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Assessment of yield, quality and economics of coriander (*Coriandrum sativum* L.) genotypes in south-eastern plains of Rajasthan under irrigated condition

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ABSTRACT

An experiment was conducted during *Rabi* season of 2008-09 and 2009-10 on clay loam-soil at Instructional Farm, KVK, Bundi (Rajasthan), to assess yield, quality and economics of coriander (*Coriandrum sativum* L.) genotypes i.e. RKD 25, RKD 29, RKD 13, RKD 36, RKD 18,RKD 27, check : RCr 436 and CS 6 under irrigated condition. Among different coriander genotype, RKD 18 gave significantly higher test weight (12.60 g) and seed yield (19.16 q /ha) over RKD 25, RKD 29, RCr 436 and CS 6 (check) and was remained at par with RKD 27, RKD 36 and RKD 13. The genotype RKD 13 took significantly minimum days (56) to produce 50% flowering and for maturity (99) over best check with RCr 436 and was remained at par with each other. The highest essential oil content (0.40%) was obtained by RKD 18 whereas it was lowest in RKD 13 (0.24%) and check CS 6 (0.24%).The net return(Rs 46,812 /ha) and B:C ratio (4.23) was also highest in RKD 18 that was significantly superior over CS 6 (Rs38,076 /ha), RCr 436 (Rs 40,380/ha) and all remaining new genotypes, however in other genotype the difference in B:C ratio was non significant. On the basis of results it was concluded that RKD 18 coriander variety was found most suitable and profitable in respect of yield, quality and economics than other genotypes.

Key words : Coriander, Genotypes, Yield and Economics

INTRODUCTION

Coriander (*Coriandrum sativum* L.) is an important winter season commercial seed spice crop of humid south-eastern plains of Rajasthan, which is also used as medicinal as well as flavoring agent i.e. curry powder, pickling and confectionery in many parts of the country. In Rajasthan, more than 75% area of total acreage is under irrigated condition. The major reasons responsible for poor performance of coriander in irrigated area is use of long duration and old existing varieties. Long duration variety of coriander is exposed to heat stress problem during grain filling stage, which consequently reduce the productivity. Development of high yielding early maturing, fertilizer-responsive varieties is a new proposition which would ensure stability and higher profit per unit area of land and has potential to produce 20-25% higher seed yield than other existing varieties (Nagar *et al*., 2 and Vibha Doshi, 5). Under prevailing agro-climatic conditions i.e. a creating situation of sudden rising in environmental temperature at later stages of the crop development, adoption of early maturing improved varieties have been performed better and also reported by various workers for better growth and yield (Bochalia *et al.,* 1). Therefore, the present investigation was carried out to test the suitability of coriander genotypes for realizing higher yield under irrigated conditions.

MATERIALS AND METHODS

A field experiment was conducted at Instructional Farm, Krishi Vigyan Kendra Bundi, Rajasthan, during *Rabi* seasons of 2008-09 and 2009-10. The soil of the experimental field was clay loam in texture, slightly alkaline in reaction (pH 8.1), medium in available N (276.8 kg/ha) and P (16.80 kg/ha) and high in available K (350 kg/ha) and organic C (0.50%). The annual rain fall of the area was 565 mm and 414, in 2008 and 2009, respectively. The experiment was laid out in randomized block design with eight coriander genotypes: RKD -25, RKD -29, RKD-13, RKD- 36, RKD -18, RKD -27, check RCr -436 and CS- 6 in three replications. Sowing of coriander genotype were done on 26th November, 2009 and 24th November, 2010 using seed rate of 20 kg / ha at a row spacing of 30 cm, during both the years in a plot size of 4 x3.2 m (12.8 m^2) and genotype wise harvested manually in first week of March, in the respective seasons of the years. All the

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recommended cultural operations to raise the crop were followed as and when required. The percentage of essential oil content in seed was determined by solvent extraction soxhlet's method. Data on growth, yield attributes, yield and economics were calculated as per the standard procedures. Standard statistical methods were used for comparing the treatment means.

RESULTS AND DISCUSSION

Growth attributes of coriander

Results of the experiment revealed that among the genotype, RKD-13 took significantly minimum days (56) to produce 50% flowering and days to maturity (99) over best local check RCr-436 (64 and 107, respectively) (Table 1). Variation in days to flowering and maturity among varieties was attributed to their genetic/inherent characteristics. The variety CS-6 produced the shortest plants (85cm), while RCr-436 (88-57cm) had the tallest plants (Table 1). However all varieties had no significant differences in plant height. The marked variation in growth could be ascribed on account of their genetic capabilities to exploit available resources for their growth and development (Singh, 4).

