Collection and evaluation of leafy coriander genotypes for higher productivity

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Abstract
The present experiment on “Collection and evaluation of leafy coriander genotypes for higher productivity” was carried out at Horticultural College and Research Institute, Periyakulam to identify the promising leafy coriander genotypes suitable for off season leaf production was aimed at. Totally seventeen leafy coriander genotypes were used for this study and were evaluated during the months of April to June (summer) and it was laid out in randomized block design (RBD) and replicated thrice. The split seeds were sown soaked in water for eight hours and sowned at a spacing of 20 x15 cm in flat beds. The bed size was 4 x 2.4 m. Data on growth and yield parameters such as plant height (cm), number of days taken for germination, number of leaves per plant, no. of primary branches, number of secondary branches, plant weight (g), yield per plot (kg/ 10m²), net profit (Rs.) and B:C ratio were recorded and analysed statistically. The results revealed that among the twenty two leafy coriander genotypes evaluated Acr-1 recorded the highest values of growth, yield parameters and economic values. Acr-1 recorded the highest values of characters viz., plant height (31.77 days), number of leaves per plant (6.40), number of primary branches (6.40), number of secondary branches (16.47), plant weight (7.50g), yield per plot (3.87 kg/10m²) and estimated yield (3.83 t/ha), followed by CS – 38 and LCC-232 recorded the higher values then rest of the genotypes. Acr-1 recorded the lowest days taken for germination (6.00 days) when compared with other genotypes studied. In the case of cost economics, Acr-1 recorded the highest benefit cost ratio of 4.04 with net profit of Rs. 1,41,000. However, genotype LCC 244 recorded the lowest values in all the growth, yield and economic characters. Among the leafy coriander genotypes, Acr-1 performed better and recorded the highest yield with benefit cost ratio as well as other growth characters and hence highly suitable for Periyakulam condition during summer months.

Keywords: Coriander, leaf production, genotypes, yield, plant height

Introduction
Coriander botanically called as Coriandrum sativum L., and belongs to the family Apiaceae. Coriander is used as both spices and condiment for its medicinal properties as well as culinary purposes. Besides seeds, green leaves of coriander are also extensively used for culinary purposes. It is an annual spice and condiments herb that is mostly used for pleasant aromatic odour. The aroma and test in coriander are due to the presence of essential oil, which is used for flavoring liquors, cocoa preparations in confectionary and the mask offensive odours in pharmaceutical preparations (Farooqi, 2005) [2]. In India coriander is cultivated Gujarat, Rajasthan, Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra, Odissa in larger areas. Among the states of India, Rajasthan is a major coriander producer. India is rank first in terms of area and production in the world (Datta et al, 2006) [1]. The productivity of coriander is very low in Tamil Nadu when compared with Rajasthan and Gujarat. In Tamil Nadu, coriander is extensively cultivated in almost all the districts and getting very low productivity. In general, leafy coriander cultivation quite difficult during summer months due to prevailing of hot weather conditions. Hence, during summer months considered as off season production. During this period coriander leaf fetches higher price in the market. By cultivating genotypes of leafy coriander during summer months the farmers could get higher profit. Keeping above facts into consideration, it was felt necessary to consider this aspect for research on “Collection and evaluation of leafy coriander genotypes for higher productivity” with the objective to identifying high yielding leafy coriander genotype for green leaf purpose suitable for off season cultivation under shade net condition.
Materials and methods
The present field experiment was conducted at Horticultural College and Research Institute, Periyakulam during the months of April to June (summer months). The objective of the present study is evaluation of suitable off season coriander genotypes for higher productivity during summer months under shade net condition. There were fifteen leafy coriander genotypes and two checks (CO-4 and Sadhana -1) were used for this study. The trial was laid out in randomized block design (RBD) with replicated thrice. The split seeds of the coriander were sown at a spacing of 20 x 15 cm. The bed size is 4x2.4 m. Source of collection of seventeen leafy coriander genotypes are given in Table1. Land was ploughed thoroughly and 25 t/ha well rotten farm yard manure was applied during last ploughing. Neem cake @ 2t/ha was incorporated in the soil during the last ploughing as a preventive measure against termites and other soil insects. 2.5 kg of *Pseudomonas fluorescens* were applied and incorporated into the soil. The half of N&K applied as basal and another half was applied 20 days after sowing. P applied as basal application. Five randomly selected plants in each genotype in each replication were tagged for recording observations on growth, yield and quality characters. The growth and yield parameters on days taken for germination (days), number of leaves per plant, plant height (cm), plant weight (g), number of primary branches, number of secondary branches, yield per plot (g/10m²), estimated yield (t/ha) and B:C ratio were recorded and mean values were subjected to statistical analysis as per the method was suggested by Panse and Sukhatme (1978).

