



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

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## Authors' contributions

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

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## 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<sub>0</sub>: 00.0cm (Un-pruned plants/ Without Pruning), P<sub>1</sub>: Pruned at 30cm of the shoot length, P<sub>2</sub>: Pruned at 40cm of the shoot length and P<sub>3</sub>: Pruned at 50cm of the shoot length and four different levels of nutrients (NPK) viz., F<sub>1</sub>: NPK (260:320:260 g/plant) (Control), F<sub>2</sub>: NPK (220:280:300 g/plant), F<sub>3</sub>: NPK (300:360:300g/plant) and F<sub>4</sub>: 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<sub>16</sub>:P<sub>3</sub>(P<sub>3</sub>: 50cm x F<sub>4</sub>: 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.

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## 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 Orchard 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<sub>0</sub>: 00.0cm (Un-pruned plants/ Without Pruning), P<sub>1</sub>: Pruned at 30cm of the shoot length, P<sub>2</sub>: Pruned at 40cm of the shoot length and P<sub>3</sub>: Pruned at 50cm of the shoot length and four different levels of nutrients (NPK) viz., F<sub>1</sub>: NPK (260:320:260 g/plant) (Control), F<sub>2</sub>: NPK (220:280:300 g/plant), F<sub>3</sub>: NPK (300:360:300g/plant) and F<sub>4</sub>: 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 <sub>0</sub> :F <sub>1</sub>	00.0cm (Without Pruning)+ NPK (260:320:260 g/plant) Control
2	P <sub>0</sub> : F <sub>2</sub>	00.0 cm (Without Pruning)+ NPK (220:280:300 g/plant)
3	P <sub>0</sub> : F <sub>3</sub>	00.0 cm (Without Pruning)+ NPK (300:360:300g/plant)
4	P <sub>0</sub> : F <sub>4</sub>	00.0 cm (Without Pruning)+ NPK (340:400:340g/plant)
5	P <sub>1</sub> : F <sub>1</sub>	Pruned at 30cm of the shoot length+ NPK (260:320:260 g/plant) Control
6	P <sub>1</sub> : F <sub>2</sub>	Pruned at 30cm of the shoot length+ NPK (220:280:300 g/plant)
7	P <sub>1</sub> : F <sub>3</sub>	Pruned at 30cm of the shoot length+ NPK (300:360:300g/plant)
8	P <sub>1</sub> : F <sub>4</sub>	Pruned at 30cm of the shoot length+ NPK (340:400:340g/plant)
9	P <sub>2</sub> : F <sub>1</sub>	Pruned at 40cm of the shoot length+ NPK (260:320:260 g/plant) Control
10	P <sub>2</sub> : F <sub>2</sub>	Pruned at 40cm of the shoot length+ NPK (220:280:300 g/plant)
11	P <sub>2</sub> : F <sub>3</sub>	Pruned at 40cm of the shoot length+ NPK (300:360:300g/plant)
12	P <sub>2</sub> : F <sub>4</sub>	Pruned at 40cm of the shoot length+ NPK (340:400:340g/plant)
13	P <sub>3</sub> : F <sub>1</sub>	Pruned at 50cm of the shoot length+ NPK (260:320:260 g/plant) Control
14	P <sub>3</sub> : F <sub>2</sub>	Pruned at 50cm of the shoot length+ NPK (220:280:300 g/plant)
15	P <sub>3</sub> : F <sub>3</sub>	Pruned at 50cm of the shoot length+ NPK (300:360:300g/plant)
16	P <sub>3</sub> : F <sub>4</sub>	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<sub>0</sub> : 00.0cm (Un-pruned plants/ Without Pruning)  
P<sub>1</sub> : Pruned at 30cm of the shoot length  
P<sub>2</sub> : Pruned at 40cm of the shoot length  
P<sub>3</sub> : Pruned at 50cm of the shoot length

