

## Effect of Different Organic and Inorganic Manure on Flower Yield and Tubers Yield of Dahlia (*dahlia variabilis*) cv. Glory of India as Intercropping with Damask Rose

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### Abstract:

*The experiment "Effect of Different Organic and Inorganic Manure on Growth and Flowering of Dahlia (*Dahlia variabilis*) cv. glory of India as intercropping with Damask Rose" was conducted at Ornamental Horticulture nursery Farm, Department of Horticulture, SHATS, Allahabad-211007(U.P.) during 2012-2013. One cultivar of Dahlia (*Dahlia variabilis*) cv. glory of India was planted in four different planting media control, FYM, FYM +NPK, Poultry manure, Poultry manure + NPK and Vermicompost, Vermicompost + NPK in different combinations. The experiment was laid out in randomized block design with split plot arrangement. Media mostly affected the parameters studied during the experiment. Maximum weight of the flower (92.67g).were produced with Poultry manure 30  $th^{-1}$  + NPK. Whereas, minimum flower weight (51.33g) was produced with FYM 10  $th^{-1}$ , Vermicompost 10 $th^{-1}$ . Maximum weight of the tubers (996.67) were produced by Poultry manure 30  $th^{-1}$ +NPK. Whereas, minimum weight of the tubers (225.48) was produced with FYM 10  $th^{-1}$ .*

**Key words:** Dahlia, NPK Fertilizer, Farm yard manure, Poultry manure, Vermicompost, Growth and Yield.

Dahlia is one of the most popular bulbous flower grown in many parts of the world for its beautiful ornamental blooms of varying shades of colours for the beautification of gardens and cut flowers. It is belonging to the family Asteraceae having its origin in Mexico (Willis 1966). Dahlia (*Dahlia variabilis*) is a very beautiful flower which by virtue of extra-ordinary quality has attained attention of many people all over the world. It is a perennial, half hardy, herbaceous plant with tuberous root system and erect growing habit. In India it is mostly grown as winter flower because of severe climatic conditions during summer. Number of chromosomes to (*Dahlia variabilis* L)  $2n = 64$  (Ajeet & Babita Singh Salaria 2010).

Dahlia has many ornamental characteristics such as wide range of plant heights (varies from 30 -180 and more than 250 cm ), single and collaret varieties, decorative in various sizes with double flowers having broad petals and cactus varieties (double with narrow petals) show a pompon Dahlia have ball- like flowers and these are orchid- flowered and anemone flowered types. Dahlia offers a most extensive colour range with two colours in same flower. Dahlia are used with advantage for making bouquets and wreaths or vase decorations. The long clean and stiff foot stocks are very suitable for both handling and decoration purposes. There are certain medicinal and nutritional uses of dahlia. Dahlias are also suitable for planting in front of shrubberies or between newly planted shrubbery to fill up the inter space in front and bring more colours (Ajeet & Babita Singh Salaria 2010). Dahlia can hold their own among Roses and Oriental Lilies, are lovely with many annuals, and pair beautifully with ornamental Goldenrod (*Solidago*) and fall-blooming Asters. ([www.White Flower Farm- plantsmen since 1950.com](http://www.WhiteFlowerFarm-plantsmen-since-1950.com)). The lasting quality of

a flower is of great importance in the cut flower trade. Like Holland, India also can develop an industry of dahlia which will enable us to earn more coveted foreign exchange by exporting tuber's seeds and flowers. In India due to the great diversity in soil and climatic conditions the flowers can be raised for trading during a long spell of the year.

Dahlias prefer rich, fertile, moist and well- drained soil with pH 6.5 in areas with heavy or clay type soil, use well-rotten manure or suitable organic matter and sand in equal quantities to make it ideal for planting (www.tnau.agriportal.com.)

