

व्यावसायिक परीक्षण रिपोर्ट

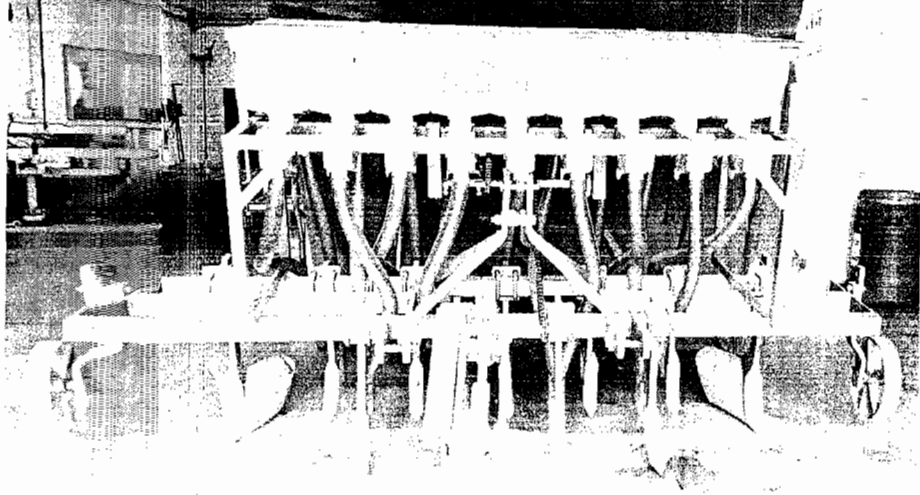
संख्या / No.: 17/2021

COMMERCIAL TEST REPORT

माह / Month: September, 2022

THIS TEST REPORT ISSUED ON: 16 SEP 2022

THIS TEST REPORT VALID UPTO: 15 SEP 2029



**ANKITA IMPLEMENTS PVT. LTD. TRACTOR MOUNTED BROAD BED
FURROW SEED CUM FERTILIZER DRILL (9-TINES)**



कृषि यांत्रिकीकरण प्रभाग
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REPORT NO. 17/2021	ANKITA IMPLEMENTS PVT. LTD. TRACTOR MOUNTED BROAD BED FURROW SEED CUM FERTILIZER DRILL (9-TINES)	COMMERCIAL
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Manufacturer : M/s. Ankita Implements Pvt. Ltd.,
K-37, Opp. CEAT Tyres, MIDC Waluj,
Pandharpur, Aurangabad - 431136 (M.H.)

Applicant : M/s. Ankita Implements Pvt. Ltd.,
K-37, Opp. CEAT Tyres, MIDC Waluj,
Pandharpur, Aurangabad - 431136 (M.H.)

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Type of test	:	COMMERCIAL
Name of machine	:	Tractor Mounted Broad Bed Furrow Seed cum fertilizer drill (9-Tines)
Test requested by	:	M/s. Ankita Implements Pvt. Ltd., K-37, Opp. CEAT Tyres, MIDC Waluj, Pandharpur, Aurangabad - 431136 (M.H.)
Testing Authority	:	ICAR - Central Institute of Agricultural Engineering, Nabi Bagh, Berasia Road, Bhopal - 462038 (M.P.)
Period of test	:	October 2021 to June 2022
Test Report No.	:	17/2021
This test report issued on	:	16 SEP 2022
This test report valid upto	:	15 SEP 2029

- i) The results reported in this report are observed values and no corrections have been applied for atmospheric and site conditions.
- ii) The data given in this report pertains to the particular machine submitted by the applicant for test.
- iii) The results presented in this report do not in any way attribute to durability of the machine.
- iv) This report should not be reproduced in part or full without prior permission of the Director, ICAR - Central Institute of Agricultural Engineering, Nabi Bagh, Berasia Road, Bhopal - 462038 (M.P.)

SELECTED CONVERSIONS

S. No.	Units	Conversion Factor
1	Force	
	1 kgf	9.80665 N
		2.20462 lbf
2	Power	
	1 hp	745.7 W
		0.7457 kW
	1 kW	1.35962 Ps
	1 kW	1.341 hp
3	Pressure	
	1 psi	6.895 kPa
	1 kgf/cm ²	98.067 kPa = 735.55 mm of Hg
	1 bar	100 kPa = 10 N/cm ²
	1 mm of Hg	1.3332 m-bar

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1. SCOPE OF TEST

The scope of test was to check and assess the following:-

1.1 Laboratory Test

- i) Checking of specifications
- ii) Metering mechanism to meter seed and fertilizer at desired rate.
- iii) Variation in dropping of seed and fertilizer among different furrow openers (Inter opener variation).
- iv) Variation in dropping of seed due to change in quantity of seed in the seed box.
- v) Seed damage determination test
- vi) Uniformity of seeding
- vii) Hardness and chemical composition of the soil engaging parts.

