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The Influence of Various Growing Media on Flowering Parameters of Zinnia

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Zinnia is a loose flower used for religious purposes and for social functions in India. The present experiment entitled "The effect of various growing media on quality of Zinnia" was carried out at Horticultural nursery, College of Agriculture, IGKV, Raipur, (C.G) during the year 2022 and the experiment was conducted in Completely Randomized Design (CRD) with 10 treatments and 3 replications. All the media treatments studied recorded superior over control. Among the media treatments studied T10 (Garden soil 50% + FYM 25% + VC 25% + Azotobacter showed significant effect with different parameters *viz*. minimum days taken to first flower bud initiation (34.73 days), maximum blooming period (12.03 days), maximum flower weight (1.95 g), maximum flower yield (42.4 g), maximum number of flowers per plant (37.96). The findings revealed that all the characters linked flowering parameters were greatly affected by all the growing media treatments and quality as well.

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1. INTRODUCTION

In India, Zinnia as a loose flower used for religious purposes and for social functions as well [1]. These plants are easy to care for but underrated between home gardeners and local farmers, so it is important to find out best suited organic media to suggest for maximum and quality flowering [2].

The idea of using various growing media and biofertilizer compositions in this research is to increase the quality and quantity of flowers in a plant [3,4]. Due to the emphasis placed primarily on productivity in commercial agriculture, it may not be able to preserve the quality of the produce. The usage of organic manures including compost, vermicompost, phosphocompost, farmyard manure, green manure, and biofertilizers like Azotobacter, Azospirillum, and phosphate solubilizing bacteria are now prioritized as they are viable for long-term agriculture on a commercial and lucrative scale.

The vermicompost serves as organic manure since it is a source of nutrients, such as nitrogen, phosphorous, potassium, humic acids and micronutrients. FYM supplies all major nutrients (N, P, K, Ca, Mg, S,) as well as micronutrients (Fe, Mn, Cu and Zn) necessary for plant growth and development. A free-living, nitrogen-fixing bacteria called azotobacter can be used on a variety of non-leguminous crops. Additionally, it is known to encourage the synthesis of some growth hormones, including auxin, gibberellins and cytokinins. When plants are infected with Azotobacter, they fix atmospheric nitrogen, reducing the need for nitrogen fertilizer by 20-25%. Azotobacter is an important nitrogen fixer inoculant.

2. MATERIALS AND METHODS

The experiment was performed during the year 2022 at the Horticulture research cum Instructional Farm, College of Agriculture, IGKV, Raipur (C.G).

Seeds were primarily treated with fungicide and then sown in protrays in a protected structure. One seed was sown per block of protray. One week after sowing seeds were germinated and started showing two leaf stage. 15 days after sowing protrays were shifted to the hardening chamber.

Polybags were used as pots and were filled with garden soil, vermicompost, well-rotted farm yard manure and Biofertilizer (Azotobacter and PSB). The ratio of media compositions (Garden soil, vermicompost and farm yard manure) were filled in pots as per the requirement.

3. RESULTS AND DISCUSSION

The minimum days taken to first flower bud initiation (34.73 days) and maximum days (43.13 days) with T_2 (Garden soil 50% + FYM 50%). It may be due to the early vegetative growth of plants which is synergetic effect of FYM, Vermicompost and Azotobacter also azotobacter fixes atmospheric nitrogen to the soil which positively affects the vegetative growth of plants similar findings are seen with Panday et al. [5].

Table 1. Treatment details

Notation	Treatment details
T1	Garden soil 100% (control)
T2	Garden soil 50% + FYM 50%
T3	Garden soil 50% + VC 50%
T4	Garden soil 50% + FYM 25% + VC 25%
T5	Garden soil 50% + FYM 50% + PSB
T6	Garden soil 50% + VC 50% + PSB
T7	Garden soil 50% + FYM 25% + VC 25% + PSB
T8	Garden soil 50% + FYM 25% + Azotobacter
T9	Garden soil 50% + VC 50% + Azotobacter
T10	Garden soil 50% + FYM 25% + VC 25% + Azotobacter

