increased numbers of functionary laterals in guava. However, significantly maximum stem diameter (cm) (35.65, 44.31 and 48.34) was recorded in treatment T_{16}:P_3:F_4(P3: 50cm x F_4: 340:400:340 g/plant) followed by T_{15}:P_3: F_3, T_{14}:P_3: F_2, T_{13}:P_3: F_1 and T_{12}:P_2: F_4. Whereas the minimum stem diameter (cm) (18.52, 25.67 and 31.11) was found with T_1:P_0 without pruning x F_1 260:320:260g/plant during pruning time May – June, Septemer – October and January – February of experiment. However, significantly maximum stem length (cm) (26.01, 28.06 and 31.07) was recorded in treatment T_{16}:$P_3$$F_4$(P3: 50cm x F_4: 340:400:340 g/plant) followed by T_{15}:P_3: F_3, T_{14}:P_3: F_2, T_{13}:P_3: F_1 and T_{12}:P_2: F_4. Whereas the minimum stem length (cm) (20.76, 22.64 and 24.69) was found with T_1:P_0 without pruning x F_1 260:320:260g/plant during pruning time May – June, Septemer – October and January – February of experiment. The results revealed that the shoot length increased up to May pruning and later decrease with delay in pruning time. However, with the increase in severity of pruning the shoot length increased. This may be attributed due to relatively less number of shoots and availability of more nutrients per shoots Bhagawati et al. [11]. It has already been established that nitrogen, being an important constituent of chlorophyll, proteins and amino acids, promoted the photosynthetic efficiency of the plant system when applied at sufficient quantities (Pafli, 1965) higher rate of increase in plant height during rainy season is obvious due to the perennial nature of tree growth and the nutrients added in the first year which would have helped in assimilation of reserves in the plant leading to desirable results in the subsequent season in mango (Sivakumar, 2007). However, significantly minimum days to taken new shoot emergence (29.25, 28.60 and 30.27) was recorded in treatment T_{16}:$P_3$$F_4$(P3: 50cm x F_4: 340:400:340 g/plant) followed by T_{15}:P_3: F_3, T_{14}:P_3: F_2, T_{13}:P_3: F_1 and T_{12}:P_2: F_4.

Table 1. Effect of pruning and nutrient levels on plant height (cm) of Guava (*Psidium guajava*) cv. Allahabad safeda under meadow orcharding Allahabad

Treatments	Plant height (cm)								
	May – June			September – October			(January –February)		
	Intial plant height (cm)	After pruning	Increase plant height (cm)	Before pruning	After Pruning	Increase plant height (cm)	Before pruning	After Pruning	Increase plant height (cm)
P_0:F_1	83.07	83.07	119.59	119.59	119.59	144.73	144.73	144.73	163.25
P_0: F_2	85.30	85.30	121.55	121.55	121.55	147.18	147.18	147.18	166.43
P_0: F_3	86.91	86.91	123.43	123.43	123.43	148.88	148.88	148.88	164.29
P_0: F_4	88.60	88.60	122.82	122.82	122.82	148.34	148.34	148.34	164.86
P_1: F_1	92.00	30.35	110.49	110.49	60.50	141.02	141.02	111.02	175.57
P_1: F_2	94.48	30.33	111.78	111.78	60.96	143.11	143.11	113.11	184.36
P_1: F_3	97.70	30.75	112.86	112.86	61.20	141.72	141.72	111.72	176.24
P_1: F_4	103.09	30.79	112.24	112.24	61.31	141.46	141.46	111.46	183.61
P_2: F_1	106.94	40.26	121.70	121.70	64.51	145.03	145.03	105.03	112.14
P_2: F_2	109.41	40.44	121.96	121.96	61.86	153.31	153.31	113.31	184.83
P_2: F_3	115.39	40.56	122.00	122.00	62.81	154.33	154.33	114.33	185.78
P_2: F_4	118.64	40.26	121.72	121.72	62.78	156.03	156.03	116.03	194.17
P_3: F_1	**119.70**	50.17	130.93	130.93	62.80	157.32	157.32	107.32	201.10
P_3: F_2	**120.07**	50.44	132.75	132.75	66.69	158.94	158.94	109.94	208.23
P_3: F_3	**122.03**	50.51	134.84	134.84	63.76	162.61	162.61	105.21	217.27
P_3: F_4	**124.42**	50.64	135.41	135.41	65.19	168.72	168.72	106.71	220.89
F-Test			**S**			**S**			**S**
S.Ed (+)			**0.439**			**0.929**			**0.851**
C.D. at 0.5%			**0.898**			**1.907**			**1.746**

