

व्यावसायिक परीक्षण रिपोर्ट  
COMMERCIAL TEST REPORT

संख्या/ No.: Machine-31/2677/2021,  
माह/Month: February, 2021

THIS TEST REPORT VALID UP TO : 29<sup>th</sup> February, 2028



**KHANDEWALA KUZD-13  
ZERO TILL SEED CUM FERTILIZER DRILL**



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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Sl. No.	Parameters	Range
1	Avg. number of seeds per meter of row length	53 to 56
2	Avg. spacing between seeds (cm)	1.8 to 1.9
3	Deviation of seed from center line (mm)	3.0 to 4.0

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	576 (Average)	<b>Does not conform</b>

### 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	0.50-0.60	3.0141	<b>Does not conform</b>
Silicon (Si)	0.10-0.40	1.50-2.00	0.0000	<b>Does not conform</b>
Manganese (Mn)	0.50-1.0	0.50-1.0	0.2971	<b>Does not conform</b>
Sulphur (S)	0.05-(Max.)	0.05-(Max.)	0.1857	<b>Does not conform</b>
Phosphorous (P)	0.05-(Max.)	0.05-(Max.)	0.0100	Conforms

## 7. FIELD PERFORMANCE TEST

The Khandewala, KUZD-13, Zero Till Seed Cum Fertilizer Drill was operated for 25 hours for sowing of Wheat seed & DAP fertilizer under varying soil and moisture condition in paddy field after combine harvesting. Total four test trials were conducted refer (Annexure-XIII).

The tractor Farmtrac-65-EPI 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 (%)	16.2 to 17.5
3	Gear used of tractor	L-3
4	Avg. speed of travel (km/h)	2.80 to 2.88
5	Avg. Wheel slip (%)	10.1 to 14.9
6	Variety of crop	Wheat HD 2967
7	Avg. depth (cm)	
	- Seed	1.4
	- Fertilizer	1.4
8	Avg. seed spacing (cm)	1.8 to 1.9
9	Area covered (ha/h)	0.415 to 0.438
10	Time required for one ha (h)	2.28 to 2.41

11	Seed rate (kg/ha)	120.6 to 128.2
12	Fertilizer rate (kg/ha)	127.2 to 142.2
13	Field efficiency (%)	57 to 63
14	Avg. draft (kgf)	468
15	Avg. power requirement (kW)	3.58
16	Fuel consumption	
	l/h	1.70 to 1.80
	l/ha	3.86 to 4.26

**7.1 Rate of work**

- > The average area covered was recorded as 0.415 to 0.438 ha/h at average operating speed 2.80 to 2.88 km/h
- > The field efficiency of seed cum fertilizer drill was recorded as 57 to 63%.

**7.2 Quality of work**

- > The average depth of sowing the seed was recorded as 1.4 cm.
- > The average depth of sowing the fertilizer was recorded as 1.4 cm.
- > The average number of seeds per meter row length was recorded as 53 to 56
- > The average spacing between seeds was recorded as 1.8 to 1.9 cm.
- > The deviation of seed from centre line was observed as 3.0 to 4.0 mm.

**7.3 Metering rate****7.3.1 Wheat**

The seed rate of Wheat was recorded 120.6 to 128.2 kg/ha.

**7.3.3 Fertilizer**

The fertilizer rate of was recorded 127.2 to 142.2 kg/ha.

**7.4 Power requirement**

7.4.1 The average draft observed during wheat sowing was 468 kgf.

7.4.2 The power requirement during wheat sowing was 3.58 kW.

**7.5 Rate of wear on mass basis (for 25 hours of field operation):**

Furrow opener No	Initial Mass (g)	Final Mass (g) after 25 h	Percent Wear (%)		
			Loss of mass (g) after 25 h	Percent (Wear)	Wear Per hour
1	3080	3050	30	0.97	0.04
2	3040	3019	21	0.69	0.03
3	3100	3081	19	0.61	0.02
4	3060	3024	36	1.18	0.05
5	3060	3034	26	0.85	0.03
6	3080	3056	24	0.78	0.03
7	3040	3021	19	0.63	0.03

Remark: The hourly rate of wear on mass basis was observed as 0.02 to 0.05%.

**7.6 Labor requirement**

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



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CI 14	MARKING & PACKING:		
CI 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. CRITICAL TECHNICAL SPECIFICATION

(Differed till 31.03.2021 Vide Ministry O.M No. 13-13/2020 M&T (I&P) dated 22.12.2020)

### 12. COMMENTS & RECOMMENDATIONS

- 12.1 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.
- 12.2 **The seed and fertilizer box should be provided with self-locking mechanism on being opened.**
- 12.3 Accessories like covering device, row marker, press wheel and area recorder may also be provided.
- 12.4 Hardness and Chemical composition of furrow opener is not within the limits specified in the relevant standard. It should be looked into for corrective action.
- 12.5 Seed agitator has not been provided. It should be looked into for corrective action.
- 12.6 **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.**
- 12.7 **The variation in dropping due to box filling at  $\frac{1}{4}^{\text{th}}$ ,  $\frac{1}{2}^{\text{nd}}$  and  $\frac{3}{4}^{\text{th}}$  of rated capacity and mechanical damage of seed were excessive and calls for improvement in the design.**
- 12.8 Variation in the quantity of seed dropping due to change in the speed were excessive and this MUST be looked in for improvement in the design.
- 12.9 The labeling plate should be provided on the machine with following information.
1. Name and address of manufacturer.
  2. Country of origin
  3. Make
  4. Model
  5. year of manufacture
  6. Serial Number
  7. Type
  8. Size ( Number of row x Row spacing (cm))
  9. Name of Crop sown recommended
  10. Required size of prime mover (kW)
  11. Weight (kg)

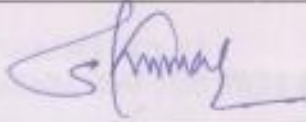
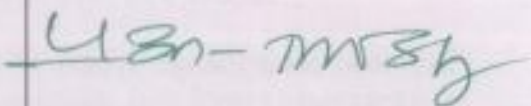
**12.11 Technical Literature**

No technical literature provided by the applicant during the test.

The following literature, therefore, MUST be provided as per IS: 8132-1999 for guidance of user.

- i) Operator's manual
- ii) Service manual
- iii) Parts catalogue

**TESTING AUTHORITY**

SANJAY KUMAR AGRICULTURAL ENGINEER	
P. K. PANDEY DIRECTOR	

Draft test Report is compiled by C.Veeranjaneyulu, Senior Technician

**13. APPLICANT'S COMMENTS**

No specific comments received from the applicant.

