Available online at www.ijpab.com

DOI: http://dx.doi.org/10.18782/2320-7051.6576

ISSN: 2320 – 7051

Int. J. Pure App. Biosci. **7 (2):** 275-278 (2019)

Research Article

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

Meenakshi Ramgiry[1*], Pragya Ramgiry[2] and B. K. Verma[3]

[1&3]Technical Assistant, [2]Research Scholar

Department of Horticulture, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (M.P.) - 482 004, India

*Corresponding Author E-mail: meenakshi.ramgiri@gmail.com

Received: 22.12.2018 | Revised: 28.01.2019 | Accepted: 7.02.2019

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 is 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

Chilli (*Capsicum annuum* L.) is an important spice-cum vegetable crops grown in India under various agro climatic conditions. Chilli, also known as hot pepper, was introduced into India from Brazil during 1492 by Portuguese[1]. Chilies are very rich in vitamin C and pro-vitamin A, particularly the red chilies. Micronutrients play a catalytic role in nutrient absorption and balancing other nutrients[2.] Application of micronutrients *viz.*, zinc, boron, calcium, magnesium, sulphur and organics *viz.*, Vermicompost, Mycorrhiza and FYM bring profound changes in various metabolic processes within the plant system thereby influence the yield considerably. In recent years, the role of these micronutrients is gaining more importance particularly in chilli to boost not only the productivity but also to improve the seed quality. Seed is the primary input, without which, the increase in production of any vegetable crop cannot be expected. Among inputs other than seed and fertilizers, foliar application of micronutrients at most appropriate concentration assumes special significance for the production of higher yield with better quality seed of any vegetable crop.

MATERIAL AND METHODS

An experiment was conducted during Kharif 2016-17at Horticulture Complex, Department of Horticulture, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (M.P.). The field experiment consisted of 8 treatments *viz.*, T_1-Control, T_2- $FeSO_4$ (0.2%), T_3-$Ca(NO_3)_2$ (0.2%), T_4- Boron (0.1 %), T_5- Mixture of all, T_6- T_5 without $FeSO_4$ (0.2%), T_7- T_5 without $Ca(NO_3)_2$ (0.2%), and T_8- T_5 without Boron (0.1 %) was laid out in randomized block design with three replications.

Cite this article: Ramgiry, M., Ramgiry, P. and Verma, B.K., Effect of Foliar Spray of Micronutrients to Enhance Seed Yield and Quality in Chilli (*Capsicum annuum* L.), *Int. J. Pure App. Biosci.* **7(2):** 275-278 (2019). doi: http://dx.doi.org/10.18782/2320-7051.6576

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[3]. 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.

Table 1: Treatment details

Treatment symbol	Treatment combinations
T_1	Control
T_2	$FeSO_4$ (0.2%)
T_3	Ca $(NO_3)_2$ (0.2%)
T_4	Boron (0.1 %)
T_5	$FeSO_4$ (0.2%) + Ca $(NO_3)_2$ (0.2%) + Boron (0.1 %)
T_6	Ca $(NO_3)_2$ (0.2%) + Boron (0.1 %)
T_7	$FeSO_4$ (0.2%) + Boron (0.1 %)
T_8	$FeSO_4$ (0.2%) + Ca $(NO_3)_2$ (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_1 (Control, 81.10 cm) followed by treatment T_3 (Ca $(NO_3)_2$ (0.2%), 75.30 cm). The foliar spray of $FeSO_4$ (0.2%) + Ca $(NO_3)_2$ (0.2%) + Boron (0.1%) (T_5) significantly increase the primary branches per plant (8.00) followed by Ca $(NO_3)_2$ (0.2%) (7.27) and $FeSO_4$ (0.2%) + Ca $(NO_3)_2$ (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[3] and micronutrient mixture with Zn, Fe and B[4]. There were highly significant differences were observed among the treatments in the fruit length. The highest fruit length was recorded in treatment T_1 (12.02 cm) followed by the treatment T_5 (10.94 cm) while the shortest fruit length was found in treatment T_7 (9.73 cm). The maximum average fruit weight was found from T_6 (4.78 g) while minimum from T_7 (3.24 g) .The result agreement with Dongre *et al.* [5] for average fruit weight. Foliar application of Boron increases weight[6]. Boron play key role on accumulation of photosynthates that has correlation with fruit weight[7]. All the treatments for 1000 seed weight showed significant except the T_5 and T_7. The maximum 1000 seed weight was recorded in treatment T_2 (6.82 g) followed by T_1 (6.71 g), T_3 (6.52g) and T_6 (6.51 g). The highest seed yield (q/ha) was found in treatment T_7 (3.93) followed by T_8 (3.64). Tamilselvi *et al.*[8] 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 $FeSO_4$ (0.2%) + Boron (0.1 %) (Table: 2). Seed germination%, seed vigour index –I and seed vigour index –II were significantly highest in treatment T_7 (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_3 (69.13%, 491.49 & 43.55). Kumari[9] suggested that foliar applicationof 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.*[10], for seed yield and germination %.

