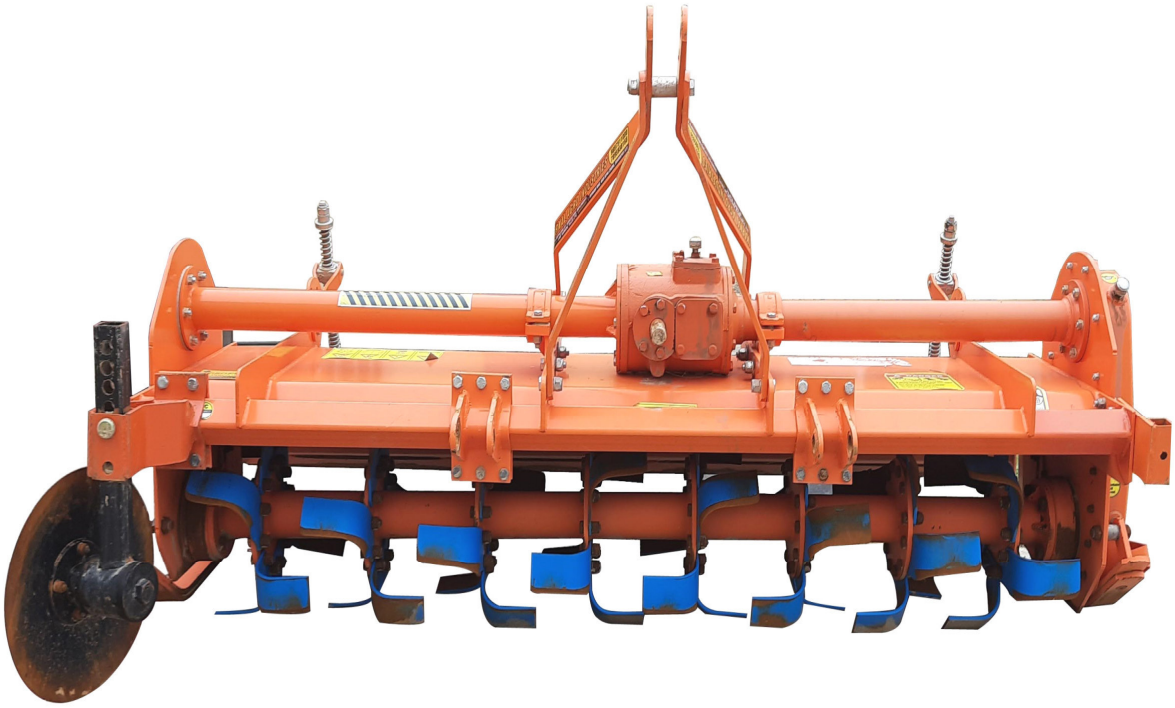
व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ **No.: ROTAVATOR-371/2875/2022**
माह/**Month: July, 2022**

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



KARNAL AGRO, GROFARM-7, 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
Northern Region Farm Machinery Training and Testing Institute
ट्रैक्टर नगर, सिरसा रोड, हिसार, (हरियाणा) - 125 001
Tractor Nagar, Sirsa Road, Hisar (Haryana)-125 001
[ISO 9001:2015 CERTIFIED]

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3.11 Lubricants:

Sr. No.	Particulars	As recommended by the manufacturer	As used during test
1	Primary Gear box	EP-140	Oil originally filled in the rotavator was not changed
2	Secondary Gear box	EP-140	
3	Rotor Hub	EP-140	EP-140
4	Propeller Shaft	Lithium base grease	Lithium base grease

4. RUNNING – IN

Rotavator was run in for 2.0 hour before field performance test.

