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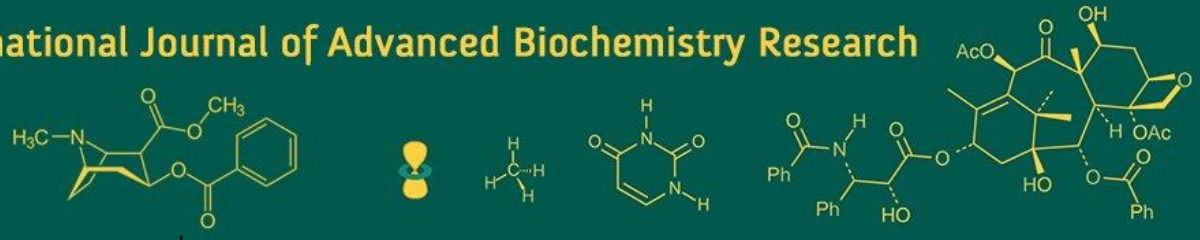

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Studies on the effect of time and levels of pruning in guava (*Psidium guajava* L.) cvs. Taiwan white and Taiwan pink grown under high density planting system for quality of fruits

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Abstract
The present investigation entitled was carried out during June, 2018 to January, 2019 in guava orchard at College of Horticulture Dr. Y.S.R. Horticultural University, Venkataramannagudem, West Godavari District of Andhra Pradesh. The experiment was laid down in a randomized block design with two replications and eighteen treatment combinations which include three factors *viz*., two varieties, three dates of pruning and three levels of pruning. All branches of three years old plants were pruned according to the treatment details (pruning severity upto 4th, 6th and 8th node from shoot tip and the time of pruning was during 15th June, 30th June and 15th July in the year 2018. Quality parameters exhibited significant difference among varieties, time and levels of pruning. Among varieties, Taiwan Pink recorded maximum total sugars (7.87%), TSS (9.97 ^{0}Brix), TSS/ acid ratio (25.93), Physiological loss in weight (7.46%). Taiwan White recorded maximum titratable acidity (0.56%), ascorbic acid (255 mg/100 g pulp) and shelf life (9.51). Among interaction effects, Taiwan Pink pruned on 15th July up to 8th node recorded maximum TSS (10.85 ^{0}Brix), TSS/acid ratio (33.78), total sugars (8.0%) and physiological loss in weight (7.85%).

Keywords: Guava, high density, pruning, quality, Taiwan white, Taiwan pink

Introduction
Guava (*Psidium guajava* L.) is very important tropical fruit crop, grown throughout the tropical and sub-tropical areas. It belongs to the family Myrtaceae and is commonly known as "Apple of tropics". Though it is native to tropical America, its cultivation has expanded to all tropical countries and became especially important in India (Samson., 1980) [16]. It is a small tree with prolific-bearing habit; bears more than once in a year. Its trees are quite hardy and give satisfactory return without much care and have the ability to withstand in wide range of soils and climatic conditions. It is believed to have been introduced in India at a very early date, as it was mentioned by Bruton who was in India early in the 17th century (Hayes., 1974) [8]. Though it is grown successfully throughout the country, the most important guava-producing states are Uttar Pradesh, Bihar, Madhya Pradesh, Maharashtra, Andhra Pradesh and Karnataka. In Andhra Pradesh, it is grown in East Godavari, West Godavari, Guntur, Krishna, Medak, Ranga Reddy, Mahaboob Nagar, Prakasham, Khammam and Ananthapur districts. It is an evergreen tree reaching to a height of 3 to 15m. It grows well in tropical and subtropical areas, preferably in sandy loam soils with a pH ranging from 4.5-9.5. Guava can bloom throughout the year in areas having mild winter climate, whereas the heaviest blooming is observed with the onset of warm weather conditions during spring season. Its fruits are good taste, have high nutritive value and a lot of vitamins and minerals. It is a rich and cheap source of vitamin C and pectin. It ranks third in vitamin C content after barbadose cherry and aonla. The ripe fruit has a characteristic odour. The fruits are consumed as fresh and also used in preparation of jam, jelly and other processed products (Samson, 1980) [16]. Leaves also have medicinal value.
Generally, guava is cultivated through traditional planting system, in which it is very difficult to achieve a desirable level of production, moreover, in this system guava tree takes 5-6 years time for commercial bearing and thus maximize the overall cost of production per unit

