

Effect of foliar application of 'Fe' and 'Zn' on growth, flowering and yield of China aster (*Callistephus chinensis* L. Nees)

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ABSTRACT

Foliar application of $ZnSO_4$ @ 0.5% at an interval of 30, 45, and 60 days after transplanting produced significantly maximum plant height (62.48cm), plant spread (24.53cm east-west direction and 26.72cm in north-south direction), and number of branches (22.40) per plant. The next best treatment was $FeSO_4$ @ 0.4% which recorded significantly maximum number of leaves (396.79) per plant at maturity stage and required significantly minimum days for emergence of first flower bud (61.97) and for full opening of first flower bud (82.13) as compared to control (70.75 and 91.11 days, respectively). Treatment $ZnSO_4$ @ 0.5% recorded maximum flower diameter (6.21cm) as well as flower stalk length (28.43cm) followed by treatment $FeSO_4$ @ 0.4%. The treatment of $ZnSO_4$ @ 0.5% recorded the significantly highest number of flowers (63.24) and weight of flowers (164.42 g) per plant as well as flower yield (182.69q) per hectare as compared to control. The next best treatment was $FeSO_4$ @ 0.4% also gave significantly higher values for total number of flowers, weight and yield of flowers as compared to control. The application of $ZnSO_4$ @ 0.5% and $FeSO_4$ @ 0.4% gave maximum vase life of cut flowers 9.53 days and 9.47 days, respectively as compared to 7.40 days in control.

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China aster (*Callistephus chinensis* L. Nees) is to be considered as one of the important commercial flower grown through out the year in the world. It belongs to family asteraceae and genus callistephus having single species *Callistephus* having chromosome number $2n=18$. It can easily be grown in the open fields and polyhouses for the production of cut flowers. Very meagre research work has been reported in respect of nutrition and micronutrient requirements in China aster. Apart from iron and zinc sprays were reported to be conducive for flower production (Kumar and Arora, 2000). Considering the economic importance, to find out an effect of foliar application of Fe and Zn on growth, flowering and yield of China aster, the present investigation was undertaken.

MATERIALS AND METHODS

The present investigation was carried out at College Nursery of B.A. College of Agriculture, Anand Agricultural University, Anand during the *rabi* season of 2004 – 05 having 9 treatments laid out in RBD with 3 replications. In this study, 4 concentrations each of $FeSO_4$ @ (0.2%, 0.4%, 0.6% and 0.8%) and $ZnSO_4$ @ (0.3%, 0.4%, 0.5% and 0.6%) and one control were taken. The soil was sandy loam and well drained. The plants were planted at a distance of 30 cm in rows spaced 30 cm apart. Three sprays were done of each concentration at 30, 45 and 60 days after transplanting.

RESULTS AND DISCUSSION

The data presented in Table 1 revealed that foliar application of $ZnSO_4$ @ 0.5% at 30, 45, and 60 days after transplanting recorded significantly maximum plant height (62.48cm), plant spread (24.53cm East-west direction and 26.72cm in north-south direction), and number of branches (22.40) per plant over control. The next best treatment was $FeSO_4$ @ 0.4% which recorded maximum leaves (396.79) per plant as compared to control (282.17). Increase in vegetative growth in respect to plant height, plant spread, number of leaves and number of branches per plant due to the micronutrients (Fe and Zn) can be attributed to improved root system of plants resulting in absorption of more water and nutrients and its utilization. Moreover, micronutrients activate several enzymes (catalase, peroxidase, alcohol, dehydrogenase, carbonic dehydrogenize, tryptophane synthates etc.) and involved themselves in chlorophyll synthesis and various physiological activities by which plant growth and development are encouraged (Kumar and Arora, 2000). These findings are in accordance with the results of Deshmukh and Wavhal (1998 and 1999) in China aster, Barman and Pal (1999) in chrysanthemum, and Kumar *et al.* (2003) in carnation

Data presented in Table 2 clearly showed that foliar application of $FeSO_4$ @ 0.4% remarkably took minimum days for emergence of first flower bud and full opening of first flower bud, while maximum days taken by