व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या / No. : Imp- 487/1315
माह / Month : December, 2010

ROTAVATOR
'PANESAR' (7 FEET)

सत्यमेव जयते

भारत सरकार

कृषि मंत्रालय

(कृषि एवं सहकारिता विभाग)

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

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TABLE-1

S. No.	Portion of blade	Hardness (HRC)		Remark
		As observed	As per :6690-Jan. 2007	
1	On Edge portion	46	53 to 59	**Does not conform**
2	On shank portion	42	37 to 45	Conforms

5.2 Chemical composition

The chemical composition of blades is tabulated in Table-2

TABLE-2

Sl. No.	Material	Requirement as per IS:6690-Jan. 2007 (% by weight)	As observed (% by weight)	Remark
1.	Carbon I	0.50 to 0.60	0.23	**Does not conform**
2.	Silicon(Si)	1.50 to 2.00	0.24	**Does not conform**
3.	Manganese (Mn)	0.50 to 1.00	1.14	**Does not conform**
4.	Sulphur (S)	0.05 (max)	0.003	Conforms
5.	Phosphorous (P)	0.05 (max)	0.013	Conforms

:: 3 out of 5 dimensions (60%) are not conforming to BIS standard.

6. FIELD TEST

The field tests of the implement comprising of dry and wet land operations were conducted for 25.0 to 16.00 hours respectively at 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 observed at 540 rpm of tractor. The performance of implement is reported in Annexure-II & III and summarized in Table - 3.

TABLE-3

Summary of field performance

Sl.No.	Parameters	Dry land operation	Wet land operation (puddling)
i)	Tractor used	Swaraj-855	
ii)	Type of soil	Medium soil	
iii)	Av. Soil moisture, %	11.8 to 12.1	-
iv)	Depth of standing water, cm	-	10.3 to 13.3
v)	Field efficiency, %	76.1 to 80.2	-
vi)	Puddling Index, %	-	74.0 to 80.0
vii)	Av. Speed of operation, kmph	2.98 to 3.10	2.53 to 2.57
viii)	Av. Depth of cut, cm	11.0 to 14.7	-
ix)	Av. depth of puddle, cm	-	8.7 to 13.0
x)	Av. Working width, cm	1.73 to 1.77	-
xi)	Area covered, ha/h	0.41 to 0.42	-
xii)	Time required for one hectare, h	2.38 to 2.45	-
xiii)	Fuel consumption		
	- l/h	5.80 to 6.05	5.13 to 5.38
	- l/ha	13.94 to 14.71	-

6.1 Rate of Work

6.1.1 Dry land operation

-The rate of work in medium soil was recorded as 0.41 to 0.42ha/h and the speed of operation as 2.98 to 3.10 kmph.

-The time required to cover one hectare area was recorded as 2.38 to 2.45 h.

6.1.2 Wet land operation

- Speed of operation varied from 2.53 to 2.57 kmph.

6.2 Quality of work

6.2.1 Dry land operation

-The depth of operation was recorded as 11.0 to 14.7 cm.

-The field efficiency was recorded as 76.1 to 80.2 %.

6.2.2 Wet land operation

-Depth of puddle was recorded as 8.7 to 13.0 cm.

-Puddling index was recorded as 74.0 to 80.0 %.

6.3 Wear of Blades

6.3.1 On Mass basis

Wear of hatchet blades (mass basis) after 41.0 hrs. of field operation is tabulated in Table-4.

8. EASE OF OPERATION, ADJUSTMENTS & SAFETY

8.1 The propeller shaft (universal coupling shaft) is not provided with any 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 for making adjustment in rotavator.

9. SOUNDNESS OF CONSTRUCTION

No breakdown occurred during 41.0 hrs operation in the field.

10. COMMENTS & RECOMMENDATIONS

10.1 Dimensions of three point linkage system are not conforming to the requirements of IS: 4468 Part-I-March 2001.The standard three point linkage system conforming to BIS should be used at regular production level.

10.2 Dimensions of power input shaft are not conforming to the requirements of IS: 4931-Oct. 2004. Necessary improvement should be done at regular production level.

10.3 Maneuverability of tractor with Rotavator and quality of work were observed to be satisfactory.

10.4 Multiple speed gear box is provided to suit wider range of soil and soil moisture conditions.

10.5 The hardness at edge of the blade is 46 HRC as against the required hardness of 56 ± 3 as per IS: 6690-Jan. 2007. This should be looked into and necessary improvement should be made.

10.6 The percentage wear of hatchet blades on mass basis during field operation of 41.0 hr, ranged from 6.32 to 8.50% which is normal.

10.7 The percentage wear of hatchet blades on dimensional basis at tip & 65 mm from edge of blade after during field operation of 41.0 hr, ranged from 11.83 to 17.70% and 12.64 to 14.85 % respectively.

10.8 The pto power requirement of tractor was from 26.7 to 27.2 kW as against the tractor pto power of 34.3 kW at 540 rpm. Hence, power utilization varies from 77.8 to 79.3 % in dry land operation

10.9 Safety clutch or belt should be provided with propeller shaft.

10.10 An identification plate should be provided on each Rotavator at regular production level.

10.11 Chemical composition of primary element of rotavator blade is not conforming to relevant BIS Standard IS 6609-Jan. 2007. Therefore, the rotavator blades comply with BIS standard under reference should be used at regular production level.