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Effects on Tree Vigor, Fruit Quality, Yield and Fruit Fly Infestation of Different Time of Pruning with Genotypes in Guava (*Psidium guajava* L.)

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A B S T R A C T

Poor quality and fruit fly infested fruit in the rainy season and failure to manipulate production periods are common problems for guava production in India. So, the research work was carried out with a management practices point of view to overcome these problems. Growth characters were significantly influenced by different genotypes. The plant spread, number of sprouted shoots was recorded maximum in cv. Sardar. Marketable yield free from fruit fly infestation were significantly higher recorded in 15th July time of pruning and its interaction with cv. Sardar. As concerned with qualitative attributes the genotype Sardar was observed better in T.S.S. as compared to other genotypes. RHR-Guv-14 genotype was found to be maximum in ascorbic acid. Sugar: acid ratio was observed higher in RHR-Guv-60. Similarly maximum shelf life of fruit was recorded by the RHR-Guv-14. Very crispy pulp texture and fruit luster was observed in all genotypes except cv. Sardar. From the present investigation, it was found that 15th July pruning time was found to be better with respect to marketable yield. Pruning time of 15th September was found to be better in the escape from fruit fly infestation but fruiting was very less. The genotype RHR-Guv-14 may evaluate for the cultivation as hast bahar crop.

Introduction

Guava fruit is often called “poor man’s apple” though the fruit is neither poor in its nutritive value and nor commercial value, contributes 3.4 % of total fruit area and 3.9 % of total fruit production in India during 2013-14 (Anon., 2014). Guava is one of the richest natural sources of vitamin C contains 2 to 5 times more vitamin C than oranges and 10 times more than tomato. Compared to other fruits, the whole guava is a moderately good source of calcium, a fair source of phosphorus and a good source of iron. Guava is consumed in different ways. The fruit has sweet aroma wholly edible along with the skin. Seeds yield 3 to 13 percent oil, which rich in essential fatty acid and can be used as a salad dressing (Mahor *et al.*, 2012), usually eaten raw both green and ripe (when it becomes fragrant). It is also stewed and used in shortcakes, puddings, sauce, ice cream, butter,

marmalade, chutney and other products and pies. The fruits produced during the rainy season are severely attacked by the seasonal insect called fruit fly. Infestation of fruit flies ranges from 20 to 46 percent with a crop loss of 16 to 40 percent, which is the matter of serious concern (Hasseb, 2007). The major objective of the present work is to study the influence of pruning and genotypes on quality, yield of fruit and incidence of the fruit fly.

Materials and Methods

Research work was carried out at the "Instructional-cum-Research Orchard" of the Department of Horticulture, MPKV, Rahuri, Dist. Ahmednagar, during the year 2013 and 2014. The soil of the experimental field was light to medium in texture with good drainage within the depth 0.2 to 0.4 m. The annual rainfall ranges from 307 to 619 mm with an average of 520 mm. Genotypes were planted with Spacing of 6x6 m in the year of 2006. Six years old guava plants were selected in the experiment. The treatment includes Factor A: Seven Genotypes of 7-8 years old i.e. Sardar (S_1), RHR-Guv-58 (S_2), RHR-Guv-60 (S_3), RHR-Guv-14 (S_4), RHR-Guv-16 (S_5), RHR-Guv-3 (S_6) and RHR-Guv-6 (S_7). Factor B:Six pruning time i.e. 15th May (P_1), 15th June (P_2), 15th July (P_3), 15th August (P_4), 15th Sept (P_5) and Control (P_0).The experiment was laid out in the factorial randomized block design with forty-two treatments replicated two times. In the experiment, 75 percent pruning of current season growth of guava trees were pruned at monthly intervals.

Results and Discussion

The height of plant

The maximum height of plant was recorded in P_0 (Control) (2.30 m) treatment. The height of plant was observed non-significant for genotypes and interaction among the pruning time and different genotypes (Table 1). There is an increase in height of plants after the pruning operation as compared to control one. It might be ascribed as a faster growth of newly sprouted shoots of pruned trees due to the availability of stored carbohydrates to the plant. The results of present studies are confirmed with those of Basu *et al.,* (2007) who also reported the significant increase in guava plant height after pruning as compared to control.

