

Effect of organic manures in combination with fertilizers on yield in gundumalli (*Jasminum sambac* Ait.)

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ABSTRACT

Malligai (*Jasminum sambac*) is one of the oldest commercial flower crop cultivated for its delightful fragrant flowers and are popular in the world for its perfume. Integrated Nutrient supply system has become an accepted strategy to bring about improvement in soil fertility and protecting the environment. In view of the increasing demand for fresh flowers and concrete, efforts are being made to increase the flower yield by adopting cultural practices. The present investigation was aimed to study the effect of integrated nutrient management on yield parameters in Malligai (*Jasminum sambac*). The experiment consists of thirteen treatment combinations which were conducted in Randomized Block Design with three replications. The treatment consists of application of various organic manures viz., farm yard manure (10 kg plant⁻¹) vermicompost (2.5 kg plant⁻¹) and neem cake (2 kg plant⁻¹) and were incorporated as basal application as per the treatment schedule along with two different levels of inorganic fertilizers viz., 75% (90:180:180 g plant⁻¹) and 100% (120:240:240 g plant⁻¹) of recommended dose. Foliar application of panchagavya at 3% was given before the commencement of flowering at 15 days intervals. Based on the present investigation, it was observed that application of FYM @ 10 kg along with 100 per cent recommended dose of inorganic fertilizers 120: 240: 240 g NPK and panchagavya 3 % bush⁻¹ registered the maximum values for yield and yield attributing characters.

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Jasmine (*Jasminum sambac*) is one of the most important commercial flower crops cultivated for fresh flower and for concrete extraction. Jasmines have an international demand now due to its adaptability to wide climatic conditions, geographical zones and seasons. Tamil Nadu is the leading producer of jasmine in the country with an annual production of 78,800 t from the cultivated area of 10,000 ha (Anon, 2006). Flower and buds are used for making garlands, bouquets, and veni, used for decorating hair of women and for religious offerings. They are also used for the production of perfumed hair oils and attars. The oil is used for perfuming expensive soaps and cosmetics, mouthwashes and dentifrices, both salts and tobacco. The flower and other parts of the plants also find use in medicine.

Integrated Nutrient Management (INM) is one of the most important components to obtain sustainable crop production. It associates available, accessible and affordable plant nutrients to increase soil fertility and plant nutrient supply to achieve a given level of crop production, through optimizing the benefits from all possible sources of plant nutrients. It implies the most efficient use and management of organic, inorganic sources of major nutrients to attain higher levels of crop productivity and to maintain the fertility of the soil. The integrated nutrient supply system has become an accepted strategy to bring

about improvement in soil fertility and protecting the environment. It involves the integral use of mineral fertilizer in combination with organic manure and microbial inoculants to sustain optimum yield, to maintain and improve the soil fertility (Abrol and Katyal, 1990). Hence, considering the above facts the present research has been carried out to evolve an ideal nutrient management for increasing the yield in Gundumalli.

MATERIALS AND METHODS

The present investigation was conducted in a farmer's field at C. Mutlur village, cuddalore district, Tamil nadu during 2005-2007. The plants of three years old already planted at a spacing of 1.25 m x 1.25 m was used for the present study. They were pruned uniformly at a height of 45 cm in vase form in the month of December before imposing the treatments. The soil of the experimental field was sandy clayey loam. The treatment consists of application of three different organic manures viz., farm yard manure (10 kg plant⁻¹) vermicompost (2.5 kg plant⁻¹) and neem cake (2 kg plant⁻¹) along with two different levels of inorganic fertilizers viz., 75% (90:180:180 g plant⁻¹) and 100% (120:240:240 g plant⁻¹) of recommended dose of inorganic fertilizers. The organic manures were incorporated as basal application as per the treatment schedule. The inorganic fertilizers were

applied in the form of urea, super phosphate and muriate of potash and were applied in 4 equal split doses at bimonthly intervals after pruning. The manures and fertilizers were applied in 15 cm deep furrows opened around the plants beyond 30 cm from the trunk and irrigated. Foliar application of panchagavya 3% was given before the commencement of flowering at 15 days intervals. Irrigation, weeding and plant protection measures were carried out as per the requirement of the crop. The experiment was laid out in a randomized block design with thirteen treatments in three replications. Randomly selected plants from each treatment were tagged for the purpose of recording various observations. The flower bud characters and yield attributes like length of flower bud, flower bud diameter, corolla tube length, bud length without corolla, hundred bud weight, flower yield per plant and flower yield per hectare were recorded and these parameters were subjected to statistical analysis as given by Panse and Sukatme (1984).

RESULTS AND DISCUSSION

The results of the present investigation presented in Table 1 showed that the yield parameters were significantly increased as a result of application of organic manures combined with 100% RDF and foliar spray of panchagavya. The soil and foliar application of organic and inorganic nutrients significantly influenced the flower bud characters *viz.*, flower bud length, flower bud

diameter, corolla tube length and bud length with out corolla. Among the various treatments tested the flower bud characters were highest when 10 kg FYM along with 100 per cent RDF and panchagavya 3% was applied bush⁻¹ which registered the highest length of flower bud (3.20 cm), flower bud diameter (3.25 cm), corolla tube length (1.50 cm) and bud length with out corolla (1.75 cm) whereas the length of flower bud (1.54 cm), flower bud diameter (1.52 cm) corolla tube length (0.60 cm) and bud length with out corolla (0.74 cm) were recorded when RDF alone was applied.

