



सत्यमेव जयते



**PRAKASH MULTICROP THRESHER  
(TOKRI)**

**TESTED AT**

**STATE LEVEL FARM MACHINERY TRAINING AND TESTING  
INSTITUTE, RAHMANKHERA, HARDOI ROAD  
LUCKNOW, U.P. - 226101**

Telephone: 0522- 2841021

E-mail: [fmtcsima@gmail.com](mailto:fmtcsima@gmail.com)

(The Institute is approved Testing Centre by Department of Agriculture & Cooperation, Ministry of Agriculture, GOI vide letter no. 8-1/2004-My (I&P) dated September 14,2010 and subsequent letters)

**THIS TEST REPORT IS VALID FROM 24.11.2022 TO 23.11.2029**

TEST REPORT NO.	NAME OF THE MACHINE/IMPLEMENT, MODEL NO.	MONTH	YEAR
IMP- 2011/390	PRAKASH MULTICROP THRESHER (TOKRI)	NOVEMBER	2022



**STATE LEVEL FARM MACHINERY TRAINING AND TESTING  
INSTITUTE, RAHMANKHERA, HARDOI ROAD  
LUCKNOW, U.P. - 226101**

Telephone: 0522- 2841021

E-mail: [fmtcsima@gmail.com](mailto:fmtcsima@gmail.com)

(The Institute is approved Testing Centre by Department of Agriculture & Cooperation, Ministry of Agriculture, GOI vide letter no. 8-1/2004-My (I&P) dated September 14,2010 and subsequent letters)

Type of test	:	COMMERCIAL
Name of machine	:	PRAKASH MULTICROP THRESHER (TOKRI)
Test Code referred	:	IS: 6284 – 2004 (Test Code for Power Thresher for Cereals) & IS: 9020 - 2002 (Power Thresher Safety Requirements) were followed for testing the Wheat Thresher.
Test requested by	:	M/S NAV BHARAT INDUSTRIES B-25 FOUNDRY NAGAR, AGRA-282006
Testing Authority	:	STATE LEVEL FARM MACHINERY TRAINING AND TESTING INSTITUTE, RAHMANKHERA, HARDOI ROAD LUCKNOW, U.P. – 226101
Period of test	:	MARCH 2022 TO NOVEMBER 2022

- 
1. This Test Report should not be reproduced in part or full without prior permission of the Incharge Testing Centre.
  2. The data given in the Test Report pertain to the particular machine submitted for test by the Applicant.
  3. The data collected during the test do not in any way attribute to the durability of the machine.
  4. The results reported in this report are observed values and no corrections have been applied for atmospheric and site conditions.
- 

### **Selected Conversions**

S. No	Units	Conversion Factor
<b>1</b>	<b>Force</b>	
	1 kgf	9.80665 N 2.20462 lbf
<b>2</b>	<b>Power</b>	
	1 hp	1.01387 metric hp (Ps) 745.7 W
	1 Ps	735W
	1 kW	1.35962 Ps
<b>3</b>	<b>Pressure</b>	
	1 psi	6.895 kPa
	1 kgf/cm <sup>2</sup>	98.067 kPa = 735.56 mm of Hg
	1 bar	100 kPa = 10 N/cm <sup>2</sup>
	1 mm of Hg	1.3332 m-bar

## CONTENTS

1.	Scope of Test	1
2.	Method of Selection	1
3.	Test Procedure	1
4.	Specification	1-7
5.	Running-in and Preliminary Adjustments	8
6.	Performance Test	9
7.	Summary of Performance Results	10
8.	Laboratory Test	11
7.	Ease of Operation, Adjustment and Safety	12-14
8.	Defects, Adjustments, Breakdowns and Repairs	15-16
9.	Literature	17
10.	Applicant's Comments	17
	ANNEXURE- I & VII	18-24

IMP 2011/390	PRAKASH MULTICROP THRESHER (TOKRI)	COMMERCIAL	1
--------------	---------------------------------------	------------	---

## **1 SCOPE OF TEST**

The purpose of test was to check and assess the following as per IS: 6284 – 2004 and IS: 9020 - 2002

- Checking of specifications
- Checking of material, visual observation and provision for adjustment
- Rate and quality of work
- Labour requirement and power consumption
- Ease of operation and adjustment
- Safety provisions.
- Nature of breakdown, etc.

## **2 METHOD OF SELECTION**

The Machine was selected by representative of the testing authority out of 05 machines made available for selection from their periodical production line at manufacturer's site. Sr. No. 22070662 was selected for testing

## **3 TEST PROCEDURE**

IS: 6284 – 2004 (Test Code for Power Thresher for Cereals) & IS: 9020 - 2002 (Power Thresher Safety Requirements) were followed for testing the Wheat Thresher.

## **4 SPECIFICATIONS**

### **1 General:**

Name & address of manufacturer/ applicant	:	M/s NAV BHARAT INDUSTRIES B-25, FOUNDRY NAGAR AGRA
a) Make	:	PRAKASH
b) Serial no.	:	22070662
c) Model	:	PT40
d) Type	:	Tractor PTO drive
e) Year of manufacture	:	2022

### **2 Power Unit:**

a) Type of Prime mover	:	Tractor
b) Recommended power, hp	:	35 & above
-As used during test	:	Massey Ferguson 410DI
c) Type of Drive	:	Through tractor PTO shaft

### **3 Crops to be Threshed:**

a) Main crop	:	Wheat , Bajara , Musturd, Jwar
b) Other crops	:	Maize, SoyaBean, Urd, Moong.
c) Thresher evaluated for	:	Wheat, Bajara , Musturd.

### **4 Main frame**

: **Refer Fig.**

### **Constructional details:**

It is fabricated construction of MS angle iron size 90× 90×5 , 65×65×5 , 50×50×5 and Channel Size 125×60×60×5 mm in rectangular box shape. All the assemblies such as feeding unit, threshing unit and cleaning unit are mounted on this frame.

