

THIS TEST REPORT VALID UP TO : 31st MARCH, 2026



**G.S. 239 HAPPY SEEDER
(TRACTOR MOUNTED)**



भारत सरकार

Government of India

कृषि एवं किसान कल्याण मंत्रालय

Ministry of Agriculture and Farmers Welfare

कृषि, सहकारिता एवं किसान कल्याण विभाग

Department of Agriculture, Cooperation and Farmers Welfare

उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

Northern Region Farm Machinery Training and Testing Institute

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[ISO 9001:2015 CERTIFIED]

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6.7 Hardness: The surface hardness of furrow opener was recorded as under:

Sl. No.	Hardness as per IS: 6813-2000 (HB)	Hardness as observed, HB (Hardened zone is not separately provided on furrow opener)	Remarks
1	350 to 450	414 to 428	Conforms

6.8 Chemical Composition

A piece of furrow opener was got analyzed for chemical composition. The results of chemical analysis which is given below:

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 to 0.60	2.5087	Does not conform
Silicon (Si)	0.10-0.40	1.5 to 2.00	> 4.51	Does not conform
Manganese (Mn)	0.50-1.0	0.50 to 1.0	1.5583	Does not conform
Sulphur (S)	0.5(Max)	0.5(Max)	0.0500	Conforms
Phosphorous (P)	0.5(Max)	0.5(Max)	0.0099	Conforms

7. FIELD PERFORMANCE TEST

The Khandewala, Dev, Happy Seeder was operated for 26.27 hours for sowing of Wheat seed & SSP fertilizer under varying soil and moisture condition in well-prepared seedbed. Total four test trials were conducted (refer **Annexure-XIII**).

The tractor Sonalika DI-60 MM Super Rx was used during the test and reported data are summarized in ensuing table.

Table: Summary of field performance results :

Sl. No.	Parameters	Range
1	Type of soil	Sandy loam
2	Soil moisture (%)	21.3 to 22.1
3	Gear used of tractor	L-1
4	Avg. speed of travel (km/h)	1.79 to 1.81
5	Avg. Wheel slip (%)	1.75 to 2.55
6	Variety of crop	HD 2967
7	Avg. depth (cm)	
	- Seed	3.89 to 3.94
	- Fertilizer	4.0 to 4.17
8	Avg. seed spacing (cm)	1.76 to 1.83
9	Area covered (ha/h)	0.288 to 0.405
10	Time required for one ha (h)	2.57 to 3.47
11	Seed rate (kg/ha)	106.9 to 110.8
12	Fertilizer rate (kg/ha)	112.0 to 116.4
13	Field efficiency (%)	65.8 to 74.6
14	Avg. draft (kN)	3.94
15	Avg. Drawbar power requirement (kW)	1.98
16	Avg. P.T.O. power requirement (kW)	8.04

17	Fuel consumption	
		l/h
		l/ha
		2.57 to 3.25
		7.89 to 10.96

7.1 Rate of work

- The average area covered was recorded as 0.288 to 0.405 ha/h at average operating speed 1.79 to 1.81 km/h
- The field efficiency of seed cum fertilizer drill was recorded as 65.8 to 74.6%.

7.2 Quality of work

- The average depth of sowing the seed was recorded as 3.89 to 3.94 cm.
- The average depth of placing the fertilizer was recorded as 4.0 to 4.17 cm.
- The average number of seeds per meter row length was recorded as 54 to 55
- The average spacing between seeds was recorded as 1.76 to 1.83 cm.
- The deviation of seed from centre line was observed as 4.1 to 4.6 mm.

7.3 Metering rate**7.3.1 Wheat**

The seed rate of Wheat was recorded 106.9 to 110.8 kg/ha.

7.3.3 Fertilizer

The fertilizer rate of was recorded 112.0 to 116.4 kg/ha.

7.4 Power requirement

- 7.4.1** The average draft observed during Wheat sowing was 3.94 kN.
- 7.4.2** The Drawbar power requirement during Wheat sowing was 1.98 kW.
- 7.4.3** The average P.T.O power requirement during Wheat sowing was 8.04 kW.

7.5 Rate of wear of furrow opener on mass basis (for 26.27 hours of field operation):

Furrow opener No	Initial Mass (g)	Final Mass (g) after 26.27 h	Percent Wear (%)		
			Loss of mass (g) after 26.27 h	Percent (Wear)	Wear Per hour
1	2843.5	2822.7	20.8	0.73	0.03
2	2916.7	2897.4	19.3	0.66	0.03
3	2856.0	2840.0	16.0	0.56	0.02
4	2918.0	2891.3	27.0	0.93	0.04
5	2854.0	2837.6	16.4	0.57	0.02

Remark: The hourly rate of wear on mass basis was observed as 0.02 to 0.04%.

7.6 Rate of wear of flail blade on Mass basis (for 26.27 hours of field operation)

Flail Blade	Initial Mass (g)	Final Mass (g) after 25.69 h	Percent Wear (%)		
			Loss of mass (g) after 26.27 h	Percent (Wear)	Wear Per hour
1.	1071.7	1060.4	11.3	1.05	0.04
2.	1054.5	1039.1	15.4	1.46	0.06
3.	1054.2	1040.7	13.5	1.28	0.05
4.	1066.7	1054.3	12.4	1.16	0.04
5.	1062.7	1051.4	11.3	1.06	0.04

Remark: The hourly rate of wear on mass basis was observed as 0.04 to 0.06%.

