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Effect of pruning intensities and time of pruning on organoleptic evaluation of guava cv. Sardar under different planting densities

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Abstract

In planting densities the maximum score for colour and appearance (4.18), taste (4), flavour (4), texture (4.31) and Overall acceptability (4.12) was noticed in the treatment M6. Similar trend was noticed in another experiment also. In pruning intensities the maximum score for colour and appearance was noticed in the treatment S2 (4.37) followed by S3, the maximum score for taste and flavour was noticed in the treatment S3 (4.08 and 4) which was on par with S2. The maximum score for overall acceptability was noticed in the treatment S2 (4.09) which was on par with S3. However, the minimum score was noticed in S4 (3.59). Time of pruning and interaction effect showed non significant with respect to all parameters.

Keywords: Pruning intensities, guava, planting densities

Introduction

Guava (*Psidium guajava* L.) is one of the most important tropical and subtropical fruit because it has a high nutritive value and can be grown under different soil and climatic conditions. It bears fruit twice in a year but the best quality fruit is obtained in winter (Bal and Dhaliwal, 2004) [1]. Guava is another tropical fruit rich in nutrition. With its unique flavor, taste, and health-promoting qualities, the fruit easily fits in the new functional foods category, often called "super fruits (Mahajan, 2004) [2]. Guava-fruit is an excellent source of antioxidant vitamin-C. Scientific studies shown that regular consumption of fruits rich in vitamin C helps the body develop resistance against infectious agents and scavenge cancer causing harmful free radicals from the body. Further, the vitamin is required for collagen synthesis within the body. Collagen is the main structural protein in the human body required for maintaining the integrity of blood vessels, skin, organs, and bones. So planting density and pruning play an important role in quality and appearance of guava fruit.

Material and methods

The investigation was carried out at the College of Horticulture, Udyangiri, Bagalkot, which is situated in northern dry zone of Karnataka (Zone-3). The experiment was laid out in split plot design with 6 planting densities viz. M1 (2x2 m), M2 (3x2 m), M3 (3x3 m), M4 (6x2 m), M5 (6x3 m) and M6 (6x6 m) as a main plot and 4 pruning intensities, viz. S1- leaving 15cm (severely pruning), S2- leaving 30cm (light pruning), S3- leaving 45cm (very light pruning), S4- control (unpruned shoot) as sub plot treatment with two replications in one experiment and in another experiment same 6 planting densities used as a main plot treatments and time of pruning ie. S1- April pruning and S2 - May pruning. The experiment was conducted during 2014 -2015. Organoleptic evaluation was carried out by a panel of judges on a day of harvest. The fresh fruit characters like colour and appearance, texture, taste, flavor and overall acceptability was judge by following score card.

Score points

Character	Score points				
	5	4	3	2	1
Colour & appearance	Attractive	Good	Medium	Dull	Not acceptable
Taste	Highly acceptable	Acceptable	Fairly acceptable	Poorly acceptable	Not acceptable
Flavor	Attractive	Good	Medium	Dull	Not acceptable
Texture	Firm	Medium firm	Soft	Very soft	Not acceptable

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Result and Discussion

A. Effect of pruning intensities on organoleptic evaluation of fruits during winter season guava cv. Sardar under different planting densities

1. Colour and appearance

Data pertaining to organoleptic evaluation of fruits during winter season was significantly influenced by spacing and pruning intensities, however its interactions were non-significant (Table 1).

The maximum score for colour and appearance was noticed in the treatment M6 (4.18) and it was statistically matching the scores obtained by the treatment M5&M4. However, the minimum score was noticed in M1 (3.56) treatment which was on par with M2.

The maximum score for colour and appearance was noticed in the treatment S2 (4.37) followed by S3. However, the minimum score was noticed in S4 (3.58) treatment followed by S1.