<b>IMP 2011/390</b>	<b>PRAKASH MULTICROP THRESHER (TOKRI)</b>	<b>COMMERCIAL</b>	<b>2</b>
---------------------	---	-------------------	----------

**5 Main Drive:**

- a) Type : Tractor PTO power & belt pully arrangement by propeller shaft.  
b) Size of belt : C 110 , 04 NOS  
c) Size of pulley (mm) : 305 MM  
d) Diameter of main shaft (mm) : 63.4 Ø  
e) Recommended speed of main drive, (rpm) : 550 RPM

**6 Threshing Unit:**

- a) Type : Spike tooth  
b) Size of cylinder, mm : 711×910  
c) No. & size of pegs on each beater/ cutter : 9 & 10 , 18 MM DIA On Each Alternate.  
d) Material & size of cylinder shaft, mm : M.S, 2440 MM Length X 63.30 MM Ø  
e) No & bearing on the shaft : 02 Nos UCP212 and 01 Nos UCP210  
f) Cylinder speed (rpm)@540 rpm of tractor pto : 800-825  
g) Peripheral speed (m/s) : 83

**7 Concave: (Bajara)**

- a) Type : Semi circular  
b) No. & spacing of longitudinal flat, mm : 85 , 5.05 MM  
c) No. & spacing of cross bar, mm : 12 , 39.76 MM  
d) total length, mm : 1140  
e) Effective length, mm : 1080  
f) Peripheral length, mm : 1075  
g) Effective width, mm : 690  
h) Concavity, mm : 340 MM  
i) Method of fixing : Bolted Through Two Bolt and Nut.  
j) Provision for concave clearance adjustment : Sliding adjustment provided .

**7.1 Concave: (Wheat)**

- a) Type : Semi circular  
b) No. & spacing of longitudinal flat, mm : 85 , 5.05 MM  
c) No. & spacing of cross bar, mm : 12 , 39.76 MM  
d) total length, mm : 1140  
e) Effective length, mm : 1080  
f) Peripheral length, mm : 1075  
g) Effective width, mm : 690

<b>IMP 2011/390</b>	<b>PRAKASH MULTICROP THRESHER (TOKRI)</b>	<b>COMMERCIAL</b>	<b>3</b>
---------------------	---	-------------------	----------

- h) Concavity, mm : 34  
Bolted through Two Nut & bolt.
- i) Method of fixing :  
By wearing the length of packs on the
- j) Provision for concave clearance  
adjustment :  
beater.

**7.2 Concave: (Mustard)**

- a) Type : Semi circular
- b) No. & spacing of longitudinal flat,  
mm : 85, 5.05 MM
- c) No. & spacing of cross bar, mm : 12, 39.76 MM
- d) total length, mm : 1140
- e) Effective length, mm : 1080
- f) Peripheral length, mm : 1075
- g) Effective width, mm : 690
- h) Concavity, mm : 340
- i) Method of fixing : Bolted through two Nut & bolt.
- j) Provision for concave clearance  
adjustment : By wearing the length of packs on the  
beater.

**8 Sieve:**

- a) No. of sieves : Two
- b) Construction details : The sieves are placed in rectangular box  
fabricated from MS Angle Of Size 32×32  
×3 MM. The complete sieve box  
reciprocating on the shaker mechanism.

**c) Specification of sieves: (Bajara)**

Sl. No.	Parameter	Upper sieves	Lower sieves
1.	Type	Punched Circular holes	Punched Circular holes
2.	Material & size, mm	GI sheet; 1.00	GI sheet; 0.50
3.	Dia. of holes, mm	6.37	2.20
4.	Density of holes in 100 cm <sup>2</sup>	360	528
5.	Size of sieve, mm	1115 X 710	1576 X 710
6.	Effective size, mm	1085 X 695	1550 X 695
7.	Effective area, cm <sup>2</sup>	1085 X 60	-----
8.	Method of fixing	The upper sieve is fixed while lower sieve is inserted and locked in the sieve box.	

IMP 2011/390	PRAKASH MULTICROP THRESHER (TOKRI)	COMMERCIAL	4
--------------	---------------------------------------	------------	---

**d) Specification of sieves: (Wheat)**

Sl. No.	Parameter	Upper sieves	Lower sieves
1.	Type	Punched Circular holes	Punched Circular holes
2.	Material & size, mm	GI sheet; 1.00	GI sheet; 0.60
3.	Dia. of holes, mm	6.35	2.15
4.	Density of holes in 100 cm <sup>2</sup>	365	528
5.	Size of sieve, mm	1115 x 710	1576 x 710
6.	Effective size, mm	1085 x 695	1550 x 695
7.	Effective area, cm <sup>2</sup>	1085 x 60	-----
8.	Method of fixing	The upper sieve is fixed while lower sieve is inserted and locked in the sieve box.	

**e) Specification of sieves: (Musturd)**

Sl. No.	Parameter	Upper sieves	Lower sieves
1.	Type	Punched Circular holes	Punched Circular holes
2.	Material & size, mm	GI sheet; 1.00	GI sheet; 0.50
3.	Dia. of holes, mm	6.35	2.20
4.	Density of holes in 100 cm <sup>2</sup>	365	530
5.	Size of sieve, mm	1115 x 710	1576 x 710
6.	Effective size, mm	1085 x 695	1550 x 695
7.	Effective area, cm <sup>2</sup>	1085 x 60	-----
8.	Method of fixing	The upper sieve is fixed while lower sieve is inserted and locked in the sieve box.	

**9 Shaking Mechanism**

**Constructional details:** The mechanism consists of a pitman shaft supported by Two ball bearing and connected to the sieves box. The rotational motion of pitman shaft is converted into to and fro motion of sieve box. The sieve box is mounted on with hanger connecting arms (with ball bearing) at it is front end and two connecting arms at it is rear end.

**9.1 Pitman shaft**

Material : MS Rod  
 Size, mm : 533 x 32.12 mm  
 Number and type of bearing : Two, UCP-206  
 Provision of lubrication : One grease nipple is provided on each bearing Housing.

