

## Effect of Foliar Spray of Micronutrients to Enhance Seed Yield and Quality in Chilli (*Capsicum annuum* L.)

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### ABSTRACT

An experiment was conducted during the 2016-17 to study the effect of foliar spray of micronutrients to enhance seed yield and quality in chilli (*Capsicum annuum* L.). The results indicated that, application of  $FeSO_4$  @ 0.2% + Boron @ 0.1% spray recorded significantly higher seed yield (3.93 q/ha) and germination (81.83%) at Jabalpur region.

**Key words:** Chilli, Seed yield, Micronutrients, Germination

### INTRODUCTION

An experiment was conducted during Kharif 2016-17 at Horticulture Complex, Department of Horticulture, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (M.P.). The field experiment consisted of 8 treatments viz., T<sub>1</sub>- Control, T<sub>2</sub>-  $FeSO_4$  (0.2%), T<sub>3</sub>- $Ca(NO_3)_2$  (0.2%), T<sub>4</sub>- Boron (0.1 %), T<sub>5</sub>- Mixture of all, T<sub>6</sub>- T<sub>5</sub> without  $FeSO_4$  (0.2%), T<sub>7</sub>- T<sub>5</sub> without  $Ca(NO_3)_2$  (0.2%), and T<sub>8</sub>- T<sub>5</sub> without Boron (0.1 %) was laid out in randomized block design with three replications. One healthy seedling of 30 days old was transplanted at 60 cm x 45 cm. All the treatments were applied as foliar spray at three stages of plant growth as 60, 90 and 120 days after transplanting. The plant protection measures were taken up to

control pest and diseases as and when required along with intercultural operations. In each plot five plants were randomly selected and tagged to record biometric observations on growth, seed yield and its attributes and seed quality parameters (Plant height, Primary branches per plant, Fruit length, Average fruit weight, 1000 seed weight, Seed yield per hectare, Germination %, Seed vigour index-I and Seed vigour index-II). Seed germination test was conducted as per the ISTA procedure<sup>3</sup>. Vigour index of seedling was calculated by multiplying germination percentage and seedling length in. The seedling length was measured in centimeter on 14 days old seedlings.

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Table 1: Treatment details

Treatment symbol	Treatment combinations
T <sub>1</sub>	Control
T <sub>2</sub>	FeSO <sub>4</sub> (0.2%)
T <sub>3</sub>	Ca (NO <sub>3</sub> ) <sub>2</sub> (0.2%)
T <sub>4</sub>	Boron (0.1 %)
T <sub>5</sub>	FeSO <sub>4</sub> (0.2%) + Ca (NO <sub>3</sub> ) <sub>2</sub> (0.2%) + Boron (0.1 %)
T <sub>6</sub>	Ca (NO <sub>3</sub> ) <sub>2</sub> (0.2%) + Boron (0.1 %)
T <sub>7</sub>	FeSO <sub>4</sub> (0.2%) + Boron (0.1 %)
T <sub>8</sub>	FeSO <sub>4</sub> (0.2%) + Ca (NO <sub>3</sub> ) <sub>2</sub> (0.2%)

## RESULTS AND DISCUSSIONS

The results of the present investigation are presented in Table: 2. The analysis of variance showed the significant difference for all the characters. The maximum plant height was recorded in T<sub>1</sub> (Control, 81.10 cm) followed by treatment T<sub>3</sub> (Ca (NO<sub>3</sub>)<sub>2</sub> (0.2%), 75.30 cm). The foliar spray of FeSO<sub>4</sub> (0.2%) + Ca (NO<sub>3</sub>)<sub>2</sub> (0.2%) + Boron (0.1%) (T<sub>5</sub>) significantly increase the primary branches per plant (8.00) followed by Ca (NO<sub>3</sub>)<sub>2</sub> (0.2%) (7.27) and FeSO<sub>4</sub> (0.2%) + Ca (NO<sub>3</sub>)<sub>2</sub> (0.2%) (7.13). It showed that the foliar application of all three nutrients have a significant effect on the development of primary branches per plant in chilli. Number of branches per plant increased by application of boron<sup>3</sup> and micronutrient mixture with Zn, Fe and B<sup>4</sup>. There were highly significant differences were observed among the treatments in the fruit length. The highest fruit length was recorded in treatment T<sub>1</sub> (12.02 cm) followed by the treatment T<sub>5</sub> (10.94 cm) while the shortest fruit length was found in treatment T<sub>7</sub> (9.73 cm). The maximum average fruit weight was found from T<sub>6</sub> (4.78 g) while minimum from T<sub>7</sub> (3.24 g). The result agreement with Dongre *et al.*<sup>[5]</sup> for average fruit weight. Foliar application of Boron increases weight<sup>6</sup>. Boron play key role on accumulation of photosynthates that has correlation with fruit weight<sup>7</sup>. All the

treatments for 1000 seed weight showed significant except the T<sub>5</sub> and T<sub>7</sub>. The maximum 1000 seed weight was recorded in treatment T<sub>2</sub> (6.82 g) followed by T<sub>1</sub> (6.71 g), T<sub>3</sub> (6.52g) and T<sub>6</sub> (6.51 g).