Plant spread

Significantly maximum East-West (5.89 m) and North-South (5.99 m) plant spread was recorded in S_1 (Sardar) genotype. East-West and North-South plant spread was observed non-significant for pruning time and for interaction among the pruning time and different genotypes. Increase in spread (EW and NS) was observed in all pruning treatments and in all genotypes as compared to control (Table 2 and 3). This might be due to a high growth rate of newly emerged shoots after the pruning which leads to increase in plant spread as compared to control. Basu *et al.,* (2007) also reported a significant increase in guava plant spread after pruning as compared to control.

Number of sprouted shoots per tree

As regards the data on pruning time, significantly maximum shoots (89.21) were recorded in P_0 (control). In case of genotype maximum shoots (84.67) were noticed in S_1 (Sardar). Regarding interaction, significantly maximum number of shoots sprouted per plant was recorded in P_0S_1 (116.00) treatment combination in pooled results (Table 4). The results of the conducted experiment show that the growth of control trees was more due to continuous growth habit of guava plant and pruned trees put forth more number of shoots.

This might be due to the translocation of metabolites and favors the more sprouting in pruned matured shoots. The results of present studies are found in line with those of Singh *et al.,* (2001) observed a maximum number of shoots in pruned trees compared to unpruned ones in guava. Dhaliwal *et al.,* (2014) reported that pruned trees of Kinnow produce a maximum number of shoots as compared to control one.

The average weight of fruit

With respect to pruning time, the highest average weight (238.2 g) of fruit was noticed in P_2 (15^{th} June). As regards to genotypes, a highest average weight of fruit 250.9 g) was observed S_4 (RHR-Guv-14). Significant interaction effect of pruning time and genotypes, with the highest average weight of fruit was noted in P_2S_4 (274.5 g) treatment combination in pooled results (Table 5). Results of the experiment show that maximum average weight of fruit was recorded by S_4 (genotype) and least in S_1 Genotypes which had pruned, control trees having less weight of fruit. The production of heavier fruits by trees subjected to pruning might be ascribed to the lesser crop load per tree and more nutrient supply to the limited fruit number. Discussion in further strengthened by the fact that trees subjected to pruning 75 percent removal of current season growth) might have produced more leaves/fruit ratio as compared to the control ones thereby increasing the fruit weight. More or less, similar results were also reported by Sundarajan and Muthuswamy (1964a) and Bajpai *et al.,* (1973) in guava as they obtained an increment in fruit weight in pruned trees than control one.

Length of fruit

As regards the data on pruning time, significantly maximum length of fruit (7.21 cm) was recorded in P_4 (15^{th} Aug.) in pooled results and in case of genotype maximum length of fruit (7.28) was recorded in S_4 (RHR-Guv-14)). Regarding interaction, the maximum length of fruit was recorded in P_4S_4 (7.55 cm) treatment combination (Table 6). In the conducted experiment, there was not too much effect of various pruning time observed on length fruit; S_4 genotypes has a maximum length of fruit and least in S1 as well as in control ones.

This might be due to the effect of pruning causes shifting of metabolites in sprouted shoots which leads to increase in vegetative and reproductive growth in plants and due to which length of fruit is increased. The results of present studies are in consonance with those of Arvindakshan (1963), Sundarajan and Muthuswamy (1964a), Lotter and Lotter (1990) and Lal *et al.,* (2000), who also obtained increased fruit size in pruned trees as compared to control ones.

The diameter of fruit

The diameter of fruit, as regards pruning time, the significantly maximum diameter of fruit (7.24 cm) was recorded in P_4 (15^{th} Aug.) in pooled results and regarding genotypes, the maximum diameter of fruit (7.31) was recorded in S_4 (RHR-Guv-14)). In case of interaction, the significantly maximum diameter of fruit was recorded in P_4S_5 (7.70 cm). In the experimental results of genotypes, in that S_4 treatment has maximum fruit diameter (Table 7). There was not too much effect of various time of pruning observed.

Maximum fruit diameter was recorded in the trees of pruned ones than control. This is might be due to the availability of stored food to the sprouted shoots fruit buds. The present studies results are in the line with those. Aravindakshan (1963), Sundarajan and Muthuswamy (1964a), Lotter and Lotter

(1990) and Lal *et al.*, (2000), who also obtained increased fruit size in pruned trees. Likewise, Fivaz and Stassen (1994) recorded an improvement in fruit size with pruning in mango.

