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Standardization of Irrigation Requirement and Irrigation Frequency for Jasmine (*Jasminum sambac* Ait. cv. Ramanathapuram Gundumalli)

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ABSTRACT

An experiment entitled, "Standardization of irrigation requirement and irrigation frequency for Jasmine (Jasminum sambac Ait. cv. Ramanathapuram Gundumalli) using Theta Probe moisture meter" was carried out at Farmer's holding, Neithalur Colony in Tiruchirappalli District, Tamil Nadu, India from November, 2015 to May, 2016 to standardize the irrigation requirement and irrigation frequency for better growth and yield of Jasmine. Factorial randomized block design was employed with three factors each two levels and replicated thrice. The investigation consisted of two levels each on soil depth, moisture depletion percentage and quantity of irrigation water viz., soil depth @ 15 cm and 30 cm, moisture percentage 40 % and 60 % and quantity of irrigation water 15 l and 20 l per plant and flood irrigation (control). The jasmine plants receiving 20 l of irrigation water per plant when moisture depletion percentage reaches 60 % at 30 cm soil depth were performing well in all the growth, yield and agronomic attributes. Hence, it is recommended that, irrigation @ 20 l per plant at 4 day intervals can be adopted for high growth, physiological, yield and agronomic parameters in Jasmine plants.

Key words: *Jasmine, Moisture Depletion percentage, Irrigation frequency, Flower yield*

INTRODUCTION

The genus *Jasminum* belongs to the family Oleaceae. Although more than 2,000 species are known, 40 species have been identified in India and 20 are cultivated in South India[1] which comprises mainly shrubs and climbers. Jasmine is a fragrance and an important commercial flower crop in tropical and sub-tropical areas of South East Asia and other parts of world. It is also an important source of jasmine concrete and perfume extraction. Jasmine is the national flower of Phillipines, which was adopted[2] in 1937. And, recently in 1990, Indonesian government also has adopted it as the national flower[3]. Jasmine concrete is now being produced industrially in India and it is a highly profitable venture and the demand is increasing in the world market because of its unique fragrance which cannot be imitated by synthetic chemicals.

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The area under jasmine cultivation is increasing because of its versatile nature and ease in cultivation. For the commercial cultivation of any flower species the most important factor to be considered is its irrigation and nutrient management. Jasmine is an evergreen bush that responds well to both soil and foliar application of nutrients.

The standard soil moisture estimation procedures such as gravimetric and neutron probe methods used were not well suited for portable use in field data collection. Recently, an impedance probe (Theta Probe, Delta-T Devices, Cambridge UK) has received acceptance for surface soil water content measurements, especially by the remote sensing community[4]. A reliable, rapid technique is needed, and recently an impedance soil moisture probe (Theta Probe) has been accepted by the scientific community. Judicial management of irrigation water can be achieved by using soil moisture sensors like neutron probe and Theta Probe.

Many of the research works has been carried out on responses of jasmine plants to macro and micronutrients, plant growth and irrigation intervals but irrigation based on moisture depletion percentage and evapotranspiration has not been studied. With this above background the present study has been taken to standardize the irrigation requirement and its frequency using Theta Probe moisture meter for jasmine (*Jasminum sambac*).

MATERIALAND METHODS

Moisture depletion percentage was estimated in the soil profile 0-15 cm, 15-30 cm and 30-45 cm. The soil moisture depletion was more pronounced in the layer of 15-30 and 30 -45 cm. So it was correlated with the evaporation and moisture extraction capacity of the jasmine plants. It was indicated that active plant roots are actively extracting the moisture content present in the layer of 15-45 cm than the layer of 0-15 cm. The moisture content in the top layer 0-15 cm can be easily reduced due to prevailing environment, it was not affected the growth and development of jasmine.

The experiment was conducted at farmer's field, Neithalur Colony, Tiruchirappalli District, Tamil Nadu during last week of November, 2015 to May, 2016. Initial soil-chemical, physical properties of selected field were: pH 7.8, EC 0.12 d sm^{-1}, N 220 kg ha^{-1}, P 20.1 kg ha^{-1}, K 229 kg ha^{-1} and bulk density of 1.36 kg m^{-3}.

