Research Article

Effect of Crop Regulation and Fertigation on Vegetative Growth of Guava (*Psidium Guajava*) CV. Sardar

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Abstract

The "Effect of crop regulation and fertigation on vegetative growth of guava (*Psidium guajava)* cv. Sardar" was carried out at Department of Horticulture, Agricultural College and Research Institute, Madurai, Tamil Nadu during the year 2012-2014. The experiment was laid out in factorial randomized black design. In this experiment three pruning levels (P_0 without pruning, P_1-15cm pruning, P_2- 30 cm pruning) and five fertigation (F_0 – Soil application, F_1 - 125 %, F_2 - 100 %, F_3 - 75 %, F_4 - 50 % with three replication. The maximum growth was recorded in the treatment P_2 and 125% in guava.

Keywords: Guava, Vegetative Characters, Pruning, Fertigation

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Introduction

Guava (*Psidium guajava* L) belongs to the family of myrtaceae, commonly known as the apple of tropics. It is one of the most important fruit in terms of area and production after mango, banana and citrus. Guava fruits are rich in flavor, aroma and all the above, their availability in the market at moderate prices (Bal and Dhaliwal, 2003). In general, guava bears in three season's namely rainy, winter and spring. The result of study has indicated that whenever pruning has been attempted in guava, there has been a vast improvement in yield and fruit quality, especially, with light pruning (Baj pai *et al*., 1973). On the other hand Jadhao *et al*. (1988) reported that severe pruning (60 cm from the tip) resulted in the most vigorous vegetative growth and the highest fruit yield and quality in guava.

Drip irrigation proved efficiently in providing irrigation water and nutrients to the roots of plant, while maintaining high yield and quality production. Many researchers have reported the higher efficiency of drip irrigation systems over the conventional basin irrigation systems (Salvin *et al*., 2000; Bharambe *et al*., 2001; Agrawal and Agrawal, 2007) compared to drip and basin irrigation systems in fruits and found that there was savings of 40 to 60% more irrigation water than basin irrigation methods. Kumar *et al*. (2007) reported that fertigation ensures substantial saving in fertilizer usage and reduces leaching losses. Sharma *et al*. (2011) observed higher guava yield and quality through fertigation than basin irrigation. Till now there has been no study conducted and reported the combined effect of pruning and fertigation. Hence, the present study was envisaged to study the combined effect of pruning and fertigation in guava.

Materials and Methods

Experimental site and treatment details

The experiment was conducted at Department of Horticulture, Agricultural College and Research Institute, Madurai, Tamil Nadu, the experiment was laid out in factorial randomized block design (FRBD) with three replications during the year 2012 to 2014, on uniform 10-years- old 'Sardar' guava plants planted at the spacing of 6 × 6 m. The research experiment conducted in the farmers field at Dhavathana patti village, Theni District, Tamil Nadu. The study aimed to standardize the pruning levels and fertigation schedules for guava, and also to understand crop regulation and fertigation on guava (*Psidium guajava* L.) cv. Sarader growth, physiology, yield and quality. The treatment includes three levels of pruning (P_0 without pruning, P_1-15cm pruning, P_2- 30 cm pruning)and five levels of fertigation (F_0 – Soil application of RDF(1000: 1000: 1000 g NPK plant^{-1} year^{-1}), F_1 – Drip fertigation of 125 % RDF (1250: 1250: 1250 g NPK plant^{-1} year^{-1}), F_2 - Drip fertigation of 100 % RDF (1000: 1000: 1000 g NPK plant^{-1} year^{-1}), F_3 - Drip fertigation of 75 % RDF (750: 750: 750 g NPK plant^{-1} year^{-1}), F_4 - Drip fertigation of 50 % of RDF (500: 500: 500 g

NPK plant^{-1} year^{-1}), with three replication. The soil application with drip irrigation was done in two split doses during June –July and October-November. Water Soluble Fertilizers (WSF) namely Urea, Polyfeed and White Potash were injected at weekly intervals in equal splits (52 weeks).

Result and Discussion

Effect of crop regulation and fertigation on vegetative attributes

The data presented in the **Table 1** recorded that there was enhancement in vegetative growth with the increase of pruning and fertigation. The maximum plant height recorded in the treatment combination in the P_2F_1 and the minimum plant height recorded in the treatment combination control P_0F_0 in both the season respectively. The maximum number of new shoots emerged from pruned branches in the treatment combination in the P_2F_1 and the minimum number of new shoots emerged from pruned branches recorded in the treatment combination control P_0F_0. The maximum shoot length in the treatment combination in the P_2F_1 and the minimum shoot length recorded in the treatment combination control P_0F_0.The maximum canopy spread in the treatment combination in the P_2F_1 and the minimum canopy spread recorded in the treatment combination control P_0F_0.

