E-ISSN: 2618-0618
P-ISSN: 2618-060X

NAAS Rating: 5.20
www.agronomyjournals.com
2025; SP-8(3): 60-62
Received: 08-01-2025
Accepted: 15-02-2025

A Premalatha
Scientist, Department of Soil Science, ICAR Krishi Vigyan Kendra, Erode, Tamil Nadu, India

S Saravanakumar
Scientist, Department of Agronomy, ICAR Krishi Vigyan Kendra, Erode, Tamil Nadu, India

P Alagesan
Senior Scientist & Head, ICAR Krishi Vigyan Kendra, Erode, Tamil Nadu, India

Corresponding Author:
A Premalatha
Scientist, Department of Soil Science, ICAR Krishi Vigyan Kendra, Erode, Tamil Nadu, India

Impact of timely application of fertilizers on yield and economics of Jasmine (*Jasminum sambac* L.)

A Premalatha, S Saravanakumar and P Alagesan

DOI: https://www.doi.org/10.33545/2618060X.2025.v8.i3Sa.2659

Abstract
The present investigation was carried out to study the Impact of timely application of fertilizers on yield and economics of Jasmine (*Jasminum sambac* L.) conducted by Krishi Vigyan Kendra, Erode District through KVK's technical programme during three consecutive years i.e., 2022-23, 2023-24 & 2024-25 in the selected villages. The result revealed that Technology Option 1: RDF- NPK @ 60:120:120 g/plant/year is applied in 2 equal splits during November (after pruning) and June-July along with 10 kg FYM per plant; Foliar spray of Panchagavya 3% + Humic acid 0.4% & Foliar spray of 0.25% $ZnSO_4$ + 0.5% $MgSO_4$ + 0.5% $FeSO_4$ @ monthly interval significantly increases 1000 flower weight (189.5 g) and flower yield /ha (3.20 q/ha). In terms of cost benefit ratio, Gross Returns and Net Returns, the same Technology Option 1 recorded the highest whereas lowest yield and economics were recorded in Farmers Practice (Control).

Keywords: Jasmine, nutrient management, economics, yield, fertilizers

Introduction
Jasmine is one of the oldest of fragrant flowers and is specially appreciated in India, where most people have a love for the fragrant flowers. The word Jasmine has been derived from Persian word. 'Yasmyn' meaning fragrance since time immemorial, it is considered as a spiritual flower of India. The scent emitted by jasmine is so well liked that the word jasmine has become a synonym for fragrance and we have climber such as *Solanum jasminoides*, *Trachelospermum jasminoides* and *Pandorea jasminoides* (*Tecoma jasminoides*), which are totally unrelated to jasmine, except for their sweet fragrance. For the past many centuries jasmines have adorned the gardens of Central Asia, Afghanistan, Iran, Nepal and many other tropical and sub-tropical countries and many of the jasmine species are native of India and have their origin in the Southern Foothills of the Himalayas. The jasmine belongs to family 'Oleaceae' and the Genus Jasminum comprises of about 300 species, which are dispersed in the warmer parts of Europe, Asia, Africa and the Pacific region (Bhattacharjee, 1980) [1]. More than 40 species have been identified in India and in South India about 20 species are in cultivation. In India, jasmines are commercially cultivated in the states of Tamil Nadu, Karnataka and West Bengal. Tamil Nadu has the largest area under jasmine cultivation followed by Karnataka, which together account for 98 per cent of the total cultivated area. Various factors such as soil fertility, irrigation, plant density, plant protection strategies, etc., affect the effective production of jasmine, crop output is mostly influenced by nutrient management.

Macro and micronutrients plays a major role in the jasmine cultivation. A major factor influencing the low output of flower buds in plants is improper nutrition, which causes nutrient imbalance. Major nutrient deficiencies, specifically N, P, and K are common under typical agro climatic conditions and can seriously hinder the development of flower buds as N, P and K play very crucial roles in growth and development of plant. More photosynthetic activities, vegetative growth, and glucose uptake in plants all depend on nitrogen, which is also an essential component of protein, nucleic acid, and amino acids (Rolaniya *et al*., 2017; Mohanty *et al*., 2021) [7, 5]. Phosphorus is a well-known element in constitution of phospholipids, enzymes, nucleic acids, energy storage and plays very important role in transmission of proper metabolism (Tisdale *et al.*, 1995) [8]. Potassium is very much essential for production of amino acids, protein, disease resistance, transpiration, chlorophyll and improves quality of several ornamental flower

crops (Luthra *et al*., 1983) [4].

Plants require micronutrients to complete their life cycle. Micronutrients are present in the soil in large quantities but only a small quantity is required as a nutrient. These micronutrients play an important role in enzymatic activity and regulate metabolic activities. Zinc helps in synthesizing various enzymes, chlorophyll formation and functional, structural components like protein synthesis, photosynthesis and synthesis of Auxin. Boron one of the most important inorganic micronutrients, plays a vital role in normal plant growth, enhanced quality of crops. Iron is essential for chlorophyll formation, protein synthesis and also involved in various metabolic reactions. Magnesium is the main constitute of chlorophyll and helps in the uptake of phosphorus.