Average number of seeds per fruit

As regards time of pruning, the significant minimum average number of seeds (268) was observed in P_3 (15^{th} July) in pooled results and the minimum average number of seeds (248.5) was observed in S_2 (RHR-Guv-58) genotype (Table 8). In the results of conducted experiment observed no such effect of pruning time on a number of seeds per fruit. However, genotypes having its independent characteristics regarding a number of seeds in fruits.

Table.1 Effect of pruning time and genotypes on height of plant (m)

Treats.	**Guava genotypes**							
Pruning Time	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**Mean**
P1	2.14	1.85	1.53	1.55	1.77	1.83	1.60	1.75
P2	1.76	1.77	1.50	1.65	1.74	1.65	1.55	1.66
P3	2.23	1.70	1.85	1.75	1.82	1.59	1.50	1.78
P4	1.58	1.54	1.59	1.55	1.73	1.48	1.83	1.61
P5	1.80	1.74	1.79	1.38	1.24	1.62	1.60	1.59
P0 (Control)	2.11	2.37	2.75	1.98	2.14	2.35	2.40	2.30
Mean	1.93	1.83	1.83	1.64	1.74	1.75	1.75	1.78
Year 2013 & 2014	Pruning Time		Guava genotypes			Interaction (P×S)		
	Pooled		Pooled			Pooled		
SE (m) ±	0.110		0.118			0.29		
CD 5%	0.304		NS			NS		

Table.2 Effect of pruning time and genotypes on plant spread (m)

Treats.	**East-west plant spread (cm)**							
	Guava genotypes							
Pruning Time	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**Mean**
P1	6.40	4.05	3.95	3.90	3.61	2.80	3.60	4.04
P2	4.96	3.40	3.33	3.75	5.27	3.56	3.15	3.91
P3	6.21	3.00	4.15	3.69	3.72	3.36	3.50	3.95
P4	5.76	3.21	3.61	3.66	4.60	3.74	3.21	3.97
P5	6.01	3.52	3.76	3.80	4.75	3.63	3.00	4.07
P0 (Control)	6.02	3.40	3.42	4.15	4.60	3.26	4.13	4.14
Mean	5.89	3.43	3.70	3.82	4.42	3.39	3.43	4.01
Year 2013 & 2014	Pruning Time		Guava genotypes			Interaction (P×S)		
	Pooled		Pooled			Pooled		
SE (m) ±	0.208		0.225			0.552		
CD 5%	NS		0.624			NS		

Table.3 Effect of pruning time and genotypes on plant spread (m)

Treats.	North-South plant spread (cm)							
	Guava genotypes							
Pruning Time	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**Mean**
P1	6.15	4.35	3.40	3.60	3.51	3.46	3.10	3.94
P2	5.80	2.80	3.61	4.15	4.16	3.75	3.31	3.94
P3	6.41	3.71	4.36	3.77	4.28	3.43	3.15	4.16
P4	6.06	4.51	3.21	3.00	3.46	4.06	3.85	4.02
P5	5.71	3.50	4.62	3.75	3.60	4.10	3.16	4.06
P0 (Control)	5.79	3.15	3.06	3.82	3.70	4.28	3.74	3.93
Mean	5.99	3.67	3.71	3.68	3.78	3.84	3.38	4.01
Year 2013 & 2014	Pruning Time		Guava genotypes			Interaction (P×S)		
	Pooled		Pooled			Pooled		
SE (m) ±	0.187		0.202			0.494		
CD 5%	NS		0.559			NS		

Table.4 Effect of pruning time and genotypes on number of sprouted shoots per tree

Treats.	Guava genotypes							
Pruning Time	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**Mean**
P1	85.00	45.00	22.00	42.00	35.00	32.00	36.00	42.43
P2	73.00	28.00	27.00	29.00	26.00	32.00	33.00	35.43
P3	76.00	35.00	25.00	26.00	32.00	31.00	30.00	36.43
P4	91.00	37.00	32.00	32.00	36.00	22.00	25.00	39.29
P5	67.00	22.00	23.00	31.00	33.00	36.00	22.00	33.43
P0 (Control)	116.00	97.50	75.50	75.50	91.00	75.50	93.50	89.21
Mean	84.67	44.08	34.08	39.25	42.17	38.08	39.92	46.04
Year 2013 & 2014	Pruning Time		Guava genotypes			Interaction (P×S)		
	Pooled		Pooled			Pooled		
SE (m) ±	0.524		0.56			1.38		
CD 5%	1.452		1.56			3.84		