Table 1 Effect of crop regulation and fertigation on vegetative growth of guava (*Psidium guajava)* cv. Sardar

Treatments	Plant height (M)		Canopy(M) North-South		Canopy(M) East-West		Shoot Length (cm)		No. of New Shoots Emerged from Pruned Plants	
	Rainy	Winter	Rainy	Winter	Rainy	Winter	Rainy	Winter	Rainy	Winter
P_0F_0	1.79	2.61	2.44	2.34	2.68	2.49	0.00	0.00	0.00	0.00
P_0F_1	2.21	2.95	2.70	2.68	2.96	2.80	0.00	0.00	0.00	0.00
P_0F_2	2.15	2.91	2.65	2.64	2.91	2.73	0.00	0.00	0.00	0.00
P_0F_3	2.09	2.86	2.61	2.57	2.85	2.68	0.00	0.00	0.00	0.00
P_0F_4	2.00	2.84	2.57	2.53	2.80	2.63	0.00	0.00	0.00	0.00
P_1F_0	1.89	2.73	2.52	2.46	2.76	2.56	17.01	18.01	5.42	6.32
P_1F_1	2.45	3.10	2.84	2.91	3.11	3.15	21.01	23.15	8.17	9.27
P_1F_2	2.39	3.07	2.81	2.84	3.07	3.05	19.64	21.00	7.84	8.73
P_1F_3	2.35	3.01	2.76	2.79	3.04	2.94	19.15	20.03	7.52	8.35
P_1F_4	2.22	2.97	2.72	2.72	3.00	2.87	18.74	18.65	7.11	7.81
P_2F_0	1.95	2.78	2.55	2.49	2.78	2.60	18.01	18.37	6.92	7.43
P_2F_1	3.09	3.40	3.05	3.40	3.35	3.60	24.89	32.31	11.79	13.29
P_2F_2	2.98	3.27	3.00	3.30	3.27	3.44	22.03	29.63	10.36	12.51
P_2F_3	2.82	3.20	2.94	3.18	3.19	3.38	21.56	28.47	9.14	11.77
P_2F_4	2.67	3.13	2.89	3.05	3.16	3.19	21.06	25.88	8.60	9.84
SEd	0.07	0.06	0.05	0.07	0.08	0.08	0.56	0.58	0.21	0.26
CD(0.05)	0.14	0.13	0.10	0.14	0.15	0.17	1.12	1.17	0.41	0.52

Pruning (P_0 Without pruning, P_1-15cm pruning, P_2- 30 cm pruning)
Fertigation (F_0 – Soil application of RDF (1000: 1000: 1000 g NPK plant^{-1} year^{-1})
F_1 – Drip fertigation of 125 % RDF (1250: 1250: 1250 g NPK plant^{-1} year^{-1})
F_2 - Drip fertigation of 100 % RDF (1000: 1000: 1000 g NPK plant^{-1} year^{-1})
F_3 - Drip fertigation of 75 % RDF (750: 750: 750 g NPK plant^{-1} year^{-1})
F_4 - Drip fertigation of 50 % of RDF (500: 500: 500 g NPK plant^{-1} year^{-1})

Regular pruning and fertigation results in increase in height of the plant, number of new shoots emerged from pruned branches, shoot length and canopy spread to the quick response of food material absorbed by the roots and transmission of the same to the main trunk of such trees, moreover, in such tress of the carbohydrates and nitrogen were utilized for the vegetative growth, thereby, resulting in stimulated production of height of the plants, more number of new shoots, shoot length and increased canopy spread (Gurdarshan Singh, 2012). Among various fertigation levels, higher doses showed better vegetative growth of the plant. It might be due to application of higher dose of fertilizers attributed to better nutritional environment in the root zone as well as in plant system. 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 (Throughton *et al*., 1974). The results of present study are in conformity with those of Dasarathy (1951), Aravindakshan (1953) and Gill (1994).

Conclusions

There was enhancement in vegetative growth with the increase of pruning and fertigation due to increase in height of the plant, number of new shoots emerged from pruned branches, shoot length and canopy spread recorded in the P_2 and fertigation F_2.The investigation of pruning and fertigation increases the height of the plant, number of new shoots emerged from pruned branches, shoot length and canopy spread recorded in the P_2F_1.

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