Yield attributes, yield and quality of coriander

The genotype 'RKD-18' recorded the highest 1000 seed weight(12.60 g) closely followed by 'RKD-27'(12.50 g) which was significantly superior to check RCr-436 (11-13 g) and RKD-25 (10.95 g) and were at par with check CS-6, RKD-36, RKD-13, and RKD-29. The variety RKD-18 recorded significantly higher seed yield(19.16 q/ ha) over RKD-25 (14.20 g/ha), RKD-29 (16.10 g/ha) and CS-6 (check) (16.43 g/ha) and was statistically at par with RKD-27, RKD-36, RKD-13 and RCr-436 (check). In remaining genotype, the difference in seed yield was not significant (Table 1). RKD-18 variety recorded higher seed yield by 34.93, 19.0, 16.62, 11.72, 9.80, 7.76, and 6.44 % respectively, over RKD-25, RKD-29, CS-6, RCr-436, RKD-13, RKD-36, and RKD-27. The higher seed yield of RKD-18 may be attributed to better expression of yield components of the genotype compared with remaining genotype of coriander under ideal nutritional conditions. RKD-18 recorded significantly higher straw yield (20.50 q/ha) than RKD-25, RKD-29 and RCr-436, though statistically at par with RKD-13, RKD-36 and CS-6. The mean data of two years reveals that the highest essential oil content (0.40%) was obtained by RKD-18 which was 20.6.% higher over best check RCr-436 (0.030%). Essential oil content in seed was lowest in RKD-13 (0.24%) and check CS-6 (0.24%).These findings are in accordance with those of Nagar *et al.,* (3) and Vibha Doshi (5).

Economics and powdery mildew reaction

The highest net return (Rs 46812 /ha) was recorded in RKD-18 that was significantly superior over RKD-25, RKD-29, CS-6, RCr-436 and RKD-13 genotypes and was at par with RKD- 27 and RKD-36 (Table 1). This might be due to higher seed yield and better quality**.** The lowest net return (Rs 30940 /ha) was recorded in RKD-25.

Table 1. Yield attributes, yield, quality and economics of coriander genotypes (Mean of two years 2008-09 and 2009-2010)

Treatment	Days to 50% flowering	Days to maturity	Plant height (cm)	1000 seed weight (g)	Seed yield (q/ha)	Oil content (%)	Straw yield (q/ha)	Net return (Rs/ha)	B: C ratio	Powdery mildew reaction
Coriander varieties										
RKD-25	59	101	85.20	10.95	14.20	0.23	16.0	30940	3.13	M
RKD-29	57	101	85.10	11.90	16.10	0.25	17.5	37020	3.55	M
RKD-13	56	99	87.20	11.90	17.45	0.24	18.10	41340	3.85	M
RKD-36	57	100	84.30	12.20	17.78	0.24	18.25	42396	3.92	M
RKD-18	59	101	86.60	12.60	19.16	0.40	20.50	46812	4.23	M
RKD-27	59	101	87.66	12.50	18.0	0.24	18.20	43100	3.97	M
RCr-436(C)	64	107	88.57	11.13	17.15	0.30	17.50	40380	3.78	H
CS-6(C)	61	99	85.00	12.0	16.43	0.24	17.80	38076	3.63	M
CD(P=0.05)	5.25	5.64	5.99	1.37	2.23	-	2.88	4854	1.05	-

C: Control, M: Medium and H: High

However, all genotype except RKD-25 had no significant differences in net return on mean data basis. The B: C ratio of RKD-18 (4.23) was significantly higher than that of RKD-25 (3.13). In remaining genotypes the difference in B: C ratio was not significant. Incidence of powdery mildew in all new genotypes and old existing 'CS-6' variety were obtained medium whereas its incidence was observed higher in the best check variety RCr-436 due to sudden raised air temperature at grain filling stage.

CONCLUSION

On the basis of results it is concluded that 'RKD-18' genotype was found most suitable and profitable in respect of seed yield, quality and economics than other genotypes for irrigated and prevailing agro-climatic conditions.

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