Table.5 Effect of pruning time and genotypes on average weight of fruit (g)

Treats.	Guava genotypes							
Pruning Time	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**Mean**
P1	165.0	227.0	246.0	247.5	227.5	250.0	205.0	224.0
P2	167.0	249.0	258.5	274.5	226.5	245.5	247.0	238.2
P3	179.0	240.5	225.5	259.5	224.	246.5	230.0	229.3
P4	165.0	235.0	251.5	231.5	250.5	232.0	242.0	229.6
P5	163.0	268.5	231.5	240.5	234.0	240.0	214.5	227.4
P0(Control)	161.0	222.0	242.0	252.0	241.0	249.5	233.0	228.6
Mean	166.6	240.3	242.5	250.9	234.0	243.9	228.5	229.5
Year 2013 & 2014	Pruning Time		Guava genotypes			Interaction (P×S)		
	Pooled		Pooled			Pooled		
SE (m) ±	0.69		0.745			1.826		
CD 5%	1.91		2.066			5.061		

Table.6 Effect of pruning time and genotypes on length of fruit (cm)

Treats.	Guava genotypes							
Pruning Time	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**Mean**
P1	6.65	7.15	7.20	7.35	7.15	7.05	7.15	7.10
P2	6.45	7.05	7.25	7.20	7.50	7.25	7.05	7.11
P3	6.95	7.05	7.15	7.10	7.15	7.25	7.05	7.10
P4	6.80	7.15	7.25	7.55	7.45	7.05	7.25	7.21
P5	6.65	7.05	7.25	7.25	7.05	7.15	7.10	7.07
P0(Control)	6.35	6.95	6.85	7.25	7.05	6.95	7.15	6.94
Mean	6.64	7.07	7.16	7.28	7.23	7.12	7.13	7.09
Year 2013 & 2014	Pruning Time		Guava genotypes			Interaction (P×S)		
	Pooled		Pooled			Pooled		
SE (m) ±	0.02		0.022			0.054		
CD 5%	0.05		0.06			0.15		

Table.7 Effect of pruning time and genotypes on diameter of fruit (cm)

Treats.	Guava genotypes							
Pruning Time	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**Mean**
P1	6.45	7.10	7.30	7.45	7.30	7.10	7.20	7.13
P2	6.35	7.10	7.30	7.20	7.50	7.30	7.10	7.12
P3	6.40	7.10	7.20	7.10	7.30	7.30	7.20	7.09
P4	6.30	7.20	7.40	7.60	7.70	7.20	7.30	7.24
P5	6.20	7.20	7.30	7.40	7.10	7.20	7.20	7.09
P0(Control)	6.20	7.00	7.10	7.10	7.10	7.00	7.20	6.96
Mean	6.32	7.12	7.27	7.31	7.33	7.18	7.20	7.10
Year 2013 & 2014	Pruning Time		Guava genotypes			Interaction (P×S)		
	Pooled		Pooled			Pooled		
SE (m) ±	0.02		0.02			0.055		
CD 5%	0.05		0.06			0.15		

Table.8 Effect of pruning time and genotypes on average number of seeds per fruit

Treats.	Guava genotypes							
Pruning Time	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**Mean**
P1	332.0	255.00	241.0	259.0	287.00	279.0	249.0	271.71
P2	313.0	241.00	260.0	280.0	291.00	257.0	278.0	274.29
P3	345.0	239.00	245.0	256.0	268.00	257.0	268.00	268.00
P4	346.0	257.00	289.0	290.0	243.00	234.0	273.0	276.00
P5	312.0	256.00	255.0	253.0	281.00	275.0	245.0	268.29
P0(Control)	329.0	243.00	244.0	253.00	278.00	254.0	281.5	268.93
Mean	329.5	248.5	255.	265.1	274.6	259.3	265.7	271.2
Year 2013 & 2014	Pruning Time		Guava genotypes			Interaction (P×S)		
	Pooled		Pooled			Pooled		
SE (m) ±	0.333		0.360			0.882		
CD 5%	0.924		0.998			2.445		