Experiment Details

The trial was laid out in Factorial Randomized Block Design with 8 treatment combinations and replicated thrice. The three factors having 2 levels such as 8 treatment combinations *viz.*, two levels of irrigation water given (15 l and 20 l per plant) when soil moisture depletion reaches 40 % and 60 % at the depth of 15 cm and 30 cm as per the treatment schedule and control (Flood irrigation once in a week). The jasmine bushes were uniformly pruned during last week of November, 2015 and except irrigation all the cultural practices were followed uniformly.

Factor 1	Depth of soil	D_1 15 cm	D_2 30 cm
Factor 2	Moisture depletion percent	M_1 40 %	M_2 60 %
Factor 3	Water level	W_1 15 l	W_2 20 l per plant

Treatment details

$D_1M_1W_1$. Soil depth 15 cm + Moisture depletion 40 % + Water level 15 l per plant
$D_1M_1W_2$. Soil depth 15 cm + Moisture depletion 40 % + Water level 20 l per plant
$D_1M_2W_1$. Soil depth 15 cm + Moisture depletion 60 % + Water level 15 l per plant
$D_1M_2W_2$. Soil depth 15 cm + Moisture depletion 60 % + Water level 20 l per plant
$D_2M_1W_1$. Soil depth 30 cm + Moisture depletion 40 % + Water level 15 l per plant
$D_2M_1W_2$. Soil depth 30 cm + Moisture depletion 40 % + Water level 20 l per plant
$D_2M_2W_1$. Soil depth 30 cm + Moisture depletion 60 % + Water level 15 l per plant
$D_2M_2W_2$. Soil depth 30 cm + Moisture depletion 60 % + Water level 20 l per plant
Control - Flood irrigation once in a week

Soil moisture content: Soil moisture content was recorded daily at the root zone depth of each treatment by Theta Probe soil moisture meter, manufactured by DELTA –T devices, England.

Plant height: The height of the plant at monthly intervals was measured from the base of the stem to the tip of the longest leaf in ten randomly tagged plants in each treatment and the mean value was expressed in cm.

Leaf area: The leaf area was measured at monthly intervals by multiplying maximum length of leaf and maximum breadth of leaf with K constant (0.46) and mean is expressed in cm^2.

Number of days taken for first flower bud emergence: The number of days from planting to appearance of visible flower bud was recorded and mean is expressed in days.

Number of days taken for first harvesting: The number of days from planting to first flower bud picking was recorded and mean is expressed in days.

Yield of flowers: The flower buds were harvested from each treatment daily and the weight was recorded and the cumulative yield at each stage was expressed in grams per plant. The estimated flower yield is expressed in $kgha^{-1}$.

Irrigation frequency: The irrigation frequency was calculated by using the formulae and expressed in days.

$$\text{Irrigation interval (days)} = \frac{\text{Total number of observed days}}{\text{Number of irrigation given}}$$

Irrigation Water Use Efficiency: The water use efficiency was calculated by using the following formulae and expressed in kg mm^{-1}.

$$\text{Irrigation Water Use Efficiency (kg mm}^{-1}\text{)} = \frac{\text{Yield per hectare (kg)}}{\text{Total water requirement (mm)}}$$

Statistical analysis

The observations on growth, physiological parameters, yield parameters and agronomic parameters were observed and data analysis subjected to LSD at 5 % probability level[5].

RESULTS

The results of the field experiment conducted are presented in this heading.

Growth parameters

The data on the growth parameters showing that the different irrigation regimes were significantly influenced the growth and development of jasmine. Growth in terms of plant height and leaf area at 30, 60, 90, 120, 150 and 180 days after pruning showed significant difference among different irrigation regimes.

Plant height (cm)

Among the different irrigation regimes, the plants receiving 20 litre of irrigation water per plant when soil moisture depletion reaches 60 % at the depth of 30 cm recorded maximum plant height 81.9, 105.8, 120.0, 131.7, 138.4 and 141.6 cm at 30, 60, 90, 120, 150 and 180 days after pruning respectively. This was closely followed by the plants receiving 20 litre of water per plant when soil moisture depletion reaches 60 % at 15 cm depth of soil (78.7, 99.1, 111.0, 121.0, 126.4 and 128.7 cm at 30, 60, 90, 120, 150 and 180 days after pruning respectively). Simultaneously, the flood irrigated plants recorded least values for plant height among the different irrigation regimes (72.0, 79.7, 85.2, 88.4, 89.6 and 90.1 at 30, 60, 90, 120, 150 and 180 days after pruning respectively (Table 1).

