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## Interactive study of spacing and different levels of nutrients on flowering and yield attributes of crossandra (*Crossandra undulaefolia* Salisb.)

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**Abstract**

A field experiment was conducted during kharif season of 2014-15 at Kittur Rani Channamma College of Horticulture Arabhavi to study the effect of spacing and different levels of nutrients on flowering and yield attributes of *Crossandra* genotype ACC-1 (Arabhavi *Crossandra* Collection-1). Days taken to spike initiation, days taken to first harvest, number of flowers/spike, number of spikes/plant, 100 flower weight, flower yield/plant and yield of flowers per hectare were found significant due to treatment interactions. Minimum days taken to spike initiation, days to first harvest, higher number of flowers/spike, spikes/plant, maximum flower yield/plant and yield/hectare was observed with the closer spacing of 60 x 30 cm along with fertilizer dose of 75:45:45 kg NPK + 18.75 t FYM + 5 t Vermicompost/ha and 100 flower weight was found higher with the treatment of 50:30:30 kg NPK + 12.50 t FYM + 2 t Vermicompost/ha.

**Keywords:** *Crossandra*, spacing, fertilizers along with FYM and vermicompost

**Introduction**

*Crossandra* is an important traditional flower crop of south India belongs to the family Acanthaceae. The genus consists of around 40-50 species of tropical plants with only a few cultivated species such as *Crossandra undulaefolia* Salisb. (Syn: *Crossandra infundibuliformis* (L.) Nees.), *Crossandra mucronata*, *Crossandra guineensis* and *Crossandra sebacaulis*. *Crossandra undulaefolia* Salisb. Is an important species grown for commercial value across the world which is a native of East Indies. In India commercially cultivated in southern states of Karnataka, Tamil Nadu and Andhra Pradesh to an extent of 4,000 ha (Bhattacharjee, 2006)<sup>[1]</sup>. Due to the ability of producing beautiful flowers with varying colours has made it extremely popular in southern states of India where the flowers are widely used in temple offering and for making gajras and venis to use as hair adornments. Owing to their attractive colours, light weight and good keeping quality, flowers are ideal for garland making either alone or along with jasmine to produce charming colour contrasts. *Crossandra* is recognized as an emerging loose flower in recent floriculture trade and hence the present investigation was carried out with following objectives of finding the optimum spacing and fertilizer level for the *crossandra* genotype ACC-1.

**Materials and Methods**

The present investigation was carried out in the field experiment of Department of Floriculture and Landscape Architecture, Kittur Rani Channamma College of Horticulture, Arabhavi, during the period from 2014-2015. Arabhavi is situated in Northern dry zone (zone-3) of Karnataka state geographically lies at 16°21' North latitude and 75°54' East longitude with an attitude of 640 m above mean sea level. The experiment was laid out in factorial randomized block design having two replications with three spacing (S<sub>1</sub> - 60 X 30 cm), (S<sub>2</sub> - 60 X 45 cm) and (S<sub>3</sub> - 60 X 60 cm) and five different levels of fertilizers viz., F<sub>1</sub> - 100:60:60 kg NPK + 25 t FYM/ha, F<sub>2</sub> - 75:45:45 kg NPK + 18.75 t FYM + 2 t Vermicompost/ha, F<sub>3</sub> - 50:30:30 kg NPK + 12.50 t FYM + 2 t Vermicompost /ha, F<sub>4</sub> - 75:45:45 kg NPK + 18.75 t FYM + 5 t Vermicompost /ha and F<sub>5</sub> - 50:30:30 kg NPK + 12.50 t FYM + 5 t Vermicompost /ha.

**Results and Discussions**

The results obtained from the present investigation are summarized in Table 1 and Table 2.

**Flowering and Flower yield attributes**

The minimum days for spike initiation, days taken to first harvest and more duration of flowering was recorded in the treatment S<sub>1</sub> (60 x 30 cm) viz., 99.95, 110.9 and 48.13 days