Table.9 Effect of pruning time and genotypes on shelf life of fruit (days)

Treats.	Guava genotypes							
Pruning Time	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**Mean**
P1	3.35	8.40	8.30	9.15	8.45	8.40	8.30	7.76
P2	3.45	8.25	8.30	9.40	8.20	8.05	8.15	7.69
P3	3.20	8.15	8.10	9.25	8.25	8.05	8.30	7.61
P4	3.30	8.15	8.25	9.10	8.15	8.10	8.15	7.60
P5	3.10	8.15	8.15	9.10	8.15	8.35	8.20	7.60
P0(Control)	3.45	8.10	8.20	9.15	8.20	8.30	8.25	7.66
Mean	3.31	8.20	8.22	9.19	8.23	8.21	8.23	7.65
Year 2013 & 2014	Pruning Time		Guava genotypes			Interaction (P×S)		
	Pooled		Pooled			Pooled		
SE (m) ±	0.054		0.058			0.142		
CD 5%	NS		0.161			NS		

Table 10 Effect of Genotypes on pulp texture

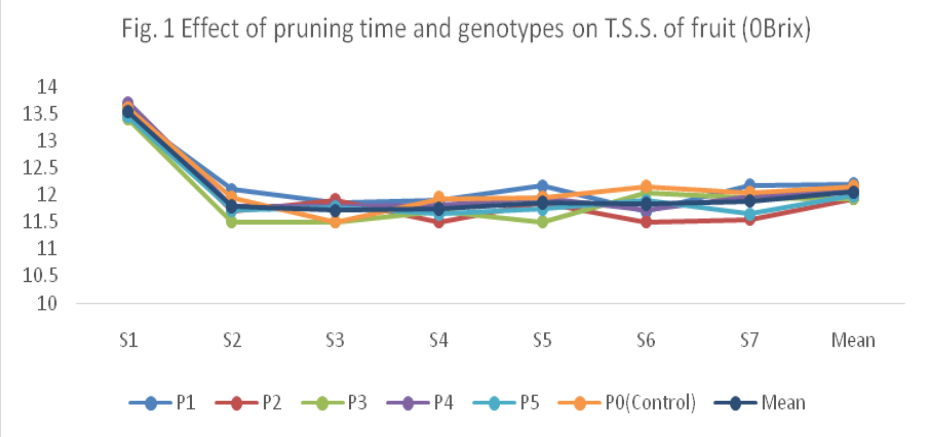
Treatment	Pulp texture	
Guava genotypes	**Mature**	**Ripe**
S1	Soft	Mashy
S2	Very crisp	Very crisp
S3	Very crisp	Very crisp
S4	Very crisp	Very crisp
S5	Very crisp	Very crisp
S6	Very crisp	Very crisp
S7	Very crisp	Very crisp

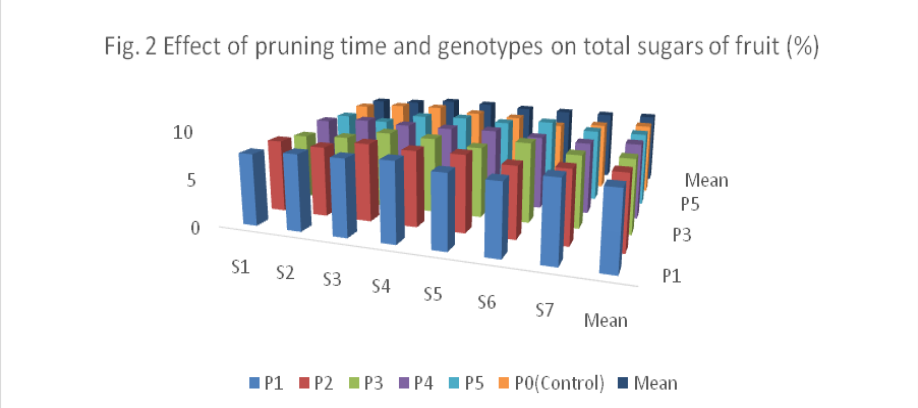
Table.11 Effect of pruning time and genotypes on fruit fly infestation (%)