Increasing trend in flower bud characters was recorded when FYM combined with inorganic nutrients and foliar spray of panchagavya. This may be due to the accelerated mobility of the photosynthetic from the source to the sink due to the readily available nitrogen from the FYM and inorganic fertilizers. Another reason might be due to the better nutritional status of the plants which was favored by the treatments. The results are in close conformity to the findings of Ramesh Kumar and Gill (1983) in Gundumalli, Bhattacharjee (1988) in *J. grandiflorum* Prakash *et al.* (2002) and Gauhane *et al.* (2004) in marigold.

With regard to the yield parameters *viz.*, 100 bud weight (25.25 g) flower yield plant⁻¹ (989.25 g) and flower yield ha⁻¹ (6.33 t) were highest in the treatment which received FYM @ 10 kg along with 100 per cent RDF and panchagavya 3 per cent bush⁻¹ whereas 100 bud

Table 1: Influence of organic and inorganic nutrients on yield and yield parameters in Gundumalli (*Jasminum sambac* Ait.)

Treatments	Length of flower bud (cm)	Flower bud diameter (cm)	Corolla tube Length (cm)	Bud length without corolla (cm)	100 bud weight (g)	Flower yield per plant (g)	Flower yield / ha (t)
T ₁ RDF @ (120:240:240 g NPK bush ⁻¹)	1.54	1.52	0.60	0.74	12.22	620.25	3.97
T ₂ FYM @ 10 kg + 100% RDF	2.52	2.52	1.14	1.38	19.74	832.32	5.32
T ₃ FYM @ 10 kg + 75% RDF	1.72	1.68	0.77	0.88	13.31	660.25	4.25
T ₄ VC @ 2.5 kg + 100% RDF	2.56	2.55	1.17	1.41	19.78	885.65	5.66
T ₅ VC @ 2.5 kg + 75% RDF	1.87	1.86	0.84	0.97	14.57	680.32	4.35
T ₆ NC @ 2 kg + 100% RDF	2.36	2.36	1.07	1.32	18.43	794.75	5.08
T ₇ NC @ 2 kg + 75% RDF	1.62	1.60	0.67	0.80	12.81	640.75	4.09
T ₈ FYM @ 10 kg + 100% RDF + PG 3%	3.20	3.25	1.50	1.75	25.20	989.25	6.33
T ₉ FYM @ 10 kg + 75% RDF + PG 3%	2.98	3.03	1.40	1.65	23.19	756.71	4.85
T ₁₀ VC @ 2.5 kg + 100% RDF + PG 3%	3.03	3.08	1.42	1.67	23.75	950.20	6.08
T ₁₁ VC @ 2.5 kg + 75% RDF + PG 3%	2.78	2.30	0.99	1.49	21.08	923.20	5.90
T ₁₂ NC @ 2 kg + 100% RDF + PG 3%	2.93	2.98	1.38	1.64	22.60	937.20	5.99
T ₁₃ NC @ 2 kg + 75% RDF + PG 3%	2.03	2.03	0.91	1.05	15.82	718.71	4.59
S.E. ±	0.069	0.07	0.03	0.037	1.19	36.80	1.23
C.D. (P=0.05)	0.140	0.15	0.07	0.075	0.59	18.31	2.48

FYM- Farm yard manure RDF- Recommended dose of fertilizers VC- Vermicompost NC- Neemcake PG- Panchagavya

weight (12.22 g), flower yield per plant (620.25 g) and flower yield ha⁻¹ (3.97 t) were the least when RDF alone was applied. The reason for increasing yield in the best treatment could be due to application of FYM, act as a slow release fertilizer and it natures the microbial activity of the soil due to the largest amount of carbon rich material available for the organism (Brar and Rekhi, 1999). In other hand panchagavya is a single organic input, which can act as growth promoter and immunity booster. It has a significant role in providing resistance to pest and diseases and in increasing the yield. The results clearly shows that organic manures are combined with inorganic nutrients gave better result. This may be due to the increased food source for microorganism and presence of nutrients in readily available form. These findings are supported by Bhattacharjee (1988) in *J. grandiflorum* and Hugar and Nalawadi (1994) in *Jasminum auriculatum*.

Considering the above results, it was revealed that application of FYM @ 10 kg along with 100 per cent recommended dose of inorganic fertilizers 120: 240: 240 g NPK, and panchagavya 3 per cent bush⁻¹ was found to be beneficial in improving the growth and yield of Gundumalli registered the maximum values for the yield characters viz., length of flower bud, flower bud diameter, corolla tube length, bud length without corolla, hundred bud weight, flower yield per plant and flower yield per hectare.

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