**9.2 Hangers:**

Number : Four (two each in front & rear of sieve unit)  
 Length of hanger, mm



<b>IMP 2011/390</b>	<b>PRAKASH MULTICROP THRESHER (TOKRI)</b>	<b>COMMERCIAL</b>	<b>5</b>
---------------------	---	-------------------	----------

	-Total	195 (front) & 195 (rear)
	-Center to center	129.18 (front) & 129.18 (rear)
Stroke length, mm	:	28
No. of oscillation, stroke/min	:	78
Number and type of bearing	:	Two in each connecting rod (6203)
Provision of lubrication	:	Manually

**10 Aspirator blower:**

Number	:	One
Type	:	Suction type

**10.1 Main Blower:**

a) Number	:	One
b) Type	:	Main Outlet blower
c) Size of blower, mm	:	902 Ø
d) Number of blades	:	4
e) Size of blades (mm)	:	266 x 305 x 2.60
f) No. & type of bearing on shaft	:	2, UCP-212
g) Provision of lubrication	:	One Grease nipple is provided on each bearing.
h) Provision of changing speed	:	Provided
i) Provision for air inflow adjustment	:	Provided
j) Location	:	One on each side of blower
k) Dia. of drive pulley, mm	:	225 Ø
l) Dia. of driven pulley, mm	:	305 Ø
m) Speed of blower, rpm	:	970, 880, 1000 rpm @540 Pto
n) length of shaft & dia	:	2440 x 63.3 Ø

**Construction details:** The blower is fabricated from 2.50 mm HR sheet and the MS bush bolted to the main shaft & four Ms bar of size 50 x 10 x 3.75mm welded to it at 90 degree each. Four Piece of 2.5mm HR sheet blade of size 275 x 300 mm are welded to the bars and four piece of Ms rod of size 290 x 12mm welded between each blades to support them.

**11 Method of Feeding : Tokri**

**Construction details:** Fabricated by 2.5 mm HR sheet in two parts. Lower part is feeder with a roller made of 220mm dia. pipe and 3 mm thickness. Roller has spikes on it. Upper part has one roller of 220 mm dia. pipe and 3 mm thickness and one shaft of 40mm dia. with 2 gears mounted on it. Chain moves between the gears and the roller. Upper part and lower part assembly are driven through belt and pulley.

IMP 2011/390	PRAKASH MULTICROP THRESHER (TOKRI)	COMMERCIAL	6
--------------	---------------------------------------	------------	---

**12 Rated Capacity:**

- The input rate was recorded as **5850** kg/hr.
- The grain output at main outlet was recorded as **4120** kg/hr.
- Fuel consumption 3.5l/hr.

**13 Lubrication points**

Sl. No.	Location	No. of lubricating points	Recommended Lubricant	Schedule
1	Cylinder shaft bearing	Two grease nipple	NL GI grade	After every 15 Days
2	Main blower	Two grease nipple	NL GI grade	After every 15 Days
3	Auxiliary blower	Two grease nipple	NL GI grade	After every 15 Days
4	Shaker unit shaft bearings	Two grease nipple	NL GI grade	After every 15 Days
5	Shaker unit hangers	Eight grease nipple	NL GI grade	After every 15 Days
6	Transporting wheels	Two grease cup	NL GI grade	After every 15 Days

**14 Transport:**

- a) Type : Pneumatic Two wheel  
b) Dimension, mm : 325  
b) Number of Wheels : 2  
c) Size of Wheels : 6.50-16-8PR  
d) Wheel bearing : 30209 Tapper roller bearing  
e) Inflation pressure, kg/cm<sup>2</sup> : 35 PSI  
f) No. and type of bearing : 4, Tapper roller bearing 30209

**15 Straw outlet:**

- Location : At the rear ends of the machine.  
Material : H.R. sheet of 1.60 mm thickness  
Size, mm : 209 x 50  
Inclination, degree : 5  
Height of outlets from ground level, mm : 380 MM

**16 Power transmission:**

- Type : Belt & pulley

**17 Prime mover to input shaft:**

- Mode of power transmission : Through flexible propeller shaft to input shaft, in two segments  
Length of propeller shaft, mm  
Specification of shaft insert on machine side, : 995 mm  
Inner dia. : 35.02  
Outer dia. : 48.58  
Depth : 65.55

<b>IMP 2011/390</b>	<b>PRAKASH MULTICROP THRESHER (TOKRI)</b>	<b>COMMERCIAL</b>	<b>7</b>
---------------------	---	-------------------	----------

Locking provision : Two hexagonal head bolt are provided to  
: lock the input shaft in the slot provided

**17.1 Specification of shaft insert on tractor  
PTO side:**

Sl. No.	Notations	Dimension in, mm		Conformity
		As per IS:4931	As observed	
1	D	34.93±03	34.95	Conforms
2	d	29.7±0.1	30.93	<b>Does not conform</b>
3	W	8.69	8.69	Conforms
4	B	55 (min.)	64.62	Conforms

**17.2 Input shaft to threshing cylinder:**

Size of drive pulley, mm : 305 Ø  
 Size of driven pulley, mm : 225 Ø  
 Reduction ratio : 1:0.75  
 Type, material & size of belt : C Type, Rubber, C-110  
 Provision for tensioning : Provided  
 Provision of safety guards : Provided

**18 Fly wheel**

Number : Two  
 Material & size, dia : Cast iron, 860 mm Ø  
 Location : Fly wheel are fitted on both side of  
threshing cylinder shaft  
 Mass, kg : Front 83 & Rear 99 kg

**19 Hitch hook:**

Size of hook (OD/ID), mm : 102/38mm  
 Height of hook from ground level, mm : 885 mm

**20 Overall Dimensions (mm):**

a) Length : 3540  
 b) Width : 2520  
 c) Height : 2574  
 d) Ground clearance : 320  
 e) Total mass (kg) : 2100