area. To overcome this, adoption of high density planting (HDP) or meadow orchard system to promote early flowering and to improve the yield per unit area. (Pal *et al*., 2016) [12]. Generally trees are pruned to increase the yield and quality of fruits by allowing better light interception into the canopy with the removal of crowded and crisscross branches. Pruning operation begins at an early stage of tree growth to form a single trunk with widely spaced scaffold branches and to develop a strong frame work of the tree. Apical growth is to be controlled within the first year of planting for development of better canopy architecture. Pruning in guava under high density planting system has achieved a great importance, since, it is necessary for building of strong framework of the trees during early years and maintaining vigor, yield, productivity and quality of fruits during later stages. Guava responds to pruning. Shoot pruning in guava has been reported to be successful in regulating bahar treatment. Shoot pruning is helpful in reducing the tree size, improving the fruit quality and it provides an opportunity to increase the number of trees per unit area (Lal *et al.*, 2000) [11]. Pruning has thus emerged as a commercial and alternative method for regulating the productivity in guava (Tiwari *et al.*, 1992) [18].

Materials and Methods

The present investigation entitled "Studies on the effect of time and levels of pruning in Guava (*Psidium guajava* L.) cvs. Taiwan White and Taiwan Pink grown under High Density Planting system for quality of fruits" was carried out during *June*, 2018 in guava orchard, Department of Fruit Science, at College of Horticulture Dr. Y.S.R. Horticultural University, Venkataramannagudem, West Godavari District of Andhra Pradesh.

Geographical location of the experimental site

The experiment was planned in an existing guava orchard planted in square system of planting at College of Horticulture, Dr. Y.S.R Horticultural University, Venkataramannagudem, West Godavari district of Andhra Pradesh. Plants were spaced at 2.8 m X 2.8 m between rows and plants respectively. The location falls under Agro-climatic zone-10, humid, East Coast Plain and Hills (Krishna-Godavari zone) and is located at an altitude of 34 m (112 feet) above MSL receiving an average annual rainfall of 900 mm. The geo-graphical situation of experimental site is 16° 63' 120" N latitude and 81° 27' 568" E longitude. It experiences hot humid summer and mild winter.

The biochemical analysis and shelf life studies of guava fruits after harvest were carried out in the Laboratory of Department of Fruit Science at College of Horticulture, Venkataramannagudem, situated at 16.83^0 N latitude and 81.60° E longitude with an elevation of 34 m above Mean Sea Level located in West Godavari district of Andhra Pradesh.

The experiment was laid out in a Factorial Randomized Block Design (FRBD) with eighteen treatments and each replicated twice. The treatments were randomized in each replication. Three plants were maintained in each treatment of the experimental plot.

