



P-ISSN: 2349-8528

E-ISSN: 2321-4902

IJCS 2018; 6(4): 2425-2427

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Received: 14-05-2018

Accepted: 18-06-2018

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Effect of pruning and drip fertigation on flowering character of Guava (*Psidium guajava* L.) cv. Lucknow 49

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Abstract

An experiment was conducted to see the “Effect of pruning and drip fertigation on flowering character of Guava (*Psidium guajava* L.) cv. Sardar” at Farmers Field, Devathanapatti, Theni (Dt), Tamil Nadu. The field experiment was laid out in Factorial Randomized Block Design (FRBD) replicated thrice with two factors (Factor 1- Pruning, Factor 2- Fertigation), *i.e.*, different pruning levels *viz.*, P₀ - Without pruning, P₁ - Light pruning (removal of past season growth up to 15 cm), P₂ - Moderate pruning (removal of past season growth up to 30 cm) and drip fertigation levels *viz.*, F₀ - 100 per cent recommended dose of fertilizer (RDF) as soil application and irrigation, F₁ - 125 per cent RDF through fertigation, F₂ - 100 per cent RDF through fertigation, F₃ - 75 per cent RDF through fertigation, F₄ - 50 per cent RDF through fertigation. The results of the investigation revealed that the flowering characters were significantly influenced by different pruning levels and drip fertigation treatments. Among the different pruning levels, P₂ - moderate pruning (removal of past season growth up to 30 cm) resulting with earlier flowering in winter season compare to the rainy season.

Keywords: Pruning, fertigation – flowering characters

Introduction

Guava (*Psidium guajava* L.) is one of the most important fruits of the tropics and sub-tropics of the world. It belongs to family Myrtaceae and is aptly called as ‘Apple of the tropics’. It was introduced to India during the 17th century by the Portuguese explorers brought the fruit and many others to Goa (Menzel and Paxton, 1985) [7]. This fruit occupies an important place in the horticultural wealth of our nation and ranks fifth with respect to area and production. The guava is almost cultivated in all the districts of Tamil Nadu with more area being concentrated in Dindigul, Madurai, Virudhunagar and Theni districts which have many factors for low productivity. Lot of scopes for increasing area under guava cultivation in Tamil Nadu in the years to come due to its demand from the consumers.

The flowering and fruit of rainy season crop are rough, insipid, poor flowering and quality due to high temperature, rainfall and humidity which leads attacked by several insect-pest and pathogens so that, rainy season crop should be avoided. On the other hand, winter season crop is superior in quality, free from diseases and fetches high price as compared to rainy season crop (Prakash *et al.*, 2012) [8]. Pruning helps in balance between vegetative and reproductive growth of the plant. A light pruning is considered necessary to encourage new shoots after the harvest. Shoot pruning is helpful in reducing the tree size and improving the fruit quality and provide opportunity to increase the number of tree per unit area. (Lal *et al.*, 2000) [10]. Use of inorganic fertilizers as a cheap source of available nutrient to plants has resulted in beneficial effects on growth, flowering, yield and quality of various fruit crops (Ram and Rajput, 2000) [9]. Hence, the present study was formulated to study the combined effect of pruning and fertigation in guava.

Material and Methods

The present Investigation was carried out in ten years old guava trees of cv. Sardar. The spacing adopted was 6 x 6 m with a plant population of 277 plants ha⁻¹. The experiment was laid out with five levels of NPK in factorial randomized block design and replicated three times. In guava, there are three main seasons of flowering known as Ambe bahar (Feb - March), Mrig bahar (June - July) and Hasta bahar (October).

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The main feature of crop regulation was based on seasonal and marketable demand. In this experiment, Ambe bahar (February - March) and Mrig bahar (June - July) flowering seasons were taken for research trials and observations were recorded. The treatment combination P₀F₀ - Control (Without pruning + Soil application of 100 % RDF), P₀F₁ - Without pruning + 125 % RDF through fertigation, P₀F₂ - Without pruning + 100 % RDF through fertigation, P₀F₃ - Without pruning + 75 % RDF through fertigation, P₀F₄ - Without pruning + 50 % RDF through fertigation, P₁F₀ - Removal of past season growth up to 15 cm (Light pruning) + Soil application of 100 % RDF, P₁F₁ - Removal of past season growth up to 15 cm (Light pruning) + 125 % RDF through fertigation, P₁F₂ - Removal of past season growth up to 15 cm (Light pruning) + 100 % RDF through fertigation, P₁F₃ - Removal of past season growth up to 15 cm (Light pruning) + 75 % RDF through fertigation, P₁F₄ - Removal of past season growth up to 15 cm (Light pruning) + 50 % RDF through fertigation, P₂F₀ - Removal of past season growth up to 30 cm (Moderate pruning) + Soil application of 100 % RDF, P₂F₁ - Removal of past season growth up to 30 cm (Moderate pruning) + 125 % RDF through fertigation, P₂F₂ - Removal of past season growth up to 30 cm (Moderate pruning) + 100 % RDF through fertigation, P₂F₃ - Removal of past season growth up to 30 cm (Moderate pruning) + 75 % RDF through fertigation and P₂F₄ - Removal of past season growth up to 30 cm (Moderate pruning) + 50 % RDF through fertigation.