#### Factor B: Nutrient levels (NPK)

F<sub>1</sub> : NPK (260:320:260 g/plant) (Control)  
F<sub>2</sub> : NPK (220:280:300 g/plant)  
F<sub>3</sub> : NPK (300:360:300g/plant)  
F<sub>4</sub> : NPK (340:400:340g/plant)

### 3. RESULTS AND DISCUSSION

The data pertaining to the effect of different levels of pruning (P<sub>0</sub>: Without pruning), (P<sub>1</sub>: 30cm), (P<sub>2</sub>: 40cm) & and (P<sub>3</sub>: 50cm) and Nutrient (NPK) (F<sub>1</sub>: 260:320:260), (F<sub>2</sub>: 220:280:300), (F<sub>3</sub>: 300:360:300) & (F<sub>4</sub>: 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., P<sub>0</sub>: Without pruning, P<sub>1</sub>: 30cm, P<sub>2</sub>: 40cm & and P<sub>3</sub>: 50cm and different of levels of nutrients NPK viz., F<sub>1</sub>: 260:320:260, F<sub>2</sub>: 220:280:300, F<sub>3</sub>: 300:360:300 & F<sub>4</sub>: 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<sub>16</sub>: P<sub>3</sub>:F<sub>4</sub> (P<sub>3</sub>: 50cm x F<sub>4</sub>: 340:400:340 g/plant) followed by T<sub>15</sub>:P<sub>3</sub>: F<sub>3</sub>, T<sub>14</sub>:P<sub>3</sub>: F<sub>2</sub> and T<sub>13</sub>:P<sub>3</sub>: F<sub>1</sub>. Whereas the minimum plant height (110.49, 141.02 and 162.14 cm) was found with T<sub>5</sub>:P<sub>1</sub>30cm: x F<sub>1</sub>260:320:260 and T<sub>9</sub>:P<sub>2</sub> 40cm x F<sub>1</sub>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<sub>16</sub>: P<sub>3</sub>:F<sub>4</sub> (P<sub>3</sub>: 50cm x F<sub>4</sub>: 340:400:340 g/plant) followed by T<sub>15</sub>:P<sub>3</sub>: F<sub>3</sub>, T<sub>14</sub>:P<sub>3</sub>: F<sub>2</sub>, T<sub>12</sub>:P<sub>2</sub>: F<sub>4</sub> and T<sub>9</sub>:P<sub>2</sub>: F<sub>1</sub>. Whereas the minimum number of branches per plant (3.45, 4.76 and 6.65) was found with T<sub>1</sub>:P<sub>0</sub> without pruning x F<sub>1</sub> 260:320:260g/plant and T<sub>5</sub>:P<sub>1</sub>30cm: x F<sub>1</sub>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<sub>16</sub>: P<sub>3</sub>:F<sub>4</sub> (P<sub>3</sub>: 50cm x F<sub>4</sub>: 340:400:340 g/plant) followed by T<sub>15</sub>:P<sub>3</sub>: F<sub>3</sub>, T<sub>12</sub>:P<sub>2</sub>: F<sub>4</sub>, T<sub>11</sub>:P<sub>2</sub>: F<sub>3</sub> and T<sub>14</sub>:P<sub>3</sub>: F<sub>2</sub>. Whereas the minimum number of leaves per plant (88.83, 123.45 and 159.60) was found with T<sub>1</sub>:P<sub>0</sub> without pruning x F<sub>1</sub> 260:320:260g/plant and T<sub>5</sub>:P<sub>1</sub>30cm: x F<sub>1</sub>260:320:260 during pruning time May – June, September – 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<sub>16</sub>:P<sub>3</sub>:F<sub>4</sub>(P<sub>3</sub>: 50cm x F<sub>4</sub>: 340:400:340 g/plant) and T<sub>12</sub>:P<sub>2</sub>: 40cm x F<sub>4</sub> 340:400:340 g / plant followed by T<sub>15</sub>:P<sub>3</sub>: F<sub>3</sub>, T<sub>14</sub>:P<sub>3</sub>: F<sub>2</sub> and T<sub>13</sub>:P<sub>3</sub>: F<sub>1</sub>. Whereas the minimum plant spread (cm) (N-S & E-W) (43.34, 58.34 and 73.06) was found with T<sub>1</sub>:P<sub>0</sub> without pruning x F<sub>1</sub> 260:320:260g/plant, T<sub>5</sub>:P<sub>1</sub>30cm: x F<sub>1</sub>260:320:260g / plant and T<sub>4</sub>:P<sub>0</sub> without pruning F<sub>4</sub> 340:400:340 g/plant during pruning time May – June, September – 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). The 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<sub>16</sub>:P<sub>3</sub>:F<sub>4</sub>(P<sub>3</sub>: 50cm x F<sub>4</sub>: 340:400:340 g/plant) followed by T<sub>15</sub>:P<sub>3</sub>: F<sub>3</sub>, T<sub>14</sub>:P<sub>3</sub>: F<sub>2</sub>, T<sub>13</sub>:P<sub>3</sub>: F<sub>1</sub> and T<sub>12</sub>:P<sub>2</sub>: F<sub>4</sub>. Whereas the minimum stem diameter (cm) (18.52, 25.67 and 31.11) was found with T<sub>1</sub>:P<sub>0</sub> without pruning x F<sub>1</sub> 260:320:260g/plant during pruning time May – June, September – October and January – February of experiment. However, significantly maximum stem length (cm) (26.01, 28.06 and 31.07) was recorded in treatment T<sub>16</sub>:P<sub>3</sub>:F<sub>4</sub>(P<sub>3</sub>: 50cm x F<sub>4</sub>: 340:400:340 g/plant) followed by T<sub>15</sub>:P<sub>3</sub>: F<sub>3</sub>, T<sub>14</sub>:P<sub>3</sub>: F<sub>2</sub>, T<sub>13</sub>:P<sub>3</sub>: F<sub>1</sub> and T<sub>12</sub>:P<sub>2</sub>: F<sub>4</sub>. Whereas the minimum stem length (cm) (20.76, 22.64 and 24.69) was found with T<sub>1</sub>:P<sub>0</sub> without pruning x F<sub>1</sub> 260:320:260g/plant during pruning time May – June, September – 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<sub>16</sub>:P<sub>3</sub>:F<sub>4</sub>(P<sub>3</sub>: 50cm x F<sub>4</sub>: 340:400:340 g/plant) followed by T<sub>15</sub>:P<sub>3</sub>: F<sub>3</sub>, T<sub>14</sub>:P<sub>3</sub>: F<sub>2</sub>, T<sub>13</sub>:P<sub>3</sub>: F<sub>1</sub> and T<sub>12</sub>:P<sub>2</sub>: F<sub>4</sub>.