Table 2. Effect of pruning and nutrient levels on number of branches per plant of Guava (*Psidium guajava*) cv. Allahabad safeda under meadow orcharding Allahabad

Treatments	Number of branches per plant								
	May – June			September – October			(January –February)		
	Intial No. Branches	After pruning	Increase No. of Branches	Before pruning	After Pruning	Increase No. of Branches	Before pruning	After Pruning	Increase No. of Branches
P_0:F_1	2.36	1.31	3.45	3.45	3.45	5.60		5.60	7.05
P_0: F_2	2.47	1.41	3.74	3.74	3.74	5.84	5.84	5.84	7.25
P_0: F_3	2.66	1.62	3.76	3.76	3.76	5.88	5.88	5.88	7.13
P_0: F_4	2.75	1.67	3.87	3.87	3.87	5.98	5.98	5.98	7.42
P_1: F_1	3.07	1.97	4.09	4.09	2.64	4.76	4.76	3.55	6.65
P_1: F_2	3.23	2.11	4.22	4.22	2.81	5.03	5.03	3.78	7.00
P_1: F_3	3.34	2.20	4.43	4.43	3.18	5.30	5.30	4.19	7.44
P_1: F_4	3.49	2.36	4.80	4.80	3.36	5.58	5.58	4.33	7.66
P_2: F_1	3.60	2.43	4.71	4.71	3.56	5.77	5.77	4.63	7.75
P_2: F_2	3.71	2.43	4.66	4.66	3.14	5.36	5.36	4.13	7.34
P_2: F_3	3.77	2.44	4.65	4.65	3.32	5.44	5.44	4.11	7.36
P_2: F_4	3.80	2.56	4.78	4.78	3.64	5.84	5.84	4.70	7.92
P_3: F_1	**3.84**	**2.51**	4.37	**4.37**	**3.53**	5.64	**5.64**	**4.31**	7.43
P_3: F_2	**3.92**	**2.58**	4.48	**4.48**	**3.68**	5.90	**5.90**	**4.65**	7.87
P_3: F_3	**4.03**	**2.68**	4.70	**4.70**	**3.75**	5.95	**5.95**	**4.55**	7.86
P_3: F_4	**4.04**	**2.93**	5.10	**5.10**	**4.04**	6.36	**6.36**	**4.93**	8.23
F-Test			**S**			**S**			**S**
S.Ed (+)			**0.104**			**0.090**			**0.154**
C.D. at 0.5%			**0.213**			**0.184**			**0.316**

Table 3. Effect of pruning and nutrient levels on number of leaves per plant of Guava (*Psidium guajava*) cv. Allahabad safeda under meadow orcharding Allahabad

