The Pharma Innovation Journal 2022; 11(7): 3161-3163

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(7): 3161-3163

www.thepharmajournal.com
Received: 07-04-2022
Accepted: 20-06-2022

Sudha Shyam
Department of Vegetable Science, BTC College of Agriculture and Research Station, Sarkanda, Bilaspur, Chhattisgarh, University of Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

Sanjay Verma
Department of Vegetable Science, BTC College of Agriculture and Research Station, Sarkanda, Bilaspur, Chhattisgarh, University of Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

RK Bisen
Department of Vegetable Science, BTC College of Agriculture and Research Station, Sarkanda, Bilaspur, Chhattisgarh, University of Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

Shani Raj
Department of Vegetable Science, BTC College of Agriculture and Research Station, Sarkanda, Bilaspur, Chhattisgarh, University of Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

TD Pandey
Department of Vegetable Science, BTC College of Agriculture and Research Station, Sarkanda, Bilaspur, Chhattisgarh, University of Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

NK Chaure
Department of Vegetable Science, BTC College of Agriculture and Research Station, Sarkanda, Bilaspur, Chhattisgarh, University of Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

PK Keshry
Department of Vegetable Science, BTC College of Agriculture and Research Station, Sarkanda, Bilaspur, Chhattisgarh, University of Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

Corresponding Author:
Sudha Shyam
Department of Vegetable Science, BTC College of Agriculture and Research Station, Sarkanda, Bilaspur, Chhattisgarh, University of Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

Effect of integrated nutrient management on yield of Carrot (*Daucus carota* L.)

Sudha Shyam, Sanjay Verma, RK Bisen, Shani Raj, TD Pandey, NK Chaure and PK Keshry

Abstract
A field experiment was conducted at the Horticultural Research cum Instructional farm, BTC College of agriculture and research station, Sarkanda, Bilaspur, (C.G.) university of Indira Gandhi Krishi Vishwavidyalaya, Raipur (Chhattisgarh). During *rabi* season of 2021-22 with a view to study the "Effect of integrated nutrient management on yield of Carrot (*Daucus carota* L.)". The carrot variety Surbhi was used to grown and treatment was replicated three times in completed randomized block design. The soil of experimental site was vertisol belonging to textural clay loam. The investigation There were two nutrients fertilizer (Nitrogen, Phosphorus and Potassium), and organic manures (FYM and vermicompost**)**, which were applied at different concentrations in carrot in eight treatments *viz*., T_1: - 100% NPK through RDF, T_2: - 75% NPK + Vermicompost + PSB, T_3: - 75% NPK + Vermicompost + Consortia, T_4: - 50% NPK + Vermicompost + Consortia, T_5: - 75% NPK + FYM + PSB, T_6: - 75% NPK + FYM + Consortia, T_7: - 50% NPK + Consortia and T_8: - Control Plot. The yield parameters *i.e.*, length of root (cm), diameter of root (cm), yield per plot (kg) and yield of root (q ha^{-1}) were significantly superior in the treatment T_3 (75% NPK + Vermicompost + Consortia). On the basis of above findings, treatment T_3 (75% NPK + Vermicompost + Consortia) stand could be better performance first in position and T_2 (75% NPK + Vermicompost + PSB) stand in second order of preference. However, treatment T_6 (75% NPK + FYM + Consortia) comes in next in order. Therefore, it may be concluded that treatment T_3 (75% NPK + Vermicompost + Consortia) may be prefer for higher yield in carrot.

Keywords: Yield parameter, nutrient management, Surbhi, vertisol, clay loam, fertilizer, Nitrogen, Phosphorus, Potassium, organic manures, FYM, vermicompost and Consortia

Introduction
Carrot (*Daucus carota* L.) is an important root vegetable crop. It belongs to the family umbelliferae having diploid chromosome number 2n = 18. It is cultivated all over the world, during spring-summer cultivated in temperate countries and in winter tropical and subtropical countries. Carrot is an excellent source of carotene and precursor of vitamin A, fibre in the diet (Handelman, 2001) [7]. It also contains high amount of nutrients such as protein, carbohydrates, fibre and sodium (Ahmad *et al*., 2004) [1]. Fleshy carrot roots are used as a vegetable for salads, soups and are also steamed or boiled in other vegetable dishes (Amjad *et al*., 2005) [2].
India is the second largest producer of vegetables next to China, producing about 12% of the global fruit and vegetable production. During the year 2019-20, we recorded the highest ever production of 320.77 million tonne in horticulture. The horticulture production in the year 2020-21 is estimated to a record 331.05 million tonne which is an increase of 10.6 million tonne (3.3%) over that achieved in 2019-20 (Anonymous, 2020) [3].
Chhattisgarh horticulture shares 3.80% of total vegetable production in India which is exhibits 489.27 thousand ha in area with the production of 6868.12 thousand MT. Carrot contributes area of 2.6 thousand hectare with the production of 29.30 thousand tonne (Anonymous, 2020) [3]. Vermicompost is produced by earthworms. It is a rich source of both micro and macro nutrients, vitamins, growth hormones and enzymes. Farm Yard Manure (FYM) is not a rich source of nutrients, increases organic carbon content to the soil and improves soil physical properties.