1.2 Field Test

- i) Quality of work
- ii) Rate of work
- iii) Power requirement
- iv) Labour requirement
- v) Ease of operation and adjustment
- vi) Breakdowns & repairs

2. TEST CODE/PROCEDURE

The following test code have been reference for testing of seed-cum-fertilizer drill:

IS 6316:1993 : Sowing equipment – Seed-cum-fertilizer drill- test code (Reaffirmed 2009).

IS 6813:2000 : Sowing equipment – Seed-cum-fertilizer drill- specifications (Reaffirmed 2011)

IS 4468(Part-1):1997 : Agricultural wheeled tractors- Rear mounted three point linkage: (Reaffirmed 2012) Part-1 category 1,2,3 and 4 (fourth revision).

3. METHOD OF SELECTION

The machine was directly submitted by the applicant for test at this institute. Hence, the method of selection is not known.

4. SPECIFICATIONS

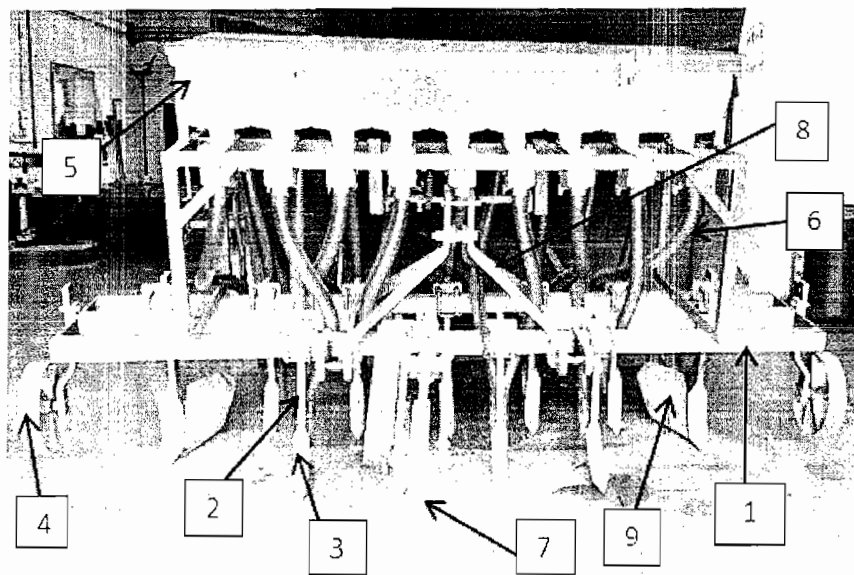
4.1	General	
	Name & address of manufacturer	: M/s. Ankita Implements Pvt. Ltd., K-37, Opp. CEAT Tyres, MIDC Waluj, Pandharpur, Aurangabad - 431136 (M.H.)
	Name of machine	: Tractor Mounted Broad Bed Furrow Seed cum fertilizer drill (9-Tines)
	Type of implement	: Tractor mounted
	Make	: Ankita Implements Pvt. Ltd.
	Model	: 9 - Tines
	Brand	: Ankita
	Serial No.	: FF-3600
	Year of manufacture	: 2021-22
	Recommended power source	: Tractor, 35 hp & above



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Recommended travelling speed of the drill, kmph.	:	Not specified, however, during test it was observed as 2.95-3.05.
Type of seed to which the drill is designed to sow (apa)	:	Soybean, Gram, Groundnut, Mung, Udad, Sorghum, Maize, Wheat etc.

4.2	Prime mover used		
	Tractor	:	New Holland 3630
	Chassis No./Engine no.	:	NHN36300ZFJ334016/169519DX
	Max. PTO Power, kW (Ps)	:	41 (55.7)



Keys:

- | | |
|---------------------|---------------------------|
| 1. Main frame | 4. Depth control wheel |
| 2. Tyne | 5. Seed/fertilizer hopper |
| 3. Shovel | 6. Seed/fertilizer tube |
| 7. Ground wheel | 8. Three point linkage |
| 9. Broad bed furrow | |

Fig.1 Constructional details of Ankita Implements Pvt. Ltd. Tractor mounted Broad bed furrow Seed cum fertilizer drill (9-Tines)

4.3	Constructional Details (Refer fig. 1)	
4.3.1	Main frame	
	Constructional details	: A rectangular main frame is fabricated from MS square pipes and MS flats by welding. Dimensions, mm MS Square pipe - 2265×60×60 - 2 Nos. MS Square pipe - 815×60×60 - 2 Nos. MS Flat- 485×65×10 - 2 Nos. MS Flat- 365×65×16 - 2 Nos.
	Size of MS angle for supporting seed & fertilizer box, (mm)	: 1) 1520×35/35×5 - 4 Nos. 2) 735×35/35×5 - 4 Nos. 3) 550×35/35×5 - 4 Nos.



