SELF PROPELLED WHEAT REAPER (WALK BEHIND)
BEST ASHOKA IMPLEMENTS BAI-SRP-141

Government of India
Ministry of Agriculture and Farmers Welfare
Department of Agriculture, Cooperation and Farmers Welfare
Northern Region Farm Machinery Training and Testing Institute

Tractor Nagar, Sirsa Road, HISAR (Haryana)-125 001

[ISO 9001:2008 COMPLIANT INSTITUTION]

Website: http://nrfmtti.gov.in/
8. FIELD TEST
The reaper was operated for 31.95 hours (Including 3.58 hours running in) in wheat harvesting. During the test Wheat crop variety HR-17 & HR-2967 was harvested to assess the performance of reaper with regard to quality of work, rate of work, fuel consumption, safety and soundness of construction. The crop and atmospheric conditions during field test are given in Annexure – II for wheat crops. The crop parameters recorded during the test with wheat crops are as given in Table-3 and Annexure II&III.

Table-3: Crop parameter for wheat crop only

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Wheat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average plant height (cm)</td>
<td>54 to 104</td>
</tr>
<tr>
<td>Average number of tillers/m²</td>
<td>223 to 281</td>
</tr>
<tr>
<td>Average moisture (%)</td>
<td></td>
</tr>
<tr>
<td>Grain</td>
<td>10.0 to 10.3</td>
</tr>
<tr>
<td>Straw</td>
<td>NR</td>
</tr>
</tbody>
</table>

The results of field performance test are given in Annexure –II and are summarized in Table-4

Table-4: Summary of field Test

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Observation</th>
<th>Wheat harvesting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Average speed of operation (kmph)</td>
<td>1.70 to 2.22</td>
</tr>
<tr>
<td>2.</td>
<td>Average area covered (ha/h)</td>
<td>0.162 to 0.213</td>
</tr>
<tr>
<td>3.</td>
<td>Average width of cut, m</td>
<td>1.128 to 1.149</td>
</tr>
<tr>
<td>4.</td>
<td>Average fuel consumption</td>
<td>l/h</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.45 to 0.62</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.54 to 2.93</td>
</tr>
<tr>
<td>5.</td>
<td>Average losses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pre harvest losses (kg/ha)</td>
<td>Nil to 17.64</td>
</tr>
<tr>
<td></td>
<td>Post harvest losses (kg/ha)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Cutter bar losses</td>
<td>1.22 to 17.11</td>
</tr>
<tr>
<td>6.</td>
<td>Average stubble height after harvesting (cm)</td>
<td>6.5 to 9.0</td>
</tr>
<tr>
<td>7.</td>
<td>Average time required to cover 1 ha area, h</td>
<td>4.70 to 6.17</td>
</tr>
<tr>
<td>8.</td>
<td>Average field efficiency, %</td>
<td>81.6 to 86.9</td>
</tr>
</tbody>
</table>

8.1 Rate of work
i) The field capacity varied from 0.162 to 0.213 ha/h.
ii) The average fuel consumption varied from 0.45 to 0.62 l/h & 2.54 to 2.93 l/ha.
iii) Field efficiency was observed as 81.6 to 86.9 percent.

8.2 Quality of work
i) During harvesting, cutter bar losses varied from 1.22 to 17.11 kg/ha
ii) The stubble height was observed from 6.5 to 9.0 cm.

8.3 Time required for daily maintenance
About 15 to 20 minutes are required for daily servicing and maintenance of reaper.

8.4 Ease of operation & adjustment
No noticeable difficulty was observed during the test.
11. SUMMARY OF OBSERVATION, COMMENTS AND RECOMMENDATION

11.1 Engine performance test
   i) Power at rated engine speed under normal ambient condition was observed as 2.86 kW against the applicant’s declaration of 2.9 kW.

11.2 Field test
   i) The area covered varied from 0.162 to 0.213 ha/h.
   ii) The fuel consumption varied from 0.45 to 0.62 l/h and 2.54 to 2.93 l/ha.
   iii) The cutter bar losses were observed as 1.22 to 17.64 kg/ha.

11.3 Ease of operation & adjustment
   i) The exhaust MUST be provided with spark arresting device.
   ii) Safety notice and hazard warnings labels MUST be provided on machine.
   iii) The decals regarding operator’s control MUST be provided on machine as per IS: 6283- Part-I 2006 & Part-2- 2007.
   iv) An extra effort is required to turn the machine in the field as there is no arrangement is provided to turn machine. This MUST be looked into for improvement to reduce operator’s effort.

11.4 Hardness and chemical composition
   i) The hardness of knife blade does not meet the requirement of IS: 6025-1982. It should be looked into for necessary improvement.
   ii) The manganese content of knife blade is not within the required range as per IS: 6025-1982. It should be looked into for improvement.
   iii) Carbon content of the knife back does not conform to the requirement as per IS: 10378-1982. It should be looked into for necessary corrective action.

11.5 Noise measurement
   i) Max. Noise at operator’s ear level and bystander’s position was observed as 92.5 dB(A) and 79.1 dB(A) respectively. The noise observed at operator’s ear level is higher than the warning limit of 85 dB(A) and the danger limit of 90dB(A) as specified by ILO for continuous exposure of 8 hours per day. This calls for reduction in noise level to improve operator’s comfort and safety.

11.6 Mechanical vibration
   The amplitude of mechanical vibration of components marked as (*) in relevant chapter of this report may be considered on higher side. This calls for providing suitable remedial measures to dampen the vibration in order to improve the operational comfort and service life of various components & sub assemblies.
11.7 Labelling plate
Only a sticker is provided on machine. A metallic labelling plate of permanent nature should be provided on machine with following information.

I. Make
II. Model
III. Serial No.
IV. Year of manufacture
V. Manufacturer’s address
VI. Engine No.
VII. Chassis No.
VIII. Max. Power (kW)
IX. Specific fuel consumption (g/kWh)

11.8 The dimension of knife blade does not meet the requirement of IS: 6025-1982. It **MUST** be improved.

11.9 The model of machine is specified as BAI-SRP-141 on labelling plate on machine, whereas in application. It is specified as ‘BAI-SPR-777’, which is different. It **MUST** be looked into for corrective action.

11.10 The serial number of machine is not specified. It **MUST** be specified on all machine at production assembly level.

11.11 Carburettor make is not specified. It **MUST** be specified.

11.12 Spark plug ignition timing is not specified. It **MUST** be specified for proper maintenance and guidance of user.

11.13 No arrangement for adjusting cutting height is provided. It needs to be provided.

11.14 The dimension of knife blade does not meet the requirement of IS: 6025-1982. It should be improved.

11.15 The dimensions of knife back does not meet the requirement of IS: 10378-1982. It should be improved.

11.16 The discard limit for engine component i.e. cylinder, piston, piston ring end gap, Big end bearing, piston ring side clearance, valve guide clearance is not specified. These **MUST** be specified for undertaking necessary repair and maintenance by user.

11.17 As per the manual provided by the applicant, diesel is recommended as lubricant oil, which is grossly inaccurate, in the light of lubricant observed in the transmission case. It **MUST** be looked into for necessary corrective action.