



Performance of Different Coriander Varieties for Seed Yield

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ABSTRACT

The present investigation entitled “Performance of different coriander varieties for seed yield” was carried out during rabi season of the year 2013 at the College of Horticulture, Akola. The study consisted of eight coriander varieties using randomized block design and each treatment was replicated thrice. The varieties viz., Hissar Sugandh, Pant Haritima, Sadhana, Swati, CO 4, Hissar Anand, CO 2 and Rajendra Swathi were studied under investigation. The results revealed that variety Pant Haritima was found superior in seed yield (13.33 q/ha) but required more number of days for seed harvesting (131d). The yield contributing parameters like days required for seed harvesting, plant height; leaf area (73.9), number of umbels (20.5), number of umbellate (5.7), number of seed (30.4) and test weight (12.23 g) were observed with maximum numerical values in variety Pant Haritima, than rest of the varieties under study. Amongst the eight coriander varieties, Pant Haritima performed better in almost all the characters. Hence, this variety can be included in further breeding programme for improving the seed yield.

Key Words: Coriander, Pant Haritima, Seed, Yield, Varieties

INTRODUCTION

Coriander (*Coriandrum sativum* L.) is an important seed spices crop of family Apiaceae (Umbelliferae). The area, production and productivity of coriander during 2013 to 2014 in India were 447 thousand ha, 314 thousand mt and 0.7 MT per ha respectively, (Anonymous, 2014). In India it is mainly grown in Rajasthan, Madhya Pradesh, Andhra Pradesh and Tamilnadu. India rank first in terms of area and production in the world (Datta *et al*, 2006). The productivity of coriander seed is about 1145.86 kg/ha only. The low seed yield in coriander is because it is mainly grown on marginal lands with poor management of soil fertility, irrigation, fertilizers, pests and the disease. Since improved varieties are not available the farmers are forced to use local material for sowing, which are variable in productivity and susceptible to various diseases.

For the improvement of seed yield in coriander, it is necessary to gather the information regarding the association of various quantitatively inherited characters with seed yield. Therefore, the present investigation was carried out with the objectives of to study the performance of different coriander varieties for seed yield and to find out suitable variety for seed yield.

MATERIALS AND METHODS

The present investigation was carried out at College of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during rabi season 2013-2014. The experimental material (different varieties of coriander) was procured and collected from different sources (Table 1). The experiment was laid out in randomized block design with eight treatments and three replications. The soil of experimental site was medium black with clay

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soil, well levelled and uniform in topography with appropriate drainage. Land was ploughed once by soil turning plough and thrice with desi plough followed by planking to obtain fine tilth of soil. Well rotten farm yard manure was applied @ 20 t/ha. Neem cake @ 2t/ha was incorporated in the soil during the last ploughing as a preventive measure against termites and other soil insects.

A raised bed was prepared of plot size 1.8m x 2m. The seeds of different varieties were sown bed on 17th of December 2013, before sowing the seeds were pre-treated with thirum @ 2 g/kg seeds, treated seeds were sown apart 30cm between rows and 10cm between plants. The recommended dose of fertilizer 20:30:20 N:P:K kg/ha were applied at the time of field preparation. Full dose of phosphorus, potash and one third of nitrogen were applied at the time of sowing of seeds. Remaining two third dose of nitrogen was top dressed in two equal splits at 30-35 days interval. The growth, flowering and seed yield observation were recorded on five randomly selected plants in each plot. The data of various observations were subjected to statistical analysis as method suggested by Panse and Sukhatme (1957).

Table 1. Different coriander varieties and their sources.

Sr. No	Variety	Source
1	Hissar Sughand	CCS HAU, Hisar
2	Pant Haritima	GBPANT (GBPANT)
3	Sadhana	RRC-Lam (APAU),-Gunter
4	Swati	RRC-Lam (APAU),-Gunter
5	CO-4	Coimbatore (TNAU)
6	Hissar Anand	CCS HAU, Hisar
7	CO-2	Coimbatore (TNAU)
8	Rajendra Swathi	RRC. (RAU) Dolia, Bihar

RESULTS AND DISCUSSION

Growth attributes

There was significant difference among coriander varieties in plant height all the growth stages (Table1). At 30th DAS, variety CO 4 was found to be the tall variety (11cm), followed by Sadhana (10.4cm) which was statistically at par with variety Rajendra Swathi (10.3cm). The variety Hissar Anand was found to be the dwarf variety (6.9cm). At 60th DAS the variety Sadhana was found to be the tall variety (36.5cm), followed by CO 4 (34.6cm), Rajendra Swathi (32.8 cm). The variety Swati was found to be the dwarf variety (22.5cm). At 90th DAS, the variety Sadhana was found to be the tall variety (73.9cm), which was statistically at par with the variety Pant Haritima (73.5 cm), CO 2 (72.9cm), Swati (70.7cm), and variety Rajendra Swathi was recorded the dwarf variety (62.9cm). These differences in plant height among the varieties might be due to the genetic makeup of the plant and its expression to the growing soil and environmental conditions. 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, Meena *et al* (2014) in Pant Haritima variety of coriander, which confirms the results of present investigation.