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	Dimensions of main frame, (mm)		
	Length	:	2285
	Width	:	485
4.3.2	Tyne		
	No. of tines	:	9
	Type	:	Rigid
	Material	:	MS flat
	Arrangement of tines on mainframe	:	4 openers in front row and 5 openers in rear row
	Spacing of Tines, mm	:	150
	Provision for adjustment of row spacing	:	'U' clamps are provided
	Dimensions, mm		
	- Curved length	:	555
	- Projected length	:	510
	- Width of tine at top	:	70
	- Width of tine at bottom	:	25
	- Thickness	:	20.27
	No. & size of holes on each tyne for fixing shovel, mm	:	02, \varnothing 10.5
4.3.3	Furrow openers		
	No. of furrow openers	:	9
	Type	:	Shovel (Reversible)
	Material	:	High carbon steel.
	Method of fixing	:	Each shovel type furrow openers are bolted with two nos. of bolt and nuts of size \varnothing 10 \times 60 – 01 No. & \varnothing 10 \times 72 – No.

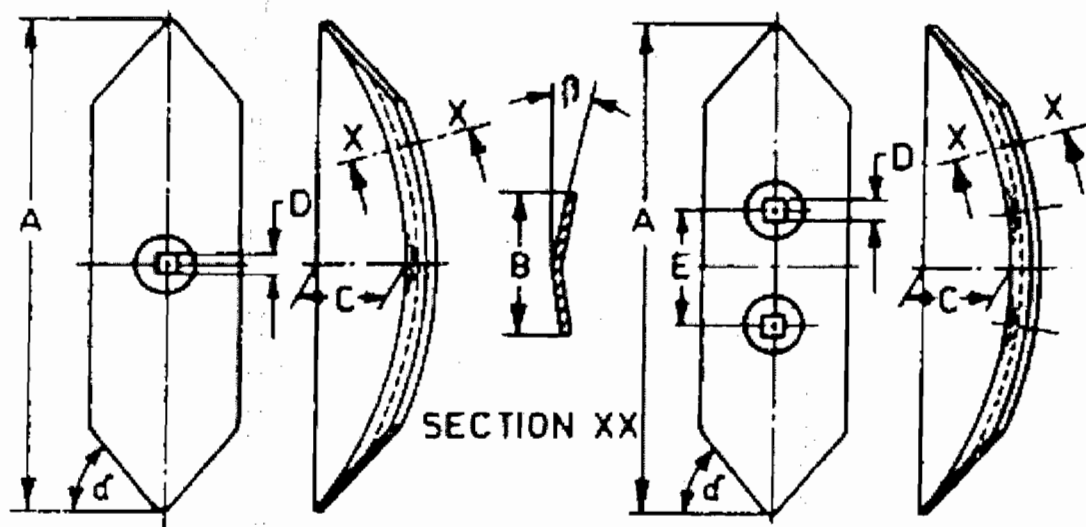


Fig. 2 : Dimensions of Reversible Shovel as per Indian Standard (mm)



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Specification details of reversible shovel (As per IS 6813:2000) (Refer fig. 2)

Notations	Dimensions (mm)			Conformity to IS
	As per IS		As measured	
	Specified	Tolerance		
A	150,170 & 180	±2	240	Does not conform
B	35 & 45	±2	45.62	Conforms
C	25 & 30	±1	31	Conforms
D	11.5	±0.5	11.97	Conforms
E	45	±0.5	39.60	Conforms
α	45°	±5°	45°	Conforms
β	10 to 20°	--	18°	Conforms