Generally nutrient deficiencies affect the yield and quality of Jasmine flower crops. The primary symptom of nutrient deficiency is interveinal chlorosis by iron and magnesium, reduced leaf size by zinc, flower abortion by boron and leaf edge burns by potassium. In severe cases, the entire leaf turns yellow or white and the outer edges may scorch and turn brown as the plant cells die. In addition, chlorotic plants often produce smaller flower with poor quality. Imbalanced nutrient use by farmers has resulted in aggravating the multiple nutrient deficiencies which reduces the quality and yield of Jasmine. Keeping these considerations in view with an objective of improving yield and quality of Jasmine.

Materials and Methods

The present study was carried out on Impact of timely application of fertilizers on yield and economics of Jasmine (*Jasminum sambac* L.) conducted by Krishi Vigyan Kendra, Erode District during Kharif season through KVK's technical programme *viz*., On Farm Testing in 2022-2023 and followed by Front Line Demonstration (FLD) 2023-2024 & 2024-25 in selected villages – Komarapalayam, K.N. Palayam of Sathyamangalam Block and Singirpalayam village of T.N. Palayam Block respectively. The details of experimental material used and methodology followed during the trail of the investigation have been described. The treatments used in the studies are Farmers Practice: Soil application of DAP @ 250 kg/ha, Urea and Potash each; Technology Option 1 – TNAU Practice: RDF- NPK @ 60:120:120 g/plant/year is applied in 2 equal splits during November (after pruning) and June-July along with 10 kg FYM per plant; Foliar spray of Panchagavya 3% + Humic acid 0.4% & Foliar spray of 0.25% $ZnSO_4$ + 0.5% $MgSO_4$ + 0.5% $FeSO_4$ @ monthly interval and Technology Option 2 – IIHR Practice: RDF - NPK @ 60:120:120 g/plant/year is applied in 4 equal splits during February, May, September & December along with 10 kg FYM per plant; Foliar spray of 0.25% $ZnSO_4$ + 0.5% $MgSO_4$ + 0.5% $FeSO_4$ @ monthly interval.

The selected progressive farmers were trained on all scientific Jasmine cultivation aspects before starting of trials. Yield per hectare (q/ha) each net plot's individual yield from each of the treatments was recorded and converted to hectares. Economics analysis the cost of cultivation of each treatment was calculated per hectare on the basis of prevailing rates of labour, nutrient sources, pest and disease management irrigation and other expenditure. The total income per hectare was calculated as per the average price of Jasmine in the local market. The net profit per hectare was obtained by deducting the cost from treatment. Cost of cultivation (₹/ha) by presuming the item-wise input cost based on the local market rate, the cost of cultivation per hectare of land was worked out and were computed treatment-wise also Gross returns (₹/ha) from the total yield of each treatment plot, the gross monetary return was worked out based on the average selling price of the product and it was recorded accordingly in ₹/ha.

Gross return (₹/ha) = Market price × Yield/ha

Net returns (₹/ha) the most crucial factor to consider before recommending any remedies to farmers for widespread use is their economic viability. The average treatment yield and current market rates for inputs and output were utilized to determine the therapy's economics. The cost of cultivation for each treatment was deducted from the gross return from the economic yield to determine the net return. Net returns (₹/ha) are calculated as follows:

Net return (₹/ha) = Gross returns (₹/ha) - Cost of cultivation (₹/ha)

Benefit cost ratio were worked out for each nutrient treatment by adopting the following formula: ultimately to yield per hectare by multiplying with a suitable factor. It determined how much head was produced per hectare, and their quantities were expressed in quintals. Benefit: Cost ratio = Net return (₹/ha) / Cost of cultivation (₹/ha)

Results and Discussion

The results on impact of timely application of fertilizers on yield and economics of Jasmine is described in Table 1 and 2. From the Table 1, it is indicated that, Technology Option 1: RDF-NPK @ 60:120:120 g/plant/year is applied in 2 equal splits; foliar spray of Panchagavya 3% + Humic acid 0.4% in Jasmine significantly reduces nutrient deficiencies and thereby increasing the crop yield. This technology has recorded flower yield of 82.0 q/ha whereas 71.0 q/ha yield recorded in farmers practice with the yield increase of 15 percent. The better yield produced per plant due to application of inorganic fertilizers along with organic nutrient sources and growth regulators at equal split application. The micronutrients are the trace elements that plays essential role in plant growth and increasing crop yields. Zinc favours the storage of more carbohydrates through photosynthesis and iron involves in synthesis of plant hormones and also plays an important role in chlorophyll synthesis, photosynthesis and respiration. This may be the attributing factor for the positive effectiveness of optimum dose of zinc and iron on reducing juvenile phase of the plant. Similar results are also obtained by Bhoomi *et al.*, (2018) [2]. The results of present investigation are in consonance with the earlier reports of Gupta *et al.* (2013) [3] in glory lily and Palagani *et al.* (2013) [6] in chrysanthemum.