Treatment details

S. No	Treatments	Notations
1	Shoot tip pruning on June 15th upto 4th node in guava cv. Taiwan White	$T_1=V_1D_1P_1$
2	Shoot tip pruning on June 15th upto 6th node in guava cv. Taiwan White	$T_2=V_1D_1P_2$
3	Shoot tip pruning on June 15th upto 8th node in guava cv. Taiwan White	$T_3=V_1D_1P_3$
4	Shoot tip pruning on June 30th upto 4th node in guava cv. Taiwan White	$T_4=V_1D_2P_1$
5	Shoot tip pruning on June 30th upto 6th node in guava cv. Taiwan White	$T_5=V_1D_2P_2$
6	Shoot tip pruning on June 30th upto 8th node in guava cv. Taiwan White	$T_6=V_1D_2P_3$
7	Shoot tip pruning on July 15th upto 4th node in guava cv. Taiwan White	$T_7=V_1D_3P_1$
8	Shoot tip pruning on July 15th upto 6th node in guava cv. Taiwan White	$T_8=V_1D_3P_2$
9	Shoot tip pruning on July 15th upto 8th node in guava cv. Taiwan White	$T_9=V_1D_3P_3$
10	Shoot tip pruning on June 15th upto 4th node in guava cv. Taiwan Pink	$T_{10}=V_2D_1P_1$
11	Shoot tip pruning on June 15th upto 6th node in guava cv. Taiwan Pink	$T_{11}=V_2D_1P_2$
12	Shoot tip pruning on June 15th upto 8th node in guava cv. Taiwan Pink	$T_{12}=V_2D_1P_3$
13	Shoot tip pruning on June 30th upto 4th node in guava cv. Taiwan Pink	$T_{13}=V_2D_2P_1$
14	Shoot tip pruning on June 30th upto 6th node in guava cv. Taiwan Pink	$T_{14}=V_2D_2P_2$
15	Shoot tip pruning on June 30th upto 8th node in guava cv. Taiwan Pink	$T_{15}=V_2D_2P_3$
16	Shoot tip pruning on July15th upto 4th node in guava cv. Taiwan Pink	$T_{16}=V_2D_3P_1$
17	Shoot tip pruning on July 15th upto 6th node in guava cv. Taiwan Pink	$T_{17}=V_2D_3P_2$
18	Shoot tip pruning on July 15th upto 8th node in guava cv. Taiwan Pink	$T_{18}=V_2D_3P_3$

All branches of three years old plants were pruned according to the treatment details (pruning severity upto 4th, 6th and 8th node from shoot tip and the time of pruning was during 15th June, 30th June and 15th July in the year 2018. Pruning of the tree was done with the help of secateurs followed by complete defoliation manually. The cut ends were smeared with a paste of Copper oxychloride.

Harvesting

Harvesting was done when majority of the fruits reached maturity. The fruits were harvested based on their maturity indices *viz.*, change in colour of the fruit from dark green to yellowish green. Three identical plants were selected and tagged in each treatment and in each replication to record the fruit yield and fruit quality parameters during *June*, 2018. In case of vegetative growth characters, observations were recorded after pruning at 30, 60, 90, 120, 150 and 180 days.

Quality parameter

TSS (ºBrix): The total soluble solids were recorded for five fully matured guava fruits plant^{-1} in each treatment and in each replication with the help of pocket digital refractometer (Atago, Pal-α, Made in Japan) by placing a drop of fruit juice on digital refractometer at room temperature. The average of total soluble solids in guava fruit pulp were calculated and expressed in degree brix.

Titratable acidity (%): A quantity of 10 g grinded fruit sample was taken into a 100 ml volumetric flask and the volume was made up to the mark with distilled water. From this, an aliquot of 10 ml was pippeted into 100 ml conical flask, add two drops of phenolphthalein indicator and titrated against 0.1 N NaOH until a faint pink colour was obtained and persisted at least for 15 seconds as an end point by (Ranganna, 1986) [14] and record the titre value. The percent acidity in guava fruit pulp was calculated by using the following formula.

$$\text{Titrable acidity (\%)} = \frac{\text{Titre value} \times \text{equivalent weight of acid} \times \text{Normality}}{\text{Weight of sample taken (g)} \times \text{Volume of aliquot taken (mL)}}$$

TSS/acid ratio: TSS / Acid ratio was calculated by dividing the value of total soluble solid of guava fruit pulp by percent acidity of guava fruit pulp.

