COMMERCIAL TEST REPORT

UNIVERSAL ROTAVATOR
'MODEL 2042-Multi Speed'

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

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6. FIELD TEST

The field tests of the implement comprising of dry and wet land operations were conducted for 25.25 & 16.00 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 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>Tempo OX-45 (Balwan-500)</td>
<td></td>
</tr>
<tr>
<td>ii)</td>
<td>Type of soil</td>
<td>Clayey loam</td>
<td></td>
</tr>
<tr>
<td>iii)</td>
<td>Av. Soil moisture, %</td>
<td>11.5 to 12.8</td>
<td>9.33 to 12.00</td>
</tr>
<tr>
<td>iv)</td>
<td>Av. depth of standing water, cm</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>v)</td>
<td>Bulk density of soil, g/cc</td>
<td>1.73 to 1.79</td>
<td></td>
</tr>
<tr>
<td>vi)</td>
<td>Field efficiency</td>
<td>82.4 to 88.42</td>
<td></td>
</tr>
<tr>
<td>vii)</td>
<td>Puddling index, %</td>
<td>--</td>
<td>78 to 84</td>
</tr>
<tr>
<td>viii)</td>
<td>Av. Speed of operation, kmph</td>
<td>2.95 to 3.06</td>
<td>2.35 to 2.39</td>
</tr>
<tr>
<td>ix)</td>
<td>Av. Depth of cut</td>
<td>11.67 to 15.67</td>
<td></td>
</tr>
<tr>
<td>x)</td>
<td>Depth of puddle, cm</td>
<td>--</td>
<td>14.0 to 15.67</td>
</tr>
<tr>
<td>xi)</td>
<td>Av. Working width, m</td>
<td>1.59 to 1.69</td>
<td></td>
</tr>
<tr>
<td>xii)</td>
<td>Area covered, ha/h</td>
<td>0.396 to 0.436</td>
<td></td>
</tr>
<tr>
<td>xiii)</td>
<td>Time required for one hectare, hr</td>
<td>2.29 to 2.53</td>
<td></td>
</tr>
<tr>
<td>xiv)</td>
<td>Fuel consumption</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- l/h</td>
<td>5.20 to 5.47</td>
<td>5.00 to 5.44</td>
</tr>
<tr>
<td></td>
<td>- l/ha</td>
<td>12.09 to 13.13</td>
<td>--</td>
</tr>
</tbody>
</table>

6.1 Rate of Work

6.1.1 Dry land operation
- The rate of work in clayey loam soil was recorded as 0.396 to 0.436 ha/h and the forward speed as 2.95 to 3.06 kmph.
- The time required to cover one hectare area was recorded as 2.29 to 2.53 h.

6.1.2 Wet land operation
- Speed of operation varied from 2.35 to 2.39 kmph.

6.2 Quality of work

6.2.1 Dry land operation
- The depth of operation was recorded as 11.67 to 15.67 cm.
- The field efficiency was recorded as 82.4 to 88.42 %.
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 Implement has provision to vary rotor shaft speed to cater to different soil and moisture conditions.

9. DEFECTS, BREAKDOWNS AND REPAIRS
No breakdown occurred during 41.25 hrs operation in the field.

10. COMMENTS & RECOMMENDATIONS
10.1 The dimensions of three point linkage of the implement do not conform to IS:4468-March 2007(Part-I). 3 out of 12 dimensions (25%) are not conforming to IS requirements.
10.2 Maneuverability of tractor with Rotavator was found to be satisfactory. The quality of work was observed to be satisfactory.
10.3 Dimensions of splined end of pinion shaft do not conform to IS:4931 –Oct. 2004. This should be incorporated at production level. 4 out of 9 dimensions (44.4%) conforming to requirements of Indian Standard.
10.4 The hardness of the blade is not conforming with IS:6609-Jan., 2007. Therefore the standard blade should be used on Rotavator at regular production level.
10.6 The hardness of hatchet blade does not conform the limit as per IS: 6690-Jan. 2007.
10.7 The percentage wear per hour of hatchet blades on mass basis during field operation (41.25 hrs.) ranged from 0.07 to 0.10%, and it is considered to be normal.
10.8 The percentage wear of hatchet blades on dimensional basis during field operation (41.25 hrs.) ranged from 6.73 to 9.85 % and 3.50 to 7.41 % at edge and at 65 mm from edge respectively.
10.9 The PTO power requirement of rotavator was observed from 21.0 to 22.4 kW (28.6 to 30.5 Ps) in dry land operation and is within the recommended range. However, tractor with 31.5 kW pto power is used during the test hence only 71.1% power of tractor is utilized. However, tractor with 31.5 kW pto power is used during the test hence only 71.1% power of tractor is utilized during dry land operation of the field.
10.10 Safety device in propeller shaft and furrow wheel should be provided essentially.
10.11 Identification plate in respect of each machine is needed to be provided at regular production level.