International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2017; 5(6): 1636-1638

Received: 13-09-2017
Accepted: 14-10-2017

Ommala D Kuchanwar
Soil Science and Agricultural Chemistry Section, College of Agriculture, Nagpu, Amravati Road, Nagpur, Maharashtra, India

Bhagyshri S Patil
Soil Science and Agricultural Chemistry Section, College of Agriculture, Nagpu, Amravati Road, Nagpur, Maharashtra, India

Neha K Chopde
Soil Science and Agricultural Chemistry Section, College of Agriculture, Nagpu, Amravati Road, Nagpur, Maharashtra, India

Nitikesh Bhujade
Soil Science and Agricultural Chemistry Section, College of Agriculture, Nagpu, Amravati Road, Nagpur, Maharashtra, India

Correspondence
Ommala D Kuchanwar
Soil Science and Agricultural Chemistry Section, College of Agriculture, Nagpu, Amravati Road, Nagpur, Maharashtra, India

Effect of integrated nutrient management on nutrient content in flowers and leaves of jasmine

Ommala D Kuchanwar, Bhagyshri S Patil, Neha K Chopde and Nitikesh Bhujade

Abstract
An investigation entitled, "Effect of Integrated Nutrient Management on growth, yield and quality of jasmine grown on Inceptisol" was carried out at Satpuda Botanic Garden, College of Agriculture, Nagpur from first week of January, 2016 to first week of August, 2016. The treatments were comprised of the ten combinations of organic manures and inorganic fertilizers i.e. T_1 – Recommended dose of fertilizer (RDF), T_2 – RDF + *Azotobacter* + PSB, T_3 – 75% RDF + *Azotobacter* + PSB, T_4 – 50% RDF + Azatobacter + PSB, T_5 – 100% N (Vermicompost) + remaining dose of P and K through chemical fertilizers + *Azotobacter* + PSB, T_6 – 100% N (Cow Dung Slurry) + remaining dose of P and K through chemical fertilizers + *Azotobacter* + PSB, T_7 – 100% N (Farm Yard Manure) + remaining dose of P and K through chemical fertilizers + *Azotobacter* + PSB, T_8 – 50% N (Vermicompost) + remaining dose of NPK through chemical fertilizers + *Azotobacter* + PSB, T_9 – 50% N (Cow Dung Slurry) + remaining dose of NPK through chemical fertilizers + *Azotobacter* + PSB and T_{10} – 50% N (Farm yard manure) + remaining dose of NPK through chemical fertilizers + *Azotobacter* + PSB. The experiment was laid out in randomized block design with three replications. The results obtained in the present investigation indicated that, nutrient uptake in flower and leaves of jasmine flowers were significantly improved in treatment 100% N (Vermicompost) + remaining dose of P and K through chemical fertilizers + *Azotobacter* + PSB.

Keywords: Integrated nutrient management, organic manures and inorganic fertilizers

Introduction
Jasmine (*Jasminum sambac* L.*)* is a tropical or subtropical plant which belongs to the family oleaceae. Its native habitat is in South East Asia. The plant is most likely originated in India, where it is one of the most popular ornamental plant grown. Jasmine is also known as "Arabian Jasmine" in English and "Mogra" in Marathi. It is an extremely fragrant and evergreen shrub which can grow up to 1 metre in ideal tropical conditions.

The flowers of jasmine contain antioxidant benefits as a result of many active constituents. It also contains anti-inflammatory components. These components are responsible for the lovely fragrance which is used in many perfumes. The leaves are antiseptic and are useful for wounds or acne when used as a poultice.

The total area under Jasmine crops in India during the year 2013 - 2014 was estimated to be 23.00 thousand hectare with the production of 122.7 thousand metric tonne of loose flowers and 44.00 lakh number of cut flowers. In Maharashtra, Jasmine is cultivated throughout the state over an area about 2.00 thousand hectare with the production of 3.50 thousand tone loose flowers.

The organic manures and bio-fertilizers are very important for plant growth and yield. It enhances the microbial activity of soil and it supplies micro and macro nutrients. Considering the important role of bio-fertilizers and organic manures in increasing the yield of better quality flowers of jasmine, in the present investigation is proposed on "Effect of integrated nutrient management on growth, yield and quality of Jasmine grown on inceptisol".

Materials and Methods
An investigation entitled, "Effect of Integrated Nutrient Management on growth, yield and quality of jasmine grown on Inceptisol" was carried out at Satpuda Botanic Garden, College of Agriculture, Nagpur from first week of January, 2016 to first week of August, 2016. The treatments were comprised of the ten combinations of organic manures and inorganic

fertilizers. The experiment was laid out in randomized block design with three replications. The recommended dose of fertilizer was 120:240:120 kg of N, P_2O_5 and K_2O respectively. The leaves and flowers plot wise were harvested separately for the chemical analysis of N, P, K and S content in leaves and flower and dried in oven at 60^0 C. The treatment wise sample were ground by using Willey grinding machine, and then stored in properly labeled paper packets for further necessary analysis. Total N was estimated by Kjeldahl method as described by Piper, (1966) [6], total P by vanadomolybdate yellow colour method using spectrophotometer Jackson, (1967) [7], total K by using di-acid extract on flame photometer, as described by Piper, (1966) [6] and total S by using di-acid extract by turbidimetric method given by Chesnin and Yien, (1951) [2].