Treatments	Number of leaves per plant								
	May – June			September – October			(January –February)		
	Intial No. leaves	After pruning	Increase No. of leaves	Before pruning	After Pruning	Increase No. of leaves	Before pruning	After Pruning	Increase No. of leaves
P_0:F_1	56.38	56.38	88.83	88.83	88.83	137.35	137.35	137.35	159.60
P_0: F_2	59.71	59.71	90.23	90.23	90.23	140.38	140.38	140.38	162.79
P_0: F_3	61.07	61.07	97.32	97.32	97.32	149.77	149.77	149.77	171.91
P_0: F_4	64.67	64.67	98.92	98.92	98.92	150.36	150.36	150.36	173.02
P_1: F_1	70.98	40.53	104.97	104.97	67.20	123.45	123.45	91.01	162.46
P_1: F_2	74.87	44.35	108.87	108.87	74.23	132.64	132.64	99.39	171.53
P_1: F_3	76.11	44.97	109.55	109.55	74.88	134.40	134.40	100.88	173.43
P_1: F_4	81.61	49.36	112.80	112.80	76.40	134.92	134.92	101.67	175.92
P_2: F_1	84.05	45.90	110.42	110.42	74.84	136.29	136.29	102.66	174.10
P_2: F_2	87.06	46.91	111.49	111.49	74.24	136.69	136.69	102.44	174.69
P_2: F_3	90.49	49.04	113.56	113.56	76.84	140.09	140.09	104.57	176.01
P_2: F_4	91.78	50.56	115.11	115.11	78.51	142.66	142.66	104.52	176.77
P_3: F_1	97.68	39.53	104.05	104.05	68.11	136.26	136.26	99.74	171.37
P_3: F_2	99.57	48.12	112.81	112.81	75.10	142.62	142.62	105.37	176.81
P_3: F_3	101.50	50.05	118.27	118.27	83.73	151.74	151.74	114.30	183.97
P_3: F_4	104.10	51.96	119.64	119.64	84.79	153.20	153.20	114.76	184.94
F-Test			**S**			**S**			**S**
S.Ed (+)			**1.875**			**1.506**			**1.721**
C.D. at 0.5%			**3.848**			**3.090**			**3.532**

Table 4. Effect of pruning and nutrient levels on plant spread (N-S & E-W) cm of Guava (*Psidium guajava*) cv. Allahabad safeda under meadow orcharding Allahabad

Treatments	Plant spread (N-S & E-W)								
	May – June			September – October			(January –February)		
	Intial No. spread	After pruning	Increase plant spread (N-S & E-W)	Before pruning	After Pruning	Increase plant spread (N-S & E-W)	Before pruning	After Pruning	Increase plant spread (N-S & E-W)
P_0:F_1	27.71	15.19	43.34	43.34	43.34	61.49	61.49	61.49	81.64
P_0: F_2	31.30	17.94	46.46	46.46	46.46	61.87	61.87	61.87	84.12
P_0: F_3	32.37	20.23	45.35	45.35	45.35	61.60	61.60	61.60	83.12
P_0: F_4	36.26	20.71	46.23	46.23	46.23	58.34	58.34	58.34	80.57
P_1: F_1	40.54	18.39	43.83	43.83	28.42	63.87	63.87	47.65	73.06
P_1: F_2	41.27	21.02	46.43	46.43	31.18	67.40	67.40	50.88	79.00
P_1: F_3	43.41	19.89	46.41	46.41	30.19	68.34	68.34	54.12	82.75
P_1: F_4	46.77	25.32	49.98	49.98	35.76	74.28	74.28	60.76	84.87
P_2: F_1	48.73	26.48	54.93	54.93	42.30	81.74	81.74	68.49	94.01
P_2: F_2	53.66	28.40	57.81	57.81	45.48	82.03	82.03	68.37	94.81
P_2: F_3	54.44	30.22	60.43	60.43	45.91	80.43	80.43	66.91	93.43
P_2: F_4	58.47	35.25	66.58	66.58	51.36	87.91	87.91	73.36	94.40
P_3: F_1	**62.81**	**32.69**	64.84	**64.84**	**44.29**	80.81	**80.81**	**64.29**	96.64
P_3: F_2	**66.01**	**32.76**	64.87	**64.87**	**41.65**	77.90	**77.90**	**62.76**	98.12
P_3: F_3	**69.06**	**43.84**	75.99	**75.99**	**50.55**	85.07	**85.07**	**69.85**	101.86
P_3: F_4	**71.12**	**44.90**	77.12	**77.12**	**50.90**	85.14	**85.45**	**70.01**	104.85
F-Test			**S**			**S**			**S**
S.Ed (+)			**1.203**			**1.236**			**1.414**
C.D. at 0.5%			**2.468**			**2.536**			**2.901**