4.3.4	Seed box		
	Number of box	:	9
	Material	:	Nylon
	Type	:	Trapezoidal shape
	Dimensions of each seed box.mm		
	- Length	:	215
	- Width at top	:	160
	- Width at bottom	:	100
	- Depth	:	210
	Provision of cover	:	Provided
	Height from ground level, (mm)	:	1065
4.3.5	Fertilizer box		
	Number of box	:	9
	Material	:	Nylon
	Type	:	Trapezoidal shape
	Dimensions of each seed box.mm		
	- Length	:	215
	- Width at top	:	160
	- Width at bottom	:	100
	- Depth	:	210
	Provision of cover	:	Provided
	Height from ground level, (mm)	:	1065
4.3.6	Seed/Fertilizer Metering Mechanism		
	Type	:	Cup feed vertical roller
	Material	:	Plastic
	Size and no. of vertical roller	:	Ø91 mm, 9 Nos.
	Size of feed shaft, (mm)	:	1450×16×16



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	Method of drive to feed shaft	:	Chain and sprocket
	Method of feed rate control	:	Shutters are provided with 10 positions to vary the feed rate by adjusting the opening clearance
4.3.7	Seed & fertilizer tube		
	Type	:	Flexible, PVC
	Number of tube	:	18
	Length of tube, (mm)	:	820 to 1220
	Size of tube (OD/ID), (mm)	:	46/42
	Thickness of tube, (mm)	:	2
	Method of fixing	:	One end of the tube is inserted in the feed cup, and the other end in the boot
4.3.8	Furrower		
	No. of furrower	:	02
	Material	:	Mild steel
	Shank of furrower Dimensions, mm		
	- Curved length	:	670
	- Projected length	:	610
	- Width at top	:	70.87
	- Width at bottom	:	25
	- Thickness	:	20.64
	Dimension of furrower (L×W×T), mm	:	380×205×5.33
	Wings of furrower	:	02 (Each)
	Span of furrower	:	215-295
4.3.9	Marker details	:	Not Provided
4.3.10	Seed covering arrangement	:	Provided
4.3.11	Type of hitch & its details	:	
	Type	:	Three point linkage
	Shape	:	Pyramid
	Material of construction	:	M.S. flats
	Size of flats, mm	:	640×50×15(t) - 02 Nos. (Front) 740×50×15(t) - 02 Nos. (Rear)
	Height of lower link hitch pins from ground level, mm	:	530

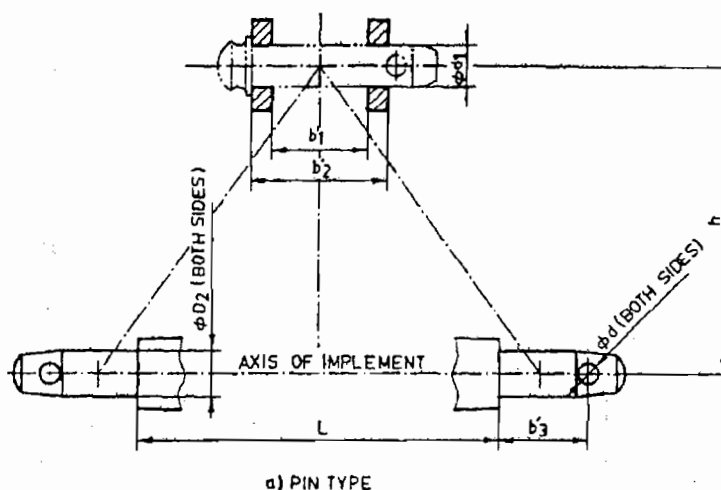
Dimensions of three point linkage (Refer fig. 3)

Dimension (See Fig.)	Description	As per IS: 4468(Part-I):1997 (Cat-I/Cat-II), mm	As measured	Remarks
Upper hitch attachments				
d ₁	Diameter of hitch pin hole	19.3 to 19.5/ 25.7 to 25.9	19.38	Conforms
b' ₁	Width between inner face of yoke, min.	44.5/52	48.77	Conforms

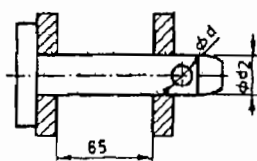


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b'_2	Width between outer face of yoke, max	69/86	82.29	Conforms
Lower hitch points				
D_2	Diameter of hitch pin	21.8 to 22.0 /27.8 to 28.0	22	Conforms
b'_3	Linch pin hole distance, min	39/49	100	Conforms
l	Lower hitch point span	$683\pm 1.5/825\pm 1.5$	684.5	Conforms
Other dimensions				
d	Diameter for linch pin - for upper hitch pin, min - for lower hitch pin, min	12/12 12/12	9.5 12	Does not conform Conforms
h	Mast height	$460\pm 1.5/610\pm 1.5$	461	Conforms



a) PIN TYPE



b) CLEVIS TYPE

Fig. 3 Dimensions of three point linkage

4.3.12	Ground drive		
	No. of wheels	:	1
	Type of wheel	:	Lugged type
	No. of lugs & height	:	12 Nos. with 120 mm height
	Diameter of wheel with lug, mm	:	535
	Method of transmitting power to feed shaft	:	Through chain & sprocket
	Position of ground wheel	:	Front side of the seed drill