Results and Discussion

Total nutrient status in flower

The date regarding nutrient content in flower presented in table1

Total nitrogen content in flower

The values for total nitrogen content ranged from 1.57 to 1.68%. Highest range for total nitrogen content from the flower was recorded with application of 100% N (Vermicompost) + remaining dose of P and K through chemical fertilizers + *Azotobacter* + PSB, while lowest range for total nitrogen content from the flower was recorded with application of recommended dose of fertilizer (RDF). This may be due to steady mineralization of nutrients in general and nitrogen in particular by vermicompost. Therefore, N content in flower was found more. Similar findings were recorded by Airadevi (2014) [1] that, the highest total nitrogen (2.38%) in garland chrysanthemum was recorded in treatment *Azospirillium* + PSB + 50% VC equivalent to RD'N' + 50% RDF.

Total phosphorus content in flower

The total phosphorus content ranged from 0.38 to 0.44%. Highest range for total phosphorus content from the flower was recorded with application of 100% N (Vermicompost) + remaining dose of P and K through chemical fertilizers + *Azotobacter* + PSB and 100% N (Cow Dung Slurry) + remaining dose of P and K through chemical fertilizers + *Azotobacter* + PSB, while lowest range for total phosphorus content from the flower was recorded with application of recommended dose of fertilizer (RDF) and 50% RDF + Azotobacter + PSB. Similar findings were recorded by Gupta *et al.,* (2013) [3]. They reported that, the highest total phosphorus (0.32%) in gloriosa superb was observed in treatment vermicompost at 4 t/ha along with ⅓ of recommended dose of NPK.

Total potassium content in flower

The total potassium content ranged from 1.43 to 1.65%. Highest range for total potassium content from the flower was recorded with application of 100% N (Vermicompost) + remaining dose of P and K through chemical fertilizers + *Azotobacter* + PSB, while lowest range for total potassium content from the flower was recorded with application of recommended dose of fertilizer (RDF). Similar findings were recorded by Shirsat *et al.,* (2015) [7]. They reported that, the total potassium (3.15%) in tuberose was recorded maximum in treatment 50% N through vermicompost + 50% N through urea + P and K (RDF).

Total sulphur content in flower

The total sulphur content ranged from 1.07 to 1.20%. Highest range for total sulphur content from the flower was recorded with application of 100% N (Cow Dung Slurry) + remaining dose of P and K through chemical fertilizers + *Azotobacter* + PSB and 100% N (Farm Yard Manure) + remaining dose of P and K through chemical fertilizers + *Azotobacter* + PSB, while lowest range for total sulphur content from the flower was recorded with application of recommended dose of fertilizer (RDF).

Total nutrient status in leaves

The date regarding nutrient content in leaves presented in table1

Total nitrogen content in leaves

The total nitrogen content ranged from 2.19 to 2.42%. Highest range for total nitrogen content from the leaves was recorded with application of 100% N (Vermicompost) + remaining dose of P and K through chemical fertilizers + *Azotobacter* + PSB, while lowest range for total nitrogen content from the leaves was recorded with application of recommended dose of fertilizer (RDF) this may be because of losses of nitrogen due to leaching and denitrification. Similar findings were recorded by Shirsat *et al.,* (2015) [7]. They reported that, the total nitrogen (2.37%) in tuberose was recorded maximum in treatment 50% N through vermicompost + 50% N through urea + P and K (RDF).

Total phosphorus content in leaves

The total phosphorus content ranged from 0.18 to 0.27%. Highest range for total phosphorus content from the leaves was recorded with application of 100% N (Vermicompost) + remaining dose of P and K through chemical fertilizers + *Azotobacter* + PSB treatment, while lowest range for total phosphorus content from the leaves was recorded with application of recommended dose of fertilizer (RDF). Similar findings were recorded by Marathe *et al.,* (2012) [5]. They reported that, the total phosphorus (1.11%) in sweet orange was recorded maximum in treatment FYM (to supply 50% N) + 50% RDF.

Total potassium content in leaves

The total potassium content varies from 2.05 to 2.24%. Highest range for total potassium content from the leaves was recorded with application of 100% N (Vermicompost) + remaining dose of P and K through chemical fertilizers + *Azotobacter* + PSB, while lowest range for total potassium content from the leaves was recorded with application of recommended dose of fertilizer (RDF). Similar findings were recorded by Airadevi (2014) [1] that, the highest total potassium (3.69%) in garland chrysanthemum was recorded in treatment *Azospirillium* + PSB + 50% VC equivalent to RD'N' + 50% RDF.

