

Effect of biofertilizers and nitrogenous fertilizer on growth, flowering and yield of annual white chrysanthemum (*Chrysanthemum coronarium* L.) under middle Gujarat agroclimatic conditions

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ABSTRACT

The present investigation entitled “Effect of biofertilizers and nitrogenous fertilizer on growth, flowering and yield of annual white chrysanthemum (*Chrysanthemum coronarium* L.) under middle Gujarat condition” was conducted at College Horticulture Nursery, Department of Horticulture, B.A. College of Agriculture, Anand Agricultural University, Anand during 2007-2008. The treatments comprising two biofertilizers (*Azospirillum* and *Azotobacter*) and five levels of nitrogen (100, 125, 150, 175 and 200 kg N/ha) including control (200 kg N/ha) were tried in Randomized Block Design with three replications. The results revealed that application of 175 Kg N/ha + *Azospirillum* + *Azotobacter* (T₁₃) produced significantly maximum plant height (96.23 cm), number of branches per plant (50.59), plant spread (79.08 cm in North - South direction and 78.79 cm in East - West direction), Relative growth rate (0.032 g/g/day), leaf area index (21.32cm²) and harvest index (4.32%). The plants under the same treatment required significantly minimum days for first flower initiation (37.00 days), also produced maximum number of flowers per plant (161.28) and recorded maximum flower diameter (7.37 cm) as well as weight of individual flower (3.26 g). Significantly maximum flower yield per plant (569.55 g) as well as per hectare (22.56 t) was recorded in the same treatment. The treatment T₄ (150 Kg N/ha + *Azospirillum*) produced flowers with maximum shelf life (4.33 days).

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Annual chrysanthemum (*Chrysanthemum coronarium* L.) is one of important commercial cultivated flower crop growing in India as well as in Gujarat. It is a winter season annual and propagated by seeds producing white and yellow colour blooms, which are used for garland making as well as a bedding plant. It also used for making garlands, veni and for decorations during religious and social functions. Nutrition plays an important role for higher quality of chrysanthemum flowers. The biofertilizers may help in improving soil fertility by way of accelerating biological nitrogen fixation from atmosphere. It helps in solubilization of the insoluble nutrient already present in soil, decomposition of plant residues, stimulating plant growth and development. Therefore, the present investigation on “Effect of biofertilizers and nitrogenous fertilizer on growth, flowering and yield of annual white chrysanthemum (*Chrysanthemum coronarium* L.) under middle Gujarat condition” was carried out.

MATERIALS AND METHODS

A field trial was conducted at College Horticulture Nursery, Department of Horticulture, B.A. College of Agriculture, Anand Agricultural University, Anand during

2007-2008. The experiment was laid out in Randomized Block Design (RBD) with 14 treatments. All treatments were replicated thrice. The details of experimental treatments were as under: T₁ : 200 kg N/ha (control), T₂ : 100 kg N/ha + *Azospirillum*, T₃ : 125 kg N/ha + *Azospirillum*, T₄ : 150 kg N/ha + *Azospirillum*, T₅ : 175 kg N/ha + *Azospirillum*, T₆ : 100 kg N/ha + *Azotobacter*, T₇ : 125 kg N/ha + *Azotobacter*, T₈ : 150 kg N/ha + *Azotobacter*, T₉ : 175 kg N/ha + *Azotobacter*, T₁₀ : 100 kg N/ha + *Azospirillum*+ *Azotobacter*, T₁₁ : 125 kg N/ha + *Azospirillum* + *Azotobacter*, T₁₂ : 150 kg N/ha + *Azospirillum* + *Azotobacter*, T₁₃ : 175 kg N/ha + *Azospirillum* + *Azotobacter*, T₁₄ : 200 kg N/ha + *Azospirillum* + *Azotobacter*. The seedlings of annual white chrysanthemum were transplanted in the plot at the spacing of 45 x 45 cm. A light irrigation was given immediately after transplanting for better establishment of seedlings in the field. Biofertilizers *i.e.* *Azotobacter*, *Azospirillum* and combination of *Azotobacter* and *Azospirillum* were applied by seedling dipping method. Slurry of *Azotobacter* (5ml/lit) and *Azospirillum* (5ml/lit) and *Azotobacter* (5ml/lit) + *Azospirillum* (5ml/lit) was prepared and roots of the seedlings were dipped in this solution for 15 minutes as per the treatments and