Studies on varietal performance of turmeric (Curcuma longa L.)

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Abstract

A field experiment was conducted in the year 2002-03 and 2003-04 at Bareilly, district of UP in randomized block design with four replications using five varieties of turmeric viz. Krishna, Suvarna, Rajendra Sonia, Suguna and Sudarshana. Average of two years pooled data revealed that the variety Krishna recorded highest fresh (405.60 q/ha) and cured rhizome (65.80 q/ha) yield followed by Rajendra Sonia and Suvarna, while in curing percentage, Suvarna (20.68%) was found to be superior followed by Rajendra Sonia and Krishna. With regard to rhizome numbers and their size, Krishna produced more rhizomes (11.48), maximum length (10.20 cm) and girth (2.45 cm) followed by Rajendra Sonia. The varieties Suvarna, Rajendra Sonia, Suguna and Sudarshan were found to be early duration types (190 to 210 days) compared to Krishna, which matured relatively late (255 days). Krishna recorded significantly highest shoot dry weight (19.54 g) followed by Rajendra Sonia (17.96 g) at maturity.

Key words: Turmeric, performance, varieties, Curcuma longa

Introduction

Turmeric (Curcuma longa L.) is one of the important spice crops in India and plays a vital role in the national economy. India is the largest producer and exporter of turmeric in the world and accounts for more than 50 per cent of the World trade (Philip, 1983). Though wide genetic variability exists in this crop with regard to the yield and yield attributes, however, not much work has been done on crop improvement through the selection of superior types with high yield in Tarai region of Uttar Pradesh. Hence, the present study was carried out to evaluate the performance of different varieties with regard to yield and yield components of turmeric.

Materials and methods

The field experiment was conducted at Bareilly district of Uttar Pradesh during the year 2002-03 and 2003-04. The trials were laid out in randomized block design (RBD) with four replications using five varieties of turmeric viz. Krishna, Suvarna, Rajendra Sonia, Suguna and Sudarshan. The net plot size was 4 x 2m and rhizomes were planted in second week of April each year in ridge and furrow method with a spacing of 40 x 20 cm. The observations on yield and yield attributes were recorded during both the years and pooled analysis was done.

Results and discussion

A perusal of data presented in Table 1 shows highly significant variations among the cultivars for fresh and cured yield. Further, it was noted that yield attributing characters such as rhizome length, breadth, number and curing percentage varied significantly among cultivars. The most important yield contributing character in turmeric is the number of rhizomes and their size (Chadha, 2001). More number of rhizomes per plant were produced by Krishna (11.48) closely followed by Rajendra Sonia (10.22). However, Sudarshan and Suguna produced less number of rhizomes per plant. The length pf rhizomes varied from 6.27 cm in Suguna to 10.20 cm in Krishna whereas rhizome girth at center varied from 1.62 cm in Suguna to 2.45 cm in Krishna. Krishna and Rajendra Sonia produced thick and large rhizomes whereas short and thick rhizomes were observed in Suguna and Suvarna. Chadha (1994) reported 4 to 7 rhizomes in variety Suguna and found the varieties, Suvarna and Sudarshan with rhizome length 6 cm to 8.8 cm respectively. Similar results were observed in the present investigation. Philip and Nair (1983) reported the range of rhizome length from 12.1 cm in cv. Chayapasupa to 7.3 cm in duggirala C 17-325. This range is in line with the present findings. The data presented in Table 1 showed highly significant variation among the turmeric types with regard to the yield of green turmeric per hectare and percentage recovery of the cured produce. Variety Krishna produced significantly more green turmeric per hectare (405.60 q) than all other varieties, followed by Rajendra Sonia, whereas, the variety Suguna recorded significantly lower green yield per hectare. Similar results were obtained by Pujari et al. (1987) in the variety Krishna. Ramakrishna et al. (1995) reported 191.50 q/ha fresh rhizome yield in variety Suguna and Hegde et al. (1997) obtained the fresh rhizome yield of 215.50 and 196.30 q per ha from Sudarshan and Suguna respectively. Similar yield were obtained in the above varieties in the present investigation under Bareilly conditions. It was noted that varieties, Krishna and Rajendra Sonia produced bold, plump, thick and larger rhizomes, and attained higher green yield.
Length and girth of rhizomes correlated positively with the green yield because of higher weight due to higher girth and the plants with longer primary rhizomes naturally produced more secondary rhizomes and consequently the yield was more. These results are in agreement with the findings of Philip and Nair (1983). Cured percentage (driage) is an important factor as the fresh rhizomes are to be cured to obtain marketable turmeric. Maximum recovery of the cured produce was recorded in Suvarna followed by Rajendra Sonia and Krishna. Cured turmeric is also one of the important attributes in grading the turmeric produced for export and domestic market. The yield of cured produce per ha was found to be maximum in Krishna (65.80 q) followed by Rajendra Sonia (60.18 q) whereas comparatively lower yield was recorded in Suguna (22.56 q). The variation in rhizome characters, fresh yield and recovery percentage among various turmeric varieties could be due to genetic factors rather than the environmental conditions as reported by Aiyadurai (1966) and Subbarayudu et al. (1976).

Thus, it can be concluded that among the turmeric varieties evaluated under Bareilly conditions, the variety Krishna produced highest fresh and cured rhizome yield, highest number and maximum length and girth of rhizomes shoot dry weight, whereas maximum curing percentage were observed in the variety Suvarna. Further, the varieties Suguna, Sudarshan, Suvarna and Rajendra Sonia were found to be early duration types as compared to Krishna.

### References


### Table 1. Studies on yield and yield attributes of turmeric varieties

<table>
<thead>
<tr>
<th>Types</th>
<th>Rhizomes per plant</th>
<th>Length of the rhizome (cm)</th>
<th>Rhizome girth (cm)</th>
<th>Gross yield of green turmeric per ha (q)</th>
<th>Curing percentage (%)</th>
<th>Cured turmeric per ha (q)</th>
<th>Dry weight of shoot (g)</th>
<th>Crop duration (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Krishna</td>
<td>11.48</td>
<td>10.20</td>
<td>2.45</td>
<td>405.60</td>
<td>16.23</td>
<td>65.80</td>
<td>19.54</td>
<td>255.20</td>
</tr>
<tr>
<td>Suvarna</td>
<td>8.19</td>
<td>6.36</td>
<td>1.70</td>
<td>209.19</td>
<td>20.68</td>
<td>43.26</td>
<td>17.44</td>
<td>213.16</td>
</tr>
<tr>
<td>Rajendra Sonia</td>
<td>10.22</td>
<td>8.13</td>
<td>1.95</td>
<td>348.44</td>
<td>17.27</td>
<td>60.18</td>
<td>17.96</td>
<td>230.06</td>
</tr>
<tr>
<td>Suguna</td>
<td>6.73</td>
<td>6.27</td>
<td>1.62</td>
<td>171.97</td>
<td>13.12</td>
<td>22.56</td>
<td>14.56</td>
<td>196.00</td>
</tr>
<tr>
<td>Sudarshan</td>
<td>5.06</td>
<td>7.40</td>
<td>1.84</td>
<td>179.73</td>
<td>12.86</td>
<td>23.11</td>
<td>13.86</td>
<td>210.48</td>
</tr>
<tr>
<td>CD at 5%</td>
<td>1.942</td>
<td>1.261</td>
<td>0.319</td>
<td>61.168</td>
<td>3.022</td>
<td>8.275</td>
<td>1.484</td>
<td>22.63</td>
</tr>
</tbody>
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