The average number of primary branches over all the eight varieties was (5.8). The maximum (7.7) number of primary branches was recorded in variety Hissar Anand, which was statistically at par with the variety Pant Haritima (7.4) whereas, the variety Swati produced less number of primary branches (4.8). The significant difference in early stages of growth was observed, as during germination and growth initiation process, the varieties might not have expressed their genetic potential. The findings of Moniruzzaman *et al* (2013) in CS004 variety of coriander, Verma *et al* (2014) in coriander, Meena *et al* (2014) in Pant Haritima variety of coriander, supports the results of present findings. The average

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number of secondary branches over all the eight varieties was found to be 15.3. The maximum (24.0) number of secondary branches were recorded in variety Hissar Anand, which was statistically at par with the variety Pant Haritima (23.5). Variety Swati was found to produce less number of secondary branches (8.3).

Regarding the character leaf area (cm²) for all the eight varieties a range of 11.7 to 21.8 cm² was observed. The average leaf area cm² over all the eight varieties was found to be (17.5 cm²). The leaf area was found maximum (21.8 cm²) in Hissar Anand, which was statistically at par with the variety Pant Haritima (21.6 cm²) and Hissar Sugandha (20.9 cm²). The variety Swati was found to produce less leaf area (11.7 cm²). These variations in leaf area among various varieties of coriander might be attributed to their inherent characters. Maximum leaf area might be helpful for more photosynthesis and making food for better yield potential character of plant growth and produce maximum yield. Similar results were obtained by Meena *et al* (2014) in coriander, which supported the present findings.

Flowering attributes

The data in respect of days required to 50 per cent flowering in coriander as influenced by different varieties are presented in table 2. The character, days to 50 per cent flowering for all the eight varieties ranged between 40.3d to 64d with the average of (53.3d) for 50 per cent flowering. The variety Sadhana required minimum (40.3d) 50 per cent flowering and the variety Hissar Anand required maximum (64d) to 50 per cent flowering, The genotypes Swati (42.7d), CO 2 (51d), CO 4 (52d), Rajendra Swathi (53 d) and Pant Haritima (61d), Hissar Sugandha (63.3d) which was numerically decreased over the variety Hissar Anand.

The significant differences among varieties were observed for number of umbel per plant. The maximum (20.5) numbers of umbel per plant were observed in variety Pant Haritima and the minimum (16.3) number of umbel per plant was observed in Swati. The varieties Hissar Sugandha (19.2), CO 2 (18.2), Hissar Anand (17.2), Sadhana (16.5), Rajendra Swathi (16.8), CO 4 (16.6), which was numerically increased over Swati. The number

Table 2. Performance of different coriander varieties in respect of growth attributes.

Sr. No.	Variety	Plant height (cm)			Number of primary branches	Number of secondary branches	Leaf area in (cm ²)
		30 DAS	60 DAS	90 DAS			
T1	Hissar Sugandh	8.0	23.8	64.1	6.7	17.9	20.9
T2	Pant Haritima	7.3	25.6	73.5	7.4	23.5	21.6
T3	Sadhana	10.4	36.5	73.9	4.9	14.9	14.0
T4	Swati	6.9	23.9	70.7	4.8	8.3	11.7
T5	CO-4	11.0	34.6	64.7	5.5	13.5	16.3
T6	Hissar Anand	7.9	22.5	65.1	7.7	24.0	21.8
T7	CO-2	8.9	28.8	72.9	5.4	10.9	14.8
T8	Rajendra Swathi	10.3	32.8	62.9	5.0	9.0	18.6
SE(m)+		0.083	0.225	1.520	0.23	0.30	0.749
CD at 5%		0.252	0.680	4.589	0.69	0.91	2.254

Table 3. Performance of different coriander varieties in respect of flowering attributes.

Sr. No.	Variety	Days to 50 per cent flowering	Number of umbel per plant	Number of umbellet per umbel
T1	Hissar Sugandh	62.7	19.2	4.5
T2	Pant Haritima	61.0	20.5	5.7
T3	Sadhana	40.3	16.5	4.7
T4	Swati	42.7	16.3	4.4
T5	CO 4	52.0	16.6	5.3
T6	Hissar Anand	64.0	17.2	5.5
T7	CO 2	51.0	18.2	4.3
T8	Rajendra Swathi	53.0	16.8	4.3
SE (m) +		0.295	0.46	0.179
CD at 5 %		0.892	1.39	0.539

of umbel per plant affects to seed yield when increase the umbel per plant. The similar variations in number of umbel per plant among different coriander varieties have reported by Kalidasu *et al* (2008) in sadhana varieties of coriander supports the results of present findings.

