BVG Trust

J. Sci. Trans. Environ. Technov. 2012, 5(3) : 159 - 161

Scientific Transactions in Environment and Technovation

Effect of fertigation on nutrient content in Coriander (*Coriandrum sativum*).

G. Rajaraman, P. Paramaguru, P. Aruna and I.P. Sudagar

Horicultural college and Research Institute, Tamil Nadu Agricultural University, Coimbatore - 03, Tamil Nadu, India.

Abstract

The effects of fertigation on the N, P, K, contents in the leaves of the varrties of *Coriandrum sativum* (Co CR-4 and CS11) were investigation. Fertigation with 125 per cent water soluble fetilizer enhanced the absorption of the three nutients viz., N,P and K as these nutrients recorded the highest values in the leaves of *C.sativum.*

Keywords: coriander, crop yield, fertigation, nutrients, plant growth

INTRODUCTION

The efficient use of fertilizers is necessary for optimum growth and yield of crops. Hence knowledge about the availability of nutrients in the soil is very essential. For scheduling a fertilizer programme, analysis of plant nutrient status has been found useful to prevent the deficiency or excess of nutrient effects in any horticultural crops. The concentration and uptake of nutrient in plants serves as an elegant tool for understanding the growth and physiology of the plant at various phases of its growth (Hartz and Hochmuth, 1996). The present investigation was carried out to find the optimum level of fertigation for higher yield besides quality in *Coriander sativum.*

MATERIALS AND METHODS

The field experiment was conducted at the University orchard of Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore. Two genotypes of *C. sativum* (Co CR-4, CS 11) were selected for this study, as these genotypes proved well for use as leafy type. The experiment was laid out in FRBD design with 4 treatments replicated thrice. Drip fertigation with water soluble fertilizer at 75%, 100%, 125% RDF along with the recommended normal fertilizer was applied to soil with furrow irrigation.

RESULTS AND DISCUSSION

The effect of fertigation on leaf N content at harvest stage of Coriander in two different varieties are furnished in the Table 1 . The treatments had a significant influence on leaf N content at harvest. Application of 125 per cent RDF (T1) recorded the maximum leaf N content of 3.36 and 3.17% during first and second season, respectively at Days After sowing (DAS). The lowest leaf N content was registered in the treatment applied with recommended NPK applied to soil with furrow irrigation (T_4) with values of 2.67 and 2.47 % during first and second season, respectively. The variety Co CR-4 (V_1) had maximum leaf N content than CS 11 (V_2). Regarding the interaction effect, the maximum leaf N content was recorded in Co CR - 4 with 125 per cent of fertigation (T_1V_1) followed by T_1V_2 in both two seasons. Kavitha (2005) reported that the application of 125 per cent water soluble fertilizer under fertigation system showed higher nitrogen content in leaf stem and fruits at all the three seasons. The nitrogen content was higher in leaves and later started to decline in stems and fruits.

The effect of fertigation on leaf P content at harvest stage of coriander varieties are furnished in the Table 2. The treatments had a significant influence on leaf P content at harvest stage. The treatment T1 recorded the maximum leaf P content of 0.25 and 0.23 % during first and second season, respectvely, at harvest. The lowest leaf P content was registered in the treatment applied with recommended NPK applied to soil with furrow irrigation (T_4) with vales of 0.18 and 0.16 %during first and second season, respectively. Variety Co CR-4 (V_1) had maximum leaf P content than CS11(V_2). Regarding the interaction effect, the maximum leaf P content was recorded in Co CR-4 with 125 per cent of fertigation (T_1V_1) followed by T_1V_2 in both the seasons.

The effect of fertigation on leaf K content at harvest stage of coriander in two different varieties are furnished in Table 3. The treatments had a significant influence on the leaf K content at harvest. The treatment T_1 recorded the maximum leaf K content of 4.39 and 4.14 % during first and second season, respectively at 45 DAS. The lowest leaf K content was registered in the treatment applied with recommended NPK applied to soil with furrow irrigation (T_4) with values of 2.31 and 2.09 % during first and second season, respectively. Variety Co CR-4 (V_1) had maximum leaf K content than CS 11 (V_2). Regarding the interaction effect, the maximum leaf K content was recorded in Co CR - 4 with 125 per cent of fertigation (T_1V_1) followed by T_1V_2 in both seasons.

*Corresponding Author
email: *hortraja@gmail.com*

The plants grown with fertigation of 125 per cent water solubale fertilizer produced significant results on highest nutrient contents of leaves (Figs. 1, 2&3). Increased nutrient status in leaves at harvesting stages of crop growth may be due to accumulation of carbohydrate, which may take place gradually, with the advancement of crop growth.

