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COMMERCIAL TEST REPORT

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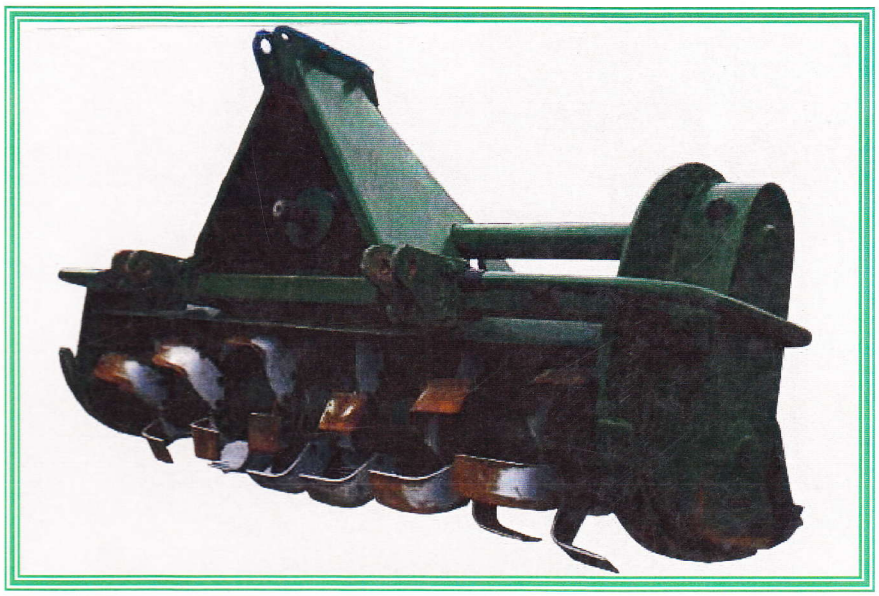

ROTAVATOR
'AMAR-5500'

सत्यमेव जयते

भारत सरकार

कृषि मंत्रालय

(कृषि एवं सहकारिता विभाग)

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

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5. LABORATORY TEST

5.1 The hardness of blades was determined at edge and shank portion. The results of hardness test are tabulated in Table-I.

TABLE-1

Description	As per IS:6690-Jan. 2007 (HRC)	Hardness as observed (HRC)	Remarks
Edge portion	53 to 59	44	**Does not conform**
On shank portion	37 to 45	39	Conforms

:: Values of hardness at edge portion is not conforming to Indian Standard.

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	0.57	Conforms
2.	Silicon(Si)	1.50 to 2.00	1.98	Conforms
3.	Manganese (Mn)	0.50 to 1.00	0.79	Conforms
4.	Sulphur (S)	0.05 (max)	0.008	Conforms
5.	Phosphorous (P)	0.05 (max)	0.023	Conforms

6. FIELD TEST

The field tests of the implement comprising of dry and wet land operations were conducted for 20.25 & 15.00 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

Sl.No.	Parameters	Dry land operation	Wet land operation (puddling)
i)	Tractor used	Farmtrac -60 DX	
ii)	Type of soil	Sandy Loam	
iii)	Av. Soil moisture, %	12.2 to 13.5	-
iv)	Depth of standing water, cm	-	11.6 to 13.5
v)	Field efficiency, %	69.0 to 98.1	-
vi)	Puddling Index, %	-	76.5 to 78.2
vii)	Av. Speed of operation, kmph	2.91 to 3.46	3.16 to 3.29
viii)	Av. Depth of cut, cm	9.5 to10.8	-
ix)	Av. depth of puddle, cm	-	11.5 to 15.6
x)	Av. Working width, m	1.44 to 1.69	-
xi)	Area covered, ha/h	0.36 to 0.51	-
xii)	Time required for one hectare, h	1.96 to 2.78	-
xiii)	Fuel consumption		
	- l/h	5.00 to 5.57	2.50 to 4.00
	- l/ha	9.80 to 15.48	-

6.1 Rate of Work

6.1.1 Dry land operation

-The rate of work in sandy loam soil was recorded as 0.36 to 0.51 ha/h and the forward speed as 2.91 to 3.46 kmph.

-The time required to cover one hectare area was recorded as 1.96 to 2.78 h.

6.1.2 Wet land operation

-Speed of operation varied from 3.16 to 3.29 kmph.

6.2 Quality of work

6.2.1 Dry land operation

-The depth of operation was recorded as 9.5 to 10.8 cm.

-The field efficiency was recorded as 69.0 to 98.1 %.

6.2.2 Wet land operation

-Depth of puddle was recorded as 11.5 to 15.1 cm.

-Puddling index was recorded as 76.5 to78.2 %.

6.3 WEAR OF BLADES

1.3.1 On Mass basis

Wear of hatchet blades (mass basis) after 35.25 hrs. of field operation is tabulated in Table-4.

8.5 Operator has to get down from tractor to make adjustments in rotavator.

9.0 SOUNDNESS OF CONSTRUCTION

No breakdown occurred during 35.25 hrs of operation in the field.

10.0 COMMENTS & RECOMMENDATIONS

10.1 The dimensions of three point linkage of the implement partly conform to IS: 4468-March 2007(Part-I). 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 Manouverability of tractor with rotavator and quality of work were observed to be satisfactory.

10.4 Dimensions of power input shaft & corresponding pto hub of rotavator do not conform to IS: 4931-Oct. 2004. The shaft with corresponding pto hub whose 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 44 HRC and 39 HRC respectively against the requirement of 53 to 59 HRC (edge portion) and 37 to 45 HRC (on shank portion) as per IS:6690-Jan. 2007. This calls for improvement at production level..

10.6 The percentage wear of hatchet blades on mass basis during field operation 35.25 hrs, ranged from 1.83 to 2.11 % which is normal.

10.7 The percentage wear of hatchet blades on dimensional basis after field operation 35.25 hrs, ranged from 5.44 to 7.62 % and 2.52 to 3.68 % respectively at edge and at 65 mm from edge.

10.8 The PTO power requirement of rotavator was observed from 22.0 to 23.7 kW in dry land operation; however tractor of pto power as 30.0 kW (corresponding to 540 rpm) was used during field test. Hence, 73.3 to 79.0 % of PTO power was utilized.

10.9 An identification plate should be provided on each rotavator at regular production level.

10.10 The suitable safety device should be incorporated to propeller shaft at regular production level.

10.11 The chemical composition of primary elements of rotavator blade are well within specified limit in IS 6690-Jan.2007.