

Effect of zinc on the growth and flowering of carnation (*Dianthus caryophyllus* L.) cv. CHABAUD RED

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ABSTRACT

An experiment entitled "Effect of zinc on the growth and flowering of carnation (*Dianthus caryophyllus* L.) cv. Chabaud Red" was conducted at Horticulture Research Farm, Institute of Advanced Studies, Department of Horticulture, Ch. Charan Singh University Meerut (U.P.) during the winter season of 1999-2000. The results revealed that among different treatments, Zinc @800ppm gave the best result with plant height (75.12cm), number of leaves per plant (301.98), number of branches per plant (28.60), length of branches (51.73cm), days taken to first flower bud appearance (97.80), days taken to first flower bud opening (8.86), number of flowers per plant (40.86), diameter of flowers (6.88cm) and duration of flowering (42.86 days).

Key words: Zinc, Growth, Flowering, Carnation, *Dianthus caryophyllus*

Carnation (*Dianthus caryophyllus* L.) belongs to the family caryophyllaceae. Carnation is being cultivated by man for over 2000 years. There are about 280 species of *Dianthus* of which only few are cultivated, the most common being *Dianthus caryophyllus*, *Dianthus barbatus* and *Dianthus chinensis*. *Dianthus caryophyllus* is one of the most popular annual grown in garden, excellent for bedding, herbaceous borders, edgings, pots and as cut flower. It ranks third in international cut flower trade (27.6 million Dutch guilders) as first and second position is occupied by rose and chrysanthemum respectively (Anonymous, 1996). To complete the life cycle normally all green plants require a supply of inorganic substances from outside known as mineral nutrition. Besides the major elements, the micro-nutrients like Zinc also have a great influence on the growth and flowering of carnation. Zinc regulates various metabolic reactions and influences the formation of growth hormones in the plant. It also helps in reproduction of certain plants (Rai, 1995). Therefore an attempt was made to find out a standard dose of zinc for better growth and flowering of carnation.

MATERIALS AND METHODS

The present investigation was carried out at the Horticulture Research Farm, Department of Horticulture, Ch. Charan Singh University Meerut (U.P.) during the winter season of 1999-2000. Carnation cv. Chabaud Red was selected for this study. The soil of the experimental field was sandy loam having good moisture holding and heat absorbing capacity with pH of 7.2. The field was ploughed thrice and all the weeds etc. were removed.

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The planting was done at a distance of 25x25cm and the size of the plot was 1sq. mt. There were five treatments consisting of different levels of zinc. All the treatments were replicated thrice in a Randomized Block Design (RBD). Stock solution of zinc was prepared by dissolving one gram of zinc in a small quantity of 100% absolute alcohol separately and then pH was adjusted to 6.8 to 7.0 by adding N/10 hydrochloric acid. The distilled water was added and desired concentration were worked out using the formula $V_1C_1=V_2C_2$, where V_1 = volume of stock solution to be taken, V_2 = volume of desired solution to be made, C_1 = concentration of stock solution available, C_2 = concentration of desired solution. The observations were recorded on plant height (cm), no. of branches per plant, length of branches (cm), days taken to first flower bud appearance and opening, no. of flowers per plant, diameter of flowers (cm) and duration of flowering. Data were analyzed statistically.

RESULTS AND DISCUSSION

Growth parameters

The analysis of the data revealed that zinc had a significant effect on all the vegetative parameters viz., plant height, no. of leaves per plant, no. of branches per plant and length of the branches. Maximum plant height (75.12cm) was recorded when zinc was applied at a concentration of 800ppm whereas minimum plant height was observed in control (61.66cm). Significantly maximum number of leaves (301.98) and branches (28.60) per plant, length of branches (51.73cm) were recorded when zinc was applied at the rate of 800ppm (Table 1). These results are in conformity with Maze (1919) and Sommer (1928)

This increase in the parameters of growth due to application of zinc may be due to the reason that zinc in moderate concentrations had a significant effect on cell