Table 1: Effect of timely application of fertilizers on yield and yield parameters of Jasmine (*Jasminum sambac* L.)

Technology Option	Yield (q/ha)	1000 flowers weight (g)	Flower yield / plant (g)
Farmers Practice: Application of complex fertilizer (17:17:17) & MOP each @ 50 g/plant as basal dose	71.0	157.8	26.54
Technology 1: RDF- NPK @ 60:120:120 g/plant/year is applied in 2 equal splits during November (after pruning) and June-July along with 10 kg FYM per plant; Foliar spray of panchagavya 3% + Humic acid 0.4% & Foliar spray of 0.25% ZnSO4 + 0.5% MgSO4 + 0.5% $FeSO_4$ @ monthly interval	82.0	189.5	50.21
Technology 2: RDF - NPK @ 60:120:120 g/plant/year is applied in 4 equal splits during February, May, September & December along with 10 kg FYM per plant; Foliar spray of 0.25% ZnSO4 + 0.5% MgSO4 + 0.5% $FeSO_4$ @ monthly interval	73.8	176.5	43.43

The highest Net returns (Rs.5,64,058 /ha) and benefit cost ratio of 3.20 was recorded in Technology Option 1 followed by Technology Option 2 with Net returns of Rs.4,91,800/ha whereas Farmers practice recorded the lowest net returns of Rs. 4,64,400 /ha with BCR 2.89. Application of nutrient sources both organic and inorganic with timely application produces good yield which ultimately improves the net returns and higher benefit cost ratio in Jasmine. Similar findings are reported by Zala *et al* 2021[9] in *Jasminum sambac*.

Table 2: Effect of timely application of fertilizers on economics of Jasmine (*Jasminum sambac* L.)

Technology Option	Gross Cost (Rs. In Lakhs)	Net returns (Rs./ha)	B:C ratio
Farmers Practice	2.455	464400.00	2.89
Technology option: 1	2.559	564058.00	3.20
Technology option: 2	2.461	491800.00	3.00

Conclusion

Based on the findings of present investigation, it can be concluded that Technology Option 1- TNAU Practice: RDF-NPK @ 60:120:120 g/plant/year is applied in 2 equal splits; Foliar spray of Panchagavya 3% + Humic acid 0.4% and foliar spraying of micronutrients 0.25% $ZnSO_4$ + 0.5% $MgSO_4$ + 0.5% $FeSO_4$ @ monthly interval significantly improves flower yield and yield parameters of Jasmine. Similarly, the highest net returns and benefit cost ratio also found beneficial from Technology option 1.

References

1. Bhattacharjee SK, Singh V, Saxena NK. Studies on vegetative growth, flowering, flower quality and vase life of roses. Singapore J Primary Ind. 1993;21(2):67-71.
2. Naik B, Bhatt ST, S, Dipal S, Bhatt, Gamit D, Patel MA. Economics of off season flower induction through various stimulants in *Jasminum sambac* L. Biosci Trends. 2018;1:43.
3. Gupta LM, Kumar S, Gupta M, Sharma V. Integrated nutrient management for growth and yield in glory lily (*Gloriosa superba* L.). J Med Plant Res. 2013;7(43):3197-3201.
4. Luthra KL, Saha SK, Awaski PK. Role of rock phosphate in agriculture. Indian J Agric Chem. 1983;15:13-27.
5. Mohanty P, Umesha C, Ranjan SD, Lalit K. Impact of spacing and nitrogen levels on growth and yield of chia (*Sylvia hispanica* L.). Biol Forum Int J. 2021;13(1):149-153.
6. Palagani Neelima, Barad AV, Nilima Bhosale, Thumar BV. Influence of integrated plant nutrition on growth and flower yield of chrysanthemum (*Chrysanthemum morifolium* Ramat.) cv. IIHR-6 under Saurashtra conditions. Asian J Hort. 2013;8(2):502-506.
7. Rolaniya MK, Khandelwal SK, Choudhary A, Jat PK. Response of African marigold to NPK, biofertilizers and spacing. J Appl Nat Sci. 2017;9(1):593-597.
8. Tisdale SL, Nelson WL, Beaton JD, Halvin JL. Soil Fertility and Fertilizer. 6th ed. New Delhi: Prentice Hall of India Pvt Ltd; 1995. p. 684.
9. Zala KR, Bhatt ST, Patel HM, Tandel BM, Patel GM, Bhatt D. Year-around flowering strategy for *Jasminum sambac* L. Int J Curr Microbiol Appl Sci. 2021;10(04):834-847.