ROTAVATOR
"GRTG 20048"

MINISTRY OF AGRICULTURE
(DEPARTMENT OF AGRICULTURE & COOPERATION)

NORTHERN REGION FARM MACHINERY TRAINING AND TESTING INSTITUTE
TRACTOR NAGAR, SIRSA ROAD, HISAR-125001 (HARYANA)
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 4.2

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

**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>HMT 6522</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>--</td>
</tr>
<tr>
<td>iv)</td>
<td>Depth of standing water, cm</td>
<td>--</td>
<td>8.7 to 9.3</td>
</tr>
<tr>
<td>vi)</td>
<td>Field efficiency, %</td>
<td>68.9 to 83.1</td>
<td>--</td>
</tr>
<tr>
<td>vii)</td>
<td>Puddling Index, %</td>
<td>--</td>
<td>74.0 to 90.9</td>
</tr>
<tr>
<td>viii)</td>
<td>Av. Speed of operation, kmph</td>
<td>3.44 to 3.67</td>
<td>3.49 to 3.64</td>
</tr>
<tr>
<td>ix)</td>
<td>Av. Depth of cut, cm</td>
<td>9.8 to 10.3</td>
<td></td>
</tr>
<tr>
<td>x)</td>
<td>Av. depth of puddle, cm</td>
<td>--</td>
<td>11.3 to 12.3</td>
</tr>
<tr>
<td>xi)</td>
<td>Av. Working width, cm</td>
<td>2.09 to 2.12</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Area covered, ha/h</td>
<td>0.508 to 0.699</td>
<td>0.385 to 0.547</td>
</tr>
<tr>
<td></td>
<td>Time required for one hectare, h</td>
<td>1.43 to 1.97</td>
<td>1.83 to 2.60</td>
</tr>
<tr>
<td></td>
<td>Fuel consumption</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- l/h</td>
<td>4.430 to 6.636</td>
<td>3.712 to 4.416</td>
</tr>
<tr>
<td></td>
<td>- l/ha</td>
<td>6.338 to 13.06</td>
<td>6.786 to 11.471</td>
</tr>
</tbody>
</table>

6.1 Rate of Work

6.1.1 Dry land operation
- The rate of work in sandy soil was recorded 0.508 to 0.699 ha/h and the speed operation as 3.44 to 3.67 kmph
- The time required to cover one hectare area was recorded as 1.43 to 1.97 h.

6.1.2 Wet land operation
- Speed of operation varied from 3.49 to 3.64 kmph
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 very rotor shaft speed to cater to different soil and 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 partly conforms to IS:4468-2001 (Part-I).

10.2 Maneuverability of tractor with Rotavator was found to be satisfactory. The quality of work was observed to be satisfactory.

10.3 The specification of propeller shaft does not conform to IS: 4931-2004. This should be taken care at production level.

10.4 Dimensions of splined end of pinion shaft does not conform to IS 4931-2004. This 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.

10.7 Wear of blades:

a) The percentage wear of hatchet blades on mass basis during field operation (35.0 hrs.) ranged from 1.8 to 5.1 %, it is considered to be normal.
b) The percentage wear of hatchet blades on dimensional basis during field operation (35.0 hrs.) ranged from 3.4 to 10.7 % and 4.7 to 7.4 % respectively at edge and at 65 mm from edge.

10.8 The pto power requirement of rotavator was observed from 25 kW (34 Ps) in dry land operation against tractor pto power of 40.7 kW. Therefore, 61.4% of pto power was utilized during the dry land test.

10.9 Rotavator stand and furrow wheel should be provided essentially.

10.10 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 personnels.

TESTING AUTHORITY

<table>
<thead>
<tr>
<th>(R.M.TIWARI)</th>
<th>ASSISTANT ENGINEER (W/S)</th>
</tr>
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<tbody>
<tr>
<td>(P. K. CHOPRA)</td>
<td>SENIOR AGRICULTURAL ENGINEER</td>
</tr>
<tr>
<td>(A. N. MESHRAM)</td>
<td>DIRECTOR -</td>
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<tr>
<th>S.No.</th>
<th>Our Reference</th>
<th>Applicant’s comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Para 5.1 Blade Hardness</td>
<td>We are using Italian blades, as they have better perform.</td>
</tr>
<tr>
<td>2.</td>
<td>Para 10.1, 10.3, 10.4 and 10.5 (Comments &amp; recommendations)</td>
<td>As per your comments and recommendations it will be taken care in future production.</td>
</tr>
</tbody>
</table>