https://doi.org/10.29321/MAJ.10.A02828

Madras agric. J. 67 (4) : 252–255, April 1980

*Response of Jathimalli (Jasminum grandiflorum L.) to Nitrogen and Phosphorus**

S. NATARAJAN[1] and V. N MADHAVA RAO[2]

A fertilizer experiment was conducted with four levels of N (0,30,60 and 120 g/plant/year) and four levels of P_2O_5 (0, 60, 120 and 240 g/plant/year) to study their effects on Jathimalli. Application of N and P_2O_5 at 60 and 120 g respectively registered higher flower yield and essential oil production individually and in combination, but the oil content was higher at 120 g N and 240 g P_2O_5 levels. The length of the primary shoot and total leaf production were affected by levels of N, but not by P_2O_5. Application of 60 g N and 120 g P_2O_5 along with 240 g K_2O and 30 kg farmyard manure per plant per year was found to be optimum for Jathimalli

Jasmine is an important commercial flower crop of Tamil Nadu and Jathimalli is one of the most commonly cultivated species. The yield of Jasmine flowers and its products can be effectively increased by adequate fertilization. The fertilizer recommendation is based on the work done by Nayak (1934), Ratnam (1937), Padmanabha Raju (1953) and Bhatnagar (1960). But work on recent varieties is wanting. A study was, therefore, undertaken in Jathimalli to find out the effects of N and P_2O_5 and their optimum levels.

MATERIAL AND METHODS

The investigation was carried out at the Department of Horticulture, Tamil Nadu Agricultural University, Coimbatore with six month-old plants, of Jathimalli, clone Thimmapuram. The plants were propagated by rooted stem cuttings and planted in rows with spacings of 2.0 m x 1.5 m. Pruning was done during the last week of December 1975 to a height of 75cm from the ground level. The trial was laid out in Randomised Block Design with two replications, and with 4 levels each of N and P_2O_5 as follows.

N at 0, 30, 60 and 120 g/plant/year.
P_2O_5 at 0, 60, 120 and 240 g/plant/year.

Observations were made on two plants in each treatment with a guard row alround. The manures and fertilizers were applied in 15 cm deep furrows opened around the plant, 30 cm away from the main stem. Ammonium sulphate, superphosphate and muriate of potash formed the sources for nutrient elements. The fertilizers

---

* Part of the M.Sc. (Ag.) thesis submitted by the senior author to the Tamil Nadu Agricultural University, Coimbatore-3.

1. Horticultural Research Station, Kodaikanal and
2. Tamil Nadu Agricultural University, Coimbatore-3

were applied twice a year in two equal splits in December-January and June-July alogwith 15 Kg of farmyard manure and 120 g of K_2O each time per plant.

Observations were made on the length and diamater of primary shoot, flower yield and essential oil content of flowers. The essential oil content was estimated by the solvent extraction procedure (Guenther, 1952).

RESULTS AND DISCUSSION

Effects levels of N:

The length of primary shoot was significantly higher at 60 g N than at level (Table I). The number of secondary laterals per primary shoot did not vary significantly among the levels of N and the maximum number of 12.38 was noticed at 120 g N. The total leaf production showed significant differences among the levels of N (323. at 120 g N and 291.2 at 0 level), The diametrical growth of the primary shoot did not show differences due to levels of N. The plants treated with 60gN recorded relatively higher yield of flowers (3248.38 g/plant) than without N(2995.38 g). The floral characters *viz.*, length and diameter of the flower bud and weight of 100 buds were not affected by levels of N. But higher oil contenr was noticed at 120 g N. Although the essential oil content was low at 60 g the total quantity of oil was the highest due to increased yield of flowers. The lack of significant differences in flower yields due to N levels might be because of N applied steadily over a long period by the farmyard manure applied basally to all the treatments (Haworth, 1961) and the results corroborate the findings of Muthusamy and Pappiah (1976) ih *Jasminum auriculatum*.