**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 <sub>0</sub> :F <sub>1</sub>	83.07	83.07	119.59	119.59	119.59	144.73	144.73	144.73	163.25
P <sub>0</sub> : F <sub>2</sub>	85.30	85.30	121.55	121.55	121.55	147.18	147.18	147.18	166.43
P <sub>0</sub> : F <sub>3</sub>	86.91	86.91	123.43	123.43	123.43	148.88	148.88	148.88	164.29
P <sub>0</sub> : F <sub>4</sub>	88.60	88.60	122.82	122.82	122.82	148.34	148.34	148.34	164.86
P <sub>1</sub> : F <sub>1</sub>	92.00	30.35	110.49	110.49	60.50	141.02	141.02	111.02	175.57
P <sub>1</sub> : F <sub>2</sub>	94.48	30.33	111.78	111.78	60.96	143.11	143.11	113.11	184.36
P <sub>1</sub> : F <sub>3</sub>	97.70	30.75	112.86	112.86	61.20	141.72	141.72	111.72	176.24
P <sub>1</sub> : F <sub>4</sub>	103.09	30.79	112.24	112.24	61.31	141.46	141.46	111.46	183.61
P <sub>2</sub> : F <sub>1</sub>	106.94	40.26	121.70	121.70	64.51	145.03	145.03	105.03	112.14
P <sub>2</sub> : F <sub>2</sub>	109.41	40.44	121.96	121.96	61.86	153.31	153.31	113.31	184.83
P <sub>2</sub> : F <sub>3</sub>	115.39	40.56	122.00	122.00	62.81	154.33	154.33	114.33	185.78
P <sub>2</sub> : F <sub>4</sub>	118.64	40.26	121.72	121.72	62.78	156.03	156.03	116.03	194.17
P <sub>3</sub> : F <sub>1</sub>	<b>119.70</b>	50.17	130.93	130.93	62.80	157.32	157.32	107.32	201.10
P <sub>3</sub> : F <sub>2</sub>	<b>120.07</b>	50.44	132.75	132.75	66.69	158.94	158.94	109.94	208.23
P <sub>3</sub> : F <sub>3</sub>	<b>122.03</b>	50.51	134.84	134.84	63.76	162.61	162.61	105.21	217.27
P <sub>3</sub> : F <sub>4</sub>	<b>124.42</b>	50.64	135.41	135.41	65.19	168.72	168.72	106.71	220.89
<b>F-Test</b>			<b>S</b>			<b>S</b>			<b>S</b>
<b>S.Ed (+)</b>			<b>0.439</b>			<b>0.929</b>			<b>0.851</b>
<b>C.D. at 0.5%</b>			<b>0.898</b>			<b>1.907</b>			<b>1.746</b>

