

## Studies of NPK nutrition on growth and flowering of chrysanthemum (*Dendranthema grandiflorum Tzeleve*)

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### SUMMARY

Response of graded levels of NPK on growth and flowering of chrysanthemum cv. 'Snowball' was studied during the year 2000-2001. The treatments comprised of four levels of nitrogen i.e.  $N_1 = 0.0$  g/m<sup>2</sup>,  $N_2 = 15.0$  g/m<sup>2</sup>,  $N_3 = 30.0$  g/m<sup>2</sup>,  $N_4 = 45.0$  g/m<sup>2</sup>, and three levels of each of Phosphorus and Potassium i.e.  $P_0 \& K_0 = 0.00$  g/m<sup>2</sup>,  $P_1 \& K_1 = 15.0$  g/m<sup>2</sup>,  $P_2 \& K_2 = 30.0$  g/m<sup>2</sup>, respectively. An application of 30.0 g/m<sup>2</sup> of NPK was found effective in increasing the vegetative parameters viz., plant height, stem length, number of leaves per stem, leaf area, plant spread and flowering parameters viz. days taken to flowering, size of flower, stem thickness, vase life and duration of flowering.

Key words: Chrysanthemum, nitrogen, phosphorus, potassium, growth, flowering.

Chrysanthemum (*Dendranthema grandiflorum*, Tzeleve) is one of the important crop of family Asteraceae. The standard cultivars of chrysanthemum are used for cut flower production. Among cut-flower, it is ranked second in the International market and is equally important in domestic market also.

It is well known fact that the successful growth and flowering depends upon the application of balanced nutrition. Since chrysanthemums are heavy feeders of nutrients so the use of NPK dose play an important role right from the beginning. Keeping this in view the standardization of optimum level of NPK was undertaken for the standard cultivar 'SnowBall' of chrysanthemum.

### MATERIALS AND METHODS

These investigations were carried out at Research farm of Department of Floriculture and Landscaping of Dr. Y.S. Parmar University of Horticulture and Forestry, Nauni-Solan during the years 2000-2001. The cultivar 'Snow Ball' which is incurving in nature and white in colour was selected for this study. For cut flower production for stems per plant were retained following disbudding and deshoooting from time to time. The rooted plants of chrysanthemum were planted during July, 2000 in a plot size of 1.0 x 1.0 meter at a spacing of 30x30 cm. Treatments comprised of four levels of nitrogen viz.  $N_0 = 0.0$  gm/m<sup>2</sup>,  $N_1 = 15.0$  g/m<sup>2</sup>,  $N_2 = 30.0$  g/m<sup>2</sup>,  $N_3 = 45.0$  g/m<sup>2</sup> and three levels of each of phosphorus and potash viz.  $N_0 \& P_0 = 0.0$  g/m<sup>2</sup>,  $N_1 \& P_1 = 15.0$  g/m<sup>2</sup>,  $N_2 \& P_2 = 30.0$  g/m<sup>2</sup>, respectively. Nitrogen, phosphorus and potassium were applied through calcium ammonium nitrate (CAN), single super phosphate (SSP) and muriate of potash (MOP). Thirty six treatment combinations were tried in Factorial Randomized Block Design using three replications. Before planting, 10 kg of

well rotten FYM, half of nitrogen and full amounts of phosphorus and potash were applied as a basal dose whereas remaining half nitrogen was given after 30 days of planting. Soil of experimental area was silty loam in texture and neutral in reaction. The fertility of experimental field was low in respect of available nitrogen and high in available phosphorus and potassium.

### RESULTS AND DISCUSSION

#### Effect of nitrogen

A perusal of Table 1a and 1b reveals that plants receiving  $N_2$  treatment (30 g N/m<sup>2</sup>) resulted maximum plant height (69.74 cm), stem length (66.26 cm), number of leaves/stem (19.82), plant spread (30.92 cm) and leaf area (17.88 cm<sup>2</sup>) as compared to other treatment whereas it was minimum under  $N_0$  (control). It is well known that N is the key element for plant growth and increase in N supply accelerates the synthesis of chlorophyll and amino acids which enhanced the vegetable growth (Mengel and Kirby, 1987). Lodhi and Tiwari (1993) observed significant increase in plant height with 30g N/m<sup>2</sup> in chrysanthemum cv 'Flirt'. Also, Rao *et al.* (1992) found maximum plant spread with higher levels of nitrogen. The beneficial effects of nitrogen application were reported by Mostafa (1996). From Table 2a and 2b, it is clear that plants of cv 'Snow Ball' took more time for opening of flowers (101.9 days) and prolonged duration of flowering (22.54 days) was noticed with 3 g N/m<sup>2</sup> ( $N_2$ ) in comparison to other levels. Lodhi *et al.* (1991) found that increasing supply of N (0-45 g/m<sup>2</sup>) delayed flowering in cultivar 'Flirt' Mengel and Kirby (1987) also observed longer duration of flowering with higher levels of N. Flower size and stem thickness was maximum (10.68 cm, 1.13 cm, respectively) with  $N_2$  and minimum under  $N_0$  (7.79 cm, 9.1 cm). Lodhi and Tiwari (1993) found similar

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