Leaf area

Irrigation regime of 20 litre of irrigation water per plant when soil moisture depletion reaches 60 % at the soil depth of 30 cm were recorded highest leaf area of 7.07, 8.14, 9.29, 10.50, 11.82 and 12.84 cm^2 at 30, 60, 90, 120, 150 and 180 days after pruning respectively. This was closely followed by the plants receiving 20 litre of water per plant when soil moisture depletion reaches 60 % at 15 cm depth of soil (6.87, 7.90, 8.99, 10.16, 10.60 and 12.32 cm^2 at 30, 60, 90, 120, 150 and 180 days after pruning respectively). The flood irrigated plants recorded least values for leaf area among the different irrigation regimes (6.06, 6.81, 7.53, 7.91, 8.43 and 8.62 cm^2 at 30, 60, 90, 120, 150 and 180 days after pruning respectively (Table 2).

Yield parameters

Earlier flower bud emergence (24.4 days) and earlier flower bud picking (34.2 days) were observed in the treatment receiving optimum irrigation frequency and control (Flood irrigation) taken maximum days for flower bud emergence and flower bud picking (Table 3). Data on flower yield per plant are presented in Table 4 and Figure 1. The maximum yield (49.70, 74.54, 95.66, 104.84 and 82.08 g) per plant was recorded by the treatment receiving 20 l of irrigation water when moisture depletion reaches 60 % at 30 cm depth. The lowest yield of 17.15, 30.49, 42.01, 43.34 and 19.46 g per plant was recorded by flood irrigation (Control) during the month of January 2016, February 2016, March 2016, April 2016 and May 2016 respectively.

Irrigation frequency and Irrigation Water use efficiency

From the statistical analysis, the optimum irrigation frequency was 4 days interval and maximum water use efficiency (8.99 $kgha^{-1}mm^{-1}$) recorded by the plants receiving 20 litre of irrigation water per plant when moisture depletion percentage reaches 60% at the soil depth of 30 cm with maximum value for all the yield contributing attributes. The

least water use efficiency was recorded by control treatment (3.63 $kgha^{-1}mm^{-1}$) (Figure 2). During the period of experiment, there was a temperature range between 29.2 to 41.3°C and evaporation between the ranges of 1.5 to 4.1 cm. The irrigation water efficiently utilized by the plants which receiving optimum irrigation frequency.

DISCUSSION

With availability of irrigation water dwindling day-by-day, it has become necessary to resort to alternate water saving methods like drip irrigation which provides continuous supply of water in drops right at the root zone of the plant. The scarcity of water is becoming more acute due to erratic and improper distribution of rainfall and faulty water management practices[6a].

The linear trend in plant growth might be due to the fact that optimum irrigations maintained most of the root zone at well aerated condition and at adequate soil moisture content there were no fluctuations between wet and dry extremes[7,8]. Availability of moisture under drip irrigation might have contributed to effective absorption and utilization of nutrients and better proliferation of roots resulting in better growth. Better soil moisture condition may positively contribute for higher solubility and mobility of nutrients which ultimately results into increased mass flow transport of nutrients[9].

Growth and development in plants are a consequence of excellent coordination of several processes operating at different stages of plant. Reduced irrigation level resulting in water deficit might manifest many changes in plant anatomy such as decrease in size of cells and inter cellular spaces limiting cell division and elongation resulting in overall decrease in plant growth[10]. In the present study the growth of jasmine, as influenced by the various treatments, has been elucidated through plant height and leaf area.

In this experiment, early flowering and early flower bud picking were observed. It could be due to the fact that, optimum irrigation and pruning helps to broaden the C/N ratio, thus stimulating flowering and increasing vigour of plant[11,12].

Higher might be attributed to effective utilization of root zone irrigation and fertilizer. Irrigation scheduling based on developmental stage or deficit irrigation is the technique of applying water on a timely and accurate basis to the crop, and is the key to conserving water and improving irrigation performance and sustainability of irrigated agriculture[13]. The deficit irrigation as applying less water to the plant at selected stages during the growing season. This approach may save water with little or no negative impact on the final crop yield[14].

