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6. FIELD TEST

The field tests of the implement with hatchet blade comprising of dry and wet land operations were conducted for 20.32 & 15.81 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 pto speed was maintained at 540 rpm. The performance of implement is reported in Annexure-II and summarized in Table-3.

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>John Deer-5055E</td>
<td>John Deer-5055E</td>
</tr>
<tr>
<td>ii)</td>
<td>Type of soil</td>
<td>Sandy loam</td>
<td>Sandy loam</td>
</tr>
<tr>
<td>iii)</td>
<td>Av. Soil moisture, %</td>
<td>9.5 to 20.3</td>
<td>--</td>
</tr>
<tr>
<td>iv)</td>
<td>Depth of standing water, cm</td>
<td>--</td>
<td>10.2 to 10.9</td>
</tr>
<tr>
<td>v)</td>
<td>Field efficiency, %</td>
<td>77.4 to 87.81</td>
<td>87.5 to 94.0</td>
</tr>
<tr>
<td>vi)</td>
<td>Puddling Index, %</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>vii)</td>
<td>Av. Speed of operation, kmph</td>
<td>2.67 to 3.07</td>
<td>3.06 to 3.35</td>
</tr>
<tr>
<td>viii)</td>
<td>Av. Depth of cut, cm</td>
<td>8.25 to 11.60</td>
<td>--</td>
</tr>
<tr>
<td>ix)</td>
<td>Av. depth of puddle, cm</td>
<td>15.3 to 19.2</td>
<td></td>
</tr>
<tr>
<td>x)</td>
<td>Av. Working width, m</td>
<td>2.11 to 2.21</td>
<td>--</td>
</tr>
<tr>
<td>xi)</td>
<td>Area covered, ha/h</td>
<td>0.48 to 0.56</td>
<td>--</td>
</tr>
<tr>
<td>xii)</td>
<td>Time required for one hectare, h</td>
<td>1.78 to 2.83</td>
<td>--</td>
</tr>
<tr>
<td>xiii)</td>
<td>Fuel consumption</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- l/h</td>
<td>9.400 to 11.060</td>
<td>3.06 to 3.35</td>
</tr>
<tr>
<td></td>
<td>- l/ha</td>
<td>18.870 to 21.420</td>
<td>--</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 0.48 to 0.56 ha/h and the forward speed as 2.67 to 3.07 kmph.
The time required to cover one hectare area was recorded as 1.78 to 2.83 h.

6.1.2 Wet land operation
Speed of operation varied from 3.06 to 3.35 kmph.

6.2 Quality of work
6.2.1 Dry land operation
The depth of operation was recorded as 8.25 to 11.6 cm.
The field efficiency was recorded as 77.4 to 87.81 %.

6.2.2 Wet land operation
Depth of puddle was recorded as 15.3 to 19.2 cm.
Puddling index was recorded as 87.5 to 94.0 %.
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 36.13 hrs of operation in the field.

10. COMMENTS & RECOMMENDATIONS

10.1 The dimensions of three point linkage of the implement does not 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 52.4 to 54.3 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 for hardness of rotor blade at its shank portion.

10.6 The percentage wear of hatchet blades on mass basis during field operation 36.13 hrs. ranged from 4.81 to 6.16 % which is normal.

10.7 The percentage wear of hatchet blades on dimensional basis after field operation 36.13 hrs., ranged from 15.75 to 18.64 % and 5.44 to 7.13 % respectively at edge and at 65 mm from edge.
10.8 The PTO power requirement of rotavator was observed from 21.55 to 35.03 kW in dry land operation; however tractor of pto power as 36.9 kW (corresponding to 540 rpm) was used during field test. Hence, 58.40 to 94.93 % of pto power was utilized.

10.9 An identification plate is provided on chassis of rotavator. The approx mass of the implement and power requirement may be provided on it.

10.10 The safety bolt is provided in propeller shaft to protect from overloading.

10.11 Carbon & silicon content of rotar blade are lower than the limit as specified in IS:6690-1981 and therefore this should be taken care in future at regular production level.

11. LITERATURE :-
The manufacturer has provided in form at two sets at technical specification sheet at rotavator in English, however these should be modified as per IS: 8132:1983 in Hindi & other regional language for guidance at users & technical personnel.

TESTING AUTHORITY

G.R. AMBALKAR Agricultural Engineer

R.K. NEMA Senior Agricultural Engineer

HIMAT SINGH Director

Test report compiled by: Sh. Maan Singh, Sr. Tech. Assistant

12. APPLICANT'S COMMENTS

<table>
<thead>
<tr>
<th>Para No.</th>
<th>Our Reference</th>
<th>Applicant's Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1</td>
<td>10.1, 10.4, 10.5 &amp; 10.11</td>
<td>Related to non conformity of some parts, we will transfer the matter to related department or concern supplier to improve.</td>
</tr>
</tbody>
</table>