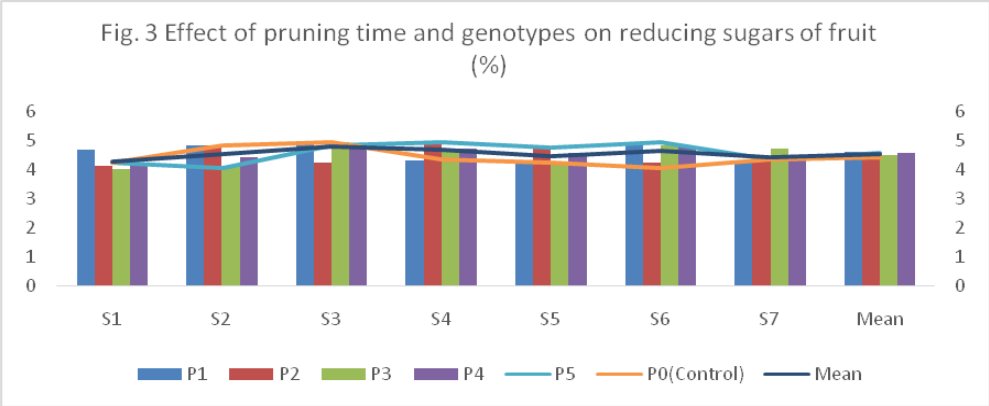
Treats.	Guava genotypes							
Pruning Time	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**Mean**
P1	47.10	48.60	50.62	47.34	50.62	47.73	49.10	48.73
P2	40.70	40.17	39.45	37.94	40.00	40.84	39.50	39.80
P3	14.00	16.50	14.00	13.50	15.50	16.50	17.50	15.36
P4	11.50	13.50	13.50	12.00	13.00	14.00	15.00	13.21
P5	7.50	10.50	10.00	8.50	10.50	10.50	12.50	10.00
P0(Control)	46.99	48.00	49.00	46.00	46.50	47.89	47.99	47.48
Mean	27.97	29.55	29.43	27.55	29.35	29.58	30.27	29.10
Year 2013 & 2014	Pruning Time		Guava genotypes			Interaction (P×S)		
	Pooled		Pooled			Pooled		
SE (m) ±	0.836		0.903			2.211		
CD 5%	2.316		NS			NS		

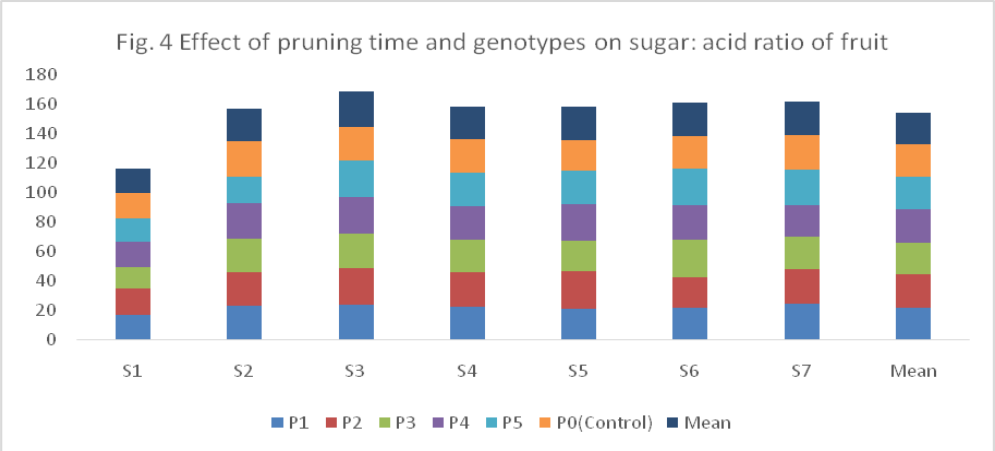
Table.12 Effect of pruning time and genotypes on marketable Yield per plant free from fruit fly infestation (kg)

