YIELD PERFORMANCE OF TIKHUR (CURCUMA ANGUSTIFOLIA ROXB.)
GENOTYPES IN NARAYANPUR DISTRICT OF CHHATTISGARH

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Abstract: The investigation was undertaken during the year of kharif season 2014-15 and 2015-16 at demonstration farm of
KVK, Narayanpur. The experiment was laid out in Randomized Complete Block Design (RCBD) and experiment was
conducted for evaluation of six genotypes of Tikhur (IGSJT-10-1, IGSJT-10-2, IGBLT-10-1, IGBT-10-4, IGDMT-10-1 and
Local Check) with three replications. The genotypes were grown randomly in each replication/block in a total of 18 plots of
3.0 m x 2.4 m each containing 60 plants per plot and planting spacing was 60 x 20 cm. Observations were recorded from ten
randomly selected sample plants in each treatment and observed mean value used for statistical analysis. The result revealed
that the maximum rhizome weight (327.5 g plant⁻¹) maximum rhizome yield (27.30 t ha⁻¹) and starch recovery 14.29 per cent
was recorded in genotype IGSJT-10-2 and followed by IGSJT-10-1. On the basis of experimental results of two years pooled
data the genotype IGSJT-10-2 may be recommended to farmers of Narayanpur district for commercial production.

Keywords: Tikhur, Curcuma angustifolia Roxb., Rhizome yield, Starch recovery per cent MLT

INTRODUCTION

Tikhur (Curcuma angustifolia, family Zingiberaceae) is a rhizomatous herb also known as white turmeric or East Indian Arrowroot. It’s
cultivation has now been undertaken by the farmers of Bastar on a large area. Tikhur cultivated as medicinal crop in many parts of the state under moist
deciduous mixed and sal forest of Madhya Pradesh, Chhattisgarh and Jharkhand. It is generally propagated by rhizomes and good source of starch
and fibre (Misra and Dixit, 1983). Tikhur is also found in central province, Bihar, Maharashtra and Southern part of India. In undivided Madhya
Pradesh, it is widely distributed in Bastar, Balaghat, Chhindwara, Surguja, Bilaspur, Raipur & Mandla
districts (Kirtikar and Basu, 1918). In Chhattisgarh, it is
found abundantly in the hilly tracts and forests of Bastar, Dantewada, Bijapur, Narayanpur, Kanker, Rajnandgaon, Kawardha, Dhamtari, Bilaspur,
Raipur, Korba, Korea and Surguja districts. The total collection of tikhur rhizome as a minor forest produce in Chhattisgarh is 1,90.00 tonnes. Bastar and
Bilashpur divisions are the major potential area of the state for tikhur (Anonymous, 2005).
The farmers of Chhattisgarh reside vicinity to the forest, collect naturally grown tikhur rhizomes as a
minor forest produce and some farmers grown commercially in their kitchen garden and badi
farming system. Farmers grown unidentified locally available genotypes of tikhur for rhizome production and
doing processing of rhizomes through traditional method for starch extraction. Farmers yielded less
starch due to lack of improved and high starch yielding genotype. Very little information is available
regarding this crop especially collection and
evaluation under agro-climatic condition of Chhattisgarh. These kinds of work would ensure ex-
situ conservation of tikhur plants, besides the economical up scaling of farmers and the
augmentation of supply of raw material to pharmaceutical industries.

Looking to the importance of the crop for people of the Chhattisgarh an investigation entitled “Yield
Performance of Tikhur (Curcuma angustifolia Roxb.) genotypes under Multilocational Trial in
Narayanpur District of Chhattisgarh” was conducted with the objectives viz. to study the performance of
different genotypes of tikhur for growth, rhizome and
starch yield.

MATERIAL AND METHOD

The present investigation was conducted at Krishi Vigyan Kendra Farm (IGKV), Narayanpur, Bastar,
Chhattisgarh during Kharif seasons of 2014-15 and 2015-16. Six genotypes of Tikhur were provided
from SG CARS, AICRP on Tuber Crops under MLT
for evaluation of the genotypes in Narayanpur district of Chhattisgarh.
The experiment was laid out in Randomized Complete Block Design (RCBD) with 6 genotypes of
tikhur with three replications. The experimental field
was prepared by two ploughing upto a depth of 30 cm and FYM thoroughly mixed with soil as pH of
soil was slightly basic in nature. Raised 30 cm
planting beds as plot was made to overcome water
logging condition and prepared proper drainage
channels.
Farm yard manure was applied 20 tones/ha and N: 40
kg/ha, P₂O₅: 20 kg/ha, K₂O: 40 kg/ha during the crop
season. Full dose of FYM mixed in plots during field
preparation. Half dose of N and full dose of P and K was mixed in the plots before planting (basal dose) and remaining half dose was applied 45 days after planting during intercultural operation and earthing-up for better rhizome yield. The genotypes were grown randomly in each replication/block in a total of 18 plots of 3.0 m x 2.4 m each containing 60 plants per plot and spacing was 60 x 20 cm. The crop was grown under rainfed conditions for 6 months. All the observations were taken from sprouting of rhizomes and up to maturity. The harvested rhizomes were cleaned up and mother rhizomes and finger rhizomes were separated. Growth observations were taken during maturity of the crop and rhizome yield and starch recovery observations were taken after harvesting of the rhizome.