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)		
	Initial 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 <sub>0</sub> :F <sub>1</sub>	2.36	1.31	3.45	3.45	3.45	5.60		5.60	7.05
P <sub>0</sub> : F <sub>2</sub>	2.47	1.41	3.74	3.74	3.74	5.84	5.84	5.84	7.25
P <sub>0</sub> : F <sub>3</sub>	2.66	1.62	3.76	3.76	3.76	5.88	5.88	5.88	7.13
P <sub>0</sub> : F <sub>4</sub>	2.75	1.67	3.87	3.87	3.87	5.98	5.98	5.98	7.42
P <sub>1</sub> : F <sub>1</sub>	3.07	1.97	4.09	4.09	2.64	4.76	4.76	3.55	6.65
P <sub>1</sub> : F <sub>2</sub>	3.23	2.11	4.22	4.22	2.81	5.03	5.03	3.78	7.00
P <sub>1</sub> : F <sub>3</sub>	3.34	2.20	4.43	4.43	3.18	5.30	5.30	4.19	7.44
P <sub>1</sub> : F <sub>4</sub>	3.49	2.36	4.80	4.80	3.36	5.58	5.58	4.33	7.66
P <sub>2</sub> : F <sub>1</sub>	3.60	2.43	4.71	4.71	3.56	5.77	5.77	4.63	7.75
P <sub>2</sub> : F <sub>2</sub>	3.71	2.43	4.66	4.66	3.14	5.36	5.36	4.13	7.34
P <sub>2</sub> : F <sub>3</sub>	3.77	2.44	4.65	4.65	3.32	5.44	5.44	4.11	7.36
P <sub>2</sub> : F <sub>4</sub>	3.80	2.56	4.78	4.78	3.64	5.84	5.84	4.70	7.92
P <sub>3</sub> : F <sub>1</sub>	<b>3.84</b>	<b>2.51</b>	4.37	<b>4.37</b>	<b>3.53</b>	5.64	<b>5.64</b>	<b>4.31</b>	7.43
P <sub>3</sub> : F <sub>2</sub>	<b>3.92</b>	<b>2.58</b>	4.48	<b>4.48</b>	<b>3.68</b>	5.90	<b>5.90</b>	<b>4.65</b>	7.87
P <sub>3</sub> : F <sub>3</sub>	<b>4.03</b>	<b>2.68</b>	4.70	<b>4.70</b>	<b>3.75</b>	5.95	<b>5.95</b>	<b>4.55</b>	7.86
P <sub>3</sub> : F <sub>4</sub>	<b>4.04</b>	<b>2.93</b>	5.10	<b>5.10</b>	<b>4.04</b>	6.36	<b>6.36</b>	<b>4.93</b>	8.23
<b>F-Test</b>			<b>S</b>			<b>S</b>			<b>S</b>
<b>S.Ed (+)</b>			<b>0.104</b>			<b>0.090</b>			<b>0.154</b>
<b>C.D. at 0.5%</b>			<b>0.213</b>			<b>0.184</b>			<b>0.316</b>

