

Effect of fertigation on herbage yield at different growth stages of coriander

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ABSTRACT

The present investigation was taken up to find out the influence of fertigation on growth, of leafy types coriander. Drip fertigation with water soluble fertilizer at 75 %, 100 %, 125 % RDF along with the recommended normal fertilizer applied to soil with furrow irrigation. At 45 DAS, the plants applied with 125 per cent RDF (T_1) recorded the maximum herbage yield 17.29 and 18.81 g per plant during first and second season respectively. Regarding the interaction effect, the maximum estimated yield was recorded in Co CR-4 with 125 per cent of fertigation (T_1V_1) in harvesting stages of the crop growth followed by T_1V_2 in both two seasons.

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Key words : Coriander, Fertigation, Herbage yield

INTRODUCTION

The correct quantity of fertilizers application not only increases the yield but also improves the quality. Fertigation allows applying the nutrients exactly and uniformly only to the root volume, where the plants active roots are concentrated. Hence, the present investigation was taken up to find out the influence of fertigation on growth, of leafy types coriander. Coriander (*Coriandrum sativum* L.) is a annual herb with several branches and lacy leaves with jagged edges belonging to the family Apiaceae. It is native of Mediterranean region. This aromatic herb is found in many parts of the world. In India, coriander is mainly cultivated in Rajasthan and Gujarat with a sizeable acreage in Madhya Pradesh, Haryana, Punjab, Uttar Pradesh, Andhra Pradesh, Tamil Nadu and Bihar.

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 (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.

RESULTS AND DISCUSSION

The effect of fertigation on herbage yield at different growth stage of coriander in varieties are furnished in

the Table 1. The treatments had a significant influence on herbage yield at all stages of observation.

At 35 DAS, application of nutrients through fertigation significantly influenced the herbage yield. Application of 125% RDF (T_1) recorded 11.55 and 12.83 g per plant in first and second season, respectively. With regard to variety Co CR-4 (V_1) had high yield than CS 11(V_2).

At 45 DAS, the plants applied with 125 per cent RDF (T_1) recorded the maximum herbage yield 17.29 and 18.81 g per plant during first and second season, respectively. The lowest herbage yield was registered in the treatment with recommended NPK applied to soil with furrow irrigation (T_4) with values of 7.00 and 7.64g per plant during first and second season, respectively. Variety Co CR-4 produced more herbage yield than C 11.

Regarding the interaction effect, maximum herbage yield was recorded in Co CR-4 with 125 per cent of fertigation (T_1V_1) in all the stages of the crop growth followed by T_1V_2 in both two seasons.

The effect of fertigation on yield per plot at harvest stage of coriander in varieties are furnished in the Table 2. The treatments had a significant influence on yield per plot at harvest stage of observation.

Application of 125 per cent RDF (T_1) recorded the maximum yield per plot of 3.72 and 3.59 kg per plot during first and second season, respectively. The lowest yield per plot was registered in the treatment with recommended NPK applied to soil with furrow irrigation (T_4) with values of 1.53 and 1.30 kg per plot during first and second season, respectively. With regard to variety Co CR-4 (V_1) had maximum yield per plot than CS 11(V_2).

Regarding the interaction effect, maximum yield per

plot was recorded in Co CR-4 with 125 per cent of fertigation ($T_1 V_1$) followed by $T_1 V_2$ in both seasons. (Table 2).

The effect of fertigation on estimated yield at harvest stage of coriander in varieties are furnished in the Table 3. The treatments had a significant influence on estimated yield at harvest stage of observation.

The plants which were applied with 125 per cent RDF (T_1) recorded the maximum estimated yield of 9.3 and 9.4 tonnes per hectare during first and second season, respectively. The lowest estimated yield was registered in the treatment with recommended NPK applied to soil with furrow irrigation (T_4) with values of 5 and 5.3 tonnes per hectare during first and second season, respectively. With regard to variety, Co CR-4 (V_1) had maximum yield per hectare than CS 11 (V_2).

Regarding the interaction effect, the maximum estimated yield was recorded in Co CR-4 with 125 per cent of fertigation ($T_1 V_1$) in harvesting stages of the crop growth followed by $T_1 V_2$ in both two seasons (Table 3).

