

Original Research Article

<https://doi.org/10.20546/ijcmas.2020.912.130>

Evaluation of Coriander (*Coriandrum sativum* L.) Varieties in Prayagraj Agro-climatic Conditions

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ABSTRACT

Keywords

Coriander varieties,
Growth, Yield,
quality,
Randomized block
design

Article Info

Accepted:
10 November 2020
Available Online:
10 December 2020

Coriander (*Coriandrum sativum* L.) is an important seed spice cultivated in India. The leaves of coriander & its seeds are widely used as a condiment as well as a spice. The present experiment was carried out in Vegetable Research Farm, Department Of Horticulture, Sam Higginbottom University Of Agriculture, Technology and Sciences, Prayagraj during October (2019)- March (2020). The present experiment is on "Evaluation of coriander varieties in prayagraj Agro-climatic conditions". The experiment was laid out in randomized block design with three replications. Study consists of eight varieties i.e. WS-201, SURUCHI, JYOTI, DESI, GREEN AROMA, VIKRAM, SWATHI, RAMSES. During this study we observed significant differences among the varieties based on its growth, yield, quality parameters. The results revealed that the maximum height was observed in Green Aroma (65.57 cm), number of branches per plant (22.77), days to 50% flowering(126.9) number of umbellets per umbel (7.40) number of flowers per umbellate (8.63) maximum yield and quality was observed in DESI. Leaf yield (419.52 kg), seed yield per plot (214.04 kg), T.S.S (6.20⁰ brix), protein (27.04%), ascorbic acid(208.60 mg/100g). It concludes that GREEN AROMA and DESI varieties of coriander were found superior in terms of growth, yield and quality.

Introduction

Coriander (*Coriandrum sativum* L) is an annual spice herb belongs to the family apiaceae with chromosome number 2n=22. The plant is indigenous to southern Europe and Mediterranean region. It is one of the oldest consumed spices in India. India is known as "Home of spices" from ancient times. India is major producer, consumer and exporter of coriander seeds. According to (Peter *et al.*, 2000) annual production is

estimated to be 308000 tonnes. In India coriander occupied an area of 46800 ha with production of 56700 tonnes during 2018-2019 (NHB). In Uttar Pradesh spices are grown in an area of about 88204 ha, production 274681 metric ton, productivity 3.114 tonnes per ha. In India it is mainly grown in Rajasthan, Madhya Pradesh, Assam, Gujarat, Orissa, Andhra Pradesh, Tamilnadu and Karnataka. Seeds of coriander contain essential oils & the oil can be used in pharmaceutical industries, leaves of coriander is good source of Vitamin

C & it can be used for making chutney, soup etc.

Materials and Methods

The experiment was carried out at the vegetable research farm, Department of Horticulture, Naini Agricultural Institute, Sam Higginbottom university Of Agriculture, Technology and Sciences, Prayagraj. Prayagraj is situated at an elevation of 78 meters above sea level at 25.87⁰

North altitude and 85.15⁰ of E longitude

The present experiment was laid out in randomized block design with three replications, and the study consists of eight varieties. fertilizers were applied @ 15 kg of farm yard manure and 60: 40: 20 kg/ha of NPK. Full dose of phosphorous and potassium & half dose of nitrogen was applied during land preparation and remaining dose of nitrogen was top dressed at 30 days after sowing.

Seeds were soaked in water for 24 hours to enhance the germination. Seeds were germinated in 7-10 days. random plants were selected from each treatment and in each replication were tagged for recording observations on growth, and yield characters i.e plant height, number of branches per plant, number of leaves, days to 50% flowering, number of umbellets per umbel, number of seeds per umbel, leaf yield, seed yield, T.S.S(⁰Brix), protein, ascorbic acid (mg/100g).

Results and Discussion

The entire evaluation varied significantly in terms of plant growth, quality and yield. Regarding plant height maximum plant height (65.57cm) was observed in Green aroma and minimum plant height was observed in (56.26

cm) Swathi. The maximum Number of branches per plant was found by the variety Green Aroma (22.77) and minimum number of branches was Observed in Swathi (15.40).

The variation in plant growth of different coriander varieties were also observed by Carrubba *et al.*, (2002) in coriander, Kalidasu *et al.*, (2008) in Sadhana variety of coriander, Verma *et al.*, (2014) in coriander.

The maximum number of leaves per plant was found by the variety Green Aroma (62.41) and minimum was observed in WS-201 (47.51). For days to 50% flowering all the varieties showed significant differences in relation to time taken from sowing to flowering significantly minimum period (84 days) was taken by Jyothi and maximum time (126.90 days) taken by green aroma.

