

Original Research Article

<https://doi.org/10.20546/ijcmas.2023.1207.011>

## Impact of Organic Starter Solution on Vase Life of Chrysanthemum (*Dendranthema grandiflora* Tzvelev)

Ankita Chouhan<sup>ID\*</sup>, T. Tirkey and G. Sharma

Department of Floriculture and Landscape Architecture, Indira Gandhi Krishi Vishwavidyalaya,  
Raipur – 492012, India

\*Corresponding author

### ABSTRACT

#### Keywords

Chrysanthemum,  
*Dendranthema  
grandiflora*, vase  
life, starter solution  
technology

#### Article Info

**Received:**

02 June 2023

**Accepted:**

06 July 2023

**Available Online:**

10 July 2023

The present investigation entitled “Impact of organic starter solution on vase life of chrysanthemum (*Dendranthema grandiflora* Tzvelev)” was carried out at Department of Floriculture and Landscape Architecture, College of Agriculture, Indira Gandhi Krishi Vishwavidyalaya, Raipur during 2018-19. The experiment was laid out in Completely Randomized Design with thirteen treatments and three replications consisting of organic starter solution alone and in combination with PSB and Trichoderma. The purpose of the experiment was to evaluate the result of applying organic starter solution in plants, comparing it to inorganic starter solutions to evaluate the vase life of chrysanthemum grown in potted condition. Studies showed organic starter solutions significantly improved the freshness of flower over control. Maximum vase life (19.67 days) was recorded at application of treatment T<sub>8</sub> (Goatery slurry + PSB) which was significantly superior over all the other treatments including control. Minimum vase life (17.20 days) was recorded in the treatment T<sub>13</sub> (RDF 2% inorganic liquid 19:19:19) taken as control.

### Introduction

Chrysanthemum (*Dendranthema grandiflora* Tzelev) is one of the most important flowering plant, grown in different parts of the world. Chrysanthemums, also known as mums or chrysanths, are flowering plants belonging to the genus chrysanthemum in Asteraceae family. Asia and north eastern Europe is said to be the centre of

origin of Chrysanthemums. It is generally called as the “Queen of the East It is popular as a loose flower, cut flower and also as pot plant having high demand in Indian markets, used for garland making, bouquets, religious offerings, exhibitions, decorations etc. Conventionally, production in flowers is being increased by the use of massive use of high yielding varieties and incorporating heavy doses of chemical fertilizer in the recent decades.

However this has resulted in deterioration of physico-chemical properties of soil, increased pollution of soil and water bodies eventually leading it difficult to sustain profitable farming. As we know that high yielding varieties can grow well only in healthy soils, hence it is important for the farmers to maintain productive soils for benefit in flower production. Starter solutions are dilute solutions of fertilizer or manures applied to plants at time of transplanting. Organic Starter Solution Technology is a novel technology to reduce chemical fertilizer and thus altogether increase productivity through organic nutrients. The main objective is to provide for the application of nutrients to the young plants before an established root system. Contrasting to the regular or typical organic fertilizer, the ample organic matter and available nutrients in the liquid organic manure form applied at a small amount at a young stage of plants in the root zone or soil surface can enhance soil sustainability, plant health, flower quality and increase vase life making it beneficial in monetary terms in the long run.

## **Materials and Methods**

The present investigation was conducted at the Department of Floriculture and Landscape Architecture, College of Agriculture, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh during winter season of the year 2018-19. The experiment was laid out in Completely randomized design with 3 replication and 13 treatment combinations (T<sub>1</sub>=Cow dung slurry, T<sub>2</sub>= Cow urine, T<sub>3</sub>= Vermiwash, T<sub>4</sub>= Goatery slurry, T<sub>5</sub>= Cow dung slurry + PSB, T<sub>6</sub>= Cow urine + PSB, T<sub>7</sub>= Vermiwash + PSB, T<sub>8</sub>= Goatery slurry + PSB, T<sub>9</sub>=Cow dung slurry + Trichoderma, T<sub>10</sub>= Cow urine + Trichoderma, T<sub>11</sub>=Vermiwash +Trichoderma, T<sub>12</sub>=Goatery slurry + Trichoderma, T<sub>13</sub>=RDF (2% inorganic liquid 19:19:19). After filling the pots with growing media containing sand and soil in 1:1 ratio, the rooted cuttings of chrysanthemum plants (cv. Red Ball) were planted in pots. During the entire crop period cultural operations were done as and when required.. Solution of PSB was prepared by mixing 1200 gm

of PSB in 3 liter of water for the application rate of 20 gm per plot. Then it was directly applied in the growing media in pots at the rate of 50 ml per pot. In total 60 pots, PSB solution was applied. For Trichoderma solution to be supplied to the growing media at the rate of 10 gm per pot, 600 gm of Trichoderma was mixed with 3 liter of water and a solution was prepared. 50 ml of this solution was applied in the 60 pots. Both these solutions were applied in the growing media to the pots pertaining to that treatment. Cow dung, cow urine, goatery slurry and vermiwash @ 5 kg was dissolved in water on separate tanks and fermented for 15 days prior to the day of application. At the day of application (15,30and 45 DAT), 1 litre of these fermented organic materials were separately dissolved in 9 litre of water to make a 10 litre solution. 100 ml of this solution was applied to the root zone of plants at each pots on which a particular treatment is to be applied. Flower from each treatment were plucked at harvest stage with stalk (when 40-50%of the bloom is fully open) and kept in bottle which was filled with tap water. Vase life was recorded at room temperature. The number of days were counted till the color of petals faded for vase life.