Effect of levels of P_2O_5:

The length of the primary shoot and number of secondary laterals per primary shoot were not significantly affected by levels of P_2O_5. Leaf production was relatively higher at 240 g than at 0 levels. The diametrical growth of the primary shoot showed very little difference due to levels of P_2O_5. Although the yield of flowers did not show significant difference the maximum yield of 3242.88 g was recorded at 120 g. The floral characters were also not affected. The highest content of essential oil was noticed in flowers of the plants which received 240 g P_2O_5, while the total production of oil was the highest at 120 g. The non-significant yield differnce due to levels of P_2O_5 was also noticed by Muthusamy and Pappiah (1976) and this might be due to application of farmyard mauure.

A moderate supply of N (60 g/ plant) was proved to be better than 130 g, and excessive N promoted vegetative growth inturn affecting the productivity of the plant. Application of P_2O_5 at moderate level (120 g/ plant) was found to be beneficial. Although higher oil content was noticed at the highest levels of N and P_2O_5 indicating the positive effects of these elements in promoting the quality of flowers, the

total production of oil was higher at 60 g N and 120 g P_2O_5 levels and interaction and can be considered as optimum for higher flower yield and essential oil production.

REFERENCE

BHATNAGAR, C. S. 1960. Studies on cultivation of jasmines. *Indian Agriculturist*, 4: 117-20.

GUENTHER, E. 1952. Essential oils of the plant family oleaceae. In: *The Essential Oils*, E.Van Nostrand Co., Inc. New York, *V*: 319-18.

HAWORTH, F. 1961. THE effect of organic and inorganic nitrogen fertilizers on the yield of early potatoes, spring cabbage, leeks and summer cabbage. *J. Hort. Sci., 36:* 202-15

MUTHUSAMY, S. and C. M. PAPPIAH. 1976. Studies on the response of *Jasminum auriculatum* Vahl. to NPK fertilization *S. Indian hort.*, 24 (3): 88-93.

NAYAK, K. 1934. Jasmine cultivation in South Kanara. *Madras agric. J:* 11: 398-400.

PADMANABHA RAJU 1953. Some important flowers of South India and their cultivation, *S. Indian Hort.*, 3: 89-91

RATNAM, R. 1937. Jasmine cultivation and marketing in Coimbatore. *Madras agric. J.* 25: 15-20

TABLE I Effects of levels of N and P_2O_5 on Jathimalli

Level (g/plant)	Length of the primary shoot (cm)	No. of second dary laterals/ primary shoot	Total leaf production/primary shoot	Diametrical growth of the primary shoot (mm)	Yield of flowers/ plant (g)	Length of the flower bud (cm)	Diameter of the flower bud (cm)	Weight of 100 buds (g)	Essential oil content (%)	Essential oil production/plant (g)
N 0	75.8	12.05	291.2	7.50	2995.38	4.02	0.45	7.99	0.271	8.11
30	73.4	11.80	314.2	7.53	3176.38	4.03	0.46	7.91	0.270	8.58
60	79.8	12.45	320.1	7.56	3248.38	4.06	0.45	8.09	0.269	8.75
120	79.5	12.88	323.3	7.57	2637.94	4.08	0.45	8.15	0.281	7.42
CD(P=0.05)	5.01	N. S.	19.53	N. S.	N. S.	N. S.	N. S.	N. S.	0.04	N. S.
P_2O_5 0	75.7	11,63	303.7	7.49	3133.25	4.08	0.45	7.99	0.269	8.42
60	75.9	12.00	303.9	7.43	2762.19	4.07	0.46	8.02	0.266	7.33
120	77.4	12.68	316.4	7.57	3242.88	4.01	0.46	8.07	0.274	8.89
240	79.5	12.88	324.88	7.67	2919.75	4.05	0.45	8.06	0.282	8.23
CD(P=0.05)	N.S.	N.S.	N.S.	N.S	N.S	N.S.	N.S.	N.S.	0.04	N.S.