**21 Color of the machine:** : Red & yellow

IMP 2011/390	PRAKASH MULTICROP THRESHER (TOKRI)	COMMERCIAL	8
--------------	---------------------------------------	------------	---

**MATERIAL OF CONSTRUCTION OF DIFFERENT COMPONENT**

**Table: 1**

SL. No.	Name of the part	Material	Ref. to Indian Standards	As observed	Conformity to IS
1	Frame	Mild Steel	IS 2062 or IS 1977	MS angle	Conforms
2	Shaft	Mild Steel	IS 2062 or IS 1977	MS rod	Conforms
3	Concave	Mild Steel	IS 2062 or IS 1977	MS flate	Conforms
4	Feeding hopper	Mild Steel	IS 2062 or IS 1977	HR sheet	Does not Conforms
5	Aspirator	Mild Steel	IS 2062 or IS 1977	MS plate	Conforms
6	Flywheel	Cast iron	IS 210	Cast iron	Conforms
7	Pulley	Cast Iron	IS 210	Cast iron	Conforms
8	Transport wheel	Mild steel Cast iron Pneumatic wheels	IS 2062 or IS 1977 IS 210 --	Pneumatic wheels	Conforms

**5 RUNNING-IN AND PRELIMINARY ADJUSTMENTS**

The machine was run-in at no-load and on load for 1 to 2, 2 to 2, 2 to 2 in Bajara , Wheat , Musturd crop respectively at recommended threshing cylinder speed and following observations were recorded: -

- (a) It was noticed that there was no undue knocking or rattling sound.
- (b) No slippage of drive belts was noticed.
- (c) No significant vibrations were noticed in the blower.
- (d) The shaking mechanism was reciprocating smoothly, and
- (e) No unusual vibration of the thresher was noticed.

**After running in, the following adjustments were made and maintained throughout the test: -**

S. No.	Parameters	Adjustments		
		Bajara	Wheat	Musturd
1	2	3	4	5
1	No-load threshing cylinder speed (rpm)	600-750	650-780	620-730
2	Concave clearance (mm)	55	58	55
5	No-load speed of main blower (rpm)	1400	1500	1450
6	No-load shaker unit speed (rpm)	130-158	160-170	140-155
7	Inclination of top sieve (deg)	5	6	5

<b>IMP 2011/390</b>	<b>PRAKASH MULTICROP THRESHER (TOKRI)</b>	<b>COMMERCIAL</b>	<b>9</b>
---------------------	---	-------------------	----------

## **6 PERFORMANCE TEST**

**6.1 General:** The tests were conducted for bajara , Wheat and Musturd crops only. The assessment of quality of work, capacity of machine and labour requirement, handling characteristics was made after best setting of the thresher by the applicant's representative. For each test trial, three samples at regular intervals were taken for analysis. The detailed crop parameters and machine parameters are given in **Annexure- I,II,III** and are summarized as under: -

### **Crop Parameters: -**

<b>S. No</b>	<b>Parameter</b>	<b>Range</b>		
		<b>3</b>		
<b>1</b>	<b>2</b>	<b>Bajara</b>	<b>Wheat</b>	<b>Musturd</b>
1	Name of crop			
2	Variety of crop	Not specified		
3	Grain- straw ratio	0.65 to 0.74	0.61 to 0.70	0.71 to 0.78
4	Length of cob/earhead (cm)	6.3 to 7.00	24.33 to 25.66	22.75 to 25.75

### **6.3 Quality of work:**

The results obtained during the test are given in **Annexure-IV,V,VI** and are summarized in **Table-.2**

### **6.4 Rated input capacity of thresher:**

Short run test trials in respect of Bajara , Wheat and Musturd crops were conducted at different feeding rates at the recommended cylinder speed.

The rated input capacity of thresher was observed as 6000 to 6550, 2800 to 3500, 2500 to 3700 kg/h in Bajara, Wheat , Musturd crops by maintaining the average cylinder speed (on load) of 600 , 650 ,620 rpm in Bajara, Wheat, Musturd crops respectively. The rated crop input per unit of fuel consumption was observed as 3.5 ,3.1 ,3.4 l/hr. in Bajara , wheat and mustard.

### **6.5 Rated output capacity of thresher:**

The output capacity of thresher was observed as 3920 to 4150, 1600 to 1750, 1850 to 1950 kg/h in Bajara, Wheat, Musturd crop. The crop output per unit of fuel consumption was observed as 3.5 , 3.1 , 3.4 l/Hr . in Bajara, Wheat, Musturd crop.

### **6.6 Power Requirement:**

The on load engine speeds of the prime mover at rated input capacity of thresher were recorded as 600-750,650-780,620-730 rpm for threshing of Bajara, Wheat, Musturd crop. The hourly fuel consumption was recorded as 3.250-3.550,3.100-3.250,3.200-3.400 l/h in Bajara, Wheat, Musturd crop.

<b>IMP 2011/390</b>	<b>PRAKASH MULTICROP THRESHER (TOKRI)</b>	<b>COMMERCIAL</b>	<b>10</b>
---------------------	---	-------------------	-----------

### 6.7 Long run test:

Long Run Test of the thresher was carried out for 25.0 hours in Bajara, Wheat, and Musturd crop. During long run test, no breakdowns and abnormal sounds in the machine were noticed.