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4.3.13	Details of depth adjustments	:	Depth control wheel is provided
4.4	Safety arrangement for rotating parts	:	Cover provided
4.5	Overall Dimensions, mm		
	Length	:	2680
	Width	:	2200
	Height	:	1350
4.6	Mass, kg	:	365
4.7	Colour	:	White, orange and emerald green
4.8	No. of greasing/oiling points	:	Drive wheel bearing - 02 Nos. Chain & sprocket - 04 Nos.
4.9	Labelling plate	:	
	Manufacturer	:	Ankita Implements Pvt. Ltd. K-37, Opp. CEAT Tyres, Waluj, MIDC, Aurangabad 431136
	Product Sr. No.	:	FF-3600
	Website	:	www.ankitaagro.com
	Helpline	:	9130016503,5,6,1,2 9422737939

5. RUNNING-IN

No running-in was recommended by manufacturer. Hence the seed cum fertilizer drill was directly operated in the field, however nuts and bolts were tightened and lubrication was done before actual test.

6. LABORATORY TEST

6.1 Seed specifications used for test:

Variety	Bulk density gm/cc	No. of seeds in one kg sample	Moisture content (%)	Broken (%)
Soybean, JS-9560	0.62	9750	9.89	0.5
Wheat, HI-1544	0.75	16600	12.6	0.6

6.2 Hardness of furrow opener shovel

As per IS 6813:2000	As Measured	Remarks
350-450 HB	374 HB	Conforms

6.3 Chemical composition of furrow opener shovel

Sl. No.	Element	Standard Requirement as per IS: 6690-1981 for carbon steel	Actual results (% by weight)	Remarks
1	Carbon	0.70-0.85	0.71	Conforms
2	Silicon	0.10-0.40	0.18	Conforms
3	Manganese	0.50-1.00	0.64	Conforms
4	Sulphur	0.05 (max)	0.011	Conforms
5	Phosphorous	0.05 (max)	0.017	Conforms



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7. FIELD TEST

Field test of the implement was conducted at CIAE Bhopal for 23.7 hours. The implement was used for sowing Soybean (JS-9560) and Wheat (HI-1544). The detailed test results are summarised as under:-

Summary of field test results:

Sl. No.	Parameters	Range of measurement	
		Soybean	Wheat
1.	Depth of seed sowing, mm	55(50-60)	55 (50-60)
2.	Width of sowing, m	1.50	1.50
3.	Speed of operation, km/h	3.0 (2.95-3.05)	3.0 (2.95-3.05)
4.	No. of rows	5	9
5.	Field efficiency, %	72.4 (71.3-73.5)	73.8 (72.6-75.0)
6.	Field capacity, ha/h	0.33 (0.32-0.34)	0.33 (0.32-0.34)
7.	Seed rate, kg/ha	80	100
8.	Fuel consumption, l/h	5.10	5.35
9.	Inter row variation in field for seed, %	4.54±1.98	5.35±2.80

7.1 Quality of work:

Soybean

- The depth of operation and working width of implement were measured as 50 to 60 mm and 1.50 m, respectively.

Wheat

- The depth of operation and working width of implement were measured as 50 to 60 mm and 1.50 m, respectively.

7.2 Rate of work:

Soybean

- The rate of work in vertisol was observed as 0.32 to 0.34 ha/h at the speed of operation of 3.0km/h.
- The field efficiency of the implement was worked out to be 72.4%.

Wheat

- The rate of work in vertisol was observed as 0.32 to 0.34 ha/h at the speed of operation of 3.0 km/h.
- The field efficiency of the implement was worked out to be 73.8%.

7.3 Labour requirement:

Two labours are required to operate the drill. One skilled labour to make adjustments/ calibration of the seed cum fertilizer drill and operate the tractor and other unskilled to fill the seed box and cleaning of furrow openers as and when required.



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7.4 Wear of soil engaging component:

The test implement was operated for 22.3 hours. Wear of soil engaging component (Shovel) is given below

Furrow opener	Initial mass of shovel before test (g)	Final mass of shovel after test (g)	Loss in mass (g)	Wear (%) by mass
Front				
1	552	543	9	1.63
2	537	524	13	2.42
3	546	536	10	1.83
4	526	515	11	2.09
Rear				
1	562	552	10	1.77
2	522	509	13	2.49
3	527	520	7	1.32
4	545	536	9	1.65
5	534	524	10	1.87

Remark:- The wear of furrow openers varied from 1.32-2.49 % by mass basis.

