

## Beneficial effect of foliar spray of zinc and iron on economics of cauliflower cv. SNOWBALL-16

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

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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 cultivation of cauliflower cv. SNOWBALL-16 was found to be more beneficial and economical with foliar sprays of Zinc ( $ZnSO_4$ ) and Iron ( $FeSO_4$ ) in nine treatment combinations considering 3 levels of Zn (0.0, 0.5 and 1.0%) and 3 levels of Fe (0.0, 0.5 and 1.0%) at 30 and 60 days after transplanting of seedlings during *rabi* season of the year, 2002-03. Significantly highest marketable yield as 373.44 q/ha with highest net return of Rs. 151490.00/- per hectare along with highest net CBR as 1: 4.30 was obtained with combine foliar sprays of zinc and iron at 0.5% 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 belongs to the family Brassicaceae. 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 scanty. Therefore, the present investigation was carried out to know the beneficial effect of foliar spray of zinc and iron on economics 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 ( $ZnSO_4 \cdot 7H_2O$ ) and ferrous sulphate ( $FeSO_4 \cdot 7H_2O$ ), 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 crop was harvested manually in the first week of March-2003 and yield estimated from net plot was converted into yield per hectare. The selling of curd was done at the rate of Rs. 5.00/- per Kg. Net realization (return) in terms of rupees per hectare was worked out on the basis of mean marketable curd yield per hectare of each treatment and was calculated by deducting total cost of cultivation from gross realization of each treatment and recorded accordingly. The net cost benefit ratio (CBR) was calculated as given below.

$$CBR = \frac{\text{Net realization (Rs/ha)}}{\text{Total expenditure (Rs/ha)}}$$

### RESULTS AND DISCUSSION

#### Effect of zinc :

The cauliflower cultivation was found to be more beneficial and economical with foliar application of zinc. Among different levels of zinc, the maximum marketable yield (q/ha) with maximum net return (Rs/ha) along with maximum net CBR was obtained with foliar spray of zinc at 0.5% concentration (Table 1). This might be due to the beneficial effect of zinc application.

#### Effect of iron :

The cauliflower cultivation was found to be more beneficial and economical with foliar application of iron. Among different levels of iron, the maximum marketable yield (q/ha) with maximum net return (Rs/ha) along with maximum net CBR was recorded with foliar spray of

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

Treatment levels	Marketable yield (Q/ha)	Gross realization (Rs/ha)	Total expenditure (Rs/ha)	Net realization (Rs/ha)	Net CBR
Zn <sub>0</sub>	223.63	111815	33224.33	78590.67	2.36
Zn <sub>1</sub>	337.03	168515	35229.66	133283.66	3.78
Zn <sub>2</sub>	269.89	134945	36901.66	98041.66	2.66
Fe <sub>0</sub>	237.03	118515	33558.66	84958.00	2.53
Fe <sub>1</sub>	338.99	169495	35230.00	134268.33	3.81
Fe <sub>2</sub>	254.52	127260	36567.00	90689.66	2.48

**Table 2: Combine effect of different levels of zinc and iron on economics of cauliflower cv. 'SNOWBALL-16'**

Treatment combinations	Marketable yield (Q/ha)	Gross realization (Rs/ha)	Total expenditure (Rs/ha)	Net realization (Rs/ha)	Net CBR
Fe <sub>0</sub> Zn <sub>0</sub>	145.29	72645	31220	41425	1:3.3
Fe <sub>0</sub> Zn <sub>1</sub>	326.18	163090	33892	129198	3.80
Fe <sub>0</sub> Zn <sub>2</sub>	239.63	119815	35564	84251	2.37
Fe <sub>1</sub> Zn <sub>0</sub>	276.38	138190	33558	104632	3.12
Fe <sub>1</sub> Zn <sub>1</sub>	373.44	186720	35230	151490	4.30
Fe <sub>1</sub> Zn <sub>2</sub>	367.17	183585	36902	146683	3.97
Fe <sub>2</sub> Zn <sub>0</sub>	249.22	124610	34895	89715	2.57
Fe <sub>2</sub> Zn <sub>1</sub>	311.46	155730	36567	119163	3.26
Fe <sub>2</sub> Zn <sub>2</sub>	202.86	101430	38239	63191	1.65

**Table 3 : The details of cost of cultivation rupees per hectare of cauliflower crop cv. 'SNOWBALL-16'**

Sr. No.	Item	Physical Unit	Value (Rs.)
1.	Human Labour (man days)	147.00	7350.00 /-
2.	Tractor cost (Land preparation) @ Rs. 200/- per hour	20 hours	4000.00 /-
3.	Seeds (@ Rs. 550/- per 200gm)	500g	1375.00 /-
4.	Manures (@ Rs 100/- per cart load)	10 cart loads	1000.00 /-
5.	Chemical fertilizers (kg/ha)	N 150 kg P 37.5 kg K 37.5 kg	2634.75 /-
6.	Irrigation		2500.00 /-
7.	Insecticides / Pesticides		540.00 /-
8.	Miscellaneous costs (costs incurred in nursery etc.)		1000.00 /-
9.	Depreciation costs		500.00 /-
10.	Interest on working capital		2400.00 /-
11.	Rental value of owned land		4082.00 /-
12.	Interest on owned fixed capital		1000.00 /-
13.	Management cost		2838.18 /-
	<b>Total</b>		<b>31219.93 /-</b>

Urea = Rs. 10.98 per unit cost of nitrogen.

Ferrous sulphate = Rs.80/-per kg.

SSP = Rs. 19.25 per unit cost of phosphorus.

Zinc sulphate = Rs. 160/-per kg

MOP = Rs. 7.09 per unit cost of potash.

Citric acid = Rs. 100/- per kg.

Labour charge = Rs. 50/- per man.

Lime = Rs.1 /-per kg.

iron at 0.5% concentration (Table 1). This might be due to the beneficial effect of iron application

#### **Combine effect of zinc and iron :**

The cauliflower growing was found to be very beneficial and economical with combine foliar sprays of zinc and iron. Significantly highest marketable yield (q/ha) with highest net return (Rs/ha) along with highest net CBR was recorded with combine foliar sprays of zinc and iron at 0.5% concentration each (Table 2). This might be due to the combine beneficial effect of zinc and iron application on plant. This finding is in agreement with those of Selvi *et al.* (2000) and Kumar and Sen (2005) in okra, Singh and Singh (2004b) in cauliflower.

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

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