COMMERCIAL TEST REPORT

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ZERO TILL SEED CUM FERTILIZER DRILL
(KAMBOJ-11TINES)

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

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6. RUNNING-IN

The seed cum fertilizer drill was run-in for one hour. Bolts and nuts were tightened and lubrication were done before start of the actual test.

7. LABORATORY TEST

A. Seed specifications:

<table>
<thead>
<tr>
<th>Variety</th>
<th>Bulk density, gm/cc</th>
<th>No. of seeds in one Kg. Sample</th>
<th>Moisture content, %</th>
<th>Broken, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBW-550</td>
<td>0.796</td>
<td>22410</td>
<td>9.4</td>
<td>0.10</td>
</tr>
</tbody>
</table>

B. Fertilizer specifications:

<table>
<thead>
<tr>
<th>Type</th>
<th>Bulk density, g/cc</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAP</td>
<td>0.952</td>
</tr>
</tbody>
</table>

C. Wear of soil engaging component:

The test sample was operated for 20.75 hours. Wear of soil engaging components (furrow openers) is given in Table-1.

<table>
<thead>
<tr>
<th>Furrow opener</th>
<th>Mass of furrow opener before test, g</th>
<th>Mass of furrow opener after test, g</th>
<th>Loss in mass, g</th>
<th>Wear, % by mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2009</td>
<td>1987</td>
<td>22</td>
<td>1.10</td>
</tr>
<tr>
<td>2</td>
<td>2194</td>
<td>2175</td>
<td>19</td>
<td>0.87</td>
</tr>
<tr>
<td>3</td>
<td>2154</td>
<td>2139</td>
<td>15</td>
<td>0.70</td>
</tr>
<tr>
<td>4</td>
<td>2012</td>
<td>1998</td>
<td>14</td>
<td>0.70</td>
</tr>
<tr>
<td>5</td>
<td>1891</td>
<td>1875</td>
<td>16</td>
<td>0.85</td>
</tr>
</tbody>
</table>

8. FIELD TEST

Field test of seed cum fertilizer drill was conducted at HLRDC farm Hansi for 20.75 hours consisting of 5 trials. The implement was used for sowing Wheat (DBW-17) in paddy

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harvested field (Condition of field—combine harvested with straw burnt). The detailed test results are given in Annexure-IV and are summarised as under:-

Summary of field test results:

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Parameters</th>
<th>Range of measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Av. Depth of seed sowing, cm</td>
<td>6.9 to 7.6</td>
</tr>
<tr>
<td>2.</td>
<td>Av. Depth of fertilizer placement, cm</td>
<td>6.9 to 7.6</td>
</tr>
<tr>
<td>3.</td>
<td>Av. Width of sowing, m</td>
<td>1.94 to 1.97</td>
</tr>
<tr>
<td>4.</td>
<td>Av. Forward speed, kmph</td>
<td>3.35 to 3.38</td>
</tr>
<tr>
<td>5.</td>
<td>Av. Draft, Kgf</td>
<td>450 to 500</td>
</tr>
<tr>
<td>6.</td>
<td>Field capacity, ha/h</td>
<td>0.40 to 0.49</td>
</tr>
<tr>
<td>7.</td>
<td>Field efficiency, %</td>
<td>61.5 to 74.2</td>
</tr>
<tr>
<td>8.</td>
<td>Seed rate, Kgf/h</td>
<td>89.69 to 102.70</td>
</tr>
<tr>
<td>9.</td>
<td>Fertilizer rate, Kg/ha</td>
<td>113.3 to 134.8</td>
</tr>
<tr>
<td>10.</td>
<td>Fuel consumption, l/h</td>
<td>1.50 to 2.55</td>
</tr>
</tbody>
</table>

8.1 Quality of work:
The average depth of seed and fertilizer placement was observed as 6.9 to 7.6 cm. Seed and fertilizer rate was found 89.69 to 102.7 Kg/ha and 113.3 to 134.8 Kg/ha respectively.

8.2 Rate of Work & Fuel consumption:
The average width of sowing was observed as 1.94 to 1.97 m. The area covered was 0.40 to 0.49 ha/h and fuel consumption varied from 1.50 to 2.55 l/h.

8.3 Field efficiency and labour requirement:
Field efficiency of machine was observed as 61.5 to 74.2 %. Two labourers are required to operate the drill. Out of two one skilled labour is required for adjustments & calibrate the seed drill and to operate the tractor and other unskilled to load the seed and fertilizer boxes, cleaning of furrow openers etc.

8.4 Wear of soil engaging component:
The wear of furrow openers varied from 0.70 to 1.10 % by mass basis which is normal.

9.0 LUBRICATION & SERVICING
All lubrication points were lubricated/greased daily before starting the operation.

10. EASE OF OPERATION AND ADJUSTMENT
Operation and adjustment of seed cum fertilizer drill was observed to be satisfactory. However, the driver has to get down from the tractor to do the adjustments on seed drill.

11. SOUNDNESS OF CONSTRUCTION
No breakdown was observed during 20.75 hrs. of operation of zero till seed drill.

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12. COMMENTS AND RECOMMENDATIONS
i) The dimensions of seed metering mechanism do not conform to the requirement of IS: 6813-2000. Metering mechanism comply with IS requirements should be used at regular production level.

ii) The accessories like suitable covering device, row marker, are not provided in machine. These must be provided as per requirement of IS: 6813-2000.

iii) Dimension of three point linkage do not conform fully to the requirements of IS:4468-March 2007. Suitable improvement should be done at production level, to comply with BIS requirements.

iv) Wear of furrow openers was found normal.

v) Variation in seed and fertilizer dropping due to the box filling at different depth conforms to IS: 6813-2000.

vi) The variation of dropping seed and fertilizer at individual outlets conforms to IS: 6813-2000.

vii) The fertilizer rate was not adjustable upto 1000 kg/ha, which should be looked into at production level.

viii) The seed drill should be provided with tools and accessories as per Cl. 10.9.1 and Cl. 11 of IS: 6813-2000.

ix) Each seed drill should be provided with an identification plate with particulars covered under Cl. 14.1 of IS 6813-2000.

x) An operator manual should be brought out in line with IS: 8132-1983.

13. LITERATURE: The manufacturer has developed the literature of machine in a single booklet wherein calibration chart, off season storage technique are not there. Therefore, the manufacturer should modify the literature in Hindi or English & other regional languages. as per IS: 8132-1983 for the guidance of users & technical personnel.

TESTING AUTHORITY

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:: Test report compiled by Sh. B.N. Dixit (S.T.A).

APPLICANT'S COMMENTS: No comments received