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 <sub>0</sub> :F <sub>1</sub>	56.38	56.38	88.83	88.83	88.83	137.35	137.35	137.35	159.60
P <sub>0</sub> : F <sub>2</sub>	59.71	59.71	90.23	90.23	90.23	140.38	140.38	140.38	162.79
P <sub>0</sub> : F <sub>3</sub>	61.07	61.07	97.32	97.32	97.32	149.77	149.77	149.77	171.91
P <sub>0</sub> : F <sub>4</sub>	64.67	64.67	98.92	98.92	98.92	150.36	150.36	150.36	173.02
P <sub>1</sub> : F <sub>1</sub>	70.98	40.53	104.97	104.97	67.20	123.45	123.45	91.01	162.46
P <sub>1</sub> : F <sub>2</sub>	74.87	44.35	108.87	108.87	74.23	132.64	132.64	99.39	171.53
P <sub>1</sub> : F <sub>3</sub>	76.11	44.97	109.55	109.55	74.88	134.40	134.40	100.88	173.43
P <sub>1</sub> : F <sub>4</sub>	81.61	49.36	112.80	112.80	76.40	134.92	134.92	101.67	175.92
P <sub>2</sub> : F <sub>1</sub>	84.05	45.90	110.42	110.42	74.84	136.29	136.29	102.66	174.10
P <sub>2</sub> : F <sub>2</sub>	87.06	46.91	111.49	111.49	74.24	136.69	136.69	102.44	174.69
P <sub>2</sub> : F <sub>3</sub>	90.49	49.04	113.56	113.56	76.84	140.09	140.09	104.57	176.01
P <sub>2</sub> : F <sub>4</sub>	91.78	50.56	115.11	115.11	78.51	142.66	142.66	104.52	176.77
P <sub>3</sub> : F <sub>1</sub>	97.68	39.53	104.05	104.05	68.11	136.26	136.26	99.74	171.37
P <sub>3</sub> : F <sub>2</sub>	99.57	48.12	112.81	112.81	75.10	142.62	142.62	105.37	176.81
P <sub>3</sub> : F <sub>3</sub>	101.50	50.05	118.27	118.27	83.73	151.74	151.74	114.30	183.97
P <sub>3</sub> : F <sub>4</sub>	104.10	51.96	119.64	119.64	84.79	153.20	153.20	114.76	184.94
<b>F-Test</b>			<b>S</b>			<b>S</b>			<b>S</b>
<b>S.Ed (+)</b>			<b>1.875</b>			<b>1.506</b>			<b>1.721</b>
<b>C.D. at 0.5%</b>			<b>3.848</b>			<b>3.090</b>			<b>3.532</b>