RESULT AND DISCUSSION

The results of Performance of Tikhur (Curcuma angustifolia Roxb.) genotypes under Multilocational Trial in Naraynapur District of Chhattisgarh are presented in Table 1 to 3. The mean performance of genotypes for total rhizome yield t/ha, starch recovery (%) and its component characters (Table 1, 2 & 3) for the year 2014-15, 2015-16 and pooled mean of both the years are described below.

Highest plant height (141.67 cm) was observed in genotypes IGSJT-10-1 followed by IGDMT-10-1 (141.23 cm) and lowest plant height (83.27 cm) was observed in Local Check during the year 2014-15. Highest plant height (75.53 cm) was observed in genotypes IGDSJT-10-1 followed by IGDMT-10-1 (72.80 cm) and ITSJT-10-2 (69.00 cm) lowest plant height (45.07 cm) was observed in IGLBT-10-1 during the year 2015-16. Plant height ranged from 66.60 cm (Local Check) to 108.60 cm (IGSJT-10-1) average of both the years 2014-15 and 2015-16.

Maximum number of leaves per plant (13.53) was recorded in Local Check followed by IGSJT-10-1 (12.87) and minimum was 10.93 in genotype IGSJT-10-2 during the year 2014-15. Maximum number of leaves per plant (8.67) was recorded in Local Check followed by IGSJT-10-1 (7.47) and minimum was 5.33 in genotype IGSJT-10-2 during the year 2015-16. Number of leaves per plant ranged from 8.13 (IGSJ-10-2) to 11.10 (Local check) average of both the years 2014-15 and 2015-16.

The maximum rhizome weight per plant (334 g) was recorded in entry IGSJT-10-2 and lowest rhizome weight per plant (219 g) was recorded in Local Check during the year 2014-15. The maximum rhizome weight per plant (321 g) was recorded in entry IGSJT-10-2 and lowest rhizome weight per plant (206 g) was recorded in Local Check during the year 2015-16. The rhizome weight per plant ranged from 327.50 (IGSJT-10-2) to 212.50 (Local Check) average of both the years 2014-15 and 2015-16.

The highest rhizome yield (27.85 t. ha⁻¹) was recorded in entry IGSJT-10-2 followed by IGSJT-10-1 (26.13 t. ha⁻¹) and lowest rhizome yield (18.26 t. ha⁻¹) was recorded in Local Check during the year 2014-15. The highest rhizome yield (26.75 t. ha⁻¹) was recorded in entry IGSJT-10-2 followed by IGSJT-10-1 (25.44 t. ha⁻¹) and lowest rhizome yield (17.19 t. ha⁻¹) was recorded in Local Check during the year 2015-16. The rhizome yield t. ha⁻¹ ranged from 27.30 (IGSJT-10-2) to 17.70 (Local Check) which is average of both the years 2014-15 and 2015-16.

The highest starch recovery per cent (14.38 %) was recorded in entry IGSJT-10-2 followed by IGSJT-10-1 (13.38 %) and lowest was (8.92 %) was recorded in Local Check during the year 2014-15. The highest starch recovery per cent (14.20 %) was recorded in entry IGSJT-10-2 followed by IGSJT-10-1 (12.93 %) and lowest was (8.52 %) was recorded in Local Check during the year 2015-16. The starch recovery per cent ranged from 14.29 % (IGSJ-10-2) to 8.72 % (Local Check) which is average of both the years 2014-15 and 2015-16.


CONCLUSION

The genotypes IGSJT-10-2 and IGSJT-10-1 observed the highest rhizome yield tonne per ha and starch recovery per cent as well as mean performance under yield attributing characters of plant and rhizome for plant height, number of leaves per plant, rhizome weight per plant, total rhizome yield t.ha⁻¹ and starch recovery per cent as compared to local check.