Saving of irrigation water was found in all drip irrigation regimes than plants receiving flood irrigation once in a week. These findings were agreed with many researchers[15, 6b, 16 and 17].

The results obtain from this experiment were showed that optimum irrigation frequency resulted in highest plant growth and flower yield as well as water use efficiency. The very low and higher irrigation frequency resulted lower yield. This was accorded with study one in gerbera, in which flowering was not influenced by the very low irrigation frequency[18].

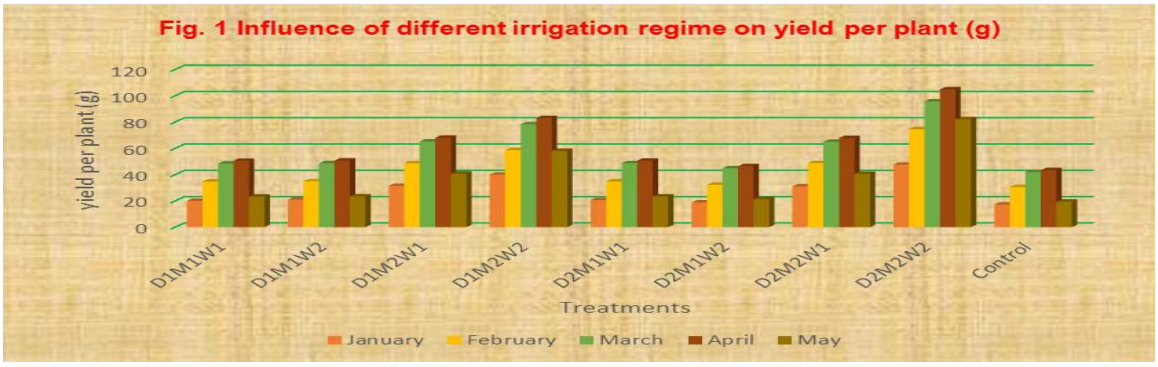

Fig. 1: Effects of different irrigation regimes on yield of flower buds per plant of *Jasminum sambac* cv. Ramanathapuram Gundumalli

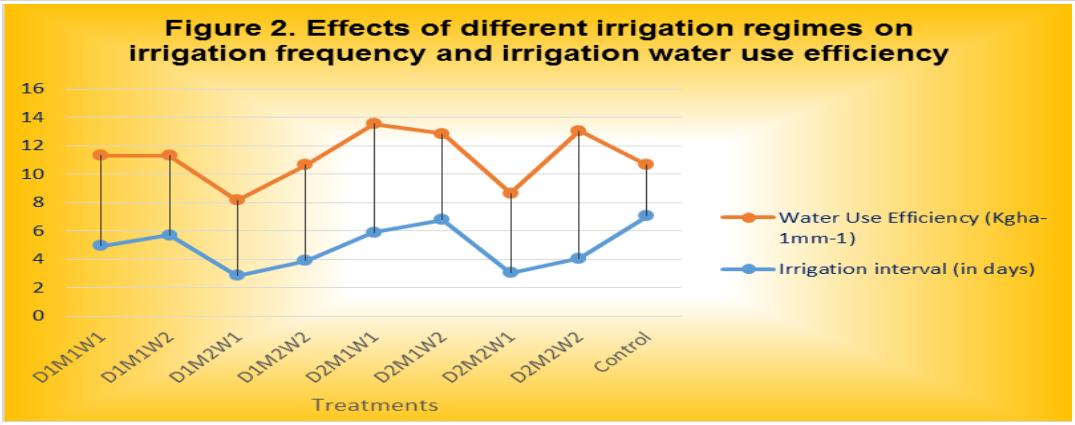

Fig. 2: Effects of different irrigation regimes on irrigation frequency and water use efficiency of *Jasminum sambac* cv. Ramanathapuram Gundumalli

Table 1: Effect of different irrigation regime on plant height (cm) of *Jasminum sambac* cv. Ramanathapuram Gundumalli at 30, 60, 90, 120, 150 and 180 days after pruning