5. LABORATORY TEST

5.1 Hardness: - The surface hardness of blade was recorded as under: -

Description	As per IS: 6690–1981 (HRC)	Hardness as observed (HRC)	Remarks
Edge portion	53 to 59	49.6 (Average)	**Does not conform**
On shank portion	37 to 45	47.0 (Average)	**Does not conform**

5.2 Chemical composition

The chemical composition of blades is tabulated as under:-

Constituents	As per IS: 6690–1981		Composition as observed (% of weight)	Remarks
	Carbon Steel	Silicon Manganese steel		
Carbon (C)	0.70 -0.85	0.50-0.60	0.350	**Does not conform**
Silicon (Si)	0.10 -0.40	1.50-2.00	1.105	Manganese steel Conforms
Manganese (Mn)	0.50 -1.0	0.50-1.00	0.743	Conforms
Sulphur (S)	0.05(max)	0.05(max)	0.091	**Does not conform**
Phosphorous (P)	0.05(max)	0.05(max)	0.000	Conforms

6. FIELD PERFORMANCE TEST

The field tests of the rotavator comprising of dry land and wet land operation were conducted for 25.95 and 11.18 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	Mahindra Arjun 555 DI	
2.	Gear used	L-1	L-1
3.	Type of soil	Sandy loam	
4.	Average soil moisture (%)	4.9 to 5.7	--
5.	Average depth of standing water (cm)	--	9.88 to 10.75
6.	Bulk density of soil (g/cc)	1.61 to 1.70	--
7.	Average speed of operation (kmph)	2.29 to 2.31	2.34 to 2.35
8.	Avg. travel reduction (%)	--	-0.51% to- 0.53%
9.	Avg. wheel slip (%)	-0.99 to -1.40	--
10.	Average depth of puddle (cm)	--	19.91 to 21.0
11.	Average depth of cut (cm)	11.33 to 12.66	--
12.	Avg. effective width (m)	2.12 to 2.17	--
13.	Area covered (ha/h)	0.40 to 0.41	--
14.	Time required for one ha (h)	2.44 to 2.50	--
15.	Field efficiency (%)	80% to 83.67%	--
16.	Puddling index (%)	--	65% to 66%
17.	Fuel consumption		
	l/h	5.36 to 5.94	2.97 to 3.20
	l/ha	13.83 to 14.81	--
18.	Avg. PTO power consumption, kW	17.56	--

6.1 Dry land operation

6.1.1 Rate of work

i) The rate of work was recorded 0.40 to 0.41 ha/h, and the speed of operation varies from 2.29 to 2.31 kmph.

ii) The time required to cover one hectare was recorded as 2.44 to 2.50 h

6.1.2 Quality of work

i) The depth of operation was recorded as 11.33 to 12.66 cm.

ii) Average effective width was observed as 212.0 to 217.0 cm.

iii) Field efficiency was observed as 80.00 to 83.67%.

6.2 Wet Land operation

6.2.1 Quality of work

i) The depth of puddle was recorded as 19.91 to 21.0 cm.

ii) The puddling index was recorded as 65 to 66 %.

12. COMMENTS AND RECOMMENDATIONS

12.1 The hardness of blades does not conform, in toto, to the requirements of IS: 6690-1981. This needs to be looked into for corrective action.

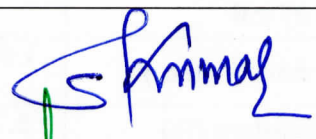
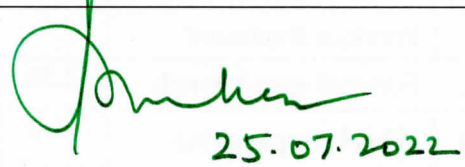
12.2 The chemical composition of blades does not conform, in toto, to the requirements of IS: 6690-1981. This needs to be looked into for corrective action.

12.3 The dimension of PIC of implement does not conform, in toto, to the requirement of IS:10318-2002 and therefore, it may be looks into for corrective action.

12.4 Technical Literature:

One booklet entitled "operator manual, service manual, part catalogue" 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**	 25.07.2022

13. APPLICANT'S COMMENTS

We will work on the recommendations.