Table 2. Influence of various growing media

Notation	Treatment details	Days taken to first flower bud initiation	Blooming period	Flower weight	Flower yield	Number of flowers per plant
T_1	Garden soil 100% (control)	40.42	9.50	0.95	29.39	30.63
T_2	Garden soil 50% + FYM 50%	43.13	9.43	1.02	31.29	31.06
T_3	Garden soil 50% + VC 50%	41.09	9.46	1.09	33.66	32.06
T_4	Garden soil 50% + FYM 25% + VC 25%	39.96	9.70	1.16	34.66	31.70
T_5	Garden soil 50% + FYM 50% + PSB	39.03	9.76	1.33	35.66	32.70
T_6	Garden soil 50% + VC 50% + PSB	38.90	10.90	1.46	37.33	33.10
T_7	Garden soil 50% + FYM 25% + VC 25% + PSB	38.76	11.03	1.56	38.33	34.66
T_8	Garden soil 50% + FYM 25% +Azotobacter	37.20	11.00	1.66	39.33	35.46
T_9	Garden soil 50% + VC 50% + Azotobacter	37.13	11.90	1.83	40.33	35.76
T_{10}	Garden soil 50% + FYM 25% + VC 25% + Azotobacter	34.73	12.03	1.95	42.4	37.96
CD (P@5%)		**1.30**	**0.87**	**0.32**	**1.31**	**1.39**
SE(m)		**0.43**	**0.29**	**0.11**	**0.44**	**0.47**