**Table-2**

### SUMMARY OF PERFORMANCE RESULTS

Tests	Threshing Drum Speed -On load (rpm)	Feeding rate (kg/h)	Grain output (kg/h)	Fuel consumption (l/h)	Capacity (kg/l)		Losses on the basis of Total grain input (%)				Efficiency (%)	
					Input	Output	Broken	Sieve overflow	Blown	Unthres hed	Clean ing	Thresh ing
1	2	3	4	5	6	7	8	9	10	11	12	13
<b>Bajara</b>												
<b>A</b>	<b>Short Run Test: -</b>											
	600	5500	3900	3.2	1715	1215	0.130	0.277	0.271	0.300	98.5	99.05
	710	5850	4120	3.5	1670	1180	0.213	0.131	0.210	0.405	98.7	99.24
<b>B</b>	<b>At 50 % of maximum input capacity: -</b>											
	650	6000	4150	3.4	1764	1220	0.190	0.210	0.364	0.950	98.300	98.400
<b>C</b>	<b>At Varying Speed: -</b>											
(i)	<b>At 15% more than specified speed: -</b>											
	816	6720	4655	3.3	2035	1410	0.110	0.631	0.231	0.459	98.400	99.541
(ii)	<b>At 15% less than specified speed: -</b>											
	600	4950	3500	3.5	1415	1020	0.220	0.641	0.301	0.347	95.300	99.653
<b>Wheat</b>												
<b>A</b>	<b>Short Run Test: -</b>											
	650	2800	1430	3.2	875	525	0.729	0.21	0.35	0.69	98.100	99.303
<b>B</b>	<b>At 50 % of maximum input capacity: -</b>											
	700	3150	1920	3.3	950	581	0.70	0.250	0.35	0.695	98.750	99.310
<b>C</b>	<b>At Varying Speed: -</b>											
(i)	<b>At 15% more than specified speed: -</b>											
	715	3200	1975	3.4	941	580	0.769	0.31	0.38	0.57	98.950	99.424
(ii)	<b>At 15% less than specified speed: -</b>											
	680	2650	1625	3.3	805	495	0.69	0.28	0.42	0.765	96.700	99.235
<b>Musturd</b>												
<b>A</b>	<b>Short Run Test: -</b>											
	620	3250	1280	3.45	940	541	0.210	0.289	0.370	0.35	98.70	99.650
<b>B</b>	<b>At 50 % of maximum input capacity: -</b>											
	685	3500	2025	3.4	1029	591	0.23	0.92	0.39	0.385	98.900	99.030
<b>C</b>	<b>At Varying Speed: -</b>											
(i)	<b>At 15% more than specified speed: -</b>											
	710	3700	2150	3.5	1055	610	0.25	0.321	0.432	0.42	98.100	99.499
(ii)	<b>At 15% less than specified speed: -</b>											
	690	2760	1590	3.4	810	470	0.28	0.305	0.402	0.35	98.00	99.643

<b>IMP 2011/390</b>	<b>PRAKASH MULTICROP THRESHER (TOKRI)</b>	<b>COMMERCIAL</b>	<b>11</b>
---------------------	---	-------------------	-----------

**6.8 Chemical analysis:** Chemical composition of cutter blade and better rod is given as under:-

**Table- 3: Chemical analysis of critical component**

S. No.	Component	Primary element				
		Carbon	Manganese	Silicon	Phosphorous	Sulphur
<b>1.</b>	Cutter	0.83	0.67	0.24	0.022	0.004
<b>2</b>	Stud	0.19	0.36	0.16	0.042	0.028

**6.9 Wear analysis:** The wear on beater/cutter blade of thrashing cylinder/drum was measured after completion of 25.0 hours. Percentage wear on mass basis was computed and the results are given in table 4.

**Table 4:Wear Measurement of Thrashing Cylinder/Drum**

S. No.	Initial mass, g	Final mass, g	Total loss, g	Wear, %
1.	367.00	361.40	5.6	0.015
2.	361.80	356.60	5.2	0.014
3.	356.10	349.70	6.4	0.017
4.	358.5	351.50	7.0	0.019
5.	344.70	337.10	7.6	0.022
6.	366.30	360.40	5.9	0.016
7.	343.11	335.50	7.61	0.022
8.	363.60	356.70	6.9	0.018
9.	365.70	358.80	6.9	0.018
10.	352.70	344.60	8.1	0.022
11.	332.70	326.50	6.2	0.018
12.	369.89	364.00	5.89	0.015
13.	364.95	358.40	6.55	0.017
14.	367.80	359.80	8.00	0.021
15.	369.66	361.20	8.46	0.022
16.	312.20	306.20	6.00	0.019
17.	375.55	369.30	6.25	0.016
18.	341.60	336.70	4.90	0.014
19.	337.30	329.40	7.90	0.023
20.	350.80	344.50	6.30	0.017
21.	356.60	348.60	8.00	0.022
22.	351.70	344.70	7.00	0.019
23.	353.10	346.30	6.80	0.019
24.	353.20	346.20	7.00	0.019

<b>IMP 2011/390</b>	<b>PRAKASH MULTICROP THRESHER (TOKRI)</b>	<b>COMMERCIAL</b>	<b>12</b>
---------------------	---	-------------------	-----------

#### 6.10 Labour requirement: -

The Labour requirements for the machine were assessed when crop is available at the threshing floor and are as given below: -

S. No.	Nature of work	Bajara	Wheat	Musturd
1.	Crop handling	2	2	2
2.	Continuous feeding of crop	1	1	1
3.	Straw handling	-	-	-
4.	Grain handling (main outlet)	-	-	-
	<b>Total</b>	<b>03</b>	<b>03</b>	<b>03</b>

#### 7. EASE OF OPERATION AND SAFETY PROVISIONS

##### Conformity of Indian Standard

<b>Observations on general and safety requirements as per IS: 9020 - 2002: -</b>			
S. No.	Requirements	Observations	Conformity
1	2	3	4
1	<b>MATERIALS:</b>		
1.1	The material for construction of different components shall be selected from those given Table-1.		
2	<b>GENERAL REQUIREMENTS:</b>		
2.1	Fastening connections between different components shall be made in such a way that they will not get loosened due to vibration or such other forces as may occur during normal operation.	No such defect was noticed	Conforms
2.2	The thresher shall be so designed that general maintenance including cleaning, replacement of parts can be done without damage to the components or danger to the operator	Provided	Conforms
2.3	Proper arrangement for lubrication of moving components shall be provided. All points requiring frequent lubrication shall easily be accessible. In case of bearings, where these are in accessible or in a hazardous position and require frequent lubrication, the means of lubrication shall be located in an accessible position and the lubricant piped into the bearing.	Grease nipple /block are provided	Conforms
2.4	Bearing shall be adequately protected against the ingress of dust	Protected against ingress of dust	Conforms
2.5	In case the prime-mover is to be mounted on the thresher, a protective cover shall be provided to prevent it from dust or straw falling on it and to ensure operator's safety	Not applicable	-----



