The Asian Journal of Horticulture, **Vol. 3 No. 2 : 380-381 (December-2008)**

Influence of zink and iron on yield and quality of cauliflower (*Brassica oleracea* var. botrytis Linn.) cv. SNOWBALL-16

C.O. LASHKARI, H.B. PAREKH, S.J. SHARMA, K.M. KARETHA AND D.K. KAKADE

Accepted : *October, 2008*

See end of the article for authors' affiliations

Correspondence to:

C.O. LASHKARI
Department of Horticulture, College of Agriculture, Junagadh Agricultural University, JUNAGADH (GUJARAT) INDIA

ABSTRACT

The present investigation entitled "Influence of zinc and iron on yield and quality of cauliflower (*Brassica oleracea* var. botrytis Linn.) cv. SNOWBALL-16" was conducted during *rabi* season of the year, 2002-03. The field trial was laid out in Factorial Randomized Block Design with four replications and nine treatment combinations, considering three concentrations of Zn (0.0, 0.5 and 1.0%) and three concentrations of Fe (0.0, 0.5 and 1.0%) applied as foliar sprays at 30 and 60 days after transplanting of seedlings. The results indicate that significantly highest diameter of curd (cm), volume of curd $(cm)^3$ and average weight of curd per plot (kg) were recorded with combine foliar sprays of zinc ($ZnSO_4$) and iron ($FeSO_4$) at 0.5% concentration each. The non-significant result was obtained on total soluble solids (%) with individual foliar sprays of zinc and iron at 0.0, 0.5 and 1.0% concentration, respectively and with different combine foliar sprays of zinc and iron at 0.0, 0.5 and 1.0 % concentration each.

Key words : Zinc, Iron and Cauliflower.

Cauliflower (*Brassica oleracea* var. botrytis Linn.) is one of the most important vegetable cole crops grown in India. It is grown for its white tender curd formed by shortened flower parts. It has high nutrient requirement, particularly macro and micronutrients. Cauliflower curd yield has been set aside by deficiency of micronutrients, which leads to certain physiological disorders (Mehrotra and Misra, 1974). But the research done on use of zinc with combination of iron is scantly. So that the present investigation was carried out to study the influence of Zinc ($ZnSO_4$) and Iron ($FeSO_4$) on yield and quality of cauliflower cv. SNOWBALL-16.

MATERIALS AND METHODS

The field trial was conducted during *rabi* season of the year, 2002-03 at Agronomy Research Farm, College of Agriculture, Junagadh Agricultural University, Junagadh. The experiment was laid out in Factorial Randomized Block Design with four replications. Zinc and iron were applied in the form of zinc sulphate ($ZnSO_4.7H_2O$) and ferrous sulphate ($FeSO_4.7H_2O$), respectively. There were nine treatment combinations, considering three concentrations of zinc (0.0, 0.5 and 1.0%) and three concentrations of iron (0.0, 0.5 and 1.0%) applied as foliar sprays at 30 and 60 days after transplanting of seedlings. The seedlings of cauliflower cv. Snowball-16 were transplanted after five weeks of seed sowing at 45×30 cm spacing. All the experimental plots received recommended dose of nitrogen (150 kg/ha), phosphorus (37.5 kg/ha) and potassium (37.5 kg/ha) along with F.Y.M. (15 tones/ha). The data were recorded on diameter of curd (cm), volume of curd $(cm)^3$, average weight of curd per plot (kg) and total soluble solids (%) from randomly selected plants.

RESULTS AND DISCUSSION

Effect of zinc :

It is evident from Table 1 that the maximum diameter of curd, volume of curd and average weight of curd per plot were recorded with foliar spray of zinc 0.5% concentration. The marked improvement in diameter and volume of curd by the application of zinc might be due to the improved physiological activities like photosynthesis during which food is manufactured by the plant,

Table 1: Effect of different levels of zinc and iron on yield and quality of cauliflower cv. 'SNOWBALL-16'

Treatment levels	Diameter (cm)	Volume $(cm)^3$	Average weight of curd per plot (kg)	Total soluble solids (%)
Zn levels				
Zn_0 (Control)	13.56	301.00	14.08	6.68
Zn_1 ($ZnSO_4$ 0.5 %)	15.56	373.33	20.20	7.00
Zn_2 ($ZnSO_4$ 1.0 %)	15.12	328.68	16.57	6.87
Fe levels				
Fe_0 (Control)	14.11	301.17	14.80	6.53
Fe_1 ($FeSO_4$ 0.5 %)	15.64	375.07	20.31	7.20
Fe_2 ($FeSO_4$ 1.0 %)	14.48	326.77	15.74	6.80
S.E. ±	0.30	8.60	0.56	0.30
C.D. (P=0.05)	0.90	25.00	1.63	N.S.

translocation of assimilates form leaves to curd and their storage in curd for which zinc was a responsible factor. These findings have been supported by Lal and Maurya (1981) in onion. Shrihari *et al.* (1987) and Hazra *et al.* (1987) stated that zinc has involved in many metallo enzyme systems, regulatory functions and in auxin synthesis, which might have helped in enhancement in yield of okra. The non-significant result was obtained on total soluble solids (%) among different foliar sprays of zinc at 0.0, 0.5 and 1.0 % concentration, respectively.

