SEED CUM FERTILIZER DRILL
"SUPER SASANI"

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

NORTHERN REGION FARM MACHINERY TRAINING AND TESTING INSTITUTE
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<table>
<thead>
<tr>
<th>Cl. 9</th>
<th>Performance Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cl.9.1</td>
<td>The variation in dropping of seed and fertilizer in different feeding outlets separately shall be not more than 7 and 12.5 percent respectively from the average quantity obtained.</td>
</tr>
<tr>
<td>Cl.9.2</td>
<td>The variation in quantity dropped per hectare and quantity specified to be dropped at a particular setting shall be not more than 7 and 12.5 percent for seed and fertilizer respectively.</td>
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<tr>
<td>Cl.9.3</td>
<td>The seed and fertilizer rate shall be easily adjustable upto 125Kg and 1000 Kg per hectare respectively.</td>
</tr>
<tr>
<td>Cl.9.4</td>
<td>The percentage of visible damage to seed in the drill shall not exceed 0.5 percent</td>
</tr>
<tr>
<td>Cl.9.5</td>
<td>The variation in dropping due to box filling at ¼, ½ and ¾ of rated capacity shall not exceed 10 percent.</td>
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<tr>
<td>Cl.9.7</td>
<td>The variation in quantity of seed per meter of row length shall not exceed by 10 percent</td>
</tr>
<tr>
<td>Cl. 9.8</td>
<td>a) The drill shall be able to sow seed up to 100 mm deep</td>
</tr>
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<td></td>
<td>b) The drill shall be able to drop fertilizer at a minimum of 25mm to the side of the seed</td>
</tr>
<tr>
<td>c)</td>
<td></td>
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<tr>
<td>Cl. 9.11</td>
<td>The drill shall be able to sow wheat and one or more of the following: a) Barley b) Paddy, c) Millet, d) Pea e) Bengal gram, Soyabean &amp; pigeon pea The drill shall also be able to sow all types of granular fertilizers</td>
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<tr>
<td></td>
<td></td>
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<tr>
<td>CI 10 Other requirements</td>
<td></td>
</tr>
<tr>
<td>10.2</td>
<td>Row spacing shall be adjustable ranging from 150 to 225 mm preferably in steps of 25 mm</td>
</tr>
<tr>
<td>10.3</td>
<td>When the furrow openers are lowered to plain surface, openers shall not deviate by more than 5 mm from the line of alignment vertically and horizontally</td>
</tr>
<tr>
<td>10.4</td>
<td>The weight of tractor-mounted drill including the weight of seed and fertilizer filled at rated capacity of box shall not exceed 300 N/kW drawbar power of the tractor recommended for the drill</td>
</tr>
<tr>
<td>10.5</td>
<td>A permanent type metallic calibration plate indicating the position and quantity of seed &amp; Fertilizer should be attached under the top cover of seed box.</td>
</tr>
</tbody>
</table>
C Wear of soil engaging component:

The test sample was operated for 20.00 hours. Wear of soil engaging components (furrow openers) is given in Table-1.

### 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>328.5</td>
<td>324.2</td>
<td>4.3</td>
<td>1.31</td>
</tr>
<tr>
<td>2</td>
<td>323.6</td>
<td>318.5</td>
<td>5.1</td>
<td>1.58</td>
</tr>
<tr>
<td>3</td>
<td>335.1</td>
<td>331.2</td>
<td>3.9</td>
<td>1.16</td>
</tr>
<tr>
<td>4</td>
<td>341.9</td>
<td>336.7</td>
<td>5.2</td>
<td>1.52</td>
</tr>
<tr>
<td>5</td>
<td>316.9</td>
<td>312.4</td>
<td>4.5</td>
<td>1.42</td>
</tr>
<tr>
<td>6</td>
<td>320.9</td>
<td>313.9</td>
<td>7.0</td>
<td>2.18</td>
</tr>
</tbody>
</table>