The maximum number of umbellets per umbel was found highest in Green aroma (7.40) and minimum was observed in Ramses (6.06). Maximum number of flowers per umbellet was recorded in vikram (8.63) and minimum was observed in WS-201 (6.60). The number of seeds per umbellet was recorded in significantly highest in vikram (14.06) and minimum was observed in Suruchi (5.63). The maximum number of umbels was obviously noted in case of green aroma but for other traits like number of umbellet / number of flowers/ umbellet and number of seeds / umbellet Vikram was found to be significantly superior over the other treatments.

These varietal differences may be attributed to inherent nature of the varieties to express themselves in response to climatic and nutritional factors. Similar findings were also reported by Sharma and Bhati (1998) in UD-21, UD-41 and CS-6 and Shrihar *et al.*, (1990) in CS-1 and DFWD-7 (Table 1–3).

Table.1 Performance of coriander varieties based on growth attributes

Treatment symbols	Notation symbols	Varieties	Plant height			Number of branches/plant			Number of leaves/plant		
			30 days	60 days	90 days	30 days	60 Days	90 days	30 days	60 days	90 days
T ₁	V ₁	WS-201	14.44	36.37	61.05	3.69	10.38	19.61	19.42	30.23	47.51
T ₂	V ₂	Suruchi	15.22	29.44	60.72	3.02	9.17	20.08	22.23	34.95	58.49
T ₃	V ₃	Desi	9.95	30.74	63.15	4.56	11.17	22.71	22.51	32.47	55.37
T ₄	V ₄	Jyoti	18.40	33.28	60.89	5.21	13.31	16.82	19.51	29.33	48.15
T ₅	V ₅	Ramses	17.18	33.59	58.88	4.11	13.17	16.18	20.78	33.07	48.25
T ₆	V ₆	Green Aroma	21.38	36.82	65.57	5.92	14.24	22.77	22.75	37.69	62.41
T ₇	V ₇	Vikram	12.56	34.51	59.35	3.49	13.85	16.76	22.74	35.62	57.10
T ₈	V ₈	Swathi	13.24	34.70	56.26	3.33	12.34	15.40	20.90	36.93	51.52
Mean			15.30	33.68	60.73	4.17	12.21	18.79	22.75	37.69	62.41
F-test			S	S	S	S	S	S	19.42	29.33	47.51
C.D. at 0.5%			2.32	2.64	2.95	0.56	2.38	3.19	2.104	4.143	6.393
S.Ed(+)			1.083	1.23	1.37	0.26	1.11	1.49	0.981	1.932	2.98

Table.2 Performance of coriander varieties based on yield attributes

Treatment symbols	Notation symbols	Varieties	Leaf yield			Seed yield		
			Leaf yield/plant(gm)	Leaf yield/plot (kg)	Leaf Yield q/ha ⁻¹	Seed yield/plant(gm)	Seed yield/plot (kg)	seed Yield q/ha ⁻¹
T ₁	V ₁	WS-201	13.20	316.72	29.33	6.16	147.84	13.69
T ₂	V ₂	Suruchi	15.40	369.52	34.21	6.37	152.80	14.15
T ₃	V ₃	Desi	17.48	419.52	38.84	8.92	214.04	19.82
T ₄	V ₄	Jyoti	14.53	348.72	32.29	7.32	182.16	16.87
T ₅	V ₅	Ramses	13.95	334.80	31.00	6.30	151.20	14.00
T ₆	V ₆	Green Aroma	17.38	417.20	38.63	7.59	175.60	16.26
T ₇	V ₇	Vikram	13.52	324.48	30.04	4.95	118.88	11.01
T ₈	V ₈	Swathi	14.81	355.36	32.90	6.05	145.20	13.44
Mean			15.03	360.79	33.41	6.71	160.97	14.90
F-test			S	S	S	S	S	S
C.D. at 0.5%			1.936	46.46	4.302	0.739	17.725	1.641
S.Ed(+)			0.903	21.662	2.006	0.344	8.264	0.765