The highest seed yield (q/ha) was found in treatment T<sub>7</sub> (3.93) followed by T<sub>8</sub> (3.64). Tamilselvi *et al.*<sup>8</sup> reported that foliar application of iron combined with other micronutrients (Zn, Cu, Mn, B and Mo) significantly increased the number of fruits per plant, fruit setting percentage, single fruit weight, yield per plant and seed yield. Seed quality parameters like germination %, seedling vigour index –I and seedling vigour index –II were significantly increased with foliar spray of FeSO<sub>4</sub> (0.2%) + Boron (0.1 %) (Table: 2). Seed germination%, seed vigour index –I and seed vigour index –II were significantly highest in treatment T<sub>7</sub> (81.53%, 911.15 & 207.90), although the lowest seed germination%, seed vigour index –I and seed vigour index –II were recorded in treatment T<sub>3</sub> (69.13%, 491.49 & 43.55). Kumari<sup>9</sup> suggested that foliar application of boron, iron and manganese each at 100 ppm at 30 days after transplanting at an interval of 10 days resulted in maximum seed yield and seed germination. These results in confirmation with the result of Verma *et al.*<sup>10</sup>, for seed yield and germination %.

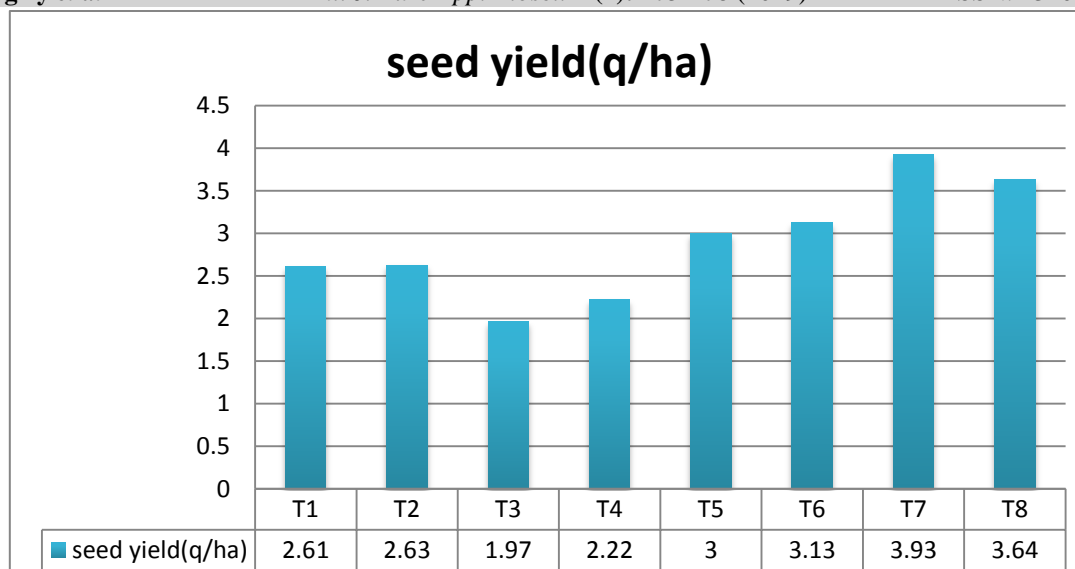


Fig. 1: Effect of micronutrients spray on seed yield in chilli

Table 2: Effect of micronutrients spray on seed yield and quality in chilli

Treatment Sym.	Treatments	Plant height	Primary branches /plant	Fruit length	Avg. fruit weight (g) (red ripe)	1000 seed weight (g)	Seed yield (q/ha)	Germination %	Seed Vigour Index I	Seed Vigour Index II
T <sub>1</sub>	Control	81.10	6.60	12.02	3.90	6.71	2.61	71.97	752.05	106.51
T <sub>2</sub>	FeSO <sub>4</sub> @ 0.2%	67.59	6.87	10.06	4.10	6.82	2.63	71.53	704.60	79.40
T <sub>3</sub>	Ca(NO <sub>3</sub> ) <sub>2</sub> @ 0.2%	75.30	7.27	10.73	4.17	6.52	1.97	69.13	491.49	43.55
T <sub>4</sub>	Boron @ 0.1%	72.20	6.10	10.72	3.70	6.40	2.22	71.08	525.28	54.73
T <sub>5</sub>	Mixture of all	70.14	8.00	10.94	3.40	5.91	3.00	73.30	781.41	117.29
T <sub>6</sub>	T <sub>5</sub> without FeSO <sub>4</sub>	65.17	7.00	10.02	4.78	6.51	3.13	77.07	631.23	134.88
T <sub>7</sub>	T <sub>5</sub> without Ca(NO <sub>3</sub> ) <sub>2</sub>	66.39	5.83	9.73	3.24	5.72	3.93	81.53	911.15	207.90
T <sub>8</sub>	T <sub>5</sub> without Boron	64.18	7.13	10.51	3.90	6.48	3.64	80.21	731.32	197.31
	SEm ±	2.49	0.30	0.38	0.19	0.18	0.24	1.80	16.94	3.21
	C.D. at 5%	7.57	0.91	1.17	0.60	0.57	0.73	5.49	51.38	9.75

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