The aim of any applied research is to get increased yield. According to Marschner (1983), a balanced supply of macronutrients promotes the translocation of

phytohormones to the shoot probably induces growth. In the present investigation, the most important economic trait namely yield was significantly influenced by different levels of fertigation. The higher dose of 125 per cent water soluble fertilizer applied through fertigation had significantly influenced yield. Similar results were reported by Prabhu (2007) in Paprika. It may probably be attributed to the nature of interaction of physiological and growth parameters by way of increased dry matter production. The profound effect of fertigation on growth attributes and physiological characteristics are reflected on the higher yield and related characters. Similar results were reported by Locascio and Smajstrla (1995) and Salvatore *et al.* (1997). Felipe and Casanova (2000) in tomato, Sundar Raman *et al.* (2000) in gherkin, Veeranna *et al.* (2000) in chilli and Kavitha (2005) in tomato.

The yield per plant, yield per plot and yield per ha were significantly improved by the application of major and micronutrients through fertigation as they boosted the overall vegetative growth and biological efficiency of the plant. Drip fertigation with 125 per cent water soluble fertilizer had produced higher yield in both the seasons which might be due to application of optimum level of

Table 1 : Effect of fertigation on herbage yield (g/plant) at different growth stages in coriander

Treatments	35 DAS						45 DAS					
	Season I			Season II			Season I			Season II		
	V_1	V_2	Mean	V_1	V_2	Mean	V_1	V_2	Mean	V_1	V_2	Mean
T_1	12.58	10.52	11.55	13.32	12.35	12.83	18.34	16.25	17.29	19.36	18.26	18.81
T_2	11.93	9.93	10.93	11.93	11.08	11.50	17.55	14.37	15.96	17.24	16.54	16.89
T_3	11.32	8.64	9.98	10.43	10.33	10.38	16.33	12.93	14.63	15.34	14.23	14.78
T_4	6.53	4.24	5.38	7.37	6.51	6.94	7.16	6.84	7.00	8.21	7.07	7.64
Mean	10.59	8.33		10.76	10.06		14.84	12.60		15.04	14.02	
	S.E. \pm	C.D. (P=0.05)		S.E. \pm	C.D. (P=0.05)		S.E. \pm	C.D. (P=0.05)		S.E. \pm	C.D. (P=0.05)	
V	0.01485	0.03185		0.07053	0.15129		0.02115	0.04536		0.01509	0.03237	
T	0.02100	0.04505		0.09974	0.21395		0.02991	0.06415		0.02134	0.04577	
V x T	0.02970	0.06371		0.141065	0.30258		0.04230	0.09072		0.03018	0.06473	

Note : DAS = Days after sowing

Table 2 : Effect of fertigation on estimated yield (kg/ha) in coriander at harvest

Treatments	Season I			Season II		
	V_1	V_2	Mean	V_1	V_2	Mean
T_1	9838	8756	9297	9968	8920	9444
T_2	8769	8361	8565	9096	8535	8815
T_3	7249	7229	7239	7333	7320	7326
T_4	5259	5139	5199	5330	5250	5290
Mean	7779	7372		7932	7219	
	S.E. \pm		C.D. (P=0.05)	S.E. \pm		C.D. (P=0.05)
V	9.55887		20.50397	11.26573		24.16521
T	13.51829		28.99699	15.93215		34.17477
V x T	19.11774		41.00793	22.53146		48.33042

Note : DAS = Days after sowing

Table 3 : Effect of fertigation on yield per plot (kg) in coriander at harvest

Treatments	Season I			Season II		
	V ₁	V ₂	Mean	V ₁	V ₂	Mean
T ₁	4.30	3.14	3.72	3.83	3.34	3.59
T ₂	3.73	2.53	3.13	3.15	2.95	3.05
T ₃	3.12	2.06	2.59	2.93	2.43	2.68
T ₄	1.98	1.09	1.53	1.57	1.22	1.30
Mean	3.28	2.21		2.87	2.49	
	S.E. _±		C.D. (P=0.05)	S.E. _±		C.D. (P=0.05)
V	0.00932		0.02000	0.01465		0.03142
T	0.01318		0.02828	0.02072		0.04444
V x T	0.01864		0.03999	0.02930		0.06284

fertigation which could increase the dry matter at harvest (Siviero *et al.*, 2001).

Fertigation with higher rates of fertilizer resulted in higher availability of nutrients in soil solution which obviously led to increased growth; higher uptake of nutrients, better photo assimilation and better translocation of assimilates from source to sink which in turn resulted in increased yields. Similarly increased yield under drip fertigation with water soluble fertilizers were also reported by Shivashankar (1999) in capsicum, Veeranna *et al.* (2000) and Singandhupe *et al.* (2003) in chillies

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