Table.3 Performance based on flowering and fruiting attributes

Treatment symbol	Notation symbol	Varieties	Days to 50% flowering	Number of umbellets/ umbel	Number of flowers/umbellet	Number of seeds/umbellet
T ₁	V ₁	WS-201	95.00	6.10	6.60	11.40
T ₂	V ₂	Suruchi	95.33	6.60	7.26	5.63
T ₃	V ₃	Desi	89.66	6.53	7.60	12.06
T ₄	V ₄	Jyoti	84.66	6.23	7.60	10.26
T ₅	V ₅	Ramses	93.33	6.06	7.46	11.26
T ₆	V ₆	Green Aroma	126.09	7.40	7.66	10.93
T ₇	V ₇	Vikram	90.00	6.85	8.63	14.06
T ₈	V ₈	Swathi	87.00	6.26	7.4	7.93
Mean			95.12	6.53	7.52	10.41
F-test			S	S	S	S
C.D. at 0.5%			0.339	0.284	0.284	0.594
S.Ed(+)			0.728	0.610	0.610	1.275

Table.4 Performance of coriander varieties based on quality attributes

Treatment symbol	Notation symbol	Varieties	T.S.S(° Brix)	Protein (%)	Ascorbic acid (mg/100gm)
T ₁	V ₁	WS-201	4.71	21.28	157.58
T ₂	V ₂	Suruchi	5.27	25.76	151.72
T ₃	V ₃	Desi	6.20	27.04	208.60
T ₄	V ₄	Jyoti	4.62	20.93	151.05
T ₅	V ₅	Ramses	5.30	21.48	197.95
T ₆	V ₆	Green Aroma	5.51	20.84	190.00
T ₇	V ₇	Vikram	5.10	21.33	175.20
T ₈	V ₈	Swathi	5.17	23.82	175.42
Mean			5.24	22.81	175.94
F-test			S	S	S
C.D. at 0.5%			0.466	2.220	4.248
S.Ed(+)			0.217	1.035	1.981

The data revealed that significantly highest leaf yield plot⁻¹ (kg) was recorded in variety Desi (419.52kg) than all other variety. This variety was followed by Green Aroma (417.20kg), Suruchi (369.52kg) Swathi

(355.36kg) and Jyoti (348.72kg) and minimum leaf yield plot⁻¹ (kg) was obtained in variety V1 WS-201 (316.72kg). The greater leaf number on November sown crop might have helped in the production of more

metabolites and consequent growth accumulation of total solids which ultimately resulted in the production of larger amount of green leaf yield. November month showing the favourable environmental condition to grow the crop in earlier better leaf yield can be obtained Govindaraj *et al.*, (2019). Highest seed yield plot⁻¹ (kg) was observed in Desi (214.04kg) and other treatments found next in order in this regard as Suruchi (152.80) Jyoti (182.16), Green Aroma (175.60) and Ramses (151.20). Lowest seed yield plant⁻¹ (kg) was found in variety Vikram (118.88kg).

Data in respect of TSS (⁰Brix) as affected by variety are presented in Table 4. It is evident from the data that TSS (⁰Brix) was significantly affected by varieties. The highest TSS (⁰Brix) was found in treatment Desi (6.20) and other variety found next in order in this regard as Suruchi (5.27), Ramses (5.30), Green Aroma (5.51), Vikram (5.10) and Swathi (5.17). Lowest TSS (⁰Brix) was found in treatment WS-201 (4.71). The highest protein (%) content was found in treatment Desi (27.04) and other variety found next in order in this regard as Suruchi (25.76), Ramses (21.48), Vikram (21.33), Swathi (23.82), WS-201 (21.28), Green Aroma (20.93). The highest Ascorbic acid (mg/100g) was found in treatment Desi (208.60 mg /100g) and other variety found next in order in this regard as Ramses (197.95 mg/100g), Green Aroma (190.00 mg/100g), Vikram (175.20 mg/100g) and Swathi (175.42 mg/100g), Jyoti (151.05 mg/100g).

In conclusion among the different varieties of coriander Green Aroma and Desi varieties were found superior in terms of growth and yield and quality attributing traits. Based on the results obtained maximum plant height, number of branches, number of leaves, days to 50% flowering, number of umbels was found better in the variety Green aroma. Herbage Yield, seed yield, T.S.S(⁰Brix),

protein and ascorbic acid was found better in the variety Desi. It conclude that desi variety was found better in terms of yield and quality.

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How to cite this article:

Lavanya Gandepalli and Prasad, V. M. 2020. Evaluation of Coriander (*Coriandrum sativum* L.) Varieties in Prayagraj Agro-climatic Conditions. *Int.J.Curr.Microbiol.App.Sci.* 9(12): 1086-1091. doi: <https://doi.org/10.20546/ijemas.2020.912.130>