<b>IMP 2011/390</b>	<b>PRAKASH MULTICROP THRESHER (TOKRI)</b>	<b>COMMERCIAL</b>	<b>13</b>
---------------------	---	-------------------	-----------

2.6	Provisions shall be made for tightening of the belts	Provided	Conforms
2.7	Threshing drum shall be statically balanced	Balanced	Conforms
2.8	Provision for easy adjustments of concave clearance, airflow rate, screen pitch, sieve speed, eccentricity of shaking mechanism, sieve clearance, etc., should be made	Provided	Conforms
2.9	Provision for easy transportation of the thresher and towing with the tractor shall be provided	Transport wheel & towing hook for towing by tractor is provided.	Conforms
2.10	Each thresher shall be provided with an operators manual (Refer IS: 8132 & 9019) in Hindi or English or any other vernacular language.	Not Provided	Does not Conforms
2.11	All the required tools for operation, maintenance and adjustment of various components of the thresher shall be supplied by the manufacturer.	Provided	Conforms
2.12	The thresher shall be run idle (without load) for at least 5 minutes at the specified speed of threshing cylinder to check the following: -		
	a) There shall not be any undue knocking or rattling sound	Refer chapter 5 of this report	Conforms
	b) Drive belts shall not slip frequently		
	c) Fan shall run without any significant vibrations		
	d) Sieve shall oscillate smooth. And		
	e) Thresher shall not vibrate unusually		
<b>3</b>	<b>GUARDING OF TRANSMISSION SYSTEM: -</b>		
3.1	Guards shall be provided on all moving parts of the thresher to prevent accidental contact of persons or parts of clothing being caught.	Guards are provided for transmission belts	Conforms
3.2	The guards shall be made of blind sheets of MS having a minimum thickness of 1.8 mm	Thickness is 1.5 mm	Conforms
3.3	The guards shall be so designed as not to hinder in easy adjustment, servicing and operation of the thresher.	---	Does not Conforms
3.4	All guards shall be either permanently attached or firmly secured to prevent their removal without the aid of tools. The servicing and adjustment should be possible without complete removal of the guard.	Provided	Conforms
<b>4</b>	<b>FEEDING SYSTEM: -</b>		
4.1	Type	Tokari	Conforms
4.2	Specification of chute/hopper	<b>Refer Para 12.1 of this report</b>	Conforms

<b>IMP 2011/390</b>	<b>PRAKASH MULTICROP THRESHER (TOKRI)</b>	<b>COMMERCIAL</b>	<b>14</b>
---------------------	---	-------------------	-----------

<b>5</b>	<b>WORKMANSHIP AND FINISH:</b>		
5.1	Welding used for joining different components should be done in accordance with IS816	Satisfactory	Conforms
5.2	The components shall be free from rust and shall have protective coating to prevent corrosion and surface deterioration in transit and storage.	Protective coat of paint is provided	Conforms
5.3	The components should be free from pits, burrows and other defects that may be detrimental for their use.	Satisfactory	Conforms
<b>6</b>	<b>Marking:</b> -Each thresher shall be marked with the following particulars:		
(a)	Manufacturer's name and recognized trade-mark, if any:	Provided	Conforms
(b)	Model number	Provided	Conforms
(c)	Batch or code number, or Sl. No. if any	-----	Does Not Conforms
(d)	Power rating, (RPM)	Provided	Conforms
(e)	Revolutions per minute of the threshing drum and its direction of rotation	-----	Does not Conforms
<b>6.1</b>	<b>Minimum cautionary notices:</b> – Each thresher shall be fitted with a label/plate containing following cautionary notices written in vernacular language and their pictorial representation. The size of the pictures and the typography of the letters shall be selected according to the size of the label or poster and the distance at which these have to be seen or read. The minimum size for picture shall be 40 mm. The colour of symbols should be Red & yellow		
(a)	Do not put or take-off belt while pulley is running	Provided	Conforms
(d)	Do not feed ear-heads by hand	Provided	Conforms
(e)	Children and aged persons should be discouraged for feeding the crop	Provided	Conforms
(f)	Do not cross over the belts	Provided	Conforms
(g)	Do not wear loose dress, bangle, watch, etc. while working	-----	Does not Conforms
(h)	Don't work under the influence of intoxicants like liquor, opium, etc. while working	Provided	Conforms
(i)	Do not work while tired	-----	Does not Conforms
(j)	Do not make adjustment when thresher is working	Provided	Conforms
<b>7</b>	<b>Hardness</b>		
	The blade shall be heat to have a hardness with in a range of 35 to 50 HRC up to two third portion from the tip of the beveled edge . the hardness value shall not differ from the maximum hardness found in the same blade by more than to percent.	48 HRC	Conforms

IMP 2011/390	PRAKASH MULTICROP THRESHER (TOKRI)	COMMERCIAL	15
--------------	---------------------------------------	------------	----

## 8. DEFECTS, BREAKDOWNS AND REPAIRS

No breakdown occurred during 25.0 h of performance test of the machine.

## 9. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

9.1 The machine submitted for test was stated to be a multi crop thresher & as such it was required to be tested for threshing of Bajara, Wheat, Musturd crop. However, test could only be conducted with Bajara , Wheat , Musturd.

9.2 Arrangement should be made to permanently display the quality and parameters obtained in the test in all commercially manufactured (agriculture machines by putting engraved seals or plates) on the machines, so that the farmers can get proper information about the quality of the equipment.

9.3 **Wheat threshing: -**

9.4 **Quality of work**

❖ The percentage of broken grain was recorded as 0.100-2.100,0.325-0.769,0.210-2.300 Bajara , Wheat , Musturd.