8. FIELD TEST

Field test of seed cum fertilizer drill was conducted at HLRDC farm Hisar for 20.0 hours consisting of 5 trials. The implement was used for sowing Wheat (PBW-502 & 509) in a well prepared seed bed field. 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>5.2 to 5.7</td>
</tr>
<tr>
<td>2</td>
<td>Av. Depth of fertilizer placement, cm</td>
<td>5.2 to 5.7</td>
</tr>
<tr>
<td>3</td>
<td>Av. Width of sowing, m</td>
<td>1.88 to 2.00</td>
</tr>
<tr>
<td>4</td>
<td>Av. Forward speed, kmph</td>
<td>5.12 to 6.64</td>
</tr>
<tr>
<td>5</td>
<td>Av. Draft, Kgf</td>
<td>150 to 170</td>
</tr>
<tr>
<td>6</td>
<td>Field capacity, ha/h</td>
<td>0.75 to 0.96</td>
</tr>
<tr>
<td>7</td>
<td>Field efficiency, %</td>
<td>65.1 to 80.7</td>
</tr>
<tr>
<td>8</td>
<td>Seed rate, Kg/ha</td>
<td>84.3 to 133.2</td>
</tr>
<tr>
<td>9</td>
<td>Fertilizer rate, Kg/ha</td>
<td>97.9 to 150.4</td>
</tr>
<tr>
<td>10</td>
<td>Fuel consumption, l/h</td>
<td>2.67 to 3.33</td>
</tr>
</tbody>
</table>
8.1 Quality of work:

The average depth of seed and fertilizer placement was observed as 5.2 to 5.7 cm. Seed and fertilizer rate was found 84.3 to 133.2 Kg/ha and 97.9 to 150.4 Kg/ha, respectively.

8.2 Rate of Work & Fuel consumption:

The average width of sowing was observed as 1.88 to 2.00 m. The area covered was 0.75 to 0.96 ha/h and fuel consumption varied from 2.67 to 3.33 l/h.

8.3 Field efficiency and labour requirement:

Field efficiency of machine was observed as 65.1 to 80.7%. Two labours are required to operate the drill. Out of two, one skilled labour to make adjustments & calibrate the seed drill and to operate the tractor, the 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 1.16 to 2.18% by mass basis which is considered on normal side.

9. LUBRICATION & SERVICING

All greasing & lubricating points are greased daily before starting of 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 20.00 hrs. Of operation of seed drill.

12. COMMENTS AND RECOMMENDATIONS

i) The dimensions of seed metering mechanism do not conform fully to the requirement of IS: 6813-2000. Suitable improvement should be made at production level, to use seed metering mechanism conforming the requirements of IS code under reference.

ii) The accessories like suitable covering device, row marker, is not provided in machine. These may be incorporated as per requirement of IS:6813-2000.
iii) Dimension of three point linkage do not conform fully to the requirements of IS:4468-1997. Then a three point linkage system comply with IS requirements should be incorporated at regular production level.

iv) Wear of furrow openers was found on normal side.

v) Variation in seed and fertilizer dropping due to the box filling at different depths do not conform to IS: 6813-2000.

vi) The variation of dropping seed and fertilizer at individual outlets does not conform to IS: 6813-2000.

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

viii) The seed & fertilizer boxes are uncovered. Hence, suitable cover should be provided on boxes to avoid entrance of water.

13. LITERATURE The manufacturer should develop a manual in Hindi, English or regional language in line with IS: 8132 -1983 with detail material on calibration chart, operation instruction off season storage instruction etc. therein.

TESTING AUTHORITY

<table>
<thead>
<tr>
<th>(R. M. TIWARI)</th>
<th>(P. K. CHOPRA)</th>
<th>(A. N. MESHRAM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSISTANT ENGINEER (W/S)</td>
<td>SENIOR AGRICULTURAL ENGINEER</td>
<td>- DIRECTOR-</td>
</tr>
</tbody>
</table>

:: Test report compiled by Sh. B.N. Dixit (Tech. Asstt.).

APPLICANT’S COMMENTS

No comments received

Northern Region Farm Machinery Training & Testing Institute, Hisar