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)		
	Initial 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 <sub>0</sub> :F <sub>1</sub>	27.71	15.19	43.34	43.34	43.34	61.49	61.49	61.49	81.64
P <sub>0</sub> : F <sub>2</sub>	31.30	17.94	46.46	46.46	46.46	61.87	61.87	61.87	84.12
P <sub>0</sub> : F <sub>3</sub>	32.37	20.23	45.35	45.35	45.35	61.60	61.60	61.60	83.12
P <sub>0</sub> : F <sub>4</sub>	36.26	20.71	46.23	46.23	46.23	58.34	58.34	58.34	80.57
P <sub>1</sub> : F <sub>1</sub>	40.54	18.39	43.83	43.83	28.42	63.87	63.87	47.65	73.06
P <sub>1</sub> : F <sub>2</sub>	41.27	21.02	46.43	46.43	31.18	67.40	67.40	50.88	79.00
P <sub>1</sub> : F <sub>3</sub>	43.41	19.89	46.41	46.41	30.19	68.34	68.34	54.12	82.75
P <sub>1</sub> : F <sub>4</sub>	46.77	25.32	49.98	49.98	35.76	74.28	74.28	60.76	84.87
P <sub>2</sub> : F <sub>1</sub>	48.73	26.48	54.93	54.93	42.30	81.74	81.74	68.49	94.01
P <sub>2</sub> : F <sub>2</sub>	53.66	28.40	57.81	57.81	45.48	82.03	82.03	68.37	94.81
P <sub>2</sub> : F <sub>3</sub>	54.44	30.22	60.43	60.43	45.91	80.43	80.43	66.91	93.43
P <sub>2</sub> : F <sub>4</sub>	58.47	35.25	66.58	66.58	51.36	87.91	87.91	73.36	94.40
P <sub>3</sub> : F <sub>1</sub>	<b>62.81</b>	<b>32.69</b>	64.84	<b>64.84</b>	<b>44.29</b>	80.81	<b>80.81</b>	<b>64.29</b>	96.64
P <sub>3</sub> : F <sub>2</sub>	<b>66.01</b>	<b>32.76</b>	64.87	<b>64.87</b>	<b>41.65</b>	77.90	<b>77.90</b>	<b>62.76</b>	98.12
P <sub>3</sub> : F <sub>3</sub>	<b>69.06</b>	<b>43.84</b>	75.99	<b>75.99</b>	<b>50.55</b>	85.07	<b>85.07</b>	<b>69.85</b>	101.86
P <sub>3</sub> : F <sub>4</sub>	<b>71.12</b>	<b>44.90</b>	77.12	<b>77.12</b>	<b>50.90</b>	85.14	<b>85.45</b>	<b>70.01</b>	104.85
<b>F-Test</b>			<b>S</b>			<b>S</b>			<b>S</b>
<b>S.Ed (+)</b>			<b>1.203</b>			<b>1.236</b>			<b>1.414</b>
<b>C.D. at 0.5%</b>			<b>2.468</b>			<b>2.536</b>			<b>2.901</b>

**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 <sub>0</sub> :F <sub>1</sub>	11.08	18.52	25.67	31.11
P <sub>0</sub> : F <sub>2</sub>	12.88	20.40	27.73	33.36
P <sub>0</sub> : F <sub>3</sub>	14.11	21.26	28.40	33.98
P <sub>0</sub> : F <sub>4</sub>	14.34	21.56	28.89	34.44
P <sub>1</sub> : F <sub>1</sub>	14.56	21.67	29.08	34.62
P <sub>1</sub> : F <sub>2</sub>	14.87	22.02	29.17	34.72
P <sub>1</sub> : F <sub>3</sub>	15.26	22.78	29.89	35.55
P <sub>1</sub> : F <sub>4</sub>	15.84	23.39	30.80	36.38
P <sub>2</sub> : F <sub>1</sub>	16.58	23.73	31.13	36.76
P <sub>2</sub> : F <sub>2</sub>	16.96	24.40	31.84	37.38
P <sub>2</sub> : F <sub>3</sub>	17.48	24.63	32.04	37.67
P <sub>2</sub> : F <sub>4</sub>	18.65	26.17	33.28	38.86
P <sub>3</sub> : F <sub>1</sub>	<b>22.87</b>	29.98	37.42	43.19
P <sub>3</sub> : F <sub>2</sub>	<b>24.88</b>	32.51	39.87	45.86
P <sub>3</sub> : F <sub>3</sub>	<b>26.17</b>	34.20	42.34	47.52
P <sub>3</sub> : F <sub>4</sub>	<b>28.47</b>	35.65	44.31	48.34
<b>F-Test</b>		<b>S</b>	<b>S</b>	<b>S</b>
<b>S.Ed (+)</b>		<b>0.348</b>	<b>0.357</b>	<b>0.352</b>
<b>C.D. at 0.5%</b>		<b>0.714</b>	<b>0.733</b>	<b>0.721</b>