Total Sugars (%): The percent of total sugars present in guava fruit pulp were determined by Lane and Eyon method (AOAC, 1984). A quantity of 50 ml of lead free filtrate was transformed into 100 ml volumetric flask 5 ml of diluted HCl (2:1) was added, mixed well and kept overnight at room temperature. The excess acid was neutralized with NaOH by using a drop of phenolphthalein indicator till the pink colour was persisted at least for few seconds. Finally the volume was made up to 100 ml. The percent total sugars in guava fruit pulp were estimated by taking this solution into a burette and titrated against a mixture of standard Fehling's solution A and B (1:1) by using methyle blue as an indicator until the dark red colour precipitate was formed. Note down the titre value and calculate the percent total sugars in guava fruit pulp by using the following formula.

$$\text{Total sugars (\%)} = \frac{\text{Dilution factor} \times \text{volume made up (ml)}}{\text{Titre value} \times \text{weight of sample (g)}} \times 100$$

Ascorbic acid (mg/100 g pulp): Ten grams of guava fruit pulp was blended with 3% metaphosphoric acid and transferred into a 100 ml volumetric flask and the volume was made up to the mark with 3% metaphosphoric acid. Five ml of 3% metaphosphoric acid and the sample extract were transferred into a 100 ml conical flask and titrated with standard dye until the pink colour was persisted at least for 15 seconds. The ascorbic acid content in guava fruit pulp was calculated by using the following formula.

$$\text{Ascorbic acid} = \frac{\text{Titre value x Dye factor x Volume made up}}{\text{Volume of sample extract taken (ml) x weight of the sample (g)}} \text{ x } 100$$

Physiological loss in weight (PLW): The initial fruit weight was recorded for five fully matured fruits in each treatment and in each replication with the help of electric top pan balance. Therefore, the fruit weight was recorded in each treatment were recorded for every 2 days of storage. At regular intervals, the average of cumulative losses in fruit weight were calculated and expressed as percent physiological loss in weight by using following formula.

$$\text{PLW} = \frac{W_1 - W_2}{W_1}$$

Shelf life (d): In all the treatments when 50 to 60 percent of the stored guava fruits become unfit for consumption, that stage was considered as the end of the shelf life of that particular treatment. The average number of days taken to 50-60% of spoilage of fruits and expressed in days.

Statistical analysis: The data recorded on vegetative growth parameters, yield and yield attributing parameters, physical parameters of the fruit and quality parameters of guava fruits were tabulated and statistically analysed by adopting factorial randomized block design as suggested by Panse and Sukhatme (1985) [13]. The differences among the treatment means were tested for significance by F value at 5% level. The critical difference values were calculated at 0.05 levels where ever the treatment mean differences were found to be significant.

Results and Discussion

Significant variation on TSS (^{0} Brix), Titratable acidity (%), Total sugars (%), ascorbic acid (mg/100 g pulp), Physiological loss in weight (PLW in%), TSS/ acid ratio and Shelf life (d) with respect to varieties, dates of pruning, levels of pruning and their interactions was observed. Considering the interaction effects of varieties, time and level of pruning, TSS content was higher in Taiwan Pink pruned on 15th July up to 8th node (10.85) and lower content of TSS was recorded in Taiwan White pruned on 15th June up to 4th node (8.15).Taiwan Pink has recorded more TSS might be due to genotypic variation of the variety. Plants pruned on 15th July up to 8th node recorded less number of fruits and fruit yield per plant, thereby TSS of the fruits might have increased. This is in accordance with the findings of Bajpai *et al*. (1973) [2], Gopikrishna (1981) [7] and Dhaliwal *et al*. (2000) [6] in guava.

Taiwan White variety when pruned on 15th June recorded highest percentage of titratable acidity (0.60%) and lowest titratable acidity was noticed in Taiwan Pink when pruned on 15thJuly (0.33%). Pruning of Taiwan Pink up to 4th node noticed maximum titratable acidity (0.58%) and Taiwan Pink when pruned up to 8th node observed lowest titratable acidity percentage (0.39%).Pruning the guava plants on 15th June up to 4th node recorded higher percentage of titratable acidity (0.57%) and found to be lower when pruned on 15th July up to 8th node (0.42%). With respect to interactions among the varieties, date of pruning and level of pruning, maximum titratable acidity was found in Taiwan White when pruned up to 4th node on 15th June (0.62%) and lowest in Taiwan Pink pruned up to 8th node on 15th July (0.32%). Acidity was more in Taiwan White than Taiwan Pink might be due to genotypic variation. Plants pruned up to 4th node on 15th June recorded more acidity might be due to decrease in TSS of the fruit. This was in contrary with the findings of Reynolds and Wardle (2001) [15] in grapes, Brar *et al*. (2007) [4] in guava.

