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Study of Yield and Quality Response of Coriander For Fertigation and Irrigation Levels Under Drip Irrigation System

[*]Dnyaneshwar A. Madane,

[*]*Assistant Professor, Department of Soil Science, School of Agriculture,*
Lovely Professional University, Phagwara, Punjab.
[*]*Corresponding Author: madane_1213@rediffmail.com*

Abstract

The experiment was conducted on coriander in sandy loam soil at Experimental Farm of LPU, Punjab. The experiment consist of the three irrigation treatments viz, I_1(1.0 ET_C), I_2(0.80 ET_C) and I_3(0.60 ET_C) and two nitrogen fertigation treatmentsF_1(100 % RDF) and F_2(75 % RDF) with four replication arranged on split plot design. Significant superior plant height (52.50 cm), number of branches (8.67), seed yield per plant (216.25 kg/ha), grain yield (1602.50 kg/ha) , biological yield (3569 kg/ha) and HI(0.45 per cent)was found in treatment combination I_2F_1(1.0 ET_c and 100 % RDF) through drip irrigation systems, followed by treatment combination I_2F_2, respectively.

Keywords: Irrigation scheduling, grain yield, biological yield and HI

Introduction

In India maximum production of 391 thousand metric ton followed by 277.4 thousand hectares followed by Rajasthan and Gujarat (Anonymous, 2018). An annual herb*Coriandrumsativum*is belonging to the family *Apiaceae*. It came under Mediterranean region, by Harshita Singh, V.P.S Panghal (2017).

Coriander leaves and seeds are valued as food mainly for its high Vitamin A and Vitamin C (Rubatzky *et al.*,1999). Due to deficit water resource, the favorable soil and climatic conditions as well as low water requirements and short duration coriander crop, this crop has been widely adopted by the farmers. Irrigation plays an significant role in plant growth, increase yield and quality (Singh and Goswami, 2000).

Material and Methods

The research trial was conducted duringrabi season 2019 at Research Farm of Lovely Professional University in Punjab. The research trial consist of main treatment I_1 (0.8 ETC), I_2 (1.0 ETC) and I_3 (0.6 ETC) irrigation levels and sub treatment two nitrogen fertigation

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levels,F_1 (100 % RDF), F_2 (75 % of RDF) with total four replications arranged on strip plot design. The coriander crop (cv. GC-2) was sown at 30 cm row spacing at recommended seed rate. The Drip system with lateral Size: 16 cm, emitter spacing: 30 cm and emitter discharge: 4.0 lph was used and fitted at spacing of 60 cm providing lateral cock to each lateral in the each of the plot of the size: 1.0 x 8 m in the experiment. The observations of plant height (cm), number of branches, yield of seed per plant, grain yield, dry matter yield, harvest index.

Result and Discussion

Effect of growth parameters

It is depicted from the data in Table 1 that significant plant height of 52.50 cm and no of branches 8.67, obtained for treatment combination I_2F_1 followed by I_2F_2 treatment combination respectively.

Table 1 Effect of treatments on plant growth parameters of coriander

Treatments	Plant Height (cm)	No of branches
I_1F_1	34.00	6.80
I_1F_2	41.25	6.87
I_2F_1	52.50	8.67
I_2F_2	42.75	7.60
I_3F_1	37.25	7.10
I_3F_2	37.50	7.30
C.D.	8.6	1.02
S.E (m)	2.4	0.29

The plant height and number of branches higher than other treatments due to uniformly wetted regime and more efficient and frequent application of water through drip irrigation and this results is corroborated with the findings of Vadar*et al.*,(2016).

Yield parameters of coriander

No of grains per plant (kg.ha^{-1})

From presented data in the Table 2 that effect of irrigation and fertigation treatment found significant on grains per plant. The maximum no of grains per plant (216.25 kg.ha^{-1}) was found in treatment combination I_2F_1, followed by I_2F_2 treatment combination respectively.

Grain Yield (kg.ha^{-1})

From the data presented in the Table 2, that interaction effect revealed significant grain yield of coriander was found in I_2F_1 treatment combination and on par to other treatment combination. The

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superior yield was found in treatment combination I_2F_1 (1602.50 kg.ha^{-1}) followed by I_2F_2 treatment combination, respectively. These results are in accordance with the results reported by Kamkar*et al.* (2011) and Vadar*et al.*,(2016).

Table 2 Effect of treatments on plant growth parameters of coriander

Treatments	Grain per plant kg/ha	Grain yield Kg/ha	Biological Yield kg/ha	Harvesting Index (%)
I_1F_1	174.25	1342.50	3231.50	0.42
I_1F_2	178.00	1420.00	3438.70	0.43
I_2F_1	216.25	1602.50	3569.00	0.45
I_2F_2	180.25	1510.00	3412.50	0.44
I_3F_1	175.25	1497.50	3445.00	0.43
I_3F_2	171.25	1425.00	3416.25	0.42
C.D.	11.92	94.76	164.60	NA
S.E (m)	3.47	27.12	47.33	.0009

Biological Yield (kg.ha^{-1})

The data shown in Table 2, thatinteraction effect revealed significant yield was obtained in treatment combination I_2F_1. The highest biological yield was found in I_2F_1 (3569.00 kg.ha^{-1}) treatment combination followed by I_2F_2. These results are corroborated with the results reported by Kamkar *et al.* (2011) and Vadar*et al.*,(2016).

Harvest Index (%)

From the data depicted in Table 2, that significant harvesting index was obtained in treatment combination I_2F_1. It is clearly observed from the data presented in Table no 2 that maximum harvest index was found in treatment combination I_2F_1 (0.45 %) followed by I_2F_2 treatment combination respectively.

Conclusion

It was finally concluded that interaction effect revealed that significant superior plant height (cm), number of branches, seed yield per plant, grain yield, biological yield and harvest index was found in treatment combination I_2F_1 (1.0 ETC and 100 % RDF) through drip irrigation systems, followed by treatment combination I_2F_2, respectively.

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