Days taken for first flowering

Number of days taken from vegetative to first flowering was calculated by taking the difference in days from the date of vegetative to first flower.

Statistical Analysis

The statistical analysis of data was done by adopting the standard procedures of Panse and Sukhatme (1985) [2].

Results and Discussion

In guava training and pruning of guava trees has been found to improve the yield and quality and provide a strong framework, Scaffolding branches are suitable for bearing a remunerative crop. Guava growers in Tamil Nadu rarely do a systematic nutrient management program. Most of them apply only FYM or poultry manure once a year after summer harvest. However, TNAU recommends a fertilizer dose of 1.0 kg in each of N, P and K per tree per year (Anon, 1999) [1] and fertigation through drip system is not adopted by farmers in Tamil Nadu.

The results of the investigation revealed that the flowering character namely, days taken for first flowering were significantly influenced by different pruning level moderate pruning (30cm), 125 per cent RDF through fertigation and interaction between moderate pruning (30cm) and 125 per cent RDF through fertigation.

Among the various pruning levels 30 cm pruning had minimum days taken for first flowering. It may be due to the fact that the pruned trees put forth new vegetative growth immediately after pruning and almost the entire amount of carbohydrates which otherwise favour the flower bud initiation might have been utilized in the vegetative growth of the tree, thereby induction of early flowering. Similar results were obtained by Gill (1999) [3] and Singh (2001) [4] in guava (Table 1).

Table 1: Effect of pruning and fertigation on days taken for first flowering of guava cv. Lucknow 49 in rainy season

Rainy season				
Pruning Fertigation	P ₀ (No pruning)	P ₁ Light Pruning (15 cm)	P ₂ Moderate Pruning (30 cm)	Mean
F ₀ (Control)	112.05	107.11	105.04	108.07
F ₁ (125% of RDF)	94.13	84.57	69.23	82.64
F ₂ (100% of RDF)	97.40	88.50	77.78	87.89
F ₃ (75% of RDF)	98.32	90.44	79.76	89.51
F ₄ (50% of RDF)	101.91	91.22	81.65	91.59
Mean	100.76	92.37	82.69	91.94

	P	F	P × F
SEd	2.05	2.51	2.28
CD at 5%	4.11	5.03	4.57

Among the various fertigation levels (125 per cent 'recommended dose of fertilizers' (RDF) through drip irrigation), higher doses showed minimum days taken for first flowering of the plant. It may be due to faster frame work development after pruning and accumulation of leading to higher photosynthesis in the leaves. Due to the rapid metabolic process after accumulation at vegetative phase the plants create new sink to store the food produce and as a results, it would had put forth reproductive bud earlier than control. Similar results were obtained by Takahashi *et al.*,

(1993) [6] in tomato.

The days taken for first flowering a linear trend of growth in all the treatments during both the season of the study. The increment was slightly higher during winter. Among the treatments, moderate pruning (30 cm) and application of 125 per cent RDF as WSF through fertigation recorded the early days taken for first flowering during both the season. It might be due to the removal of unproductive shoots and as a part of effective utilization of source and accurate placement of fertilizers in available form at the active root zone area resulting in vigorous growth which ultimately resulted in early flowering. Similar results were obtained by (Madhumathi *et al.*, 2004) [5] in papaya (Table 2).

Table 2: Effect of pruning and fertigation on days taken for first flowering of guava cv. Lucknow 49 in winter season

Rainy season				
Pruning Fertigation	P₀ (No pruning)	P₁ Light Pruning (15 cm)	P₂ Moderate pruning (30 cm)	Mean
F ₀ (Control)	108.23	103.81	101.30	104.45
F ₁ (125% of RDF)	80.34	70.12	61.45	70.64
F ₂ (100% of RDF)	93.21	73.95	66.71	77.96
F ₃ (75% of RDF)	94.44	75.87	67.39	79.23
F ₄ (50% of RDF)	98.78	79.54	69.91	82.74
Mean	95.00	80.66	73.35	83.00

	P	F	P × F
SEd	2.06	2.27	2.47
CD at 5%	4.12	4.54	4.95

Conclusion

Hence the present investigation clearly indicates that in moderate pruning (30 cm) and application of 125 per cent RDF as WSF through fertigation, the minimum days taken for first flowering of the plant.

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