Table 5. Effect of pruning and nutrient levels on Stem diameter (mm) of Guava (*Psidium guajava*) cv. Allahabad safeda under meadow orcharding Allahabad

Treatments	Stem diameter (mm)			
	Stem diameter (mm)	May –June	September –October	January –February
P_0:F_1	11.08	18.52	25.67	31.11
P_0: F_2	12.88	20.40	27.73	33.36
P_0: F_3	14.11	21.26	28.40	33.98
P_0: F_4	14.34	21.56	28.89	34.44
P_1: F_1	14.56	21.67	29.08	34.62
P_1: F_2	14.87	22.02	29.17	34.72
P_1: F_3	15.26	22.78	29.89	35.55
P_1: F_4	15.84	23.39	30.80	36.38
P_2: F_1	16.58	23.73	31.13	36.76
P_2: F_2	16.96	24.40	31.84	37.38
P_2: F_3	17.48	24.63	32.04	37.67
P_2: F_4	18.65	26.17	33.28	38.86
P_3: F_1	**22.87**	29.98	37.42	43.19
P_3: F_2	**24.88**	32.51	39.87	45.86
P_3: F_3	**26.17**	34.20	42.34	47.52
P_3: F_4	**28.47**	35.65	44.31	48.34
F-Test		**S**	**S**	**S**
S.Ed (+)		**0.348**	**0.357**	**0.352**
C.D. at 0.5%		**0.714**	**0.733**	**0.721**

Table 6. Effect of pruning and nutrient levels on stem length (cm) cm of Guava (*Psidium guajava*) cv. Allahabad safeda under meadow orcharding Allahabad

Treatments	Stem length (cm)			
	Stem length (cm)	**May –June**	**September –October**	**January –February**
P_0:F_1	19.43	20.76	22.64	24.69
P_0: F_2	19.84	21.19	23.11	25.21
P_0: F_3	20.17	21.53	23.22	25.27
P_0: F_4	20.20	21.58	23.52	25.63
P_1: F_1	20.29	21.81	23.47	25.49
P_1: F_2	20.78	22.14	24.05	26.16
P_1: F_3	21.35	22.87	24.98	27.13
P_1: F_4	21.60	22.81	24.82	26.95
P_2: F_1	21.88	23.10	25.22	27.33
P_2: F_2	22.17	23.53	25.63	27.76
P_2: F_3	22.59	23.83	25.86	28.07
P_2: F_4	22.47	23.80	26.01	28.12
P_3: F_1	**23.62**	24.95	27.17	29.31
P_3: F_2	**23.96**	25.28	27.38	29.60
P_3: F_3	**24.24**	25.49	27.60	30.16
P_3: F_4	**24.79**	26.01	28.06	31.07
F-Test		**S**	**S**	**S**
S.Ed (+)		**0.086**	**0.163**	**0.191**
C.D. at 0.5%		**0.176**	**0.334**	**0.392**

Table 7. Effect of pruning and nutrient levels on Days to taken new shoot emergence cm of Guava (*Psidium guajava*) cv. Allahabad safeda under meadow orcharding Allahabad

Treatments	Days to taken new shoot emergence		
	May –June	**September –October**	**January –February**
P_0:F_1	48.74	46.89	49.86
P_0: F_2	47.59	45.73	48.81
P_0: F_3	47.11	44.75	48.00
P_0: F_4	46.05	43.11	47.30
P_1: F_1	44.47	41.95	45.47
P_1: F_2	41.40	39.56	42.42
P_1: F_3	40.24	38.47	42.09
P_1: F_4	38.51	35.96	39.25
P_2: F_1	36.44	34.33	37.58
P_2: F_2	33.45	30.25	34.04
P_2: F_3	34.64	32.50	35.68
P_2: F_4	35.19	32.97	36.33
P_3: F_1	32.66	30.06	33.74
P_3: F_2	32.02	29.87	33.20
P_3: F_3	30.82	29.55	32.65
P_3: F_4	29.25	28.60	30.27
F-Test	**S**	**S**	**S**
S.Ed (+)	**0.906**	**0.811**	**0.755**
C.D. at 0.5%	**1.860**	**1.665**	**1.550**