Materials and Methods
The field experiment was conducted at the Instructional farm of Horticulture, Barrister Thakur Chhedilal College of Agriculture and Research Station, Bilaspur (Chhattisgarh) university of Indira Gandhi Krishi Vishwavidyalaya, Raipur (Chhattisgarh). The Research Farm is situated at 22.09˚N latitude, 82.15˚E longitude and at an altitude of 292.3 m above mean sea level.

The region falls under the Eastern plateau and hill region (Agro-climatic zone-VII) of India. Chhattisgarh state is classified into three agro-climatic zones, in which Bilaspur falls under the Chhattisgarh plains zone of the state. The experimental field was well drained with uniform topography. And the soil of experimental site was vertisol belonging to textural clay loam.

Recommended dose of Nitrogen, Phosphorus and Potassium (80:60:60 kg ha^{-1}) were provided through urea, DAP and muriate of potash according to the treatment. Full quantity of phosphorus, potash and 1/3 of nitrogen was applied at basal at the time of sowing while the remaining was applied 30 and 45 days after sowing. Organic manures *viz.*, FYM, vermicompost were incorporated as per treatment to respective plots prior to sowing on the basis of nitrogen percentage. Observations were recorded on single plant basis from five randomly tagged competitive plants of each treatment for all the traits separately. Recorded observations were averaged over replication to get treatment mean.

Results and Discussion

Data pertaining to yield attributes influenced by various treatment has been given in table 1 and fig 1, 2, 3 and 4.

Significantly highest root length (26.00 cm) was observed in treatment T_3 (75% NPK + Vermicompost + Consortia) which remained at par with treatment T_2 (75% NPK + Vermicompost + PSB) and T_6 (75% NPK + FYM + Consortia). Significantly lowest root length (20.03 cm) was observed in treatment T_8 (Control Plot). The finding of present study is in accordance with those of Asghar *et al.* (2006) [4] studied the integrated use of recycled organic waste and chemical fertilizers for improving growth and yield characters of radish (*Raphanus sativus* L.) and revealed that maximum root length (12.41 cm). Similar results were also observed by Balloch *et al.* (1993) [5] and Kumar *et al.* (2014) [8].

Significantly highest root diameter (4.50 cm) was observed in treatment T_3 (75% NPK + Vermicompost + Consortia) which remained at par with treatment T_2 (75% NPK + Vermicompost + PSB) and T_6 (75% NPK + FYM + Consortia), while significantly lowest root diameter (3.10 cm) was observed in treatment T_8 (Control Plot). Also, similar results were reported by Kumar *et al.* (2014) [8] studied the effect of organic and inorganic nutrient sources on Vermicompost along with 75% NPK through fertilizer (T_4) increased carrot root diameter (3.34 cm).

Significantly highest yield per plot (33.60 kg) was observed in treatment T_3 (75% NPK + Vermicompost + Consortia) which remained at par with treatment T_2 (75% NPK + Vermicompost + PSB) and T_6 (75% NPK + FYM + Consortia), Significantly lowest yield per plot (18.01 kg) was observed in treatment T_8 (Control Plot). The results obtained in the present study is in accordance with the results of Pande (2017) [10] studied the effect of nutrient management on growth, yield and quality of carrot (*Daucus carota* L.). All the treatments showed better results when compared with control. NPK @ 80:70:60 kg/ha + vermicompost @ 10 q/ha was the best treatment among all the treatments which recorded maximum yield.