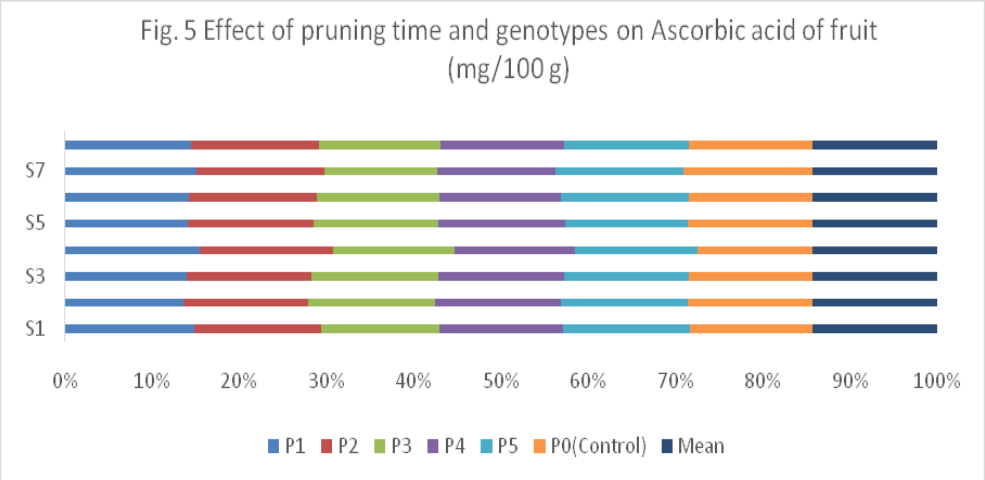
Treats.	**Guava genotypes**							
Pruning Time	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**Mean**
P1	17.68	14.18	16.64	16.43	13.80	16.52	12.74	15.42
P2	17.59	17.25	19.70	20.92	15.85	18.51	17.72	18.22
P3	31.84	27.52	26.91	31.82	25.69	27.99	25.85	28.23
P4	21.55	20.53	20.53	19.57	20.76	18.92	18.40	20.04
P5	15.69	17.53	12.90	13.57	12.82	13.86	12.85	14.17
P0(Control)	16.89	13.89	15.70	17.37	13.91	15.60	13.68	15.29
Mean	20.21	18.48	18.73	19.95	17.14	18.56	16.87	18.56
Year 2013 & 2014	Pruning Time		Guava genotypes			Interaction (P×S)		
	Pooled		Pooled			Pooled		
SE (m) ±	0.198		0.214			0.525		
CD 5%	0.550		0.594			1.455		











TSS

As regards, the effect of genotypes was found to be significant, maximum (13.54^{0}Brix) TSS was noted in S_1 (Sardar) Cv. (Fig. 1). The result of the conducted experiment shows that time of pruning does not affect TSS too much. But, different genotypes get affected by pruning in that maximum TSS recorded in S_1 treatment and less TSS was recorded in control ones. This is due to the effect of pruning of plants, attributed to lower leaves/ fruit ratio in such trees. Pruning time was not affecting too much acid. Similar results

regarding the effect of pruning on TSS of fruits were recorded by Bajpai *et al.*, (1973) and Sheikh and Hulmani (1996). They also reported an increased fruit TSS with pruning in guava.

Total sugars and reducing sugars

Effect of pruning time and genotypes were found to be non-significant, but more total and reducing sugars were found in S_3 (RHR-Guv-60) (Fig. 2 and 3). The improvement was observed in quality of guava fruit of pruned trees compared to control one were better. Bajpai *et al.*, (1973), Sing *et al.*, (2005) reported that better quality of fruits observed in fruits of pruned guava plants compared to control ones.

Acidity

This is very important biochemical parameter decides taste blend of guava. Non-significant differences due to different pruning time were observed. Data of effect of genotypes were observed to be significant. However, Maximum (0.43 %) acidity was noted in S1 (Sardar) (Fig. 4). Pruning time was not affecting too much acidity. But the genotypes differed in acidity; it might due to the independent characteristic of genotype along with pruning effect and also might be due to the abundant availability of photosynthesis for a limited number of fruits leads to increase in acidity.