Application of 125 per cent water soluble fertilizer registered the highest N content in leaf. The fertigation of macronutrient had resulted in the enhanced absorption of N by the crop that utlimately leads to higher yield. Similar findings were reported by

Table 1. Effect of fertigation on N content (%) of leaves of *C. sativum* at harvest

Treatments	Season I			Season II		
	V_1	V_2	Mean	V_1	V_2	Mean
T_1	3.47	3.25	3.36	3.27	3.07	3.17
T_2	3.32	3.12	3.22	3.12	2.19	2.66
T_3	3.20	2.19	2.69	3.00	2.17	2.58
T_4	2.82	2.52	2.67	2.62	2.32	2.47
Mean	3.20	2.77		3.00	2.44	
	SED	CD (0.05)		SED	CD (0.05)	
V	0.00661	0.01419		0.00143	0.00306	
T	0.00935	0.02007		0.00202	0.00432	
V x T	0.1323	0.02838		0.00285	0.00611	

Table 2. Effect of fertigation on P content (%) of leaves *C. sativum* at harvest

Treatments	Season I			Season II		
	V_1	V_2	Mean	V_1	V_2	Mean
T_1	0.27	0.24	0.25	0.25	0.21	0.23
T_2	0.26	0.23	0.24	0.24	0.20	0.22
T_3	0.24	0.22	0.23	0.22	0.18	0.20
T_4	0.19	0.17	0.18	0.17	0.15	0.16
Mean	0.24	0.22		0.22	0.19	
	SED	CD (0.05)		SED	CD (0.05)	
V	0.00102	0.00219		0.00102	0.00219	
T	0.00144	0.00310		0.00144	0.00310	
V x T	0.00204	0.00438		0.00204	0.00438	

Papadopoulos (1987), Colla et al., (2001) and Prabhu (2007).

The relatively maximum P content in leaf showed the effectiveness of the application of 125 per cent water soluble fertilizer. Papadopoulos and Leena, (2000) found the increased levels of phosphorus to result in increased the yield of potato cv. Spunta. Similar findings were reported by Kavitha (2005).

It was observed in the present study that fertigation with 125 per cent water soluble fertilizer enhanced the absorption of potassium at harvesting stages of crop growth. Dangler and Locascio (1990) and Fontes *et al.*, (2000) stated that application of nitrogen and potassium in combination with drip irrigation increased the yield by way of maximizing the mobility of the nutrients around the root zone. The transformation reactions that took place led to greater availability of potassium in the soil and consequently resulted in the better utilization by the plant. Similar trend of results have been

Table 3. Effect of fertigation on K content (%) of leaves of *C. sativum* at harvest

Treatments	Season I			Season II		
	V_1	V_2	Mean	V_1	V_2	Mean
T_1	4.54	4.24	4.39	4.24	4.04	4.14
T_2	3.48	3.18	3.33	3.28	2.19	2.73
T_3	3.50	3.22	3.36	3.30	3.02	3.16
T_4	2.50	2.12	2.31	2.20	1.98	2.09
Mean	3.50	3.19		3.25	2.81	
	SED	CD (0.05)		SED	CD (0.05)	
V	0.02526	0.05418		0.00116	0.00250	
T	0.03572	0.07662		0.00165	0.00353	
V x T	0.05052	0.10836		0.00233	0.00499	

documented by El-Sherif *et al.*, (1993), Hartz and Hochmuthu (1996) and Soumya *et al.*, (2005), as well. In the present investigation, among the various treatments, application of 125 per cent water soluble fertilizer under fertigation increased the uptake of nutrients in different plants parts at harvesting stages of crop growth. This may be due to the higher mobilization of nutrients and photosynthesis during development phases. The total nutrient content in leaf was highest at harvest stage. This is in confirmation with the findings of Paul *et al.*, (1996) and Shivashankar (1996).

REFERENCES

Colla, G., Temperini, O., Battistelli, A., Moscatello, S., Projetti, S., Saccardo, F. and Brancaleone, M. P., 2001. Nitrogen and celery. *Coltura Protette*, 30:68-70.

Dangler, J. M. and Locascio, S. J. 1990. Yield of trickle - irrigated tomatoes as affected by time of N&K application. *J. Amer. Soc. Hort. Sci.*, 115:585-589.

El-Sherif, A. F., Shata, S. M. and Youssef, R. A. 1993. Effect of rates and methods of zinc application on growth and nutrient uptake of tomato plants. *Egypt. J. Hort.*, 17:123-129.

Fontes, P.C.R., Sampaio, R.A. and Finger, F. L. 2000. Fruit size, mineral composition and quality of trickle irrigated tomatoes as affected by potassium rats. *Pesquisa Agropecuaria Brasileira*, 35:21-25.

Hartz., T. K. and Hochmuth, G. J. 1996. Fertility management of drip irrigated vegetables. *Hort. Tech.*, 6:168.

Kavitha, 2005. Studies on the effect of shade and fertigation on growth, yield and quality of tomato (Lycopersicom esculentum Mill.) Ph.D., (Hort) Thesis submitted to TNAU, Coimbatore.

Papadopoulos, I. 1987. Nitrogen fertigation of green house grown tomato, *Commn. Soil Sci. Plant Anal.,* 18:897-907.

Papadopoulos, I. and Leena, R. M. 2000. Nitrogen and phosphorus fertigation of tomato and egg plant, *Acta Hort.,* 511:73-79.

Paul, J., Joseph, V. and Ahammed Kabeer, T. 1996. Fertilizer irrigation - An overview. All India seminar on modder irrigation techniques. June 26-27, Bangalore, P. 191-195.

Prabhu, T. 2007. Standardisation of fertigation techniques in paprika (*Capsicum annuum var. longum* L.) under open and coconut shade conditions Ph.D., (Hort.) Thesis submitted to TNAU, Coimbatore.

Soumya, T. M., Ramachandrappa, B.K. and Manjappa, H. V. 2005. Effect of fertigation with different sources and levels of fertilizer on growth and yield of tomato. International conference on plasticulture and precision farming, 17-20 November, New Delhi, P. 220.