Significantly highest yield of root (q ha^{-1}) (280.02) was observed in treatment T_3 (75% NPK + Vermicompost + Consortia) which remained at par with treatment T_2 (75% NPK + Vermicompost + PSB) and T_6 (75% NPK + FYM + Consortia), Significantly lowest yield of root (q ha^{-1}) (150.05) was observed in treatment T_8 (Control Plot). Similar results were also observed by Patil and Rajkumar (2016) [11] conducted experiment on integrated nutrient management in carrot (*Daucus carota* L.) under North Eastern transitional track of Karnataka and reported that, the application of 50% RDF + 25% N through FYM 25% N through Vermicompost recorded higher root yield of carrot (24.10 t ha^{-1}) compared to rest of the treatments.

Table 1.1: Effect of integrated nutrient management on yield of carrot

Tr. no.	Treatment details	Root length (cm)	Root diameter (cm)	Yield per plot (kg)	Yield of root (q ha^{-1})
T_1	100% NPK through RDF	24.02	4.05	31.56	263.01
T_2	75% NPK + Vermicompost + PSB	25.50	4.40	33.12	276.02
T_3	75% NPK + Vermicompost + Consortia	26.00	4.50	33.60	280.02
T_4	50% NPK + Vermicompost + Consortia	23.00	3.90	30.72	256.00
T_5	75% NPK + FYM + PSB	24.50	4.20	32.04	267.02
T_6	75% NPK + FYM + Consortia	25.00	4.31	32.52	271.02
T_7	50% NPK + Consortia	22.04	3.70	24.20	201.67
T_8	Control Plot	20.03	3.10	18.01	150.05
S.Em (±)		1.14	0.12	1.10	9.81
CD (5%)		3.47	0.38	3.34	27.85
CV (%)		8.34	5.35	6.47	6.47

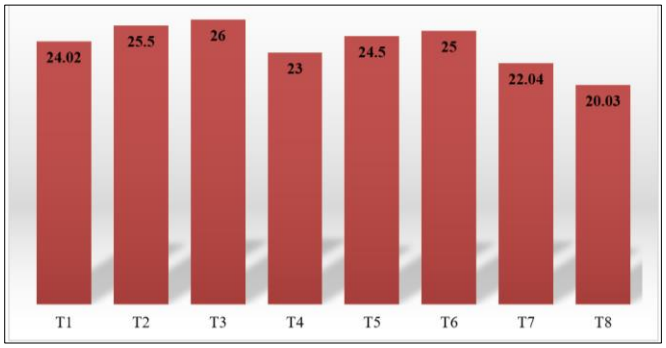

Fig 1: Root length (cm)

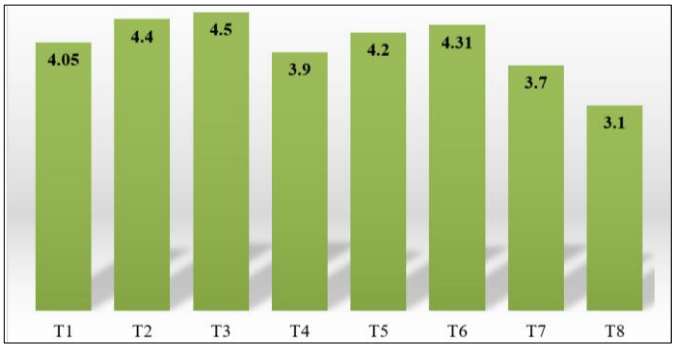

Fig 2: Root diameter (cm)

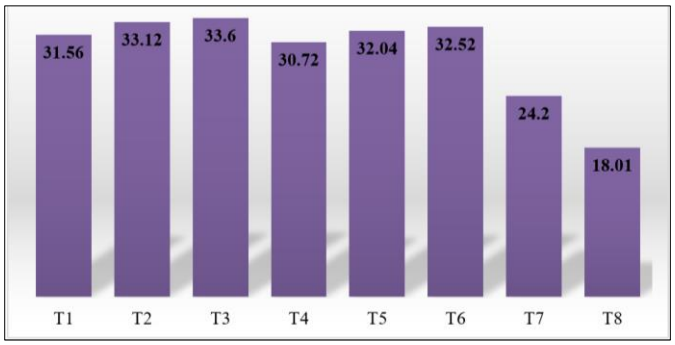

Fig 1: Yield per plot (cm)