### Table 1. Performance of Tikhur genotypes under MLT during: 2014-15

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of Genotype/ Variety</th>
<th>Plant height (cm)</th>
<th>No. of leaves Plant⁻¹</th>
<th>Rhizome weight plant⁻¹ (g)</th>
<th>Rhizome yield t. ha⁻¹</th>
<th>Starch Recovery (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>IGSJT-10-1</td>
<td>141.67</td>
<td>12.87</td>
<td>314</td>
<td>26.13</td>
<td>13.38</td>
</tr>
<tr>
<td>2.</td>
<td>IGSJT-10-2</td>
<td>89.21</td>
<td>10.93</td>
<td>334</td>
<td>27.85</td>
<td>14.38</td>
</tr>
<tr>
<td>3.</td>
<td>IGLJT-10-1</td>
<td>103.21</td>
<td>11.53</td>
<td>231</td>
<td>19.21</td>
<td>10.39</td>
</tr>
</tbody>
</table>
Table 2. Performance of Tikhur genotypes under MLT during: 2015-16

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of Genotype/ Variety</th>
<th>Plant height (cm)</th>
<th>No. of leaves Plant $^1$</th>
<th>Rhizome weight plant $^1$ (g)</th>
<th>Rhizome yield t.ha $^1$</th>
<th>Starch Recovery (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>IGSJT-10-1</td>
<td>75.53</td>
<td>7.47</td>
<td>305</td>
<td>25.44</td>
<td>12.93</td>
</tr>
<tr>
<td>2.</td>
<td>IGSJT-10-2</td>
<td>69.00</td>
<td>5.33</td>
<td>321</td>
<td>26.75</td>
<td>14.20</td>
</tr>
<tr>
<td>3.</td>
<td>IGBLT-10-1</td>
<td>45.07</td>
<td>6.80</td>
<td>318</td>
<td>18.55</td>
<td>10.05</td>
</tr>
<tr>
<td>4.</td>
<td>IGBT-10-4</td>
<td>61.37</td>
<td>5.66</td>
<td>257</td>
<td>21.39</td>
<td>9.64</td>
</tr>
<tr>
<td>5.</td>
<td>IGDMT-10-1</td>
<td>72.80</td>
<td>6.27</td>
<td>229</td>
<td>19.05</td>
<td>9.13</td>
</tr>
<tr>
<td>6.</td>
<td>Local Check</td>
<td>49.60</td>
<td>8.67</td>
<td>206</td>
<td>17.19</td>
<td>8.52</td>
</tr>
</tbody>
</table>

CD (at 5 %) | 6.022  | 1.510  | 5.559  | 2.231  | 0.68 |
SE $\bar{m}$ | 1.887  | 0.473  | 1.742  | 0.699  | 0.213 |
CV %      | 3.017  | 6.804  | 1.125  | 5.442  | 3.356 |

Table 3. Mean Performance of Tikhur genotypes under MLT (Pooled Mean: 2014-15 & 2015-16)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of Genotype/ Variety</th>
<th>Plant height (cm)</th>
<th>No. of leaves Plant $^1$</th>
<th>Rhizome weight plant $^1$ (g)</th>
<th>Rhizome yield t.ha $^1$</th>
<th>Starch Recovery (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>IGSJT-10-1</td>
<td>108.60</td>
<td>10.17</td>
<td>309.50</td>
<td>25.79</td>
<td>13.16</td>
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<tr>
<td>2.</td>
<td>IGSJT-10-2</td>
<td>79.11</td>
<td>8.13</td>
<td>327.50</td>
<td>27.30</td>
<td>14.29</td>
</tr>
<tr>
<td>3.</td>
<td>IGBLT-10-1</td>
<td>74.14</td>
<td>9.17</td>
<td>274.50</td>
<td>18.88</td>
<td>10.22</td>
</tr>
<tr>
<td>4.</td>
<td>IGBT-10-4</td>
<td>76.37</td>
<td>8.37</td>
<td>263.50</td>
<td>21.94</td>
<td>9.61</td>
</tr>
<tr>
<td>5.</td>
<td>IGDMT-10-1</td>
<td>107.02</td>
<td>9.30</td>
<td>235.00</td>
<td>19.56</td>
<td>9.25</td>
</tr>
<tr>
<td>6.</td>
<td>Local Check</td>
<td>66.44</td>
<td>11.10</td>
<td>212.50</td>
<td>17.73</td>
<td>8.72</td>
</tr>
</tbody>
</table>

Range | 108.60-66.60 | 11.10-8.13 | 327.50-212.50 | 27.30-17.70 | 14.29-8.72 |

REFERENCES


Vimala, B. (2002). Exploration of lesser known starchy tuber crops, evaluation and utilization. Annual Report, All India Coordinated Research Project on Tuber Crops, Central Tuber Crops Research Institute, (ICAR), Thiruvananthapuram, Kerala, India. pp 75 - 76.