The Damask rose (*Rosa damascene*) is perennial shrub producing fragrant flowers is used for production of rose water, rose 'Attar', gulkand, rose hair oil 'Otto'. It is cultivars in Ajmer in Rajasthan, Palampur, and Kulla districts in Himachal Pradesh and Aligarh, kannauj and Lucknow in Uttar Pradesh. Floral extracts like essential oils, alkaloids, saponins, pigments, dyes etc. have tremendous demand in both domestic and international markets. Extracting and isolating natural dyes from flowers is becoming important (Ajeet & Babita Singh Salaria 2010).

## **Materials and Methods**

### **Experimental site**

The experiment was conducted in the Floriculture Research Farm of the Department of Horticulture, SHIATS, Allahabad during the last of November 2012-2013. The experimental field is situated on the experimental field is situated on department of horticulture experimental field.

### **Climate of the region**

The annual mean temperature is 26.1°C (79.0 °F); monthly mean temperature are 18-29 °C (64-84 °F).

### **Layout of experiment**

The experiment was conducted with Randomized Block Design (RBD) with 10 treatments each replicated three times. The allocation of treatments to the individual plots was done using random numbers in each replication.

### **Nursery prepare**

A normal size of nursery bed (3.0 m x 1.0 m) was prepared in the departmental nursery in the month of November 2012. The soil of nursery bed was prepared thoroughly and than a mixture consisting of five parts of clean garden soil, two parts of FYM and one part of clean sand was used as a 2 - 3 cm thick bedding before the tubers were sown in 15 cm deep lines at 30cm apart in the bed. Then the tubers were covered with a thin layer of above mixture and water was sprinkled. Thereafter, whenever water was required, irrigation was provided in the nursery bed.

### **Field prepare**

The experimental field was prepared by hand digging from east to west, the layout was applied to division replications, rows and plants locations. Weeding and hard pruning of Damask rose was very important to transition among Damask rose plants, the pits was made by khurpi tool and removed depth roots of weeds and burring, then start by mixing of organic manure and NPK with selected pits according to the experiment layout as top dressing, the small pools are made surrounded the plant pits and established drip irrigation organization with fixed bamboo stalks beside all the pits at 10 cm from plant location after light irrigation and fixed on the top of stalks the treatments tags. The transplanted from the nursery to the filed was in the (29<sup>th</sup> of November2013) in morning at 7 o'clock after reach the seedlings to pair of leaves by experiences labors follow to horticulture department.

Organic manure and fertilizers (NPK) were applied according to recommended doses for dahlia, i.e. Urea:-P<sub>2</sub>O<sub>5</sub>: K<sub>2</sub>O

@ 100: .120: 100 kg ha<sup>-1</sup>. Urea was applied in three equal splits. Half dose of nitrogen, total phosphorus and potash were applied as basal dressing before transplanting. Balance quantity of N<sub>2</sub> was applied in two equal split doses of one-fourth each at 30 DAT and 45 DAT until 15 days after transplanting.

## Treatment details

### Design of experiment

The following treatments were applied

T0 - Control

T1 - Farm yard manure (FYM) 10t ha<sup>-1</sup>

T2 - FYM 20 t ha<sup>-1</sup> + Urea 7.4625 g + 8.7g P<sub>2</sub>O<sub>5</sub> +1. 6875g K<sub>2</sub>O per plant.

T3 - FYM 30 t ha<sup>-1</sup> + Urea 6.45 g+ 8.3625g P<sub>2</sub>O<sub>5</sub> +0.975 g K<sub>2</sub>O per plant.

T4 - Poultry manure 10 t ha<sup>-1</sup>.

T5 - Poultry manure 20 t ha<sup>-1</sup> + Urea 6.7875 g + 8.0256g P<sub>2</sub>O<sub>5</sub>+ 2.4375 g K<sub>2</sub>O per plant.