The significant differences were observed for number of umbellet per umbel. The highest number of umbellet per umbel which were recording variety Pant Haritima (5.7) was statistically at par with the variety Hissar Anand (5.5) and CO 4 (5.3).

Seed yield attributes

The data in respect of days to seed harvesting in coriander were significantly influenced by different varieties and are presented in table 3. The variety sadhana required minimum days to harvesting (94.3d) followed by the cultivar Swati (97.7d), CO 2 (103.3d), CO-4 (108.3d), Rajendra Swathi (110.3 d), Hissar Anand (116.3 d) and Hissar sugandh (117.3d). The cultivar Pant Haritima required maximum (131.3d) to harvesting. The differences in maturity period can be attributed to genetic differences among the cultivars and ecological as well as climatic condition, as climate during growth and development of plant plays a dominant role in growth, yield and quality of coriander. Similar trend of result was also observed and supports the

results of present findings by Kofidis *et al* (2008) in coriander, Meena *et al* (2010) in coriander.

The number of seed per umbel indicated significant differences among the different coriander varieties. The maximum number of seed per umbel were obtained in the variety Pant Haritima (30.4) which was found to be at par with the variety Swathi (28.5) and CO 2 (26.9). The less number of seed per umbel was obtained in the variety Hissar Anand (18.7). The variety Pant Haritima recorded maximum (12.3g) test weight followed by variety Swati (11.2g) and variety CO 2 (11.1g). The variety CO 4 and Rajendra Swathi recorded minimum (7.3g) test weight. It might be due to the fact that, genetic cause or responses of the particular genotype to the soil and climatic conditions might be reflected in such characters. Similar results were reported by Singh and Singh (2013), Dyulgerov and Dyulgerova (2013) which supports the results of present findings.

The data in respect of seed yields per plant (g) were significantly influenced by the different varieties of coriander (Table 3). The variety Pant Haritima recorded maximum yield per plant (13.4g) followed by cultivars Swati (11.9g), CO 2 (11.3g), Sadhana (10.9g), Hissar Sugandh (10.0g) and Rajendra Swathi (9.6g). The cultivar Hissar Anand

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produced minimum seed yield per plant (7.1g) followed by CO 4 (8.3g). The similar variations in seed yield per plant among different varieties have reported by Moniruzzaman *et al* (2013) in variety CS011 of coriander, Meena *et al* (2013) in coriander, which supports the results of present findings.

The data with respect of seed yield (q/ha) in coriander influenced by different varieties of coriander (Table 3). The results indicated that, the seed yield per hectare was significantly influenced due to different varieties under study. The cultivar Pant Haritima recorded maximum seed yield per ha (13.3q/ha). The cultivar Hissar Anand produced minimum (4.2q/ha) seed yield per ha followed by CO 4 (5.3q/ha). It was observed that, the varieties which performed better in a unit area were likely to perform better on large scale as the yield per hectare was calculated by multiplying yield per plot with hectare factor. The yield is the result of interaction of the variety to a given agro climatic and management factors. The variations in yield among the coriander varieties were also reported by several workers i.e. Yadav (1999) in coriander,

Singh and Singh (2013) in coriander, Meena *et al* (2013) in coriander, Moniruzzaman *et al* (2013) in variety CS011 of coriander which supports the results of present findings.

CONCLUSION

The evaluation of present investigation concluded that, the significant variations were observed in growth, yield and quality parameters of different variety of coriander. The variety Pant Haritima showed significantly superior performance in respect of seed production. Thus, it was concluded that, the various characters of different coriander varieties can be exercised on the varieties possessing more seed yield, more average test weight, number of umbel per plant and more yield useful in identifying the suitable variety.

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Table 4. Performance of different coriander varieties in respect of flowering attributes seed yield attributes.

Sr. No.	Variety	Days to seed harvesting	Number of seed per umbel	Test weight (g) 1000 seed	Seed yield per plant (g)	Seed yield per plot (kg)	Seed yield (q/ha)
T ₁	Hissar Sugandh	117.3	23.9	9.0	10.0	0.4	11.4
T ₂	Pant Haritima	131.3	30.4	12.3	13.4	0.5	13.3
T ₃	Sadhana	94.3	22.7	10.2	10.9	0.3	9.2
T ₄	Swati	97.7	28.5	11.2	11.9	0.3	7.2
T ₅	CO-4	108.3	21.4	7.3	8.3	0.2	5.3
T ₆	Hissar Anand	116.3	18.7	8.2	7.1	0.2	4.2
T ₇	CO-2	103.3	26.9	11.1	11.3	0.4	10.3
T ₈	Rajendra Swathi	110.3	20.1	7.3	9.6	0.3	9.9
SE (m) ±		0.223	1.545	0.210	0.252	0.011	0.112
CD at 5 %		0.672	4.664	0.633	0.760	0.033	0.339

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