व्यावसायिक परीक्षण रिपोर्ट

COMMERCIAL TEST REPORT

संख्या/ **No.: Machine-32/2679/2021**

माह/**Month: February, 2021**

THIS TEST REPORT VALID UP TO : 29th February, 2028

KHANDEWALA (KKU-6) B.T COTTON PLANTER 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

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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	553 (Average)	**Does not conform**

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	2.1626	**Does not conform**
Silicon (Si)	0.10-0.40	1.50-2.00	0.0000	**Does not conform**
Manganese (Mn)	0.50-1.0	0.50-1.0	0.3195	**Does not conform**
Sulphur (S)	0.05-(Max.)	0.05-(Max.)	0.2249	**Does not conform**
Phosphorous (P)	0.05-(Max.)	0.05-(Max.)	0.0140	Conforms

7. FIELD PERFORMANCE TEST

The Khandewala, (KKU-6) B.T Cotton Planter cum Fertilizer Drill was operated for 27.8 hours for sowing of B.T cotton seed & DAP fertilizer under varying soil and moisture condition in well-prepared seedbed. Total six test trials were conducted (refer **Annexure-XIII**).

The tractor Farmtrac-Champion F2 SM 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 (%)	17.5 to 19.5
3	Gear used of tractor	L-3
4	Avg. speed of travel (km/h)	2.81 to 2.91
5	Avg. Wheel slip (%)	0.17 to 2.73
6	Variety of crop	B.T cotton & RCH 776 BG11
7	Avg. depth (cm)	
	- Seed	6.8 to 8.9
	- Fertilizer	6.8 to 8.9
8	Avg. seed spacing (cm)	25
9	Area covered (ha/h)	0.609 to 0.702
10	Time required for one ha (h)	1.42 to 1.64
11	Seed rate (kg/ha)	1.52 to 1.68
12	Fertilizer rate (kg/ha)	43.0 to 45.9
13	Field efficiency (%)	69 to 80
14	Avg. draft (kgf)	431
15	Avg. power requirement (kW)	3.33
16	Fuel consumption	
	l/h	1.48 to 1.76
	l/ha	2.11 to 2.82

7.1 Rate of work

- The average area covered was recorded as 0.609 to 0.702 ha/h at average operating speed 2.81 to 2.91 km/h
- The field efficiency of seed cum fertilizer drill was recorded as 69 to 80%.

7.2 Quality of work

- The average depth of sowing the seed was recorded as 6.8 to 8.9 cm.
- The average depth of sowing the fertilizer was recorded as 6.8 to 8.9 cm.
- The average number of seeds per meter row length was recorded as 04
- The average spacing between seeds was recorded as 25.
- The deviation of seed from centre line was observed as 2.0 to 3.0 mm.

7.3 Metering rate

7.3.1 Cotton

The seed rate of Wheat was recorded 1.52 to 1.68 kg/ha.

7.3.3 Fertilizer

The fertilizer rate of was recorded 43.0 to 45.9 kg/ha.

7.4 Power requirement

7.4.1 The average draft observed during wheat sowing was 431 kgf.

7.4.2 The power requirement during wheat sowing was 3.33 kW.

7.5 Rate of wear on mass basis (for 28 hours of field operation):

Furrow opener No	Initial Mass (g)	Final Mass (g) after 28 h	Percent Wear (%)		
			Loss of mass (g) after 28 h	Percent (Wear)	Wear Per hour
1	2663	2651	12	0.45	0.02
2	2711	2700	11	0.41	0.01
3	2670	2656	14	0.52	0.02

Remark: The hourly rate of wear on mass basis was observed as 0.01 to 0.02%.

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.

8. EASE OF OPEARATION AND ADJUSTMENT

No noticeable difficulty was observed during operation and adjustment of Zero till seed cum fertilizer drill.

9. DEFECTS, BREAKDOWNS, ADJUSTMENTS AND REPAIRS

No noticeable defect occurred in the seed cum fertilizer drill 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	3 x 1069 mm (Adjustable)	--

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, 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 ¾th, ½nd and ¼th of rated capacity and mechanical damage of seed were excessive and calls for improvement in the design.**

12.8 Although there are six holes provided for changing the hopper inclination. Yet hole no. five and six give rise to uncontrolled dropping of seed. Necessary action may be taken to improve the design.

12.9 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.

12.10 The labeling plate should be provided on the implement 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**	

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13. APPLICANT'S COMMENTS

No Comments received from the applicant.