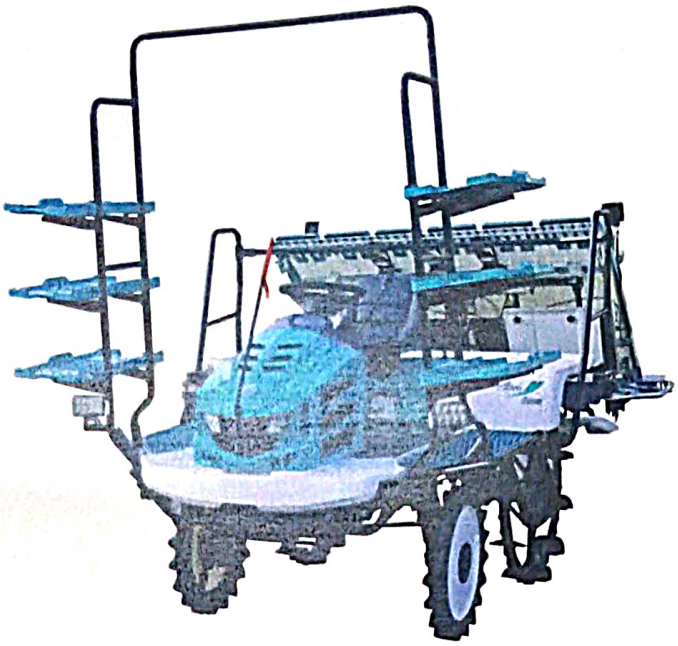
व्यावसायिक परीक्षण रिपोर्ट (प्रारंभिक)
COMMERCIAL TEST REPORT (Initial)

संख्या/No.: Machine 58/423
माह / Month: March 2022

THIS TEST REPORT IS VALID UPTO 31.03.2027



KAIRA RICE TRANSPLANTER, MODEL- 6RDX
RIDE ON TYPE

सत्यमेव जयते

भारत सरकार
GOVT OF INDIA

कृषि एवं किसान कल्याण मंत्रालय
MINISTRY OF AGRICULTURE & FARMERS WELFARE

कृषि, सहकारिता एवं किसान कल्याण विभाग
DEPARTMENT OF AGRICULTURE, COOPERATION & FARMERS WELFARE

उत्तर पूर्वी क्षेत्र कृषि यंत्र प्रशिक्षण एवं परीक्षण संस्थान
NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE

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4.8 Hydraulic System:

The Machine is provided with a gear type hydraulic pump, which gets drive from pump shaft provided inside hydrostatic transmission (HST) system. The HST system is driven by belt and pulley from engine. Hydraulic distributor is mounted on chassis RHS of below Operator seat.And hydraulic pump is mounted on transmission case. Hydraulic cylinder is at the rear of operator seat. One control lever has been provided on right hand side of operator seat, for raising, lowering seedling platform at headlands & during transport.

4.9 Power Steering:

This machine has integral power steering provided with torque generator. The torque generator is device which helps in multiplying the effort applied on the steering wheel. It comprises of a control valve and metering device. The control valve comprises of input' shaft, spool, sleeve, valve housing and relief valve.

4.10 Markers:

One centre guide, two side guide markers and line marker are provided to guide the operator in maintaining row-to-row distance after every pass. The line marker can be raised / lowered by the control lever as and when required, centre guide and side guide marker are manually operated.

5. SPECIFICATIONS

5.1 General:

Name and address of the manufacturer	:	M/s Kaira Manufacturer Company Limited, Room 1101, Building 7 (B1) No.666 Nanlinzhong Rd, Nanxun District, Huzhou City, Zhejiang Province, China
Name and address of the Indian importer	:	M/s KairaAgros, No-13, MurgunKovil Main Road, Kundrathur, Chennai-600069, Tamilnadu, India
Name and address of the applicant.	:	M/s KairaAgros, No-13, MurgunKovil Main Road, Kundrathur, Chennai-600069, Tamilnadu, India
Name of machine	:	Rice Transplanter
Type	:	Self-Propelled, Ride on, 4 wheeled
Make	:	Kaira
Model	:	6RDX
Size of Transplanter, (No. of row x row spacing) mm	:	6x300
Serial no.	:	07E210029M3610262
Year of manufacturer	:	2021
Country of origin	:	China

5.2 Details of Prime mover :

Type	:	Three cylinder, four stroke, water cooled, naturally aspirated diesel engine
Make	:	Kubota
Model	:	D782-ET09
Serial number	:	4JG2617
Year of manufacture	:	2018
Country of origin	:	Japan
Max. power , kW (PS) , (apa)	:	14.2(19.31)
Rated speed, rpm	:	3200
Maximum speed at no load, rpm (apa)	:	3400±100

11. TURNING ABILITY

Characteristics	LHS	RHS
Minimum turning circle diameter (m):	3.59	3.59
Minimum clearance diameter (m):	5.56	5.51

