

Effect of fertigation on nutrient uptake of leaves in coriander

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ABSTRACT

The effect of fertigation on nutrient uptake of leaves in coriander was carried out in two coriander genotypes Co CR-4 and CS 11. Drip fertigation with water soluble fertilizer at 125 %, 100 %, 75 % RDF along with recommended normal fertilizer was carried out in the year 2007. The effect of varieties and nutrient application methods (drip fertigation and soil application) reflected on differential rate of N, P, and K uptake by the crop. The nutrient uptake was higher under increased drip fertigation dose compared to soil application of nutrients. Among the drip fertigation doses, the N, P and K uptake was higher with 125 per cent drip fertigation compared to other treatments

Key words : Coriander, Fertigation, Nutrient uptake, N, P, K.

The efficient use of fertilizers is necessary for optimum growth and yield. Hence knowledge about the availability of nutrients in the soil is very essential. To assess the availability of various nutrients in the soil and the effect of fertilizer application, foliar and soil analysis of nutrients were made through leaf analysis. 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 plant varies with the age of the crop, season, plant parts, stage of the crop and cultivars. Plant analysis 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 nutrient uptake of leaves in coriander

MATERIALS AND METHODS

The field experiment was conducted at the University orchard of Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore in 2007. Two genotypes (Co CR-4, CS 11) were selected for this study, as the 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 applied to soil with furrow irrigation. The experiment was laid out in FRBD design with 4 treatments replicated thrice.

RESULTS AND DISCUSSION

The effect of fertigation on leaf N uptake content of coriander in two different varieties are furnished in

Table 1. The treatments had a significant influence on leaf N uptake at harvest.

The treatment T_1 recorded the maximum leaf N uptake of 58.46 and 56.46 g per plant during first and second season, respectively. The lowest leaf N uptake was registered in the treatment applied with recommended NPK with furrow irrigation (T_4) recording values of 26.84 and 24.84 g per plant during first and second season, respectively. The variety Co CR-4 (V_1) had maximum leaf N uptake content than CS 11 (V_2).

Regarding the interaction effect, the maximum leaf N uptake was recorded in T_1V_1 harvesting stage followed by T_1V_2 in both seasons.

The effect of fertigation on leaf P uptake at harvest stage of coriander in two different varieties are furnished in the Table 2. The treatments had a significant influence on leaf P uptake at harvest.

The application of 125 per cent RDF (T_1) recorded the maximum leaf P uptake of 60.94 and 58.94 g per plant during first and second season, respectively. The lowest leaf P uptake was registered in the treatment applied with recommended NPK applied to soil with furrow irrigation (T_4) with values of 20.35 and 18.35 g per plant during first and second season, respectively. With regard to variety Co CR-4 (V_1) had maximum leaf P uptake than CS 11 (V_2).

Regarding the interaction effect, the maximum leaf P uptake was recorded in Co CR-4 with 125 per cent of fertigation (T_1V_1) at followed by T_1V_2 in both seasons

The effect of fertigation on leaf K uptake at harvest stage of coriander in two different varieties are furnished in the Table 3. The treatments had a significant influence on leaf K uptake content at harvest stage of observation.

The treatment T_1 recorded the maximum leaf K

Table 1 : Effect of fertigation on leaf N uptake (g plant⁻¹) of leaves at harvest

Treatments	Season I			Season II		
	V ₁	V ₂	Mean	V ₁	V ₂	Mean
T ₁	59.45	57.47	58.46	57.44	55.43	56.46
T ₂	54.35	51.35	52.80	52.35	49.25	50.80
T ₃	49.82	47.35	48.58	47.82	45.35	46.58
T ₄	28.24	25.44	26.84	26.24	23.44	24.84
Mean	47.96	45.37		45.96	43.37	
	S.E. ±		C.D. (P=0.05)	S.E. ±		C.D. (P=0.05)
V	0.01552		0.03329	0.01538		0.03298
T	0.02195		0.04708	0.02174		0.04664
V x T	0.03104		0.06658	0.03075		0.06596

Table 2 : Effect of fertigation on leaf P uptake (g plant⁻¹) at harvest

Treatments	Season I			Season II		
	V ₁	V ₂	Mean	V ₁	V ₂	Mean
T ₁	62.42	59.47	60.94	60.42	57.47	58.94
T ₂	44.37	42.35	43.36	42.37	40.35	41.36
T ₃	35.25	33.32	34.28	33.25	31.32	32.28
T ₄	21.46	19.24	20.35	19.46	17.24	18.35
Mean	40.87	38.59		38.87	36.59	
	S.E. ±		C.D. (P=0.05)	S.E. ±		C.D. (P=0.05)
V	0.01313		0.02817	0.01344		0.02882
T	0.01858		0.03984	0.01900		0.04076
V x T	0.02627		0.05635	0.02687		0.05765

uptake of 48.14 and 46.13 g per plant during first and second season, respectively at 45 DAS. The lowest leaf K uptake was registered in the treatment applied with recommended NPK applied to soil with furrow irrigation (T₄) with values of 21.18 and 19.18 g per plant during first and second season, respectively. With regard to variety Co CR-4 (V₁) had maximum leaf K uptake than CS 11(V₂). The results are in agreement with the findings of Subramanian *et al.* (1998) and Sundar Raman *et al.* (2000) in gherkin.

Regarding the interaction effect, the maximum leaf K uptake was recorded in Co CR-4 with 125 per cent of fertigation (T₁V₁) at harvest followed by T₁V₂ in both seasons

The effect of varieties and nutrient application methods (drip fertigation and soil application) reflected on differential rate of N, P, and K uptake by the crop. The nutrient uptake was higher under increased drip fertigation dose compared to soil application of nutrients.

Among the drip fertigation doses, the N, P and K uptake was higher with 125 per cent drip fertigation compared to other treatments. As application of nutrients of N and K not only stimulated vegetative growth and capacity of the roots, but also encouraged the absorption

and translocation of more nutrients which have led to increased uptake of these nutrients under higher drip fertigation levels. Comparing the methods of N application, both drip fertigation and drip band application increased the nutrient uptake substantially, than furrow band application (Veeranna, 2000).

The higher available soil moisture, provided by continuous water supply under drip irrigation, had led to higher availability of nutrients in the soil and thereby increased the nutrient uptake by the crop. The increased uptake may also be due to split application of N under drip fertigation that resulted in the reduction in loss of nutrients thereby making them available continuously to the crop. Similar finding of higher uptake with drip fertigation over soil application of nutrients was also reported in hybrid cotton by Veeraputhiran (2000) and Selvakumar (2006) in Chilli.

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