Results and discussion
The results of the morphological traits of seventeen leafy coriander genotypes are presented in Table 2. There was significant difference among leafy coriander genotypes in growth and yield characters. The results revealed that days taken for germination varied from 6.00 to 7.67. Genotype Acr-1 recorded the least number of days (6.00 days) taken for germination followed by CS- II and CS-38 (6.33 days). The longest days taken for germination were observed in the genotype LCC 244 (7.67 days). This might be due to genetic makeup of the genotypes.

Growth characters
The results revealed that among the coriander genotypes, Acr-1 recorded the highest values of the growth characters like number of leaves per plant (6.80 days), number of primary branches (6.40) and number of secondary branches (16.47) was recorded followed by CS-38 (6.50, 6.22; 15.49). The lowest values were observed in the genotype LCC 244 (5.97; 4.85; 8.3). The variations in primary and secondary branches could be due to genetic character of genotype and environmental influence. The variations in primary and secondary branches were occurred in coriander was reported by Selvarajan *et al.,* (2002) and Saxena *et al.,* (2005). In the case of plant height the same trend was observed. The tallest plant (23.33 cm) was noticed in Acr-1 followed by CO38 (22.63 cm) where as the lowest plant height was observed in LCC 244 (16.63 cm). Regarding plant weight character, Acr-1 recorded the highest weight of 7.50 g followed by CS-38 (7.27 g) and the lowest plant weight was found in LCC 244 (5.93 g). 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, season and environmental conditions. The variation in plant growth characters of different coriander varieties were also observed by Kalidasu *et al* (2008) [4], Verma *et al* (2014) [11] and Meena *et al* (2014) [7] in coriander.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Genotypes</th>
<th>Source of collection of genotypes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>CS-1</td>
<td>HC&amp;RI, TNAU, Coimbatore</td>
</tr>
<tr>
<td>2.</td>
<td>CS-2</td>
<td>HC&amp;RI, TNAU, Coimbatore</td>
</tr>
<tr>
<td>3.</td>
<td>CS-38</td>
<td>HC&amp;RI, TNAU, Coimbatore</td>
</tr>
<tr>
<td>4.</td>
<td>LCC-210</td>
<td>Lam, Guntur</td>
</tr>
<tr>
<td>5.</td>
<td>LCC-212</td>
<td>Lam, Guntur</td>
</tr>
<tr>
<td>6.</td>
<td>LCC-219</td>
<td>Lam, Guntur</td>
</tr>
<tr>
<td>7.</td>
<td>LCC-224</td>
<td>Lam, Guntur</td>
</tr>
<tr>
<td>8.</td>
<td>LCC-225</td>
<td>Lam, Guntur</td>
</tr>
<tr>
<td>9.</td>
<td>LCC-226</td>
<td>Lam, Guntur</td>
</tr>
<tr>
<td>10.</td>
<td>LCC-227</td>
<td>Lam, Guntur</td>
</tr>
<tr>
<td>11.</td>
<td>LCC-229</td>
<td>Lam, Guntur</td>
</tr>
<tr>
<td>12.</td>
<td>LCC-234</td>
<td>Lam, Guntur</td>
</tr>
<tr>
<td>13.</td>
<td>LCC-242</td>
<td>Lam, Guntur</td>
</tr>
<tr>
<td>14.</td>
<td>LCC-244</td>
<td>Lam, Guntur</td>
</tr>
<tr>
<td>15.</td>
<td>Acr-1</td>
<td>NRCSS, ICAR, Ajmeer</td>
</tr>
<tr>
<td>16.</td>
<td>CO-4</td>
<td>HC&amp;RI, TNAU, Coimbatore</td>
</tr>
<tr>
<td>17.</td>
<td>Sadhana 1</td>
<td>Lam, Guntur</td>
</tr>
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</table>

Table 2: Evaluation of off season leafy coriander genotypes for growth characters.