12. FIELD PERFMANCE TEST

Field test were conducts for 36.92 hours. Fields were Puddle by using tractor operated rotavator. Total six test trials were conducted in sandy loam soil. Conditions of test plot and nursery & the field performance results are given Annexure-I & Annexure-II and summarized in table-1 & table-2

12.1 Nursery preparation:

- The mat /tray less type and tray type used in the Rice Transplanter was prepared over a leveled field after spreading a thin polythene sheet.
- The healthy seed of ADT-36 verity were selected to raise the nursery. After thorough cleaning, seeds were soaked in water for 12 hours. Floating seeds were removed and only healthy seeds were converted in moist gunny bags for 24 hours to promote the uniform germination.
- Seed bad was prepared on the leveled ground after removing all the stones, stubbles present in the field.
- A nursery tray having size 580 x 280 x 25 mm was laid down over leveled bed. It filled by the mixture of soil up to top followed by compacting and leveling.
- Then sprouted seeds were broadcast uniformly over the prepared seed bed and covered with a thin layer of soil. Followed by a thin cover of paddy straw. Watering twice a day done to irrigate, first by sprinkler and after the germination of seeds by flooding the bed. It was immigrated at regular interval up to its complete growth.

Summary of condition of field and nursery

Table-1

Sl. No.	Parameters	Range
	Condition of field	
1	Type of soil	Sandy loam
2	Interval between last puddling and planting, hours	02 to 03
3	Depth of puddle, cm	16.8 to 19.60
4	Depth of standing water over puddle, cm	2.38 to 3.8

	Condition of nursery	
1	Variety of paddy	ADT-36
2	Type of seed bed soil	Sandy loam
3	Area of each tray, m^2	0.162
4	Age of nursery , days	18 to 22
5	Leaf stage (no. of leafs)	2.2 to 2.4
7	Length of root (cm)	2.0 to 2.6

Summary of performance results

Table-2

Sl. no.	Parameters	Range
1	Average forward speed, kmph	3.65 to 3.97
2	Engine speed, rpm	
	No. load (idle)	3337 to 3370
	On load(with planting)	3282 to 3310
3	Average depth of transplanting, cm	2.68 to 3.30
4	Average travel reduction (%)	0.21 to 1.59
5	Average spacing between rows, cm	29.6 to 29.9
6	Average number of plants per hill (nos.)	3.27 to 5.87
7	Average spacing between hills, cm	17.2 to 17.87
8	Average total number of hills in 1 m^2	23.2 to 23.6
9	Percentages of transplanting faults (in 1 m^2)%	
	- missed hills	0.85 to 2.59
	- Floating seedlings	0.86 to 1.71
	- Buried seedlings	Nil
	- Damaged seedlings	Nil
	- Total transplanting fault %	1.69 to 3.45
10	Average area Covered ha/h	0.3705 to 0.4162
11	Time required to covered 1 ha (h)	2.40 to 2.70
12	Fuel consumption	
	- l/h	2.80to 3.33
	- l/ha	7.03 to 8.92
13	Number of seedling trays consumed per ha	160 to 188

12.2 Rate of work

The average area covered and time required to cover one hectare area recorded as 0.3705 to 0.4162 ha/h and 2.40 to 2.70 h respectively at the forward speed of 3.65 to 3.97 kmph.

12.3 Quality of work

The quality of work was assessed by taking into consideration of the following parameters :-

a. The average depth of transplanting was recorded as 2.68 to 3.30 cm.
b. The spacing between row to row was recorded 29.6 to 29.9 cm.
c. The average number of plants per hill was recorded as 3.27 to 5.87.
d. The average spacing between hills was recorded as 17.2 to 17.87 cm
e. The average total number of hill in 1 m^2 was recorded as 23.2 to 23.6.
f. The average percentage of missing hills was recorded as 0.85 to 2.59 %.
g. The average percentage of floating seedlings was recorded as 0.86 to 1.71 %.
h. The average percentage of buried seedlings was recorded as Nil.
i. The average percentage of damaged seedlings was recorded Nil.
j. The total percentage of transplanting faults was recorded as 1.69 to 3.45 %.

12.4 Fuel consumption

The hourly fuel consumption was recorded as 2.80 to 3.33 l/h and fuel required for planting of one hectare area was recorded as 7.03 to 8.92 l/h.

12.5 Labour requirement

One skilled operator's is required for continuous operation of machine. One person is required for feeding nursery mats to machine and two persons for handling the nursery trays.