## **Results and Discussion**

The analysis of variance revealed that all the treatments differed significantly from each other for the vase life. The mean performance of the treatments for vase life have been presented in Table 1.

### **Vase Life**

Application of different starter solutions showed significant effect on vase life in chrysanthemum. It is clear from the table that organic starter solutions significantly improved the freshness of flower over control. Maximum vase life (19.67 days) recorded at application of treatment T<sub>8</sub> (Goatery slurry + PSB) which was significantly superior over all the other treatments including control. Minimum vase life (17.20 days) was recorded in the treatment T<sub>13</sub> (RDF 2% inorganic liquid19:19:19).

**Table.1** Effect of organic starter solution on vase life (days) of chrysanthemum

Treatment	Vase life (days)
Cow dung slurry	18.10
Cow urine	17.32
Vermiwash	17.39
Goatery slurry	17.57
Cow dung slurry + PSB	18.28
Cow urine + PSB	19.13
Vermiwash + PSB	17.89
Goatery slurry + PSB	19.67
Cow dung slurry + Trichoderma	18.52
Cow urine + Trichoderma	18.90
Vermiwash + Trichoderma	18.77
Goatery slurry + Trichoderma	17.49
RDF (2% inorganic liquid 19:19:19)	17.20
SE <sub>m±</sub>	0.16
C.D. at 5%	0.48

Higher vase life caused by organic starter solution might be due to the higher retention of water in the cells of flowers and lower desiccation. Greater length and thickness of the flower stalk obtained due to application of organic starter solution also affected the longevity of flowers. Organic manure may have enhanced the micro flora, micronutrient availability and enzymatic activity which might have augmented the vase life. PSB as a biofertilizer is unique in making fixed soil phosphorus available to plants and produces plant growth regulating substances, which may have promoted longevity in the flowers. Ample quantities of carbohydrates translocated in the developing flowers due to increased photosynthesis caused by application of starter solutions at growth and reproductive stages of chrysanthemum may also have supported higher vase life. Similar findings have been reported by Verma *et al.*, (2011) in chrysanthemum, Golliwar *et al.*, (2007) in dahlia, Dhane *et al.*, (2009) in china aster, Mashaldi (2000) and Ajitkumar (2002) in marigold.

From the overall assessment of the data and results it can be concluded that application of organic starter solution were beneficial to significantly increase the

vase life of chrysanthemum. Treatment Goatery slurry + PSB was found to be superior over other treatments.

### Acknowledgement

I would like to thank Indira Gandhi Krishi Vishwavidyalaya, Raipur and Department of Floriculture and Landscape Architecture, IGKV, Raipur for providing me facilities to conduct my research work.

### References

- Ajitkumar, 2002. Effect of organic and inorganic fertilizers on growth, yield and post harvest life of marigold. *M. Sc. (Ag.) Thesis*, UAS, Dharwad.
- AVRDC. 2004. Progress Reports 1998-2003. Asian Vegetable Research and Development Center, Shanhua, Taiwan.
- Dhane, S. S. Sonawane, S. P., Dabke, D. J. and Dabke, S. B. 2009. Effect of nitrogen, phosphorus and FYM on yield and nutrient uptake by china aster (*Callistephus chinensis* (L.) Ness). *J. Maha. Agri. Univ.*, 34(1): 90-

91

- Golliwar, V. J., Ashwini, P., Warede Neha, Chopde, P. W., Lanje, and Thakre, S. A., Effect of organic manures and biofertilizer on growth, flowering and tuberous root production of Dahlia. *J. Soils and Crops*, 17(2): 354-357 (2007).
- Ma, C. H. and Kalb, T. 2006. Development of starter solution technology as a balanced fertilization practice in vegetable production. *Acta Hort.* 700:167-172  
<https://doi.org/10.17660/ActaHortic.2006.700.27>
- Mashaldi, A. 2000. Effect of organic and inorganic fertilizers on growth, yield and post harvest life of marigold (*Tagetes erecta* L.) cv. Double orange. *M. Sc. (Ag.) Thesis*, UAS, Dharwad, Karnataka
- Verma, S. K., Angadi, S. G., Patil, V. S., Mokashi, A. N., Mathad, J. C. and Mummigatti, U. V. 2011. Growth, yield and quality of chrysanthemum (*Chrysanthemum morifolium* Ramat.) cv. Raja as influenced by integrated nutrient management. *Karnataka J. Agri. Sci.*, 24(5) : 681-683.

**How to cite this article:**

Ankita Chouhan, T. Tirkey and Sharma, G. 2023. Impact of Organic Starter Solution on Vase Life of Chrysanthemum (*Dendranthema grandiflora* Tzvelev). *Int.J.Curr.Microbiol.App.Sci*. 12(07): 97-100.  
**doi:** <https://doi.org/10.20546/ijemas.2023.1207.011>