COMMERCIAL TEST REPORT

COMMERCIAL TEST REPORT

ROTAVATOR
“GRTC 17542”

GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE
(DEPARTMENT OF AGRICULTURE & COOPERATION)

NORTHERN REGION FARM MACHINERY TRAINING AND TESTING INSTITUTE
TRACTOR NAGAR, SIRSA ROAD, HISAR-125001 (HARYANA)

Telephone: 01662-276824, 276172
Website: http://dacnet.nic.in/nrfmtti

Telefax No.: 01662-276984
E-Mail: fmti-nr@nic.in
6. **FIELD TEST**

The field tests of the implement comprising of dry and wet land operations were conducted for 20.0 & 15.0 hours respectively in different soil moisture conditions to assess the performance of the implement. The details of tractor used for field operations are given in Annexure-I.

The tractor’s PTO speed was maintained at 540 rpm. The performance of implement is reported in Annexure-II, III and summarized in Table-3.

**Summary of field performance**

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Parameters</th>
<th>Dry land operation</th>
<th>Wet land operation (puddling)</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>Tractor used</td>
<td>Powertrac-455</td>
<td></td>
</tr>
<tr>
<td>ii)</td>
<td>Type of soil</td>
<td>Sandy loam</td>
<td></td>
</tr>
<tr>
<td>iii)</td>
<td>Av. Soil moisture,%</td>
<td>9.7 to 10.2</td>
<td>9.1 to 10.3</td>
</tr>
<tr>
<td>iv)</td>
<td>Depth of standing water, cm</td>
<td>--</td>
<td>60.0 to 90.9</td>
</tr>
<tr>
<td>vi)</td>
<td>Field efficiency, %</td>
<td>70.7 to 81.2</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Puddling Index, %</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>vii)</td>
<td>Av. Speed of operation, kmph</td>
<td>3.24 to 3.57</td>
<td>2.85 to 2.89</td>
</tr>
<tr>
<td>viii)</td>
<td>Av. Depth of cut, cm</td>
<td>8.1 to 10.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Av. depth of puddle, cm</td>
<td>-</td>
<td>11.3 to 13.7</td>
</tr>
<tr>
<td>ix)</td>
<td>Av. Working width, m</td>
<td>1.71 to 1.90</td>
<td>--</td>
</tr>
<tr>
<td>x)</td>
<td>Area covered, ha/h</td>
<td>0.426 to 0.576</td>
<td>0.229 to 0.295</td>
</tr>
<tr>
<td>xi)</td>
<td>Time required for one hectare, h</td>
<td>1.74 to 2.18</td>
<td>3.39 to 4.38</td>
</tr>
<tr>
<td></td>
<td>Fuel consumption</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- l/h</td>
<td>3.500 to 4.873</td>
<td>2.844 to 3.886</td>
</tr>
<tr>
<td></td>
<td>- l/ha</td>
<td>7.507 to 9.427</td>
<td>9.807 to 16.968</td>
</tr>
</tbody>
</table>

**6.1 Rate of Work**

6.1.1 Dry land operation
- The rate of work in sandy soil was recorded 0.426 to 0.576 ha/h and the speed operation was 3.24 to 3.57 kmph.
- The time required to cover one hectare area was recorded as 1.74 to 2.18 h.

6.1.2 Wet land operation
- Speed of operation varied from 2.85 to 2.89 kmph.

**6.2 Quality of work**

6.2.1 Dry land operation
- The depth of operation was recorded as 8.1 to 10.0 cm.
- The field efficiency was recorded as 70.7 to 81.2 %.
8. EASE OF OPERATION, ADJUSTMENTS & SAFETY
8.1 The drive shaft (universal coupling shaft) is provided with shear bolt for safety.
8.2 The propeller shaft has telescopic sections with universal joints, to adjust the length of drive shaft, which is adequate.
8.3 Depth adjustment can be made by raising or lowering the skids.
8.4 Operator has to get down from tractor to make any adjustment in rotavator.
8.5 Implement has provision to vary rotor shaft speed to cater the need of different soil under varying soil moisture conditions.
9. DEFECTS, BREAKDOWNS AND REPAIRS
No breakdown occurred during 35.0 hrs of field operation.
10. COMMENTS & RECOMMENDATIONS
10.1 The dimensions of three point linkage of the implement do not conforms to IS:4468-2001 (Part-I). So, the standard 3 point linkage system complying with BIS code under reference should be used at regular production level.
10.2 Maneuverability of tractor with Rotavator was found satisfactory. The quality of work was observed satisfactory.
10.3 The specification of propeller shaft does not conform to IS: 4931-2004. This should be incorporated at production level.
10.4 Dimensions of power input shaft does not conform to IS 4931-2004. The standard shaft should be incorporated at production level.
10.5 The hardness of hatchet blades in the edge portion and in the shank portion was 36 HRC and 32 HRC respectively against the requirement of 53 to 59 HRC (edge portion) and 42 to 39 HRC (on shank portion) as per IS:6690-Jan. 2007. This calls for improvement at production level.
10.6 Wear of blades:
a) The percentage wear of hatchet blades on mass basis during field operation (35.0 hrs.) ranged from 3.9 to 4.4%, it is considered to be normal.
b) The percentage wear of hatchet blades on dimensional basis during field operation (35.0 hrs.) ranged from 2.9 to 7.7% and 7.3 to 7.6% respectively at edge and at 65 mm from edge.
10.7 The pto power requirement of rotavator was observed from 22.5 kW (30.6Ps) in dry land operation against tractor pto power of 35.3 kW. Therefore, 63.7% of pto power was utilized during the dry land field operation.
10.8 Rotavator stand and furrow wheel should be provided essentially.

11 LITERATURE:
The manufacturer has not developed specification of machine, operator's manual, part's catalogue and service manual etc. as per IS: 8132-1983. The same should be brought out for guidance of users and service personals.

TESTING AUTHORITY

<table>
<thead>
<tr>
<th>(R.M. TIWARI)</th>
<th>(P. K. CHOPRA)</th>
<th>(A. N. MESHRAM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSISTANT ENGINEER (W/S)</td>
<td>SENIOR AGRICULTURAL ENGINEER</td>
<td>DIRECTOR -</td>
</tr>
</tbody>
</table>

Applicant's comment
No comment is received from the manufacturer.