Table 1: Effect of pruning intensities on organoleptic evaluation of guava cv. Sardar under different planting densities during winter season

Organoleptic evaluation (score out of 5)																									
Treatment	Colour appearance					Taste					Flavour					Texture					Overall acceptability				
	S1	S2	S3	S4	Mean	S1	S2	S3	S4	Mean	S1	S2	S3	S4	Mean	S1	S2	S3	S4	Mean	S1	S2	S3	S4	Mean
M1	3.25	4.00	4.00	3.00	3.56	3.75	3.25	3.75	3.00	3.43	3.25	3.37	3.5	3.12	3.31	3.12	3.25	3.50	3.00	3.21	3.34	3.59	3.68	3.03	3.41
M2	3.75	4.00	4.00	3.25	3.75	3.25	3.75	3.75	3.00	3.43	3.75	4.00	3.75	3.62	3.78	3.50	3.50	3.62	3.25	3.46	3.58	3.81	3.78	3.28	3.61
M3	3.75	4.50	4.00	3.50	3.93	3.75	4.00	4.00	3.25	3.75	3.75	4.00	4.00	4.00	3.93	3.75	4.12	3.75	3.25	3.71	3.81	4.12	3.93	3.62	3.87
M4	4.00	4.50	4.00	3.75	4.06	3.75	4.5	4.25	3.5	3.81	4.00	4.00	4.00	4.00	4.00	4.25	4.00	4.00	3.75	4.00	4.00	4.5	4.12	3.75	4.09
M5	4.00	4.50	4.00	4.00	4.12	3.25	4.00	4.25	3.75	4.00	3.75	4.00	4.25	4.00	4.00	3.75	4.50	4.00	4.00	4.06	3.68	4.18	4.12	3.93	3.98
M6	4.00	4.75	4.00	4.00	4.18	3.50	4.25	4.5	3.75	4.00	3.75	4.00	4.25	4.00	4.00	4.25	4.5	4.50	4.00	4.31	3.87	4.37	4.31	3.93	4.12
Mean	3.79	4.37	4.00	3.58	3.93	3.54	3.95	4.08	3.37	3.73	3.70	3.89	4.00	3.79	3.84	3.77	3.97	3.89	3.54	3.79	3.71	4.09	3.99	3.59	3.84
	S.E±m		CD at 5%			S.E±m		CD at 5%			S.E±m		CD at 5%			S.E±m		CD at 5%			S.E±m		CD at 5%		
M	0.11		0.34			0.12		0.36			0.09		0.29			0.12		0.37			0.06		0.19		
S	0.06		0.18			0.14		0.39			0.06		0.17			0.10		0.28			0.05		0.15		
MXS	0.17		NS			0.32		NS			0.16		NS			0.24		NS			0.13		NS		

M1: 2mX2m

S1: Severe pruning (Retaining 15cm shoot)

M2: 3mX2m

S2: Light pruning (Retaining 30cm shoot)

M3: 3mX3m

S3: Very light pruning (Retaining 45cm shoot)

M4: 6mX2m

S4: Unpruned shoot (control)

M5: 6mX3m

2. Taste

The maximum score for taste was noticed in the treatment M6 (4) and M5 (4) it was statistically matching the scores obtained by the treatment M4&M3. However, the minimum score was noticed in M1 (3.43) and M2 (3.43) treatment which was on par with M3.

Pruning intensities also had significant influence on taste of the fruit, the maximum score for taste was noticed in the treatment S3 (4.08) which was on par with S2 (3.95). However, the minimum score was noticed in S4 (3.37) treatment (Table 1).

3. Flavour

The maximum score for flavour was noticed in the treatment M6 (4), M5 (4) and M4 (4) it was statistically matching the scores obtained by the treatment M3&M2. However, the minimum score was noticed in M1 (3.31) followed by M2.

The maximum score for flavour was noticed in the treatment S3 (4) which was on par with S2. However, the minimum score was noticed in S1 (3.7) treatment (Table 1).

4. Texture

Spacing and pruning levels significantly influenced the texture of the fruit, the maximum score for texture was

noticed in the treatment M6 (4.31) which was on par with M5& M4. However, the minimum score was noticed in M1 (3.31) which was on par with M2.

Pruning intensities also had significant influence on texture of the fruit, the maximum score for texture was noticed in the treatment S2 (3.97) which was on par with S3& S1. However, the minimum score was noticed in S4 (3.54) treatment (Table 1).

5. Overall acceptability

The overall acceptability was the highest with the treatment M6 (4.12) which was on par with treatment M5& M4. However, lowest was observed in M1 (3.41).

The maximum score for overall acceptability was noticed in the treatment S2 (4.09) which was on par with S3. However, the minimum score was noticed in S4 (3.59) treatment (Table 1).