T6 - Poultry manure 30 t ha<sup>-1</sup> + Urea 6.35g + 7.35g P<sub>2</sub>O<sub>5</sub> + 2.1 g K<sub>2</sub>O per plant

T7 - Vermicompost 10 t ha<sup>-1</sup>

T8 - Vermicompost 20 t ha<sup>-1</sup> + Urea 6.6375g + 8.1 g P<sub>2</sub>O<sub>5</sub> +1.2375 g K<sub>2</sub>O per plant.

T9 - Vermicompost 30 t ha<sup>-1</sup> + Urea 5.8875 g +7.4625 g P<sub>2</sub>O<sub>5</sub> + 0.3g K<sub>2</sub>O per plant.

Samples were taken from all the growing media before planting the corms and then at an interval of 45 days, these samples were then analyzed in the soil laboratory, Department of Soil and Environmental Sciences, SHIATS, Allahabad-211007(U.P.) for Nitrogen, Phosphorus, Potassium (NPK), Organic Matter content and pH.

Treatments	weight of flower (gm)	Weight of tubers (g)
Control	51.67	281.33
FYM 10 th <sup>-1</sup>	51.33	225.48
FYM 20 th <sup>-1</sup> PM10 th <sup>-1</sup>	65.66	650.03
FYM 30 th <sup>-1</sup> +NPK	76.66	912.67
PM10 th <sup>-1</sup>	56.67	349.33
PM 20 th <sup>-1</sup> +NPK	77.33	643.33
PM 30 th <sup>-1</sup> +NPK	92.67	996.67
Vermicompost 10th <sup>-1</sup>	51.33	232.67
Vermicompost 20th <sup>-1</sup> +NPK	47.33	449.33
Vermicompost 30th <sup>-1</sup> +NPK	72.89	523.33

## Results and Discussion

Effect of Different Organic and Inorganic Manure on Flower yield and Tubers Yield of Dahlia.

### Weight of flower (g)

The effect was significant and superior at T<sub>7</sub> (92.67g), followed by T<sub>6</sub> ( 77.33g ) and T<sub>4</sub> (76.66g), whereas minimum size of diameter of flower (17.17g ) was recorded in treatment T<sub>8</sub>.

These results are in line with the findings of Sheergojri *et al.* (2013) recorded that the highest fresh flower weight and longest vase life was observed in treatment 75 kg N ha<sup>-1</sup>.

### Weight of tuber

The data regarding the weight of tubers also showed significant differences among the treatment means. Maximum weight of tubers was recorded with T<sub>6</sub> (996.67) and it was on par with T<sub>2</sub> (935.33) and T<sub>3</sub> (912.67). Minimum weight of tubers was recorded in T<sub>0</sub> (281.33) control.

These results are in line with the findings of Farhad *et al.* (2009) recorded that the parameters including plant height, number of rows per cob, number of grains per row, 1000-grain weight, grain yield, biological yield and harvest index were

significantly affected by application of Poultry manure. Maximum values for all these parameters were recorded with the application of 12 t ha<sup>-1</sup> Poultry manure.

## Conclusion and Recommendations

In view of the experimental results obtained during the present investigation, treatment T<sub>6</sub> (Poultry manure 30 t ha<sup>-1</sup>+ Nitrogen 100kg ha<sup>-1</sup>+P<sub>2</sub>O<sub>5</sub> 120kg ha<sup>-1</sup>+K<sub>2</sub>O 100kg ha<sup>-1</sup>) was found most suitable treatment for yield and economic returns for cultivation of Dahlia with (*Rosa damascina*) Damask rose under the agro-climatic condition of Allahabad. However, since this is based on one year experiment, further trials may be needed to substantiate the results.

Therefore, to sum up, it is recommended that poultry manure 30 t/h<sup>-1</sup> + NPK competition to 100:120:100 Urea, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O should be used for maximum flowers and corms production. In case, poultry manure is not available, farm yard manure (FYM) 30 t/h<sup>-1</sup>+ NPK competition to 100:120:100 Urea, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O would be a good alternative.

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