❖ The percentage of sieve overflow losses was recorded as 0.131-3.210,0.678-0.210,0.289-2.210 % Bajara , Wheat , Musturd.

❖ The percentage of blown grain losses was recorded as 0.231-4.677,0.325-0.921,0.370-3.100 % Bajara,wheat,musturd which is considered normal.

❖ The threshing efficiency of the machine was recorded 98.400-99.700,99.235-99.424,-99.030-99.650 %, Bajara , Wheat , Musturd which is considered normal.

❖ The cleaning efficiency was recorded as 95.300-98.00,95.950-97.750,96.00-98.00 %, Bajara , Wheat , Musturd which is considered normal.

9.4 The overall performance of the thresher in Bajara , Wheat , Musturd crop is considered to be satisfactory.

9.5 No major effect on performance of thresher was observed at 15% lower speed than the recommended cylinder speed. However the broken losses increased to 0.110-0.769, Nil at 15% higher speed than the recommended cylinder speed.

9.6 **On load fuel consumption: -**

The on load engine speeds of the prime mover at rated input capacity of thresher were recorded as 710-780,720-785,620-690 rpm in Bajara,wheat and musturd crop. The hourly fuel consumption was recorded as 3.4,3.5,3.2 l/h in Bajara, Wheat, Musturd crop.

9.7 **Labour requirement: -**

9.8 The thresher can be installed in harvested field itself, which reduces labour requirement and transporting losses.

9.9 The labour requirement for threshing of Bajara,Wheat, Musturd crop assessed as 3-4 numbers. However, labour requirement can be reduced if feeding conveyor is provided.

<b>IMP 2011/390</b>	<b>PRAKASH MULTICROP THRESHER (TOKRI)</b>	<b>COMMERCIAL</b>	<b>16</b>
---------------------	---	-------------------	-----------

- 10.** Long Run Test of the thresher was carried out for 25.0 hours in Bajara, Wheat, Musturd crop. During long run test, no major breakdowns and abnormal sound in the machine were noticed.
- 10.1** The specification of feeding hopper does not conform to the IS: 9020-2002. It should be provided as per the specification laid down in the said code.
- 10.2** All pulleys & belt drives used on the thresher are well protected by providing the suitable guards.
- 10.3** The thresher is tractor PTO operated, tractors are available with different PTO speeds and the PTO speed varies according to make, model and its throttle settings. Therefore it is strongly recommended that a rotational speed counter should be provided on thresher for indication of threshing cylinder speed along with a chart of crop wise recommended revolutions per minute of the threshing drum with its direction of rotation and settings of various systems.
- 10.4** The thresher should be provided with reflectors of suitable size and slow moving emblem at rear side.
- 10.5** An etched plate with following information should be provided on the machine.
- Recommended lubricants and lubricating schedule.
  - Crop wise recommended speeds and settings of various systems
  - Suitability of different types of crops and its capacity.
- However, each thresher shall be marked with Make; Model; Batch or code number, or Serial No. if any; Power rating, kW; and Revolutions per minute of the threshing drum and its direction of rotation

IMP 2011/390	PRAKASH MULTICROP THRESHER (TOKRI)	COMMERCIAL	17
--------------	---------------------------------------	------------	----

**11 Adequacy of literature: -**

No literature has been supplied with the machine. The Operators' Manual in vernacular language should be brought out. The Operator Manual must contain the information as per IS: 8132-1976 including the information on following points: -

- The optimum range of recommended cylinder speeds for each crop.
- Illustration of safety norms to be followed by operator during work.
- Installation and operation of machine.
- Preventive and periodical maintenance of machine.
- List of recommended lubricants and its schedule.
- List of standard fitments and accessories with the machine.

**12 APPLICANT'S COMMENTS**

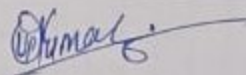

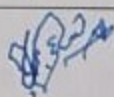

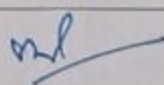
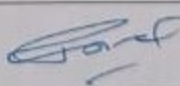
We have following Comments for PRAKASH MULTICROP THRESHER:

This test report is satisfactory and we will supply the good quality product to customer as per Indian Standard.

This implement is the latest Design of Nay Bharat Industries (Brand PRAKASH) , During the production of Maize Thresher Model we ensure that , ' we will modify / update the design at regular production level as per Indian standard. Kindly mentioned our comments in the final test report.

This report is being issued with the condition that the tested implement will be rectified as per recommendation and comments given by the Institute and applicant respectively and after rectification the implement should be manufactured on commercial basis.

**TESTING AUTHORITY**

(UPENDRA KUMAR) -SENIOR TECHNICAL ASSISTANT-	
(ANAND CHAUDHARI) -TEST ENGINEER-	
(DIGVIJAY SINGH) -TEST ENGINEER-	
(VIJAY KUMAR SINGH) -ASSOCIATE PROFESSOR – ENGG.	
(DR. PRAMOD KUMAR GUPTA) -ADDITIONAL DIRECTOR-	
(DR. PANKAJ TRIPATHI) - DIRECTOR-	