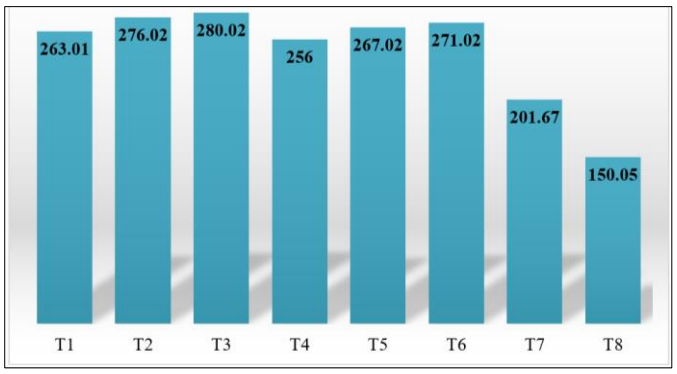

Fig 1: Yield of root (q ha^{-1})

Conclusion

The yield parameters *i.e.*, root length (cm), root diameter (cm), yield per plot (kg) and yield of root (q ha^{-1}) were significantly superior in the treatment T_3 (75% NPK + Vermicompost + Consortia).

On the basis of above findings, treatment T_3 (75% NPK + Vermicompost + Consortia) stand could be better performance first in position and T_2 (75% NPK + Vermicompost + PSB) stand in second order of preference. However, treatment T_6 (75% NPK + FYM + Consortia) comes in next in order. Therefore, it may be concluded that treatment T_3 (75% NPK + Vermicompost + Consortia) may be prefer for higher yield in carrot.

References

1. Ahmad B, Bakhsh K, Hassan S. Economics of growing carrot, Faculty of Agricultural Economics and R.S., University of Agriculture, Faisalabad. A report submitted to Pakistan Agricultural Research Council (PARC), Islamabad, Pakistan. 2004;7(5):795-796.
2. Amjad M, Naz S, Ali S. Growth and seed yield of carrot as influenced by different regimes of nitrogen and potassium. Journal Res. Sci. 2005;16(2):73-78.
3. Anonymous. Database: area, production, productivity of major horticultural crops in Chhattisgarh and India. Horticulture at a Glance. 2020, Pp. 17-18.
4. Asghar HN, Ishaq M, Zahir ZA, Khalid M, Arshad M. Response of radish to integrated use of nitrogen fertilizer and recycled organic waste. Pakisthan Journal of Botany. 2006;38(3):691-700.
5. Ballooch AF, Balloch MA, Qayyum SM. Influence of phosphorus and potassium fertilizer levels with standard dose of nitrogen on the productivity of carrot (*Daucus carota* L.) Sharhad Journal of Agriculture. 1993;9(1):21-25.
6. Caliskan S, Yetisir H, Karanlik S. Combined use of green manure and farmyard manure allows better nutrition of organic lettuce. *Notulae Botanicae Horti Agrobotanici Cluj-Napoca* 2014;42:248-54.
7. Handelman GJ. The evolving role of carotenoids in human biochemistry. Nutrition. 2001;17:818 -822.
8. Kumar p, Meghwal PR, Painuli DK. Effect of organic and inorganic nutrient sources on soil health and quality of carrot. Indian J Horti. 2014;71(2):222-226.
9. Kushwah L. Effect of organic manures, inorganic fertilizers and their combinations of growth, yield and quality of radish *(Raphanus sativus* L.). M.Sc. (Horti.). Thesis submitted to RVSKVV, Mandsaur (M.P.). 2016;7(6):2972-2974.
10. Pande N. Effect of nutrient management on growth, yield and quality of carrot (*Daucus carota* L.). M Sc Thesis. Department of Horticulture, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior (MP), 2017, 49p.
11. Patil AG, Rajkumar M. Integrated nutrient management in carrot (*Daucus carota* L.) under north eastern transitional track of Karnataka. An International Quatarlerly Journal of Life Sciences. 2016;11(1):271-273.
12. Rahman MA, Islam MT, Al Mamun MA, Rahman MS, Ashraf MS. Yield and quality performance of carrot under different organic and inorganic nutrient sources with mulching options. Asian Journal of Agricultural and Horticultural Research. 2018;1(4):1-8.
13. Sarma I, Phookan DP, Boruah S. Influence of manures and biofertilizers on carrot (*Daucus carota* L.) cv. Early Nantes growth, yield and quality. J Eco-friendly Agric. 2015;10(1):25-27.
14. Vithwel Kanaujia SP. Integrated nutrient management on productivity of carrot and fertility of soil. SAARC Journal of Agriculture. 2013;11(2):173-181.
15. Zakir HM, Sultana MN, Saha KC. Influence of commercially available organic and inorganic fertilizers on growth yield and quality of carrot (*Daucus carota* L.), Journal Environ. Sci. and natural resources. 2012;5(1):39-45.