8. LUBRICATION & SERVICING

Cleaning of machine & oiling was done daily before starting the operation.

9. EASE OF OPERATION AND ADJUSTMENT

Operation and adjustment of seed cum fertilizer drill was observed to be satisfactory.

10. BREAKDOWNS AND REPAIRS

No breakdown and repairs was observed during entire period of field & lab tests.

11. CONFORMITY WITH BIS REQUIREMENTS

Material for construction of different components (Cl. 6.1 of IS 6813-2000)

Sl. No.	Component	Material specified	As observations	Remarks
1.	Frame & tool bar	Mild steel	Mild steel	Conforms
2.	Wheel	Mild steel, Cast iron, Pneumatic tyre	Mild steel	Conforms
3.	Axle & Shaft	Mild steel	Mild steel	Conforms
4.	Seed and fertilizer boxes	Mild steel, Galvanised iron sheet, Seasoned wood, Plastic, fiber glass, reinforced plastics	Nylon	Conforms
5.	Tines	Mild steel, Carbon steel	Mild steel	Conforms
6.	Boot	Mild steel, Cast iron	Mild steel	Conforms
7.	Furrow opener	High carbon steel	High carbon steel	Conforms
8.	Seed agitator	Mild steel, Cast iron, Aluminium, PVC, Rubber, Canvas	Not Provided	---
9.	Fertilizer agitator	Mild steel, Cast iron, Aluminium, Canvas	Not Provided	---



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10.	Seed & Fertilizer tubes	Steel ribbon, Plastic, Rubber	Plastic	Conforms
11.	Seed metering mechanism (fluted roller type)			
a.	Seed feed roller, seed feed cut-off and seed plate	Cast iron, Mild steel, nylon	Nylon	Conforms
b.	Seed feed cup	Aluminium	Plastic	Does not conform
c.	Retaining ring and cover	Brass, gun metal, bakelite	Not applicable	---
13.	Fertilizer metering mechanism			
a.	Fertilizer feed roller, fertilizer feed cut-off	Cast iron, Mild steel, Cast aluminium, Nylon	Nylon	Conforms
b.	Retaining ring and cover	Brass, HDPVC, Nylon	Not applicable	---
14.	Bushes	Brass, Gun metal, Nylon	Nylon	Conforms
15.	Covering device	Mild steel, cast iron, seasoned wood	Mild steel	Conforms
16.	Pulley, Sprocket	Cast iron, Mild steel	Mild steel	Conforms
17.	Hitching Mechanism	Mild steel	Mild steel	Conforms
18.	Feed adjusting mechanism	Mild steel, Cast iron	Mild steel	Conforms
19.	Depth adjusting mechanism	Mild steel, cast iron	Mild steel	Conforms
20.	Row marker	Mild steel	Not provided	---

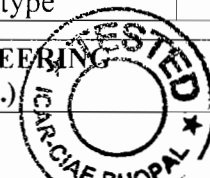
Other requirements as per IS: 6813:2000

Clause No.	Description	Observations	Remarks
Cl. 8	Constructional Requirements		
Cl. 8.1	Frame and Tool bar These should be rigid and strong.	Toolbar is rigid and strong.	Conforms
	The tool bar should have 12.4 mm diameter holes after every 50 mm throughout its length, if it has to be attached through nuts and bolts	Row spacing is adjustable by 'U' clamps.	Conforms
Cl. 8.2	Wheels Wheels should have either bushes or dust proof bearings. They should be strong and shall be provided with lugs/pegs. Wheels should be so attached that they can be easily lowered or raised	Provided with dust proof bearings. Provided with lugs and wheel can easily be lower or raised.	Conforms
Cl. 8.3	Axles and Shafts Axles and shafts should be so attached that they can be removed for cleaning when desired	Axles and shaft can be removed easily.	Conforms