**THIS TEST REPORT IS VALID FROM 24.11.2022 TO 23.11.2029**

**STATE LEVEL FARM MACHINERY TRAINING AND TESTING INSTITUTE, LUCKNOW**

IMP-2011/390	PRAKASH MULTICROP (TOKARI THRESHER)	COMMERCIAL	21
--------------	--	------------	----

**PERFORMANCE DATA ANALYSIS (BAJARA)**

**ANNEXURE-IV**

Test No	Feeding Rate (kg/h)	Output from Main outlet (kg/h)	Capacity (kg/l)		Losses in Main Grain Outlet (%)			Total losses (%)				Total machine losses (%)	Efficiency (%)	
			Input	Output	Broken	Unthreshed	Total	Broken	Blown	Unthreshed	Sieve		Cleaning	Threshing
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<b>A.</b>	<b>Short Run Test</b>													
1	5500	3900	1715	1215	0.130	0.3	0.43	0.130	0.271	0.30	0.277	0.977	98.800	99.700
2	5850	4120	1670	1180	0.213	0.405	0.618	0.213	0.210	0.405	0.131	0.959	98.00	99.595
<b>B.</b>	<b>At 50 % of maximum input capacity: -</b>													
3	6020	4150	1764	1220	0.190	0.95	1.145	0.190	0.36	0.95	0.210	1.61	98.300	98.400
<b>C</b>	<b>Varying speed test</b>													
<b>(i)</b>	<b>At 15% more than specified speed: -</b>													
5	6750	4655	2035	1410	0.11	0.459	0.56	0.11	0.231	0.459	0.631	1.43	98.400	99.541
<b>(ii)</b>	<b>At 15% less than specified speed: -</b>													
6	4950	3500	1415	1020	0.22	0.347	0.57	0.22	0.301	0.347	0.641	1.5	98.300	99.653
<b>D</b>	<b>Long run test: 25 h</b>													

\* Feed rate at rated input capacity

IMP-2011/390	PRAKASH MULTICROP (TOKARI THRESHER)	COMMERCIAL	22
--------------	--	------------	----

**PERFORMANCE DATA ANALYSIS (WHEAT)**

**ANNEXURE-V**

Test No	Feeding Rate (kg/h)	Output from Main outlet (kg/h)	Capacity (kg/l)		Losses in Main Grain Outlet (%)			Total losses (%)				Total machine losses (%)	Efficiency (%)	
			Input	Output	Broken	Unthreshed	Total	Broken	Blown	Unthreshed	Sieve		Cleaning	Threshing
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<b>A.</b>	<b>Short Run Test</b>													
1	2800	1695	875	525	0.72	0.69	1.41	0.72	0.35	0.69	0.21	1.97	98.03	99.303
<b>B.</b>	<b>At 50 % of maximum input capacity: -</b>													
2	3150	1920	950	581	0.7	0.695	1.39	0.7	0.35	0.695	0.25	1.99	98.01	99.310
<b>C</b>	<b>Varying speed test</b>													
<b>(i)</b>	<b>At 15% more than specified speed: -</b>													
3	3200	1975	941	580	0.76	0.57	1.33	0.76	0.38	0.57	0.31	2.02	97.98	99.424
<b>(ii)</b>	<b>At 15% less than specified speed: -</b>													
4	2650	1625	805	495	0.69	0.72	1.41	0.69	0.42	0.72	0.28	2.11	97.89	99.235
<b>D</b>	<b>Long run test: 25 h</b>													

\* Feed rate at rated input capacity

IMP-2011/390	PRAKASH MULTICROP (TOKARI THRESHER)	COMMERCIAL	23
--------------	--	------------	----

**PERFORMANCE DATA ANALYSIS (MUSTURD)**

**ANNEXURE-VI**

Test No	Feeding Rate (kg/h)	Output from Main outlet (kg/h)	Capacity (kg/l)		Losses in Main Grain Outlet (%)			Total losses (%)				Total machine losses (%)	Efficiency (%)	
			Input	Output	Broken	Unthreshed	Total	Broken	Blown	Unthreshed	Sieve		Cleaning	Threshing
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<b>A.</b>	<b>Short Run Test</b>													
1	3250	1870	940	541	0.2	0.35	0.55	0.2	0.37	0.35	0.28	1.2	98.80	99.650
<b>B.</b>	<b>At 50 % of maximum input capacity: -</b>													
2	3500	2025	1029	591	0.23	0.38	0.61	0.23	0.39	0.38	0.22	1.23	98.70	99.030
<b>C</b>	<b>Varying speed test</b>													
<b>(i)</b>	<b>At 15% more than specified speed: -</b>													
3	3700	2150	1055	610	0.25	0.42	0.67	0.25	0.43	0.42	0.321	1.421	98.600	99.499
<b>(ii)</b>	<b>At 15% less than specified speed: -</b>													
4	2760	1590	810	470	0.28	0.35	0.63	0.28	0.4	0.35	0.305	1.335	98.60	99.643
<b>D</b>	<b>Long run test: 25 h</b>													

\* Feed rate at rated input capacity



IMP-2011/390	PRAKASH MULTICROP THRESHER (TOKRI)	COMMERCIAL	24
--------------	---------------------------------------	------------	----

**ANNEXURE -VII**

**SYMBOL AND ABBREVIATIONS**

**SYMBOLS:**

<b>I- SYMBOLS ASSIGNED TO BASIC SI UNITS</b>			
<b>S.N.</b>	<b>PHYSICAL QUANTITY</b>	<b>NAME OF SI UNIT</b>	<b>SYMBOL</b>
1	Length	Meter	m
		Millimeter	mm
2	Mass	Kilogram	kg
		Gram	g
		Tone	t
3	Time	Second	s

<b>II- SYMBOLS ASSIGNED TO SOME DERIVED UNITS</b>			
<b>S.N.</b>	<b>PHYSICAL QUANTITY</b>	<b>NAME OF SI UNIT</b>	<b>SYMBOL</b>
1.	Area	Square centimeter	cm <sup>2</sup>
		Square meter	m <sup>2</sup>
		Hectare	ha
2	Speed/Velocity	Meter per second	m/s
		Kilometer per hour	kmph
3	Pressure	Newton per square millimeter	N/mm <sup>2</sup>
4	Time	Minute	min
		Hour	h
5	Volume	Cubic centimeter	cm <sup>3</sup>
		Milliliter	ml
		Liter	l

**ABBREVIATIONS:**

As per applicant	:	apa	Clause	:	Cl
Degree	:	deg	Figure	:	Fig
Indian Standard	:	IS	Kilowatt	:	kW
Number	:	No.	Not available	:	N.A.
Not Recorded	:	N.R.	Percent	:	%
Reference	:	Ref.	Revolution	:	rpm