Sugar: acidity ratio

With respect to genotypes, significantly maximum sugar: acid ratio (24.1) was noticed in S_3 (RHR-Guv-60) and effect of time of pruning and interaction between different times of pruning and genotypes was found to be non-significant for sugar: acid ratio (Fig. 4). In obtained results, maximum sugar acid ratio was noticed in pruned trees as compared to control trees of Guava. This is might be due to healthy shoot canopy, better sunlight distribution in the canopy, better sunlight utilization and better photosynthetic rate in pruned plants. Shirsath (2013) reported that maximum sugar acid ratio was recorded in pruned plants compared to control ones.

Ascorbic acid

Pooled results revealed that significantly maximum (199.93 mg/100 g) ascorbic acid was observed in P_2 (15^{th} June). In case of the data of effect genotypes, maximum (202.17 mg/100 g) ascorbic acid was observed in S_4 (RHR-Guv-14).In the obtained results, ascorbic acid content in fruit increased with pruning as compared to control ones (Fig. 5). This might be due to the abundant availability of photosynthesis for a limited number of fruits leads to increase in ascorbic acid. As well as the prevalence of low temperature increases ascorbic acid in the fruit. Sheikh and Hulmani (1996) and Kaur (1999), who registered the highest ascorbic acid content in fruits produced by trees subjected to severe pruning, also observed improved ascorbic acid content in fruits of guava after pruning.

The shelf life of fruit

As regards data on genotypes, the maximum shelf life of fruit (9.19 days) was noticed in S_4 (RHR-Guv-14) and effect of time of pruning and interaction between different times of pruning and genotypes was found to be non-significant (Table 9). The maximum shelf life of fruit, it might be due to a low rate of respiration of fruit due to which slow degradation of fruit taking place.

Pulp texture

Fruit of genotypes S_2, S_3, S_4, S_5, S_6 and S_7 having very crisp pulp texture at a mature stage and also at ripe stage (Table 10).

Genotype S_1 has soft pulp texture at the mature stage of fruit and mashy pulp texture at the ripe stage of fruit. Pulp texture is the very important quality parameter of fruits of guava that is related to less or more preferably of fruits of guava by consumers in the market.

Fruit fly infestation

Significantly lowest fruit fly infestation (10 %) was recorded in P_5 (15^{th} Sept.) followed by P_4 (15^{th} Aug.) (13.25 %) time of pruning. Effect of genotypes and interaction between different times of pruning and genotypes was found to be non-significant for fruit fly infestation. This is due to the change in the time of fruiting and harvesting by pruning operation. Fruit fly infestations were recorded maximum in rainy season compared to winter season crop (Table 11). When the pruning is done in Aug-Sept, the fruit will be available in Feb-March meanwhile incidence of fruit flies in too much less. The finding of present studies are found in consonance with that Shirsath (2013) reported that less incidence of fruit fly was recorded in pruned guava plants as compared to control ones. Similarly, Muhammad *et al.,* (2014) reported that the abundance of fruit fly was observed throughout the year, with two peaks in summer from May to August and during winter from November to January coinciding with availability of guava fruits. The maximum fruit damage (18.59%) occurred in August, and the second peak with 13.37% damage observed during the period of July.

Total yield per plant free from infestation

With respect to pruning time, yield per plant (kg) free from infestation was recorded significantly maximum (28.23 kg) in P3 (15th July). Highest (20.21 kg) yield per plant was noted in S1 (Sardar) (Table 12). Findings of the present studies in line with those Anon., (1979) and Rao and Khader (1980), who obtained the higher mean yields over seven years with pruning as compared to no pruning in mango. Likewise, Shirsath (2013) reported that there is an increase in the yield of moderate pruned trees as compared to compared to unpruned guava trees. Bajpai*et al.,* (1973) and Benington (1981) reported that the fruit yield increased significantly with light pruning in guava and Valencia orange trees, respectively. On the contrary, Jadhav*et al.,* (1998) obtained the highest yield in guava with severe pruning, i.e., pruning 60 cm from the tip.

In conclusion the genotype RHR-Guv-14 was found to be better in quality like lustrous fruit, crispy pulp texture, large fruit size, more fruit weight, maximum shelf life of fruit, that's why it can be evaluate for cultivation as hasta bahar crop. Similarly, 15 Sept pruning timewas found to be important in escape from fruit fly infestation and with respect to marketable yield 15th July pruning time was found to be better.

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