F<sub>3</sub> – 50:30:30 kg NPK + 12.50t FYM + 2t Vermicompost /ha

F<sub>4</sub> – 75:45:45 kg NPK + 18.75t FYM + 5t Vermicompost /ha

F<sub>5</sub> – 50:30:30 kg NPK + 12.50t FYM + 5t Vermicompost /ha

**Table 2:** Effect of spacing and different level of nutrients on yield attributes of crossandra genotype ACC-1

Treatments	100 flower weight (g)	Flower yield/plant (g)	Flower yield/ha (t)
Spacing			
S <sub>1</sub>	3.80	78.94	4.07
S <sub>2</sub>	3.43	74.08	4.02
S <sub>3</sub>	3.41	63.65	2.82
S.Em (±)	0.04	0.22	0.08
CD @ 5%	0.14	0.68	0.25
Nutrient levels			
F <sub>1</sub>	3.70	63.73	2.82
F <sub>2</sub>	3.54	78.92	4.71
F <sub>3</sub>	3.75	68.81	3.05
F <sub>4</sub>	3.20	89.46	4.82
F <sub>5</sub>	3.46	60.19	2.66
S.Em (±)	0.06	0.29	0.11
CD @ 5%	0.17	0.88	0.33
Interactions			
S <sub>1</sub> F <sub>1</sub>	3.72	77.40	5.11
S <sub>1</sub> F <sub>2</sub>	3.95	87.36	5.82
S <sub>1</sub> F <sub>3</sub>	4.20	72.00	3.20
S <sub>1</sub> F <sub>4</sub>	3.79	127.05	6.14
S <sub>1</sub> F <sub>5</sub>	3.47	78.05	5.20
S <sub>2</sub> F <sub>1</sub>	3.59	53.30	2.36
S <sub>2</sub> F <sub>2</sub>	3.88	57.15	2.54
S <sub>2</sub> F <sub>3</sub>	3.53	64.90	2.88
S <sub>2</sub> F <sub>4</sub>	3.22	69.15	3.06
S <sub>2</sub> F <sub>5</sub>	3.27	62.25	2.76
S <sub>3</sub> F <sub>1</sub>	3.43	71.05	3.15
S <sub>3</sub> F <sub>2</sub>	3.19	73.15	3.24
S <sub>3</sub> F <sub>3</sub>	3.58	60.85	2.69
S <sub>3</sub> F <sub>4</sub>	2.85	69.05	3.05
S <sub>3</sub> F <sub>5</sub>	3.59	50.67	2.25
S.Em (±)	0.105	0.50	0.19
CD @ 5%	0.32	1.52	0.58

DAT- Days after transplanting ACC-Arabhavi crossandra collection

S<sub>1</sub> – 60 X 30 cm

S<sub>2</sub> – 60 X 45 cm

S<sub>3</sub> – 60 X 60 cm

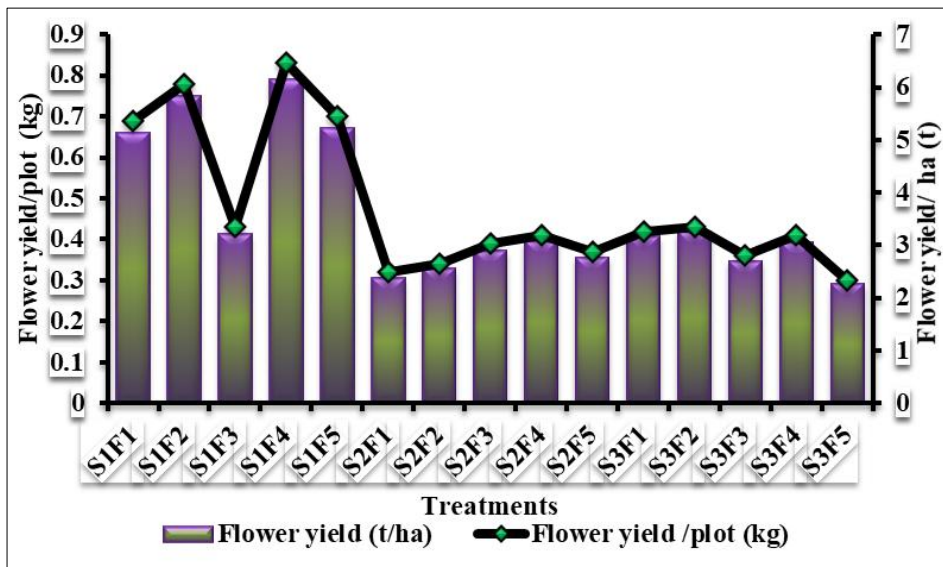
F<sub>1</sub>– 100:60:60 kg NPK + 25t FYM /ha

F<sub>2</sub> – 75:45:45 kg NPK + 18.75t FYM + 2t Vermicompost /ha

F<sub>3</sub> – 50:30:30 kg NPK + 12.50t FYM + 2t Vermicompost /ha

F<sub>4</sub> – 75:45:45 kg NPK + 18.75t FYM + 5t Vermicompost /ha

F<sub>5</sub> – 50:30:30 kg NPK + 12.50t FYM + 5t Vermicompost /ha



**Fig 1:** Interactive effect of spacing and level of nutrients on flower yield per plot and flower yield per hectare in crossandra genotype ACC-1

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