15.1.7 Valve guide clearance

Cylinder No	Valve guide diameter (mm)		Valve stem diameter (mm)		Valve guide clearance (mm)		Max. Permissible wear limit (mm)	
	Inlet	Exhaust	Inlet	Exhaust	Inlet	Exhaust	Inlet	Exhaust
1	5.98	6.00	5.95	5.95	0.03	0.05	0.10	
2	5.99	6.00	5.95	5.95	0.04	0.05		
3	5.99	6.00	5.95	5.95	0.04	0.05		

Valve, guide and timing gear:-

-Pitting of seat/faces of valves : Normal
-Any visual damage of teeth of timing gear : None
-Condition of ingnition coil & magneto : Normal

15.2 Planter

The gears of the main gear box, planting box and planting mechanism, seedling tray oscillating mechanism, chain cases and planting arms were dismantled and inspected visually. The observations are as under :-

15.2.1 Main & planting gear box

The transmission gears, bearings and shafts were visually inspected.No abnormal wear or damage of components was noticed. All components were found in satisfactory working condition.

15.2.2 Planting arms

All the six planting arms were dismantled and inspected visually. The arms ,cams, bearings, springs and rod were found in normal working condition.

15.2.3 Seedling holders &platform

The seedling platform, seedling platform and feeder were visually inspected and found in normal working condition.

15.2.4 Chain case of planting unit

The chain cases ofplanting unit were visually inspected. The chains, sprockets and bearings were found in normal working condition.

15.2.5 Floats

All the three floats were examined visually for cracks, punctures, etc and found in satisfactory working condition. No mud or water entered inside the floats.

15.2.6 Hydraulic system

All components of hydaulic system were inspected visually and found to be in satisfactory working condition.

16. SUMMARY OF OBSERVATIONS, COMMENTS AND RECOMMENDATIONS

16.1 Engine Performance Test

- The maximum power of engine was recorded as 11.65 kW at 3200 RPM against manufacturer 's declaration of 14.2 kW.
- The specific fuel consumption corresponding to maximum power were recorded as

0.289 kg/kWh.

- The maximum torque of the engine was recorded as 41.25 Nm.
- The back up torque of engine was recorded as 18.13 % in natural ambient condition which is normal.
- The maximum lubricating oil tempereture was recorded as 102^{0}C which is within the manufacturer declared limit of 150^{0}C.

16.2 Noise level

Noise level at operator's ear level was recorded as 89.17 dB(A), and noise level at bystander level was recorded 78.2 dB (A). which is well within the maximum and danger limit of 85dB(A)/ 90 dB(A) respectivelly specified for contineous exposure of 8 hours.

16.3 Mechanical Vibration

The aplitude of mechanical vibration marked as (*) on the relevant chapter are on drasfically higher side. It is not just directly concerned with operator's health safety and comfort, but also adversely affect the useful life of the components. In view of above, this deserved to be given top priority for corrective action.

16.4 Components / assembly inspection

16.4.1 The engine was dismantled after 51.82 hours of operation and wear of critical components were observed to be within the limits.

16.4.2 The main gear box, planting box, planting arm drive mechanism and bearings were dismantled after 38.57 hours of operation and found in satisfactory working condition.

16.5 Safety Provisions

The machine has the following safety provisions.

1. Safety warning and caution notice are provided on the machine.
2. Engine stop lever is provided for emergency stop of the machine.
3. Drive & moving Parts adequately protected.
4. A slip clutch (torque limiter) inside the planting arm case to protect the planter drive mechanism.
5. Automatic rising of planting portion after engaging reverse gear is provided.
6. Hydraulic lock to prevent the planting portion being lowered is provided.

16.6 Ease of operation and adjustments

1. All the controls, which are required to be used frequently, are within the easy reach of the operator.
2. The planting depth, hill spacing and number of seedling per hill can be adjusted easily.
3. The seedling carriersare provided on both sides (LHS & RHS) of operator for holding nursery trays.
4. No noticeable difficulty was observed during handling of machine.
5. Two folding type markers are provided and can be operated by the operator while planter is in motion. One centre marker at bonnet is provided to guide the operator to drive planter in straight direction.

16.7 The particulars provided on the marking/labeling plate are not adequate. It is therefore recommended to provide the following terms.

I. Make
II. Model
III. Serial No.
IV. Year of manufacture
V. Manufacture's address
VI. Engine No.
VII. Size
VIII. Required size of prime mover kW/hp

16.8 Technical literature:
Operator cum Service Manual & Parts Catalogue was provided along with the machine during the course of testing. It is further recommended to bring out these manuals in hindi and other vernacular languages as per IS: 8132-1999.

TESTING AUTHORITY

(S.G.PAWAR)
AGRICULTURAL ENGINEER

(J.P. MANDAL)
SENIOR AGRICULTURAL ENGINEER

(K.K. NAGLE)
DIRECTOR

Draft test report compiled by - **Shri. Khagendra Bora,**
Sr. Technical Assistant

17. APPLICANT'S COMMENTS

Para No	Our Reference	Applicants Comments
17.1	--	We will look into further product.