Among the interactions of varieties, date and level of pruning, pruning of Taiwan Pink on 15th July up to 8th node recorded higher TSS/ acid ratio (33.78) and lower TSS/ acid ratio was noticed in Taiwan White variety pruned on 15th June up to 4th node (13.15). Maximum TSS/acid ratio in Taiwan Pink might be due to genotypic variation. Plants pruned on 15th July up to 8th node showed more TSS/acid ratio might be due to less number of fruits in this interaction thereby reduce the competition among the fruits for

carbohydrates. Similar findings were recorded by Singh and Dhaliwal (2004) [5] and Hussein (2006) [9] in guava.

Total sugar content was found to be higher in Taiwan Pink pruned on 15th June up to 4th node (8.20%) and lower amount of total sugar was noticed in Taiwan White pruned on 15th July up to 8th node (6.24%). Taiwan Pink recorded more total sugars than Taiwan White might be due to genotypic variation between the varieties. Plants pruned on 15th June up to 4th node recorded more sugars might be due to more photosynthetic accumulation which is directed to less fruits in plants pruned up to 4th node. This is in contrary with the findings of Kumar and Rattanpal (2010) [6] and Singh *et al*. (2010) [17] in guava. Ascorbic acid content was higher in Taiwan White pruned on 30th June up to 6th node (267 mg/100 g pulp) and lower content of ascorbic acid was recorded in Taiwan Pink pruned on 30th June up to 6th node (229 mg/100 g pulp).

Minimum PLW was observed in Taiwan White variety pruned on 15th June up to 4th node (5.61%) and maximum PLW was recorded in Taiwan Pink variety pruned up to 8th node on 15th July (7.85%).Taiwan White recorded minimum physiological weight might be due to genotypic variation. Taiwan White pruned up to 4th node on 15th June recorded more soluble solids which may reduce the physiological loss in weight in guava fruits. The results were in accordance with the findings of Jorquera (2014) [10] in blueberries. Interactions among the varieties, time and level of pruning found to be significantly varying, maximum shelf life was noticed in Taiwan White variety pruned on 15th June up to 4th node (11.15 days) and minimum shelf life was observed in Taiwan Pink when pruned up to 4th node on 15th June (8.10 days). Taiwan White recorded more shelf life might be due to genotype of the plant and less amount of total sugars in Taiwan White plants pruned on 15th June up to 4th node. This is in accordance with the findings of Bhagawati *et al*., (2015) [3] in guava. (Table 1-3).

Table 1: Effect of time and levels of pruning in guava cvs. Taiwan White and Taiwan Pink on Total soluble solids, Titratable acidity and TSS/acid ratio