Days after pruning	Treatments	D_1		Mean	D_2		Mean	W x M		Mean	Control
		W_1	W_2		W_1	W_2		W_1	W_2		
30 DAP	M_1	74.6	74.7	74.7	74.8	73.6	74.2	74.7	74.2	74.4	72.0
	M_2	76.8	78.7	77.7	76.9	81.9	79.4	76.9	80.3	78.6	
	Mean	75.7	76.7	76.2	75.9	77.7	76.8	75.8	77.2	76.5	
60 DAP	M_1	89.6	89.5	89.6	89.4	84.6	87.0	89.5	87.1	88.3	79.7
	M_2	94.6	99.1	96.8	94.9	105.8	100.3	94.7	102.5	98.6	
	Mean	92.1	94.3	93.2	92.1	95.2	93.7	92.1	94.8	93.4	
90 DAP	M_1	98.1	97.9	98.0	97.6	91.7	94.7	97.8	94.8	96.3	85.2
	M_2	104.7	111.0	107.8	104.6	120.0	112.3	104.7	115.5	110.1	
	Mean	101.4	104.4	102.9	101.1	105.9	103.5	101.2	105.1	103.2	
120 DAP	M_1	104.0	103.8	103.9	103.7	96.6	100.2	103.9	100.2	102.1	88.4
	M_2	111.9	121.0	116.5	111.8	131.7	121.8	111.9	126.4	119.1	
	Mean	108.0	112.4	110.2	107.8	114.2	111.0	107.9	113.3	110.6	
150 DAP	M_1	107.0	106.7	106.9	106.7	98.3	102.5	106.9	102.5	104.7	89.6
	M_2	116.2	126.4	121.3	116.0	138.4	127.2	116.1	132.4	124.3	
	Mean	111.6	116.6	114.1	111.4	118.3	114.9	111.5	117.5	114.5	
180 DAP	M_1	107.8	107.4	107.6	107.3	99.1	103.2	107.5	103.2	105.4	90.1
	M_2	117.3	128.7	123.0	117.2	141.6	129.4	117.2	135.2	126.2	
	Mean	112.5	118.1	115.3	112.2	120.3	116.3	112.4	119.2	115.8	

		D	M	W	DM	MW	DW	DMW
30 DAP	SEd	0.1005	0.1005	0.1005	0.1422	0.1422	0.1422	0.2011
	CD @ 0.05	0.2157	0.2157	0.2157	0.3051	0.3051	0.3051	0.4315
60 DAP	SEd	NS	0.2463	0.2463	0.3484	0.3484	NS	0.4927
	CD @ 0.05		0.5285	0.5285	0.7474	0.7474		1.0569
90 DAP	SEd	0.1488	0.1488	0.1488	0.2104	0.2104	0.2104	0.2976
	CD @ 0.05	0.3192	0.3192	0.3192	0.4515	0.4515	0.4515	0.6385
120 DAP	SEd	NS	0.4351	0.4351	0.6154	0.6154	0.6154	0.8703
	CD @ 0.05		0.9334	0.9334	1.3201	1.3201	1.3201	1.8669
150 DAP	SEd	0.2844	0.2844	0.2844	0.4022	0.4022	0.4022	0.5688
	CD @ 0.05	0.6101	0.6101	0.6101	0.8628	0.8628	0.8628	1.2202
180 DAP	SEd	0.4362	0.4362	0.4362	0.6169	0.6169	0.6169	0.8724
	CD @ 0.05	0.9357	0.9357	0.9357	1.3232	1.3232	1.3232	1.8714

Table 2: Effect of different irrigation regime on leaf area (cm^2) of *Jasminum sambac* cv. Ramanathapuram Gundumalli at 30, 60, 90, 120, 150 and 180 days after pruning