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_1	Control	81.10	6.60	12.02	3.90	6.71	2.61	71.97	752.05	106.51
T_2	$FeSO_4$ @ 0.2%	67.59	6.87	10.06	4.10	6.82	2.63	71.53	704.60	79.40
T_3	$Ca(NO_3)_2$ @ 0.2%	75.30	7.27	10.73	4.17	6.52	1.97	69.13	491.49	43.55
T_4	Boron @ 0.1%	72.20	6.10	10.72	3.70	6.40	2.22	71.08	525.28	54.73
T_5	Mixture of all	70.14	8.00	10.94	3.40	5.91	3.00	73.30	781.41	117.29
T_6	T_5 without $FeSO_4$	65.17	7.00	10.02	4.78	6.51	3.13	77.07	631.23	134.88
T_7	T_5 without $Ca(NO_3)_2$	66.39	5.83	9.73	3.24	5.72	3.93	81.53	911.15	207.90
T_8	T_5 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

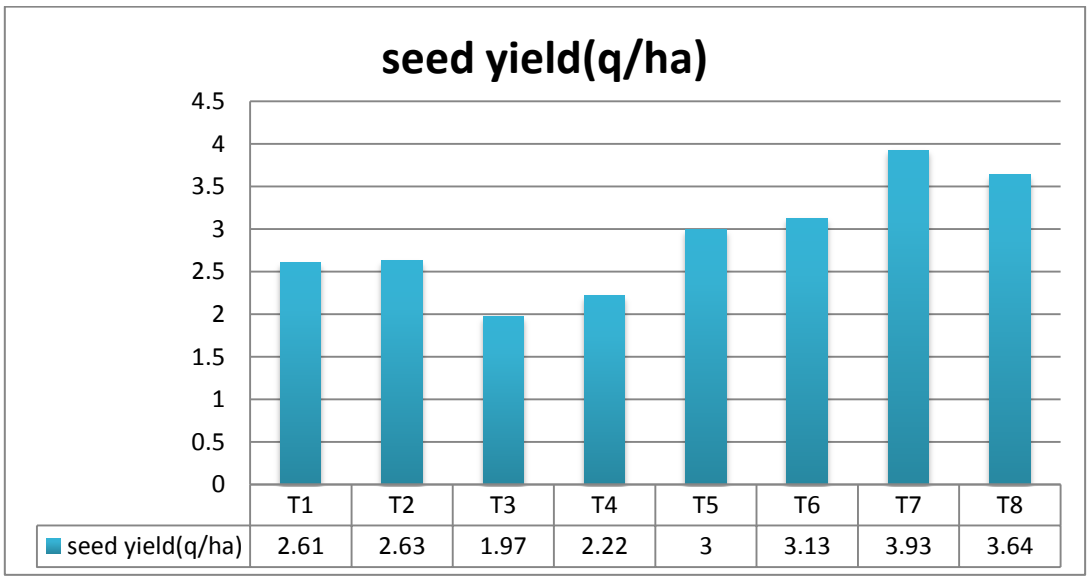

Fig. 1: Effect of micronutrients spray on seed yield in chilli

REFERENCES

1. Thamburaj, S., Singh N. "Chilli and capsicum" 'textbook of vegetables, tuber crops and spices' published by ICAR. New Delhi, 49-47 (2003).
2. Singh, K.P., Kalloo, G. Nutrient management in vegetable crops. Fertilizer News,: **45:** 77-81(2000).
3. Anonymous. International Rules for Seed Testing. *Seed Science and Technology*, 1996:24(Suppl.): 1-335.
4. Basavarajeswari, C.P., Hosamni, R.M., Ajjappalavara, P.S., Naik, B.H and Smitha, R.P., Ukkund. Effect of foliar application of micronutrients on growth, yield components of tomato (*Lycopersicon esculentum* Mill). *Karnataka Journal of Agricultural Sciences*, **21(3):** 428-430 (2008).
5. Hatwar, G.P., Gondane, S.M., Urkade, S.M. and Gahukar, O.V., Effect of micro nutrients on growth and yield of chilli. *Soils and Crops*,:**13(1):** 123-125 (2003).
6. Dongre, S.M., Mahorkar, V.K., Joshi, P.S. and Deo, D.D. Effect of micronutrients spray on yield and quality of chilli

(*Capsicum annuum* L.) cv Jayanti. *Agricultural Science Digest*,:**20(2):** 106-107 (2000).

7. Sindhu, P.C., Ahlawat, V.P. and Nain, A.S. Effect on yield and fruit quality of grapes (*Vitis vinifera* L.) cv. Perlette. *Haryana J. Hort. Sci*.,:**28(2):**19-21 (1999).
8. Shukha, AK., Effect of foliar application of calcium and boron on growth, productivity and quality of Indian gooseberry (*Emblica officinalis*). *Indian J. Agric. Sci.*, **81(7):** 628-632 (2011).
9. Tamilselvi, P., Vijayakumar, R.M. and Naina, P. Studies on the effect of foliar application of micronutrients on growth and yield of tomato (*Lycopersicon esculentum* Mill) cv PKM-1. *South Indian Horticulture*, **53(1-6):** 46- 51 (2002).
10. Kumari, S. Effect of micronutrients on quality of fruit and seed in tomato (*Solanum lycopersicum* L). *International Journal of Farm Sciences*, **2(1):** 43-46 (2012).
11. Verma, T.S., Singh, Lakhanpal, K.D. and Singh, R.V. Micronutrients application for enhancing seed yield in capsicum variety California Wonder. *Seed Res*. **32(2):** 224-225 (2004).