COMMERCIAL TEST REPORT

ROTVATOR
“HIND-299”

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)

Phones: 01662-276172
Fax No. 01662-276984

Website: http://nrfmtti.dacnet.nic.in
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 20.5 to 15.09 hours respectively to assess the performance of the implement. The details of tractor used for field operations are given in annexure-I.

The tractor pto speed was maintained at 540 rpm. The performance of implement is reported in Annexure-II and summarized in Table-3.

<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>Mahindra-555 DI, Arjun</td>
<td>Mahindra-605 DI, Arjun</td>
</tr>
<tr>
<td>ii)</td>
<td>Type of soil</td>
<td>Sandy loam</td>
<td>Clay loam</td>
</tr>
<tr>
<td>iii)</td>
<td>Av. Soil moisture, %</td>
<td>10.4 to 14.7</td>
<td>-</td>
</tr>
<tr>
<td>iv)</td>
<td>Depth of standing water, cm</td>
<td>-</td>
<td>5.46 to 8.94</td>
</tr>
<tr>
<td>v)</td>
<td>Field efficiency, %</td>
<td>71.4 to 87.9</td>
<td>-</td>
</tr>
<tr>
<td>vi)</td>
<td>Puddling Index, %</td>
<td>-</td>
<td>72.8 to 81.6</td>
</tr>
<tr>
<td>vii)</td>
<td>Av. Speed of operation, kmph</td>
<td>4.55 to 4.59</td>
<td>2.35 to 2.53</td>
</tr>
<tr>
<td>viii)</td>
<td>Av. Depth of cut, cm</td>
<td>9.3 to 9.4</td>
<td>-</td>
</tr>
<tr>
<td>ix)</td>
<td>Av. depth of puddle, cm</td>
<td>-</td>
<td>13.58 to 14.21</td>
</tr>
<tr>
<td>x)</td>
<td>Av. Working width, m</td>
<td>1.76 to 1.81</td>
<td>-</td>
</tr>
<tr>
<td>xi)</td>
<td>Area covered, ha/h</td>
<td>0.60 to 0.73</td>
<td>-</td>
</tr>
<tr>
<td>xii)</td>
<td>Time required for one hectare, h</td>
<td>1.37 to 1.67</td>
<td>-</td>
</tr>
<tr>
<td>xiii)</td>
<td>Fuel consumption</td>
<td>- l/h</td>
<td>5.0 to 6.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- l/ha</td>
<td>3.70 to 4.0</td>
</tr>
</tbody>
</table>

6.1 Rate of Work
6.1.1 Dry land operation
- The rate of work in sandy loam soil was recorded as 0.60 to 0.73 ha/h and the forward speed as 4.55 to 4.59 kmph.
- The time required to cover one hectare area was recorded as 1.37 to 1.67 h.
7. **EFFECTIVENESS OF SEALINGS**

After completion of field test in wet land operation for 15.09 hrs., the implement was dismantled for checking effectiveness of sealing provided against ingress of dust and water/mud in various sub-assemblies and also to check the condition of components of the rotavator.

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Location</th>
<th>Whether ingress of mud and/or water was observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Primary reduction gear box.</td>
<td>No</td>
</tr>
<tr>
<td>2.</td>
<td>Secondary reduction chain; drive</td>
<td>No</td>
</tr>
<tr>
<td>3.</td>
<td>Hub of rotor assembly</td>
<td>No</td>
</tr>
</tbody>
</table>

8. **EASE OF OPERATION, ADJUSTMENTS & SAFETY**

8.1 Propeller shaft is provided with safety bolt as its safety device.
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 Implement does not have provision to vary rotor shaft speed to cater to different soil and moisture conditions.
8.5 Operator has to get down from tractor to make adjustments in rotavator.

9. **SOUNDNESS OF CONSTRUCTION**

No breakdown occurred during 35.59 hrs of operation in the field.

10. **COMMENTS & RECOMMENDATIONS**

10.1 The dimensions of three point linkage of the implement partly conform to IS: 4468 (Part-I):1997. Standard three point linkage system should be used at regular production level.
10.2 It is recommended to have provision for change in rotor speed to suit wider range of soil and soil moisture conditions.
10.3 Maneuverability of tractor with rotavator and quality of work were observed to be satisfactory.
10.4 Dimensions of power input shaft of rotavator does not conform to IS:4931:1995. The shaft with specification comply with BIS standard under reference should be used at regular production level.
10.5 The hardness of hatchet blades in the edge portion and in the shank portion was 48 to 49 HRC against the requirement of 53 to 59 HRC (edge portion) and 37 to 45 HRC (on shank portion) as per IS:6690:1981. This calls for improvement at production level.
10.6 The percentage wear of hatchet blades on mass basis during field operation 35.59 hrs, ranged from 0.971 to 1.48% which is normal.
10.7 The percentage wear of hatchet blades on dimensional basis after field operation 35.59 hrs, ranged from 0.39 to 5.97 % and 1.74 to 7.88% respectively at edge and at 65 mm from edge.
10.8 The PTO power requirement of rotavator was observed from 11.94 to 13.18 kW in dry land operation; however, tractor of pto power as 30.6 kW (corresponding to 540 rpm) was used during field test. Hence, 39.0 to 43.1% of pto power was utilized.

10.9 An identification/Labeling plate with following details should be provided on chassis of rotavator.
   i.) Make
   ii.) Model
   iii.) Serial No.
   iv.) Year of manufacture
   v.) Weight & size of rotavator.

10.10 Chemical composition of rotavator blade are not within limit as specified limit as in IS: 6690:1981 hence these should be looked into in future at regular production level.

11. LITERATURE:- The manufacturer has not developed the literature of machine there. Therefore, the manufacturer should develop the literature in Hindi or English & other regional languages as per IS: 8132:1999 for the guidance of users & technical personnel.

TESTING AUTHORITY

G.R. AMBALKAR
Agricultural Engineer

R.K. NEMA
Senior Agricultural Engineer

HIMAT SINGH
Director

Test report compiled by: Sh. B. N. Dixit, Sr. Tech. Assistant

12. APPLICANT'S COMMENTS
   No comments from applicant.