7.7 Labor requirement

One skilled operator was required to operate the tractor and one more labor is needed for filling the seed and fertilizer box, to check the furrow openers and seed tubes against chocking.

8. EASE OF OPERATION AND ADJUSTMENT

No noticeable difficulty was observed during operation and adjustment of Happy seeder

9. DEFECTS, BREAKDOWNS, ADJUSTMENTS AND REPAIRS

No noticeable defect occurred in the Happy Seeder during the test

10. CONFORMITY TO INDIAN STANDARDS

Cl. No	Requirement as per IS: 6813: 2000	Observations	Remarks	
Cl 4	Type	Tractor mounted	--	
Cl 5.1	Size	10 x 236 mm (Adjustable)	--	
Cl 6.1	Material: -			
	Component Requirement			
	Frame and toolbar	MS	MS	Conforms
	Wheel	MS, Cast iron	MS	Conforms
	Axle & shaft	MS	MS	Conforms
	Seed box	MS, GI sheet, Seasoned wood, Plastic, Fiberglass, Reinforced plastics.	MS	Conforms
	Tynes	MS, carbon steel	Carbon steel	Conforms
	Boot	MS, carbon steel	MS	Conforms
	Furrow Opener	High Carbon Steel	High carbon steel	Conforms
Seed tubes	Steel Ribbon/Plastic/ Rubber	Plastic	Conforms	

Cl. 11	ACCESSORIES:		
	- The following accessories may be provided with each drill: -		
	a) Foot board	Provided	Conforms
	b) Covering device	Provided	Conforms
	c) Row marker	Not provided	Does not conform
d) Press wheel	Provided	Conforms	
e) Area recorder	Not provided	Does not conform	
Cl. 12	WORKMANSHIP & FINISH		
Cl 12.1	The welding shall be satisfactory in all aspects and should not be brittle.	Satisfactory	Conforms
Cl 12.2	The components shall be free from rust and shall have a protective coating to prevent surface deterioration in transit and storage.	The components are free from rust and have a protective coating to prevent surface deterioration in transit and storage.	Conforms
Cl 12.3	The components should be free from pits, burrs and other defects that may be detrimental for their use.	The components are free from pits, burrs and other defects.	Conforms
Cl 14	MARKING & PACKING:		
Cl 14.1	Each drill shall be marked with the following particulars: a) Indication of the source of Manufacture b) Model, code and serial number c) Type d) Size e) Type of seeds (suitability) f) Mass	Labeling plate is provided. But not as per requirement.	Does not conform in toto


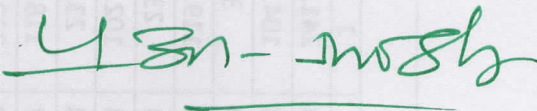
11. COMMENTS & RECOMMENDATIONS

- 11.1** The three point linkage system of the seed cum fertilizer drill does not conform to IS:4468 (Part 1):1997. This should be looked into.
- 11.2** **The seed and fertilizer box should be provided with self-locking mechanism on being opened.**
- 11.3** Accessories like covering device, row marker, press wheel and area recorder may also be provided.
- 11.4** The chemical composition of inverted T shoe type furrow opener does not meet, in full, the requirement of IS: 6690-1981. This should be looked into for corrective action.

- 11.5 No provision against overload on power take off drive shaft is provided. It **MUST** be looked into.
- 11.6 Safety guard in power take off drive shaft is not provided. It **MUST** be looked into.
- 11.7 **It is recommended that a permanent metallic calibration plate indicating the metering position and quantity of seed and fertilizer should be attached under the top cover of the seed box.**
- 11.8 **The grade of gear box oil is not specified. It MUST be specified.**
- 11.9 **The variation in dropping of seed among different furrow openers was observed to be too high and therefore needs to be looked into for improvement in design.**
- 11.10 **The variation in dropping due to box filling at $\frac{3}{4}$ th, $\frac{1}{2}$ nd and $\frac{1}{4}$ th of rated capacity and mechanical damage of seed were excessive and calls for improvement in the design.**
- 11.11 The percentage of visible damage to seed drill is high ,hence its **MUST** be looked in to for improvement in design.
- 11.12 Variation in the quantity of seed dropping due to change in the speed was excessive and this **MUST** be looked in for improvement in the design.
- 11.13 The labeling plate is provided on the machine but without adequate information. It is therefore recommended that, a labeling plate with following information may be provided on the machine
- I. Name of manufacturer and trade mark, if any
 - II. Make
 - III. Model
 - IV. Year of manufacturer
 - V. Serial No.
 - VI. Recommended power source, (kW)
 - VII. Seed to be sown
- 11.14 **Technical Literature**
No technical literature was provided for reference during the testing, therefore, it is recommended to provide operator's manual, , service manual and Parts catalogue. And operator's manual should be brought out as per IS: 8132- 1999.



TESTING AUTHORITY

R. K. NEMA SENIOR AGRICULTURAL ENGINEER	
P. K. PANDEY DIRECTOR	

12. APPLICANT'S COMMENTS

No specific comment received from applicant.