Whereas the maximum days to taken new shoot emergence (48.74, 46.89 and 49.86) was found with T_1:P_0 without pruning x F_1 260:320:260g/plant during pruning time May – June, Septemer – October and January – February of experiment. It was also observed maximum number of sprouted shoots in the G1 (Sardar) as compared to other genotypes. It might be due to the independent growth rate and habit of variety because Sardar plant having more sprouting habit compare to other genotypes. The results of present aspect are found in line with those of Singh *et al.* (2012), Thakre et al. [12] and Lakpathi and Rajkumar et al. [13] observed maximum number of sprouted shoots in pruned plants compared to un-pruned plants in guava.

4. CONCLUSION

From this experiment, it is concluded that T_{16}: P_3:F_4 (P3: 50cm x F_4: 340:400:340 g/plant) was best dose for optimum vegetative growth parameter *viz.,* plant height (cm), number of branches per plant, number of leaves per plant, plant spread (N-S & E-W), stem diameter (mm), stem length (cm) and days to taken new shoot emergence of guava cv. Allahabad Safeda.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Throughton JH, Morrby J, Currie BG. Investigation of carbon transport in plants. Journal Experiment Botany1974;25:684-694.
2. Singh G, Singh AK, Rajan S. Influence of pruning date on fruit yield of guava (*Psidium guajava* L.) Under subtropics. Journal of Applied Horticulture. 2001;3(1): 37-40.
3. Mahesh RK, Jholgiker P, Mamatha NP, Ravi P, Shivanand MR, Kallappa SN. Effect of time and level of pruning on growth and yield of guava cv. Sardar under high density planting. Research in Environment and Life Sciences. 2016;9(7): 849-853.
4. Bhagawati R, Bhagawati K, Choudhary VK, Rajkhowa DJ, Sharma R. Effect of pruning intensities on the performance of fruit plants under mid-hill condition of Eastern Himalayas: Case study on guava. Int. Let. Nat. Sci. 2015;46:46-51.
5. Thakre M, Lal S, Uniyal S, Goswami AK, Prakash P. Pruning for crop regulation in high-density guava (*Psidium guajava* L.) plantation. Spanish Journal of Agricultural Research. 2016;14(2):0905.
6. Lakpathi G, Rajkumar M, Chandrasekhar R. Effect of pruning intensities and fruit load on growth, yield and quality of guava (*Psidium guajava* L.) cv. Allahabad Safeda under high density planting. Int J Curr Res.2013;5:4083-090.
7. Rattan RK, Goswami NN. Mineral nutrition of plants. In: Goswami et al., (Eds), Fundamentals of Soil Science. Indian Society of Soil Science. 2009;349-385.
8. Choudhary SM, Musmade AM, Kulkarni SS. Impact of pruning time on shoot sprouting and yield attributes of guava (*Psidium guajava* L.) Genotypes. Biological Forum – An International Journal. 2022;14 (1):965-971.
9. Singh BP, Gorakh Singh, Singh AK. Changes in postharvest quality of guava affected by preharvest application of crop regulators. Singapore J. Pri. Ind. 1996; 24:1-9.
10. Shigeura GT, Bullock RM. Management of guava: Cycling fruit set for continuous production. Proc. Trop. Ref. Am Soc. Hort. Sci. 1976;24:166.
11. Shatat FA. Pruning guava (*Psidium guajava* L.) effect of pruning date on yield and quality. Dirasat (Series B, Pure and applied Sci.). 1993;19:153-59.
12. Singh, Gorakh, S. Rajan, D. Pandey, Singh AK. Effect of soil moisture stress on water relation by plant and cropping behaviour in guava (*Psidium guajava* L.). Indian J. Agric. Sci. 1997;67:303-06.
13. Thasleema Nasreen, Jatinder Singh. Effect of branch level and leaf pruning in vegetative growth, yield and quality of guava: A review. The Pharma Innovation Journal SP. 2022;11(1): 471-475.

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/114901