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Cl. 8.4	Seed and Fertilizer Boxes a) These should be either separate or one continuous box with a partition.	Separate seed and fertilizer boxes are provided for each furrow opener	Conforms
	b) The boxes should have adequate capacity and may be trapezoidal or cylindrical with or without tapered bottom.	The box has adequate capacity and having trapezoidal shape.	Conforms
	c) The boxes should be adequately covered to avoid entrance of water.	Cover is provided.	Conforms
	d) The boxes should be sufficiently strong and should not buckle when fully filled with seed and fertilizer	No buckling was observed during test	Conforms
	e) The boxes should be provided with self-locking mechanism on being opened	Provided	Conforms
Cl. 8.4.1	The thickness of mild steel and galvanized steel sheet for boxes shall be not less than 1.0 mm and 0.63 mm respectively.	Not applicable as the material used for making boxes are nylon	---
Cl. 8.5	Tines Tines should be properly attached with toolbar either by bolts and nuts or with clamps.	Tines are properly attached with toolbar by 'U' Clamps	Conforms
Cl. 8.6	Furrow Openers Furrow openers should be provided with depth adjustment arrangement. There may be different furrow openers for seed and fertilizer or common for seed and fertilizer with the provision of dropping them separately.	Common furrow openers are provided for seed and fertilizer with provision of separately dropping	Conforms
Cl. 8.6.1	Furrow openers of shovel, shoe or disc type shall conform to the requirements as given in Annexure B of IS: 6813: 2000	Shovel type furrow openers are provided, but does not have the dimensions as per IS 6813:2000	Does not conform
Cl. 8.7	Seed and Fertilizer tubes The tubes shall be of suitable length and shall be properly clamped with feed outlets of metering mechanism. There should not be any sharp bend in tubes. Tubes should be made of transparent plastics.	Tubes are of suitable length & tightly fitted to feed outlet and having no sharp bend and made of transparent plastic pipe	Conforms
Cl. 8.7.1	Thickness of plastic tubes shall be of 2.5 mm (min.)	2 mm	Does not conform
Cl. 8.8	Metering Mechanism		
Cl. 8.8.1	The seed metering mechanism components of fluted feed roller and plate type shall be in conformity to the requirements given in Annex C. Other type of seed metering mechanisms may also be used.	Not applicable as the vertical roller type seed metering mechanism is provided	---
Cl. 8.8.2	The fertilizer metering mechanism components, of fluted feed roller and plate	Not applicable as the vertical roller type	---



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	type shall conform to the requirements as given in Annex D.	fertilizer metering mechanism is provided	
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Cl. 9	Performance Requirements		
9.1	The variation in dropping of seed and fertilizer in different feeding outlets separately shall be not more than 7 and 12.5 percent respectively from the average quantity obtained.	Variation in dropping of seed and fertilizer among different furrow openers was within the range	Conforms
9.2	The variation in quantity dropped per hectare and quantity specified to be dropped at a particular setting shall be not more than 7 and 12.5 percent for seed and fertilizer respectively.	Variation was within the range	Conforms
9.3	The seed and fertilizer rate shall be easily adjustable upto 125 kg and 1000 kg per hectare respectively.	Adjustable	Conforms
9.4	The percentage of visible damage to seed in the drill shall not exceed 0.5 percent.	No visible damage was observed	Conforms
9.5	The variation in dropping due to box filling at $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ of rated capacity shall not exceed 10 percent.	Variation in dropping due to box filling within the range	Conforms
9.6	The variation in quantity of seed dropping due to change in speed shall not exceed 15 percent of the quantity dropped under the specified speed.	The variation in quantity of seed dropping due to change in speed was less than 15%	Conforms
9.7	The variation in quantity of seed per meter of row length shall not exceed by 10 percent	Variation was less than 10%	Conforms
9.8	The drill shall be able to sow seed upto 100 mm deep. The drill shall be able to drop fertilizer at a minimum of 25 mm to the side of the seed.	Provision is available	Conforms
9.9	The draft of animal-drawn drill shall be not more than 125 kgf.	NA	NA
9.10	The wheel slip at specified speed shall not exceed by 15 percent.	Wheel slip less than 15%	Conforms
9.11	The drill shall be able to sow wheat and one or more of the following seeds: Barley, Paddy, Millet, Pea, Bengal gram, Soyabean & pigeon pea. The drill shall also be able to sow all types of granular fertilizers.	Wheat and soybean crops were sown with drill	Conforms
Cl. 10	Other Requirements		
10.1	The animal-drawn drill shall not have more than five furrow openers; and tractor-operated drill shall have 5 to 15 furrow openers.	9 furrow openers are provided	Conforms