Days after pruning	Treatments	D_1		Mean	D_2		Mean	W x M		Mean	Control
		W_1	W_2		W_1	W_2		W_1	W_2		
30 DAP	M_1	6.41	6.42	6.41	6.42	6.21	6.31	6.41	6.31	6.36	6.06
	M_2	6.71	6.87	6.79	6.69	7.07	6.88	6.70	6.97	6.84	
	Mean	6.56	6.65	6.60	6.56	6.64	6.60	6.56	6.64	6.60	
60 DAP	M_1	7.19	7.18	7.19	7.18	6.97	7.08	7.19	7.08	7.13	6.81
	M_2	7.63	7.90	7.76	7.62	8.14	7.88	7.62	8.02	7.82	
	Mean	7.41	7.54	7.48	7.40	7.56	7.48	7.41	7.55	7.48	
90 DAP	M_1	8.05	8.04	8.05	8.04	7.74	7.89	8.05	7.89	7.97	7.53
	M_2	8.61	8.99	8.80	8.61	9.29	8.95	8.61	9.14	8.88	
	Mean	8.33	8.52	8.42	8.33	8.51	8.42	8.33	8.52	8.42	
120 DAP	M_1	8.94	8.95	8.94	8.94	8.15	8.54	8.94	8.55	8.74	7.91
	M_2	9.65	10.16	9.91	9.63	10.50	10.06	9.64	10.33	9.98	
	Mean	9.29	9.56	9.42	9.28	9.32	9.30	9.29	9.44	9.36	
150 DAP	M_1	9.85	9.82	9.83	9.83	8.63	9.23	9.84	9.22	9.53	8.43
	M_2	10.73	11.38	11.06	10.72	11.82	11.27	10.72	11.60	11.16	
	Mean	10.29	10.60	10.44	10.27	10.23	10.25	10.28	10.41	10.35	
180 DAP	M_1	10.32	10.32	10.32	10.32	8.98	9.65	10.32	9.65	9.99	8.62
	M_2	11.35	12.32	11.84	11.33	12.84	12.09	11.34	12.58	11.96	
	Mean	10.84	11.32	11.08	10.83	10.91	10.87	10.83	11.12	10.97	

		D	M	W	DM	MW	DW	DMW
30 DAP	SEd	0.0121	0.0121	0.0121	0.0171	0.0171	0.0171	0.0242
	CD @ 0.05	0.0260	0.0260	0.0260	0.0368	0.0368	0.0368	0.0368
60 DAP	SEd	0.0200	0.0200	0.0200	0.0283	0.0283	0.0283	0.0400
	CD @ 0.05	0.0429	0.0429	0.0429	0.0607	0.0607	0.0607	0.0859
90 DAP	SEd	0.0145	0.0145	0.0145	0.0205	0.0205	0.0205	0.0290
	CD @ 0.05	0.0311	0.0311	0.0311	0.0441	0.0441	0.0441	0.0623
120 DAP	SEd	0.0319	0.0319	0.0319	0.0451	0.0451	0.0451	0.0638
	CD @ 0.05	0.0684	0.0684	0.0684	0.0967	0.0967	0.0967	0.1368
150 DAP	SEd	0.0271	0.0271	0.0271	0.0384	0.0384	0.0384	0.0543
	CD @ 0.05	0.0582	0.0582	0.0582	0.0824	0.0824	0.0824	0.1165
180 DAP	SEd	0.0302	0.0302	0.0302	0.0428	0.0428	0.0428	0.0605
	CD @ 0.05	0.0649	0.0649	0.0649	0.0918	0.0918	0.0918	0.1298

Table 3: Effect of different irrigation regime on number days taken for flower bud emergence and first harvesting of *Jasminum sambac* cv. Ramanathapuram Gundumalli

Parameter	Treatments	D_1		Mean	D_2		Mean	W x M		Mean	Control
		W_1	W_2		W_1	W_2		W_1	W_2		
Number days taken for flower bud emergence	**M_1**	37.7	37.8	37.8	37.7	39.3	38.5	37.7	38.6	38.1	39.9
	M_2	31.8	28.5	30.2	31.9	24.4	28.1	31.9	26.4	29.1	
	Mean	34.8	33.2	34.0	34.8	31.8	33.3	34.8	32.5	33.6	
Number days taken for first harvesting	**M_1**	50.3	50.4	50.4	50.4	52.4	51.4	50.4	51.4	50.9	53.4
	M_2	43.7	39.3	41.5	43.8	34.2	39.0	43.7	36.7	40.2	
	Mean	47.0	44.8	45.9	47.1	43.3	45.2	47.0	44.1	45.6	