Total sulphur content in leaves

The total sulphur content varies from 0.85 to 0.97%. Highest range for total sulphur content from the leaves was recorded with application of 100% N (Vermicompost) + remaining dose of P and K through chemical fertilizers + *Azotobacter* + PSB, while lowest range for total sulphur content from the leaves was recorded with application of recommended dose of fertilizer (RDF).

Though the treatment 100% N (Vermicompost) + remaining dose of P and K through chemical fertilizers + *Azotobacter* +

PSB was more but it was at par with treatment 100% N (Cow Dung Slurry) + remaining dose of P and K through chemical fertilizers + *Azotobacter* + PSB, treatment 100% N (Farm Yard Manure) + remaining dose of P and K through chemical fertilizers + *Azotobacter* + PSB, treatment 50% N (vermicompost) + remaining dose of NPK through chemical fertilizers + *Azotobacter* + PSB, treatment 50% N (Cow Dung Slurry) + remaining dose of NPK through chemical fertilizers + *Azotobacter* + PSB and treatment 50% N (Farm Yard Manure) + remaining dose of NPK through chemical fertilizers + *Azotobacter* + PSB.for nearly all the parameters.

Table 1: Effect of Integrated Nutrient Management on nutrient content in flowers and leaves of Jasmine

Treatments	N% flower	P% flower	K% flower	S% flower	N% leaves	P% leaves	K% leaves	S% leaves
T_1 –Recommended dose of fertilizer (RDF)	1.57	0.38	1.43	1.07	2.19	0.18	2.05	0.85
T_2 – RDF + Azotobacter + PSB	1.60	0.39	1.48	1.09	2.25	0.20	2.09	0.87
T_3 – 75% RDF + Azotobacter + PSB	1.61	0.39	1.50	1.11	2.28	0.20	2.10	0.88
T_4 – 50% RDF + Azotobacter + PSB	1.59	0.38	1.46	1.08	2.23	0.19	2.07	0.86
T_5 – 100% N (Vermicompost) + remaining dose of P and K through chemical fertilizers + Azotobacter + PSB	1.68	0.44	1.65	1.17	2.42	0.27	2.24	0.97
T_6 – 100% N (Cow Dung Slurry) + remaining dose of P and K through chemical fertilizers + Azotobacter + PSB	1.67	0.44	1.62	1.20	2.40	0.24	2.22	0.96
T_7 – 100% N (Farm Yard Manure) + remaining dose of P and K through chemical fertilizers + Azotobacter + PSB	1.65	0.43	1.60	1.20	2.40	0.24	2.20	0.95
T8 – 50% N (Vermicompost) + remaining dose of NPK through chemical fertilizers + Azotobacter + PSB	1.64	0.42	1.57	1.16	2.33	0.23	2.16	0.94
T9 – 50% N (Cow Dung Slurry) + remaining dose of NPK through chemical fertilizers + Azotobacter + PSB	1.63	0.41	1.54	1.15	2.32	0.22	2.13	0.92
T10 – 50% N (Farm yard manure) + remaining dose of NPK through chemical fertilizers + Azotobacter + PSB	1.62	0.41	1.53	1.13	2.29	0.21	2.12	0.90
F test	Sig.	Sig.	Sig	Sig	Sig	Sig	Sig	Sig
S.E.(m) ±	0.02	0.01	0.05	0.03	0.05	0.02	0.03	0.03
C.D. at 5%	0.06	0.04	0.14	0.09	0.14	0.05	0.10	0.08

References

1. Angadi Airadevi P. Effect of integrated nutrient management on yield, economics and nutrient uptake of garland chrysanthemum (*Chrysanthemum coronarium* L.). The Asian J. Hort. 2014; 9(1):132-135.
2. Chesnin L, Yien CH. Turbidimetric determination of available Sulphates. Soil Sci. Soc. America proceedings. 1951; 15:149-151.
3. Gupta LM, Kumar S, Gupta M, Sharma V. Integrated nutrient management for growth and yield in Glory Lily (*Gloriosa superba* L.). J. Medical Plants Res. 2013; 7(43):3197-3201.
4. Jackson ML. Soil chemical analysis. Prentice Hall, Inc, New York, U.S.A. 1967.
5. Marathe RA, Bharambe PR, Rajvir Sharma, Sharma PR. Leaf nutrient composition, its correlation with yield and quality of sweet orange and soil microbial population as influenced by INM in Vertisol of central India. Indian J. Hort. 2012; 69(3):317-321.
6. Piper CS. Soil and plant analysis IV edition university of Acelcide, adeitada, Australia. 1966, 135-200.
7. Shirsat PR, Kuchanwar OD, Ingale SN. Effect of integrated nutrient management on yield and nutrient content in tuberose. J Soils and Crops. 2015; 25(2):402-405.