<table>
<thead>
<tr>
<th>Genotypes</th>
<th>Days taken for germination (days)</th>
<th>Number of leaves per plant</th>
<th>No. of primary branches</th>
<th>No. of secondary branches</th>
<th>Plant height (cm)</th>
<th>Plant weight (g)</th>
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<tbody>
<tr>
<td>CS-1</td>
<td>6.00</td>
<td>6.20</td>
<td>5.90</td>
<td>14.98</td>
<td>18.50</td>
<td>6.20</td>
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<td>CS-2</td>
<td>6.33</td>
<td>6.33</td>
<td>6.10</td>
<td>15.04</td>
<td>20.67</td>
<td>6.56</td>
</tr>
<tr>
<td>CS-38</td>
<td>6.33</td>
<td>6.50</td>
<td>6.20</td>
<td>15.49</td>
<td>22.60</td>
<td>7.27</td>
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<td>6.57</td>
<td>6.17</td>
<td>5.20</td>
<td>9.85</td>
<td>19.37</td>
<td>5.97</td>
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<td>6.20</td>
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<td>18.73</td>
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<td>6.17</td>
<td>5.30</td>
<td>14.05</td>
<td>18.27</td>
<td>5.93</td>
</tr>
<tr>
<td>LCC-224</td>
<td>7.00</td>
<td>6.50</td>
<td>5.30</td>
<td>11.47</td>
<td>22.63</td>
<td>6.70</td>
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<td>6.07</td>
<td>4.80</td>
<td>12.07</td>
<td>17.40</td>
<td>5.60</td>
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</table>
Yield characters
The results of the yield and economical characters of seventeen leafy coriander genotypes are presented in Table 3. The results revealed that the highest leaf yield per plot was recorded in Acr-1 (3.87 kg/10m²) genotype which was higher than among the seventeen leafy coriander genotypes were studied. The next higher yield was obtained from CO-38 (3.67 kg/10m²). The lowest leaf yield per plot was found in genotype LCC 244 (2.77 kg/10m²). The same trend was noticed in estimated yield character also. Yield per ha was ranged from 3.87 t/ha to 2.77 t/ha. Acr-1 recorded the highest yield per ha of 3.87 t/ha followed by CO-38 and Sadhana-1 (3.67 t/ha). The lowest yield found in LCC 244 (2.77 t/ha). This is to confirm that Ajmer Coriander was recorded the highest yield under Rajasthan condition (Lal et al., 2014) [8]. Irenevedamani et al. 2014 reported that coriander variety CO-4 recorded the highest yield under insect proof net house. Kalidasa et al (2008) [4] reported that highest leaf yield was recorded in the genotype Acr-1 under Andhra Pradesh condition.

Economies
In the case of benefit cost ratio, Acr-1 recorded the highest ratio of 4.04 with net profit of Rs. 1,42,000 followed by CS 38 (3.97; Rs. 1,37,000) whereas the lowest B:C ratio (3.03) with net profit (Rs. 94,500) was observed in LCC 244.

Conclusion
From the conclusion of the present study revealed that, the significant variations were observed in growth and yield parameters of different genotypes of leafy coriander. Among the promising leafy coriander genotypes Acr -1 recorded the highest leaf yield of 3.87 t/ha with net profit of Rs. 1,42,000 and B:C ratio of 4.04 followed by CS – 38 and LCC 242 were also recorded the higher leaf yield under shade net condition (off season) during summer months. These three genotypes like Acr-1, CS – 38 and LCC 242 also required further evaluation for ensuing season.

References

<table>
<thead>
<tr>
<th>Genotypes</th>
<th>Leaf yield per plot (kg/plot) (10m²)</th>
<th>Estimated yield (t/ha)</th>
<th>Net Profit (Rs.)</th>
<th>B:C Ratio</th>
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<tr>
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<td>3.17</td>
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<tr>
<td>LCC - 212</td>
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<td>3.33</td>
<td>94,500</td>
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<td>2.83</td>
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<tr>
<td>LCC - 242</td>
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<td>1,35,000</td>
<td>3.94</td>
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<tr>
<td>LCC - 244</td>
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<td>94,500</td>
<td>3.03</td>
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<tr>
<td>Acr-1</td>
<td>3.87</td>
<td>3.87</td>
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<td>4.04</td>
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<td>CO-4</td>
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<td>Sadhana-1</td>
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<td>SEd</td>
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<td>CD (0.05%)</td>
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