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10.2	Row spacing shall be adjustable ranging from 150 to 225 mm preferably in steps of 25 mm	Adjustment provided	Conforms
10.3	When the furrow openers are lowered to plain surface, openers shall not deviate by more than 5 mm from the line of alignment vertically and horizontally	Furrow openers were not deviate more than 5 mm from the line of alignment vertically and horizontally.	Conforms
10.4	The weight of tractor-mounted drill including the weight of seed and fertilizer filled at rated capacity of box shall not exceed 300 N/kW drawbar power of the tractor recommended for the drill	Weight of tractor-mounted drill including the weight of seed filled at rated capacity is within limit	Conforms
10.5	A permanent type metallic calibration plate indicating the position and quantity of seed & Fertilizer should be attached under the top cover of seed box.	Provided	Conforms
10.7	Proper lubrication arrangements should be provided for all moving components except the portions exposed to seed & fertilizer.	Proper lubrication arrangements available at necessary places	Conforms
10.8	For tractor-operated drills the system of hitching should be designed to suit the three point linkage and drawbar of agricultural tractors.	Provided	Conforms
10.9	Each drill should be provided with instruction sheets containing full information on method of operation and of drill.	Not Provided	Does not conform
10.9.1	Each drill shall also be supplied with necessary tools.	Not Provided	Does not conform
10.9.2	Provision should be made for easy removal of seed and fertilizer from the hopper after the days work.	Provided	Conforms
10.9.3	Each drill should be provided with a manual containing maintenance and storage instruction, calibration chart etc.	Not Provided	Does not conform
Cl. 11	Accessories The following accessories may be provided with each drill:-		
	a) Foot board	Not provided	Does not conform
	b) Covering device	Provided	Conforms
	c) Row marker:	Not provided	Does not conform
	d) Press wheel	Not provided	Does not conform



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	e) Area recorder	Not provided	Does not conform
Cl. 12	Workmanship and Finish		
12.1	The welding shall be satisfactory in all respect and should not be brittle or porous.	Satisfactory	Conforms
12.2	The components shall be free from rust and shall have protective coating to prevent surface deterioration in transit and storage.	Components are free from rust and provided with paint to prevent deterioration of surface	Conforms
12.3	The components should be free from pits, burrs and other defects that may be detrimental for their use.	Satisfactory	Conforms
Cl. 14	Marking and packing		
14.1	Marking Each drill shall be marked with the following particulars:- a) Indication of the source of Manufacturer b) Model, Code and serial number c) Type and size d) Type of seed (suitability) e) Mass	Labelling plate is provided, but not as per requirement	Does not conform

12. COMMENTS AND RECOMMENDATIONS

- 12.1 The Specifications of implement hitch does not conform fully to the IS 4468 (Part-I):1997 (Reaffirmed 2012). It is recommended that the same should be provided conforming to the relevant Indian Standards.
- 12.2 Accessories like foot board, row marker and area recorder are not provided in machine. This may be provided as per requirement of IS: 6813:2000.
- 12.3 The provided labeling plate should be as per required Indian standard.

12.4 TECHNICAL LITERATURE

No Literature was provided for reference during test. It is recommended to develop and brought out the operator's/service manual and spare parts catalogue as per IS: 8132-1999.

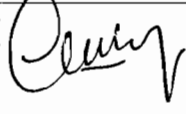

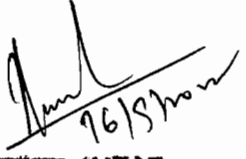
Consisting of the following:

1. Safe operation of machine.
2. Calibration procedure.
3. Recommended size of tractor
4. Recommended forward speed
5. Do's and don't's etc.



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13. TESTING AUTHORITY

Dilip Jat	Scientist and Test Engineer	
N.S. Chandel	Sr. Scientist and Testing Authority	
K.N. Agrawal	Head, Agricultural Mechanization Division, ICAR- Central Institute of Agricultural Engineering, Bhopal	 96/5/2021 प्रमाणपत्र / HEAD कृषि यंत्रिकीकरण प्रभाग Agricultural Mechanization Division कृषि यंत्र उभियांत्रिकी संस्थान Central Institute of Agricultural Engineering नबीबाग, भोपाल (म.प्र.) - 462038 Nabi Bagh, Bhopal (M.P.) - 462038

14. APPLICANT'S COMMENTS

- Manufacturer will modify machine in future as per comments and recommendation.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes the need for transparency and accountability in financial reporting.

2. The second part of the document outlines the various methods and techniques used to collect and analyze data. It highlights the importance of using reliable sources and ensuring the integrity of the data collection process.

3. The third part of the document discusses the challenges and limitations of data analysis. It notes that while data analysis can provide valuable insights, it is not a perfect science and can be subject to human error and bias.

4. The fourth part of the document concludes by summarizing the key findings and recommendations. It stresses the need for ongoing monitoring and evaluation to ensure the effectiveness of the data analysis process.