Treatments		Total soluble solids (TSS) (˚Brix)				Titratable acidity (%)				TSS : Acid			
		D_1	**D_2**	**D_3**	**Mean**	**D_1**	**D_2**	**D_3**	**Mean**	**D_1**	**D_2**	**D_3**	**Mean**
V_1		8.28	8.60	8.98	8.62	0.60	0.56	0.53	0.56	13.82	15.36	17.00	15.39
V_2		9.47	9.87	10.58	9.97	0.50	0.37	0.33	0.40	18.94	26.77	32.07	25.93
Mean		8.88	9.23	9.78		0.55	0.47	0.43		16.38	21.07	24.53	
Treatments		**P_1**	**P_2**	**P_3**	**Mean**	**P_1**	**P_2**	**P_3**	**Mean**	**P_1**	**P_2**	**P_3**	**Mean**
V_1		8.49	8.63	8.73	8.62	0.58	0.56	0.55	0.56	14.85	15.39	15.93	15.39
V_2		9.73	10.03	10.15	9.97	0.42	0.40	0.39	0.40	24.16	26.31	27.31	25.93
Mean		9.11	9.33	9.44		0.50	0.48	0.47		19.51	20.85	21.62	
Treatments		**P_1**	**P_2**	**P_3**	**Mean**	**P_1**	**P_2**	**P_3**	**Mean**	**P_1**	**P_2**	**P_3**	**Mean**
D_1		8.73	8.90	9.00	8.88	0.57	0.55	0.54	0.55	15.69	16.42	17.04	16.38
D_2		9.10	9.25	9.35	9.23	0.49	0.46	0.45	0.47	19.58	21.43	22.19	21.07
D_3		9.52	9.85	9.98	9.78	0.44	0.43	0.42	0.43	23.25	24.70	25.64	24.53
Mean		9.11	9.33	9.44		0.50	0.48	0.47		19.51	20.85	21.62	
Treatments		**P_1**	**P_2**	**P_3**	**--**	**P_1**	**P_2**	**P_3**	**--**	**P_1**	**P_2**	**P_3**	**--**
V_1	D_1	8.15	8.30	8.40	--	0.62	0.60	0.58	--	13.15	13.83	14.48	--
	D_2	8.50	8.60	8.70	--	0.57	0.56	0.55	--	14.91	15.36	15.82	--
	D_3	8.83	9.00	9.10	--	0.54	0.53	0.52	--	16.50	16.98	17.50	--
V_2	D_1	9.30	9.50	9.60	--	0.51	0.50	0.49	--	18.24	19.00	19.59	--
	D_2	9.70	9.90	10.00	--	0.40	0.36	0.35	--	24.25	27.50	28.57	--
	D_3	10.20	10.70	10.85	--	0.34	0.33	0.32	--	30.00	32.42	33.78	--
Comparing means		**SEm±**		**CD @ 5%**		**SEm±**		**CD @ 5%**		**SEm±**		**CD @ 5%**	
V		0.004		0.012		0.005		0.016		0.022		0.066	
D		0.005		0.014		0.007		0.020		0.027		0.081	
P		0.007		0.020		0.009		0.028		0.038		0.114	
VXD		0.005		0.014		0.007		0.020		0.027		0.081	
VXP		0.007		0.020		0.009		0.028		0.038		0.114	
DXP		0.008		0.025		0.011		0.034		0.047		0.140	
VXDXP		0.012		0.035		0.016		0.048		0.066		0.198	

(**Note:** V_1- Taiwan White; V_2 – Taiwan Pink; D_1- 15th June Pruning; D_2- 30th June Pruning; D_3- 15th July Pruning; P_1- Pruning up to 4th node; P_2-Pruning up to 6th node;P_3-Pruning up to 8th node)

Table 2: Effect of time and levels of pruning in guava cvs. Taiwan White and Taiwan Pink on ascorbic acid (mg/100 g pulp), total sugars (%) and shelflife