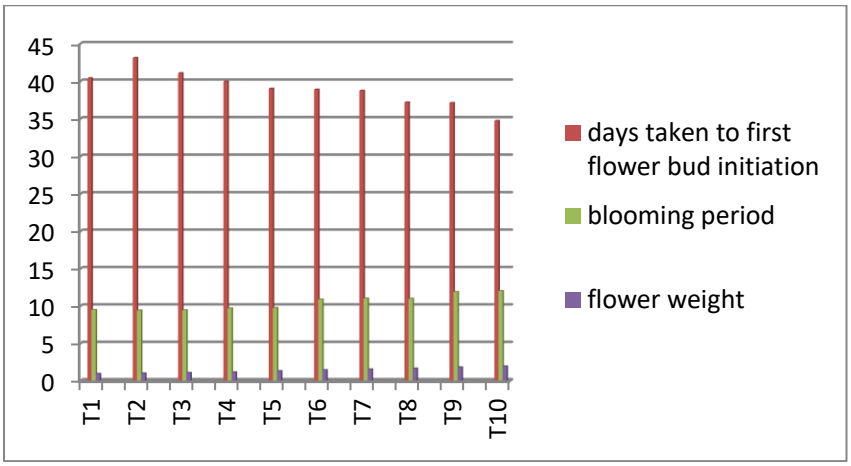

Fig. 1. Influence of various growing media

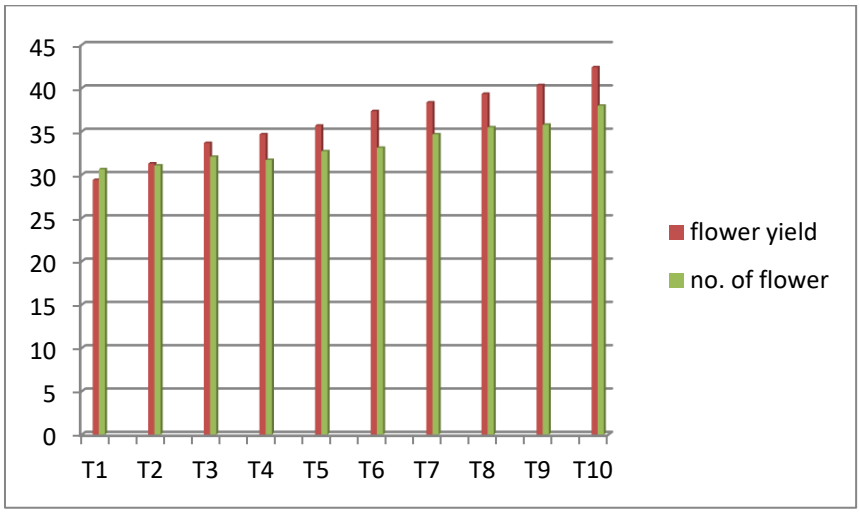

Fig. 2. Bar graph showing yield of flower

The maximum blooming period (12.03 days) with T10 (Garden soil 50% + FYM 25% + VC 25% + Azotobacter)and minimum with T2 (Garden soil 50% + FYM 50%).This is because azotobacter enhances the availability of applied as well as native soil nutrients. Similar findings was observed with Topno et al. [6].

The highest flower weight (1.95 g) was observed in T10 (Garden soil 50% + FYM 25% + VC 25% + Azotobacter)and lowest was observed with T3 (Garden soil 50% + VC 50%.These findings are in agreement with Patel et al. [7].

The highest flower yield (42.4 g) was found in T10 (Garden soil 50% + FYM 25% + VC 25% + Azotobacter) whereas, lowest was with T2 (Garden soil 50% + FYM 50%). Effect of bio-fertilizers like Azotobacter, Vermicompost gave maximum flower yield as compared to other treatments. Findings are similar with Syamal et al. [8].

The maximum number of flowers per plant (37.96)was found in T10 (Garden soil 50% + FYM 25% + VC 25% + Azotobacter)and minimum in treatment T2 (Garden soil 50% + 50%).

4. CONCLUSION

Bio-fertilizers being essential components of organic farming play vital role in maintaining long term soil fertility and sustainability by fixing atmospheric nitrogen, mobilizing fixed macro and micro nutrients or convert insoluble P in the soil into forms available to plants, there by increases their efficiency and availability. In context of both the cost and environmental impact of chemical fertilizers, excessive reliance on the chemical fertilizers is not viable strategy in long run

because of the cost, both in domestic resources and foreign exchange, involved in setting up of fertilizer plants and sustaining the production and also can get good vegetative growth and flowering in different flower crops.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Bandurska H, Breś W, Zielezińska M, Mieloszyk E. Does Potassium Modify the Response of Zinnia (*Zinnia elegans* Jacq.) to Long-Term Salinity?. Plants. 2023; 12(7):1439.
2. Szopińska D, Dorna H. Enhancing Zinnia (*Zinnia elegans* Jacq.) Seed Quality through Microwaves Application. Agronomy. 2023;13(5):1241.
3. Adderley A, Wallace S, Stubbs D, Bowen-O'Connor C, Ferguson J, Watson C, Gustave W. *Sargassum sp.* as a biofertilizer: Is it really a key towards sustainable agriculture for The Bahamas?. Bulletin of the National Research Centre. 2023;47(1):1-1.
4. Rai IN, Sudana IM, Wiraatmaja IW, Astiari NK, Wijana G. Test the viability and effectiveness of the AMF biofertilizer prototypes using different spore carrier media on production of organic cocoa. InIOP Conference Series: Earth and Environmental Science. IOP Publishing. 2023;1208(1):012047).
5. Pandey G, Kumar S, Kumar A. Effect of integrated nutrient management on growth and flowering of chrysanthemum (*Dendranthema grandiflora*). Journal of Ornamental Horticulture. 2010;13(2): 112-116.
6. Topno SE, Prasad VM, Bajpai V. Effect of organic manures and biofertilizers on growth, flowering and yield of gladiolus (*Gladiolus hybridus* Hort) cv. Pusa Srijana. International Journal of Plant & Soil Science. 2022; 1322- 1328.
7. Patel VS, Malam VR, Nurbhanej KH, Vihol AN, Chavada JR. Effect of organic manures and biofertilizers on growth, flowering and flower yield of Rose (*Rosa hybrida* L.) cv. Gladiator. International Journal of Chemical Studies. 2017;5 (5):1924-1927.
8. Syamal MM, Dixit SK, Kumar S. Effect of biofertilizers on growth and yield in marigold. J. Ornam. Hort. 2006;9(4):304-305.

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