B. Effect of time of pruning on organoleptic evaluation of guava cv. Sardar under different planting densities

Different spacing varied significantly with respect to different organoleptic parameters while, time of pruning and its interaction with spacing was found non significant (Table 2).

Table 2: Effect of time pruning on organoleptic evaluation of guava cv. Sardar under different planting densities during winter season

Organoleptic evaluation of fruits															
Treatments	Colour & appearance			Taste			Flavor			Texture			Overall acceptability		
	S1	S2	Mean	S1	S2	Mean	S1	S2	Mean	S1	S2	Mean	S1	S2	Mean
M1	3.33	3.83	3.58	3.33	3.33	3.33	3.00	3.33	3.16	3.33	3.33	3.33	3.45	3.58	3.52
M2	3.75	4.16	3.95	4.00	4.00	4.00	3.33	4.16	3.75	3.66	3.66	3.66	4.04	3.87	3.95
M3	4.25	4.50	4.37	4.25	4.00	4.12	4.33	4.33	4.33	3.83	3.66	3.75	4.31	4.10	4.20
M4	4.16	4.66	4.41	4.16	4.25	4.20	4.16	4.16	4.16	4.58	3.91	4.25	4.35	4.16	4.25
M5	4.58	4.25	4.41	4.58	4.58	4.58	4.50	4.16	4.33	4.58	4.25	4.41	4.56	4.31	4.43
M6	4.50	4.91	4.70	4.33	4.66	4.50	4.66	4.66	4.66	4.66	4.66	4.66	4.58	4.60	4.59

Mean	4.09	4.38	4.23	4.11	4.13	4.12	4.00	4.13	4.06	4.11	3.91	4.01	4.21	4.10	4.15
	S.Em±	CDat 5%													
M	0.17	0.53		0.19	0.59		0.22	0.70		0.16	0.50		0.11	0.34	
S	0.16	NS		0.05	NS		0.08	NS		0.09	NS		0.06	NS	
MXS	0.33	NS		0.21	NS		0.27	NS		0.22	NS		0.15	NS	

Spacing

M1: 2mX2m

M2: 3mX2m

M3: 3mX3m

M4: 6mX2m

M5: 6mX3m

M6: 6mX6m

Pruning time

S1: April pruning

S2: May pruning

1. Colour and appearance

The maximum score for colour and appearance was noticed in the treatment M6 (4.7) and it was statistically matching the scores obtained by the treatment M5, M4 & M3. However, the minimum score was noticed in M1(3.58) treatment which was on par with M2.

2. Taste

The maximum score for taste was noticed in the treatment M5 (4.58) it was statistically matching the scores for all the treatments except M1. However, the minimum score was noticed in M1(3.43).

3. Flavour

The maximum score for flavour was noticed in the treatment M6 (4.66) which was on par with the treatment M5, M4, & M3. However, the minimum score was noticed in M1(3.16)

4. Texture

Spacing treatments only had significant influenced the texture of the fruit while time of pruning and its interaction with spacing were non significant, the maximum score for texture was noticed in the treatment M6 (4.66) which was on par with M5 & M4. However, the minimum score was noticed in M1(3.3) which was on par with M2.

5. Overall acceptability

The overall acceptability was the highest with the treatment M6 (4.49) which was on par with treatment M5 and minimum score was noticed in M1(3.52) followed by M2.

Discussion**Different spacing**

Different spacing treatments had significant influence on organoleptic qualities of fruit viz. fruit colour and appearance, taste, flavour texture and overall acceptability of fruit, the colour and appearance taste, flavour, texture and overall acceptability obtained high score in wider spacing plant compared to closer spacing. The higher photosynthesis and availability of metabolites due to higher interception of photo synthetically active radiation by individual tree might have improved fruit quality at wider spacing resulting are finding with Mahajan (2004) [2] and Sing (2001).

Pruning intensities

Different pruning intensities had significant influence on fruit colour and appearance, taste, flavour, texture and overall acceptability of fruit, the colour and appearance (4.37), taste (4.08), flavour (4), texture (3.97) and overall acceptability (4.09) obtained high score in pruned trees compared to unpruned trees. The higher photosynthesis and availability of metabolites due to higher interception of photo synthetically active radiation by individual tree might have improved fruit

quality at pruned trees resulting are finding with Mahajan (2004) [2] and Prakash (2014).

Interaction effect

Effect of spacing and its interaction with pruning intensities were also did not exert significant effect.

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