**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 <sub>0</sub> :F <sub>1</sub>	19.43	20.76	22.64	24.69
P <sub>0</sub> : F <sub>2</sub>	19.84	21.19	23.11	25.21
P <sub>0</sub> : F <sub>3</sub>	20.17	21.53	23.22	25.27
P <sub>0</sub> : F <sub>4</sub>	20.20	21.58	23.52	25.63
P <sub>1</sub> : F <sub>1</sub>	20.29	21.81	23.47	25.49
P <sub>1</sub> : F <sub>2</sub>	20.78	22.14	24.05	26.16
P <sub>1</sub> : F <sub>3</sub>	21.35	22.87	24.98	27.13
P <sub>1</sub> : F <sub>4</sub>	21.60	22.81	24.82	26.95
P <sub>2</sub> : F <sub>1</sub>	21.88	23.10	25.22	27.33
P <sub>2</sub> : F <sub>2</sub>	22.17	23.53	25.63	27.76
P <sub>2</sub> : F <sub>3</sub>	22.59	23.83	25.86	28.07
P <sub>2</sub> : F <sub>4</sub>	22.47	23.80	26.01	28.12
P <sub>3</sub> : F <sub>1</sub>	<b>23.62</b>	24.95	27.17	29.31
P <sub>3</sub> : F <sub>2</sub>	<b>23.96</b>	25.28	27.38	29.60
P <sub>3</sub> : F <sub>3</sub>	<b>24.24</b>	25.49	27.60	30.16
P <sub>3</sub> : F <sub>4</sub>	<b>24.79</b>	26.01	28.06	31.07
<b>F-Test</b>		<b>S</b>	<b>S</b>	<b>S</b>
<b>S.Ed (+)</b>		<b>0.086</b>	<b>0.163</b>	<b>0.191</b>
<b>C.D. at 0.5%</b>		<b>0.176</b>	<b>0.334</b>	<b>0.392</b>

**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 <sub>0</sub> :F <sub>1</sub>	48.74	46.89	49.86
P <sub>0</sub> : F <sub>2</sub>	47.59	45.73	48.81
P <sub>0</sub> : F <sub>3</sub>	47.11	44.75	48.00
P <sub>0</sub> : F <sub>4</sub>	46.05	43.11	47.30
P <sub>1</sub> : F <sub>1</sub>	44.47	41.95	45.47
P <sub>1</sub> : F <sub>2</sub>	41.40	39.56	42.42
P <sub>1</sub> : F <sub>3</sub>	40.24	38.47	42.09
P <sub>1</sub> : F <sub>4</sub>	38.51	35.96	39.25
P <sub>2</sub> : F <sub>1</sub>	36.44	34.33	37.58
P <sub>2</sub> : F <sub>2</sub>	33.45	30.25	34.04
P <sub>2</sub> : F <sub>3</sub>	34.64	32.50	35.68
P <sub>2</sub> : F <sub>4</sub>	35.19	32.97	36.33
P <sub>3</sub> : F <sub>1</sub>	32.66	30.06	33.74
P <sub>3</sub> : F <sub>2</sub>	32.02	29.87	33.20
P <sub>3</sub> : F <sub>3</sub>	30.82	29.55	32.65
P <sub>3</sub> : F <sub>4</sub>	29.25	28.60	30.27
<b>F-Test</b>	<b>S</b>	<b>S</b>	<b>S</b>
<b>S.Ed (+)</b>	<b>0.906</b>	<b>0.811</b>	<b>0.755</b>
<b>C.D. at 0.5%</b>	<b>1.860</b>	<b>1.665</b>	<b>1.550</b>

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, September – 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  $T_{16}:P_3:F_4$  ( $P_3$ : 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.

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