Effect of iron :

The data presented in Table 1 indicate that the maximum diameter of curd, volume of curd and average weight of curd per plot were recorded with foliar sprays of iron 0.5% concentration. The diameter and volume of curd were improved by the iron application, which act as an important catalyst in the enzymatic reactions of plant metabolism would have helped in the larger biosynthesis of photo assimilates there by improving both diameter and volume of curd. This finding was supported by Jawaharlal *et al.* (1986) and Palanivel (1981) in onion. Kumbhar and Deshmukh (1993) reported the beneficial effect of iron application in relation to higher fruit yield in tomato. The non-significant result was obtained on total soluble solids (%) among different foliar sprays of iron at 0.0, 0.5 and 1.0 % concentrations, respectively.

Combine effect of zinc and iron :

From Table 2 it is reveal that significantly highest diameter of curd, volume of curd and average weight of curd per plot were recorded with combine foliar sprays of zinc and iron at 0.5% concentration each. The yield increased might be due to the combine beneficial effect of zinc and iron application on plant. The results are in agreement with those Raj *et al.*(2001), Bhat and Jandial (1996), Patnaik *et al.*(2001) and Jawaharlal *et al.*(1986), Palanivel (1981), Kumbhar and Deshmukh (1993). The non-significant result was obtained on total soluble solids (%) among different combined foliar sprays of zinc and iron at 0.0, 0.5 and 1.0 % concentrations, respectively.

Table 2: Combine effects of different levels of zinc and iron on yield and quality of cauliflower CV. 'SNOWBALL-16'

Treatment combinations	Diameter (cm)	Volume $(cm)^3$	Average weight of curd per plot (kg)	Total soluble solids (%)
$Fe_0 Zn_0$	12.43	235.62	9.85	5.87
$Fe_0 Zn_1$	15.04	371.00	19.61	6.87
$Fe_0 Zn_2$	14.88	296.87	14.94	6.87
$Fe_1 Zn_0$	14.25	383.75	16.92	7.12
$Fe_1 Zn_1$	16.58	390.87	22.17	7.37
$Fe_1 Zn_2$	16.10	350.58	21.83	7.12
$Fe_2 Zn_0$	14.00	283.62	15.46	7.05
$Fe_2 Zn_1$	15.08	358.12	18.82	6.75
$Fe_2 Zn_2$	14.38	338.57	12.95	6.62
S.E. ±	0.50	14.90	0.96	0.50
C.D. (P=0.05)	1.50	43.40	2.83	N.S.

Authors' affiliations:
H.B. PAREKH, S.J. SHARMA, K.M. KARETHA AND D.K. KAKADE, Department of Horticulture, College of Agriculture, Junagadh Agricultural University, JUNAGADH (GUJARAT) INDIA

REFERENCES

Bhat, K.L. and Jandial, K.C. (1996). A note on levels of zinc and iron on growth and yield of potato var.'KUFRI BADSHAH'. *Veg. Sci.*, **23** (2) : 207-209.

Hazra, P., Maity, T.K. and Mandal, A.R. (1987). Effect of foliar application of micronutrients on growth and yield of okra (*Abelmoschus esculentus* L.). *Prog. Hort.*, **19** (3-4) : 219-222.

Jawaharlal, M., Sundararajan, S. and Veeraragavathatham, D. (1986). Studies on the mode of application of zinc and iron on the growth and yield of onion (*Allium cepa* var. Cepa L.)., *South Indian Hort.*, **34** (4) : 236-239.

Kumbhar, V.S. and Deshmukh, S.S. (1993). Effect of soil application of ferrous sulphate on the uptake of nutrients, yield and quality of tomato cv. RUPALI. *South Indian Hort.*, **41** (3) : 144-147.

Lal, S. and Maurya, A.N. (1981). Effect of Zn on onion., *Haryana. J. Hort. Sci.*, **10** (3-4) : 231-235.

Mehrotra, O.N. and Misra, P.H. (1974). Micronutrient deficiencies in cauliflower. *Prog. Hort.*, **5** : 33-39.

Palanivel, A. (1981). Studies on the effect of application of micronutrients on onion. M.Sc. (Agri.) Thesis, *Tamil Nadu Agric. Univ.*, Coimbtore.

Patnaik, M.C., Raj, G.B. and Reddy, I.P. (2001). Response of tomato (*Lycopersicon esculentum*) to zinc and iron. *Veg. Sci.*, **28** (1) : 78-79.

Raj, G.B., Patnaik, M.C., Reddy, I.P. and Rao, A.P. (2001). Response of brinjal (*Solanum melongena* L.) to zinc and iron. *Veg. Sci.*, **28** (1) : 80-81.

Srihari. D., Singh, B.P. and Rao, D.V.R. (1987). Effect of foliar sprays of Zn and Mo on growth and yield of okra (*Abelmoschus esculentus* L. Moench) cv. 'PUSA SAWANI'. *Prog. Hort.*, **19** : 31-34.

****