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Impact of farmers practices on crop regulation in sweet orange cv. sathgudi for off season crop production in Telangana

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Abstract

An experiment was conducted at Horticultural Research Station, Konda Mallepally, Nalgonda, to assess the impact of farmer's practices on crop regulation in sweet orange cv. Sathgudi for off season crop production in Telangana. Results revealed that removal of top soil in the basins up to 3 inches + mulching with 50 micron black polythene sheet with perforations was found better with respect to plant height (5.35 m), canopy spread NS (4.91 m), EW(4.73 m), average fruit weight (193.00 g), number of fruits per tree (327.00), yield (46.67 kg per tree), juice (47.00 %), TSS(8.70 °B) and ascorbic acid (73.32 mg per 100 ml of juice).

Keywords: Urea, FYM, gypsum, black polythene, sweet orange, crop regulation

Introduction

Citrus (Sweet orange & Acid lime) group of fruits play important role in fruit crops in Telangana. Sweet orange occupies an area of 62,904 acres with annual production of 503028 metric tonnes (Commissioner of Horticulture, Telangana state, 2018-19) [2]. In Telangana, citrus fruits are mainly cultivated in the districts of Nalgonda, Suryapet, Yadadri, Mahaboobnagar, Gadwal, Nagar Kurnool, and in few parts of Khammam, Warangal and Karimnagar. Sweet orange plant being evergreen, flowers throughout the year in flushes. Farmers of Telangana harvest main season crop in the months of August and September and it constitutes 80 percent of the fruiting. Whereas, remaining 20 percent of crop is harvested in the months of April and May and it is called as off season crop. The crop which is harvested in the month of April and May fetches premium price in the north India markets like Delhi, Kolkata and also in Chennai, Bengaluru, Nagpur, Mumbai markets. Farmers in Telangana regulate the crop production in such a way that they will set maximum produce in the summer months of April and May to get premium price. To get a good quality crop in the summer months, they will create a stress condition in the orchard in the months of September and October. If farmers are lucky enough, they will get a good stress in the orchard, but it entirely depends upon the rainfall in the months of September and October. To get a good stress, most of the farmers do clean cultivation (deep ploughing two or three times after harvesting of main season crop in August) and wait for stress condition i.e., 60-70 percent wilting of leaves. However, due to rains in monsoon period (June to September), orchardists will not get proper stress for induction of flowering. So, in Telangana most of the farmers follow some local practices to induce the stress in the plants. This Experiment was formulated to study the impact of farmer's practices on crop regulation in sweet orange cv. Sathgudi.

Materials & Methods

An Experiment conducted on five years old Sweet orange plants cv. Sathgudi for four years at Horticultural Research Station, Konda Mallepally, Nalgonda, Telangana. The treatments consisted of T1 - soil application of Urea 1 kg + FYM 100 kg / tree + 15 days stress along with light irrigation, T2 - removal of top soil up to 6 inches, T3 - application of Gypsum @ 5 kg / tree, T4 - keeping the weeds in the basins, T5 - growing green manure crop in the basins (sunhemp), T6 - removal of top soil in the basins up to 3 inches + mulching with 50 micron

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black polythene sheet with perforations, T7 - soil moisture stress for 25 days (control) each replicated thrice in a randomized block design. The observations on vegetative growth yield and quality parameters were recorded as per the standard procedure. All the treatments were imposed in the month of August and September after harvesting of the fruits and all other orchard management practices like application of fertilizers, irrigation and pest control measures were taken uniformly.

Results & Discussion

The data (Table 1 & 2) revealed that application of different treatments significantly influenced the various vegetative, yield and quality parameters. The maximum plant height (5.35 m), canopy spread, NS (4.91 m), EW (4.73 m), average fruit weight (193.00 g), number of fruits per tree (327.00), yield (46.67 kg per tree), juice (47.00 percent), TSS (8.70 °B) and ascorbic acid (73.32 mg per 100 ml of juice) was recorded in treatment T6 when top soil in the basins is removed up to 3 inches and covered with 50 micron black polythene sheet with perforations. Improvement of vegetative growth, yield and quality

attributes might be due to the removal of 3 inches top soil and mulching with black polythene sheet might have created stress due to exposure of feeder roots. Due to removal of top soil and exposure of feeder roots, creates the of water stress condition and leaves show wilting. Farmers clearly know the wilting process and they cover the plant basin again with the removed soil and light irrigation was given. After one week of first irrigation, they will apply farm yard manure along with recommended dose of fertilizers. After application of FYM and fertilizers, new flush and flower initiation takes place within 10 - 15 days. Thereafter, farmer will give irrigation as per the requirement of the crop. Similar findings have also been obtained by Cheema *et al.* (1954) ^[1] in Guava, Nir *et al.* (1972) ^[5] in lemon and Goell *et al.* (1981) ^[3] in citrus. Singh *et al.* (2018) ^[6] in guava found withholding water, exposing feeder roots and pruning fibrous roots to force flowering are practiced in Maharashtra. Kumar (2010) ^[4] also found exposure of roots and stress by withholding the water allowed the plants to shed the leaves is practiced in Maharashtra in guava. Suresh Kumar (2017) ^[7] also advocated Bi-colour polythene mulch of 100 microns for improving yield and quality in sweet orange cv. Sathgudi.

Table 1: Impact of farmers practices on vegetative growth in sweet orange cv. Sathgudi

Treatments	Plant height (m)	Plant girth (cm)	Canopy spread	
			NS (m)	EW (m)
T1	5.18	48.15	4.47	4.16
T2	5.06	48.41	4.17	4.25
T3	5.07	47.01	4.23	4.25
T4	5.14	46.67	4.26	4.09
T5	5.18	48.07	4.34	4.31
T6	5.35	49.26	4.91	4.73
T7	5.07	47.57	4.38	4.45
CD (0.05)	0.14	N.S.	0.28	0.29
SE (m)	0.04	0.54	0.09	0.09

Table 2: Impact of farmers practices on yield and quality parameters in sweet orange cv. Sathgudi

Treatments	Average fruit weight (g)	Number of fruits/tree	Yield (kg / tree)	Juice (%)	TSS (°B)	Acidity (%)	Ascorbic acid (mg per 100 ml)
T1	169.33	312.00	35.67	43.00	7.71	0.81	71.87
T2	150.00	299.33	37.33	43.00	7.52	0.82	70.75
T3	150.33	309.33	35.33	36.00	7.68	0.85	71.14
T4	162.67	322.33	34.33	39.33	8.14	0.86	68.42
T5	160.33	309.33	42.00	42.33	8.05	0.85	67.09
T6	193.00	327.00	46.67	47.00	8.70	0.87	73.32
T7	171.67	292.33	42.33	39.67	8.11	0.84	71.79
CD (0.05)	16.05	16.69	5.07	4.38	0.37	N.S.	2.66
SE (m)	5.15	5.35	1.63	1.40	0.12	0.01	0.85

Conclusion

From the study, it is concluded that removal of top soil in the basins up to 3 inches + mulching with 50 micron black polythene sheet with perforations was found better with respect to plant height, canopy spread, average fruit weight, number of fruits per tree, yield, juice, TSS and ascorbic acid content in sweet orange cv. sathgudi for off season crop production in Telangana.

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