Treatments		Ascorbic acid (mg/100 g pulp)				Total sugars (%)				Shelf life (d)			
		D_1	**D_2**	**D_3**	**Mean**	**D_1**	**D_2**	**D_3**	**Mean**	**D_1**	**D_2**	**D_3**	**Mean**
V_1		249	253	263	255	6.93	7.21	6.59	6.91	10.23	8.70	9.60	9.51
V_2		234	237	232	235	8.00	7.73	7.88	7.87	8.33	8.73	8.22	8.43
Mean		241	245	248		7.46	7.47	7.24		9.28	8.72	8.91	
Treatments		**P_1**	**P_2**	**P_3**	**Mean**	**P_1**	**P_2**	**P_3**	**Mean**	**P_1**	**P_2**	**P_3**	**Mean**
V_1		257	251	257	255	6.90	8.07	7.49	6.90	9.78	9.45	9.30	9.51
V_2		233	233	237	235	7.02	7.67	7.34	7.02	8.43	8.38	8.47	8.43
Mean		245	242	247		6.81	7.35	7.34	6.81	9.11	8.92	8.88	
Treatments		**P_1**	**P_2**	**P_3**	**Mean**	**P_1**	**P_2**	**P_3**	**Mean**	**P_1**	**P_2**	**P_3**	**Mean**
D_1		244	237	243	241	7.49	7.61	7.29	7.46	9.63	9.18	9.05	9.28
D_2		246	241	248	245	7.69	7.11	7.60	7.47	8.90	8.63	8.63	8.72
D_3		245	247	251	248	7.27	7.30	7.14	7.24	8.80	8.95	8.98	8.91
Mean		245	242	247		7.49	7.35	7.34		9.11	8.92	8.88	
Treatments		**P_1**	**P_2**	**P_3**	**--**	**P_1**	**P_2**	**P_3**	**--**	**P_1**	**P_2**	**P_3**	**--**
V_1	D_1	256	240	250	--	6.79	7.42	6.57	--	11.15	10.05	9.50	--
	D_2	255	246	257	--	7.48	6.53	7.61	--	9.00	8.60	8.50	--
	D_3	261	266	263	--	6.44	7.11	6.24	--	9.20	9.70	9.90	--
V_2	D_1	233	235	236	--	8.20	7.80	8.00	--	8.10	8.30	8.60	--
	D_2	238	237	238	--	7.90	7.70	7.60	--	8.80	8.65	8.75	--
	D_3	230	229	239	--	8.10	7.50	8.05	--	8.40	8.20	8.05	--
Comparing means		**SEm±**		**CD @ 5%**		**SEm±**		**CD @ 5%**		**SEm±**		**CD @ 5%**	
V		0.153		0.456		0.016		0.048		0.043		0.129	
D		0.187		0.558		0.020		0.058		0.053		0.158	
P		0.187		0.558		0.020		0.058		0.053		0.158	
VXD		0.265		0.789		0.028		0.082		0.075		0.223	
VXP		0.265		0.789		0.028		0.082		0.075		0.223	
DXP		0.324		0.967		0.034		0.101		0.092		0.274	
VXDXP		0.458		1.367		0.048		0.143		0.130		0.387	

Table 3: Effect of time and levels of pruning in guava cvs. Taiwan White and Taiwan Pink on physiological loss in weight (%)

Treatments		Physiological loss in weight (%)			
		D_1	**D_2**	**D_3**	**Mean**
V_1		5.90	6.34	6.79	6.34
V_2		7.33	7.44	7.60	7.46
Mean		6.62	6.89	7.19	
Treatments		**P_1**	**P_2**	**P_3**	**Mean**
V_1		6.11	6.34	6.57	6.34
V_2		7.37	7.43	7.57	7.46
Mean		6.74	6.89	7.07	
Treatments		**P_1**	**P_2**	**P_3**	**Mean**
D_1		6.45	6.57	6.83	6.62
D_2		6.74	6.95	6.98	6.89
D_3		7.03	7.15	7.40	7.19
Mean		6.74	6.89	7.07	
Treatments		**P_1**	**P_2**	**P_3**	**--**
V_1	D_1	5.61	5.80	6.29	--
	D_2	6.10	6.44	6.48	--
	D_3	6.64	6.79	6.95	--
V_2	D_1	7.30	7.33	7.38	--
	D_2	7.39	7.46	7.47	--
	D_3	7.43	7.51	7.85	--
Comparing means		**SEm±**		**CD @ 5%**	
V		0.023		0.069	
D		0.028		0.085	
P		0.040		0.120	
VXD		0.028		0.085	
VXP		0.040		0.120	
DXP		---		NS	
VXDXP		0.070		0.208	

Conclusion

The study demonstrated significant variation in TSS, titratable acidity, total sugars, ascorbic acid, PLW, TSS/acid ratio, and shelf life among guava varieties, pruning dates, and levels. Taiwan Pink pruned on 15th July up to the 8th node exhibited the highest TSS (10.85), while Taiwan White pruned on 15th June up to the 4th node showed the lowest (8.15). Taiwan White had higher titratable acidity and longer shelf life, while Taiwan Pink had higher TSS/acid ratios and total sugars. Genotypic variation between the varieties and pruning treatments significantly influenced fruit quality and shelf life, confirming previous research findings.

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