

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: ROTAVATOR-383/2894/2022

माह/Month: August, 2022

THIS TEST REPORT VALID UP TO : 31st August, 2029



**JAMNA, JAIKMSR-5.5
ROTARY TILLER, (ROTAVATOR) TRACTOR MOUNTED**



भारत सरकार

Government of India

कृषि एवं किसान कल्याण मंत्रालय

Ministry of Agriculture and Farmers Welfare

कृषि एवं किसान कल्याण विभाग

Department of Agriculture and Farmers Welfare

उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

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6. FIELD PERFORMANCE TEST

The field tests of the rotavator comprising of dry land and wet land operation were conducted for 27.59 and 10.42 hours respectively to assess the performance test which is reported in **Annexure-I & II** for dry land and wet land operation, respectively.

Observations of field performance test is summarized in the ensuing table:-

Summary of Field Performance Test

Sr. No.	Parameters/operations	Dry land operation	Wet land operation (Puddling)
I	II	III	IV
1.	Tractor used	Powertrac 445	
2.	Gear used	L-1	L-1
3.	Type of soil	Sandy loam	
4.	Average soil moisture (%)	15.5 to 16.9	--
5.	Average depth of standing water (cm)	--	12.44 to 13.77
6.	Bulk density of soil (g/cc)	1.52 to 1.65	--
7.	Average speed of operation (kmph)	2.15 to 2.43	2.03 to 2.06
8.	Avg. travel reduction (%)	--	0.99 to 1.39
9.	Avg. wheel slip (%)	-1.00 to -2.39	--
10.	Average depth of puddle (cm)	--	19.97 to 22.40
11.	Average depth of cut (cm)	10.61 to 11.02	--
12.	Avg. effective width (m)	1.53 to 1.56	--
13.	Area covered (ha/h)	0.261 to 0.317	--
14.	Time required for one ha (h)	3.15 to 3.83	--
15.	Field efficiency (%)	77.22 to 86.38	--
16.	Puddling index (%)	--	78.6 to 79.1
17.	Fuel consumption		
		l/h	4.50 to 5.16
		l/ha	14.89 to 18.90
18.	Avg. PTO power consumption, kW	14.35	--

6.1 Dry land operation**6.1.1 Rate of work**

- i) The rate of work was recorded 0.261 to 0.317 ha/h, and the speed of operation varied from 2.15 to 2.43 kmph.
- ii) The time required to cover one hectare was recorded as 3.15 to 3.83 h

6.1.2 Quality of work

- i) The depth of operation was recorded as 10.61 to 11.02 cm.
- ii) Average effective width was observed as 153.0 to 156.0 cm.
- iii) Field efficiency was observed as 77.22 to 86.38 %.

6.2 Wet Land operation**6.2.1 Quality of work**

- i) The depth of puddle was recorded as 19.97 to 22.40 cm.
- ii) The puddling index was recorded as 78.6 to 79.1 %.

6.3 Labour requirement

In all, two skilled operators are needed to ensure continuous operation of rotavator for day long period.

6.4 Wear analysis (on mass basis)

Wear of hatchet blades (on mass basis) was measured and recorded in ensuing table:

Percentage wear of rotavator blades on mass basis

Sr. No.	Initial mass of blade (g)	Mass of blade after 39.14 hrs. of operation (g)	Difference of weight (g)	Percentage of wear (%) after 39.14 hrs.	Percentage of wear on hour basis (%)
1.	970.4	960.2	10.2	1.05	0.027
2.	983.5	970.3	13.2	1.32	0.034
3.	974.9	960.2	14.7	1.51	0.039
4.	969.0	955.5	13.5	1.39	0.036
5.	956.6	944.4	12.2	1.28	0.033
6.	975.6	962.3	13.3	1.36	0.035
7.	960.2	945.1	15.1	1.57	0.040

7. EFFECTIVENESS OF SEALINGS

After completion of wet land operation for 10.42 hours, the rotavator was dismantled for checking the effectiveness of sealing provided against ingress of dust, and water/mud in various sub-assemblies/components. The observations are given in ensuing table:-

Sr. No.	Location	Whether ingress of mud and/or water was observed (Yes/No)
1.	Primary reduction gear box	No
2.	Secondary reduction gear box	No
3.	Rotor assembly (hub)	No

8. EASE OF OPERATION & ADJUSTMENTS

No noticeable difficulty was observed during the operation and adjustment of rotavator

9. DEFECTS, BREAKDOWN AND REPAIRS

No defect observed during the test.

11. CRITICAL TECHNICAL SPECIFICATION



(Vide Ministry's communication No. 13-9/2019 M &T (I&P) dated 26.04.2019)

Sr. No	Parameters	Specification	Observed	Remarks
1.	Working width (mm)	1200 (Min.)	1690	Conforms
2.	Type of blade	C/L/J shape as per demand Hatchet blade	L-Shape	Conforms
3.	Thickness of blade (mm)	7-8 (Min.)	7.2	Conforms
4.	No. of blades	30(Min.)	39	Conforms
5.	Total Number of flanges	5 (Min.)	07	Conforms
6.	Number of blades per flanges	6 (Max.)	06, 03	Conforms
7.	Outer diameter of rotor shaft mm	75-90	90	Conforms
8.	Rotor diameter, including flange and blade mounted on flange, mm	425 (Min.)	450	Conforms
9.	Side Drive	Gear Drive /Chain Drive (Optional)	Gear drive	Conforms
10.	Depth control mechanism	Arc shaped skid on both side of rotavator	Skid on both Side of rotavator	Conforms
11.	Material of blades	Boron 27/28/30 Mn (28MnCrB5) / High Carbon steel of grade EN42/EN45/EN47	Boron (28MnCrB5)	Conforms
12.	Hardness of blade Material, HRC	38 (min)	54.07 (Average)	Conforms
13.	Safety clutch/Device (Shear bolt) in PTO drive shaft	Must be provided	Provided	Yes
14.	Rotavator stand	Must be provided	Provided	Conforms
15.	Guard over propeller shaft	Must be provided	Provided	Yes
16.	Sheet metal	AS36 / IS:2062	IS:2062	Conforms
17.	Marking/labeling of machine	The labeling plate should be riveted on the body of machine having Name and address of manufacturer, Country of Origin, Make, Model, Year of manufacturer, Serial Number, Type, size, required of prime mover (kW)	Meet the requirement	Conforms
18.	Literature	Operator manual, Service manual and Parts catalogue should be provided.	Provided	Conforms

12. COMMENTS AND RECOMMENDATIONS

- 12.1** The Dimension of PIC of Implement does not conform, in toto, to the requirements of IS: 10318-2002 and therefore, it may be looked into for corrective action.
- 12.2 Technical Literature:**
One booklet entitled "Owner's manual" was provided for reference during test. The same, however, needs to be updated as per IS:8132-1999.

TESTING AUTHORITY

Er. SANJAY KUMAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN DIRECTOR	 18.08.2022

The test report is compiled by Er. Ajay

13. APPLICANT'S COMMENTS

We will comply with during our regular production of the rotavator.