		D	M	W	DM	MW	DW	DMW
Number days taken for flower bud emergence	SEd	0.1410	0.1410	0.1410	0.1994	0.1994	0.1994	0.2820
	CD @ 0.05	0.3025	0.3025	0.3025	0.4278	0.4278	0.4278	0.6050
Number days taken for first harvesting	SEd	0.1397	0.1397	0.1397	0.1976	0.1976	0.1976	0.2795
	CD @ 0.05	0.2997	0.2997	0.2997	0.4239	0.4239	0.4239	0.5995

Table 4: Effect of different irrigation regime on yield per plant of *Jasminum sambac* cv. Ramanathapuram Gundumalli during January, February and March

Period	Treatments	D_1		Mean	D_2		Mean	W x M		Mean	Control
		W_1	W_2		W_1	W_2		W_1	W_2		
31 – 60 DAP (January)	**M_1**	20.06	20.95	20.51	20.62	18.72	19.67	20.34	19.84	20.09	17.15
	M_2	31.40	39.98	35.69	31.05	49.70	40.38	31.23	44.84	38.03	
	Mean	25.73	30.47	28.10	25.84	34.21	30.02	25.78	32.34	29.06	
61 – 90 DAP (February)	**M_1**	34.63	34.88	34.76	34.81	32.26	33.54	34.72	33.57	34.15	30.49
	M_2	48.53	58.61	53.57	48.68	74.54	61.61	48.61	66.58	57.59	
	Mean	41.58	46.75	44.16	41.75	53.40	47.57	41.66	50.07	45.87	
90 – 120 DAP (March)	**M_1**	48.45	48.60	48.53	48.61	44.86	46.74	48.53	46.73	47.63	42.01
	M_2	65.18	78.37	71.78	64.97	95.66	80.32	65.08	87.02	76.05	
	Mean	56.82	63.49	60.15	56.79	70.26	63.53	56.80	66.87	61.84	
121 – 150 DAP (April)	**M_1**	50.46	50.65	50.56	50.60	46.36	48.48	50.53	48.51	49.52	43.34
	M_2	68.03	82.99	75.51	67.84	104.84	86.34	67.94	93.92	80.93	
	Mean	59.25	66.82	63.03	59.22	75.60	67.41	59.23	71.21	65.22	
151 – 180 DAP (May)	**M_1**	23.25	23.45	23.35	23.29	21.35	22.32	23.27	22.40	22.84	19.46
	M_2	40.68	58.03	49.36	40.56	82.08	61.32	40.62	70.06	55.34	
	Mean	31.97	40.74	36.35	31.93	51.72	41.82	31.95	46.23	39.09	

		D	M	W	DM	MW	DW	DMW
31 – 60 DAP (January)	SEd	0.2802	0.2802	0.2802	0.3963	0.3963	0.3963	0.5605
	CD @ 0.05	0.6011	0.6011	0.6011	0.8502	0.8502	0.8502	1.2023
61 – 90 DAP (February)	SEd	0.5761	0.5761	0.5761	0.8148	0.8148	0.8148	1.1523
	CD @ 0.05	1.2358	1.2358	1.2358	1.7477	1.7477	1.7477	2.4717
90 – 120 DAP (March)	SEd	0.6902	0.6902	0.6902	0.9761	0.9761	0.9761	1.3804
	CD @ 0.05	1.4805	1.4805	1.4805	2.0937	2.0937	2.0937	2.9610
121 – 150 DAP (April)	SEd	0.3976	0.3976	0.3976	0.5623	0.5623	0.5623	0.7952
	CD @ 0.05	0.8529	0.8529	0.8529	1.2062	1.2062	1.2062	1.7058
151 – 180 DAP (May)	SEd	0.4568	0.4568	0.4568	0.6461	0.6461	0.6461	0.9137
	CD @ 0.05	0.9800	0.9800	0.9800	1.3859	1.3859	1.3859	1.9600

CONCLUSION

In the present work different irrigation regimes were tried to standardize the drip irrigation scheduling. Results from this experiment demonstrated that the plants receiving 20 l of irrigation when soil moisture depletion reaches 60 % at 30 cm soil depth can improve the vegetative and flowering characteristics. This treatment were recorded optimum irrigation frequency (4 days interval). This may be attributable to availability of sufficient moisture for better growth and yield of *Jasminum sambac*.

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