

व्यावसायिक परीक्षण रिपोर्ट

COMMERCIAL TEST REPORT

रांगना/ No. : Imp-533/1378

माह /Month : October-2011



WHEAT STRAW REAPER
“DILNAZ & GURNAZ-999”



शास्त्र सरकार

कृषि मंत्रालय

(कृषि एवं सहकारिता मंत्रालय)



GOVERNMENT OF INDIA
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9. FIELD TEST

The straw reaper fitted with Sonalika International 750-III tractor at engine throttle setting corresponding to 1700 rpm was tested in the field for 36.00 hours for harvesting of wheat straw left over by grain combine. During testing wheat straw was harvested to assess field performance of straw reaper with regard to quality of work, rate of work, fuel consumption, safety and soundness of construction etc. The crop parameters and atmospheric conditions as observed during field tests are given in Annexure-II.

9.1 Rate of work and fuel consumption

The “split straw percentage” is defined as the percentage of straw split to the total weight of straw sample collected after passing through the machine. The quantity of straw collected is expressed in terms of straw recovery percentage which is defined as the percentage of difference of straw weight before and after machine operation to the initial weight of straw in the randomly selected sample area of test field.

During straw harvesting tests, rate of work in wheat straw varied from 0.412 to 0.512 ha/h. The speed of operation varied from 2.74 to 3.02 kmph and gear used was L-II in wheat harvested field. Fuel consumption varied from 4.40 to 4.98 l/h

The results of field performance tests are summarized in Table-1 and detail is given in Annexure-II.

TABLE -1 : SUMMARY OF FIELD PERFORMANCE TEST

Wheat Crop variety	Forward speed (kmph)	Rate of work		Fuel consumption		Av. Length of bhusa (mm)	Straw split (%)	Straw recovery (%)
		(ha/h)	h/ha	(l/h)	(l/ha)			
DBW 17	2.74 to 3.02	0.431 to 0.508	1.97 to 2.31	4.60 to 4.93	9.08 to 11.02	17.7 to 21.2	97.0 to 97.4	71.5 to 73.7
PBW-373	2.90 to 2.97	0.426 to 0.512	1.95 to 2.35	4.40 to 4.98	9.73 to 10.33	17.4 to 24.3	96.0 to 97.0	71.6 to 78.3
PBW-550	2.93 to 2.96	0.412 to 0.500	2.00 to 2.44	4.61 to 4.98	9.22 to 12.08	21.3 to 22.5	97.7 to 99.0	74.7 to 80.0

9.3 Quality of work :

9.3.1 Wheat straw harvesting:

During wheat straw harvesting the straw split ranged from 96.0 to 99 % and straw recovery ranged from 71.5 to 80.0%

The length of straw in wheat ranged from 17.4 to 24.3 mm. The straw recovery mainly depends upon the stubbles height remaining in the field after harvesting by the combine harvester. The length and splitting of straw so formed is considered to be satisfactory as animal feed.

9.	Beater shaft bearing	2	-do-
10.	Chaffer cylinder shaft bearing	2	-do-
11.	Blower shaft bearing	2	-do-
12.	Reel mounting bearing	2	-do-
13.	Sieve crank bearing (once in year)	1	-do-
	Total	29	
A-2	Idler pulley bearings(alternate days in season)		
1.	Idler pulley bearing of cutter bar drive belt	1	Daily (after 8 hrs.)
2.	Idler pulley bearing of blower belt.	1	-do-
3.	Idler pulley bearing of beater belt	1	Daily (after 15 hrs.)
4.	Idler pulley bearing of main shaft	-	
	Total	3	
A-3	Grease cups: (At the time of repair)		
1.	Grease cup of wheel bearings	2	
B.	Oiling points:		
1.	Reel moving bushes	15	Daily (after 8 hrs.)
2.	Reel drive mechanism pulley	05	Daily (after 8 hrs.)
	Total	20	Daily (after 8 hrs.)

8. LABORATORY TESTS:

A	Hardness of knife blades (HRC)	As observed	As per IS:6025-1999	Remarks
	a. Hardened Zone :	38 to 39	48 to 58	Does not conform
	b. Remainder Zone :	32 to 34	20 to 35	Conforms

B	Hardness of chaffer drum blade (HRC)	As observed	As per IS:6025-1999	Remarks
	Hardened Zone :	38 to 39	48 to 58	Does not conform
	Remainder Zone :	32 to 35	20 to 35	Conforms

C. Chemical composition of Knife blades

	As observed	As per IS:6025-1999	Remarks
Carbon %	0.76	0.70 to 0.95	Conforms
Manganese %	0.76	0.30 to 0.50	Does not conform

D. Chemical composition of chaffer Drum blades

	As observed	As per IS:6025-1999	Remarks
Carbon %	0.73	0.70 to 0.95	Conforms
Manganese %	0.74	0.30 to 0.50	Does not conform

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13 DEFECTS, ADJUSTMENTS, BREAKDOWNS AND REPAIRS.

No breakdown was observed during 36.0 hrs. of field operation under test.

14 SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS:

14.1. Rate of work and fuel consumption

From the field test for wheat straw harvesting, output of the machine varied from 0.412 to 0.512 ha/hr. The forward speed of the tractor Sonalika International 750-III varied from 2.74 to 3.02 kmph and gear used was L-1 & L-2 both as per field condition. Fuel consumption varied from 4.40 to 4.98 l/h(9.08 to 12.08 l/ha).

14.1.2 Quality of work

Quality of straw is expressed in terms of split straw percentage and length of straw. The split straw was 96 to 99%. The average length of straw observed from 17.4 to 24.3 mm. The straw recovery was from 71.5 to 80.0 %.

14.2 EASE OF HANDLING DURING OPERATION:

No specific problem was observed during operation of wheat straw reaper in field.

14.3 COMMENTS AND RECOMMENDATIONS

1. Quality of wheat straw was observed to be satisfactory and is considered to be suitable for animal feed.
2. The straw split percentage was observed from 96 to 99. This is considered to be satisfactory.
3. Hardness of the blade of chaffer drum and cutter bar are not conforming the IS requirement. Therefore the blades conforming to IS:6028- Dec-2004 should be use at regular production level.
4. Chemical composition of knife blades and chaffer drum blades do not meet requirements of IS:6025-Dec.2004 respectively. These should be looked into for compliance.
5. Adequate arrangements have to be make for protecting belt and pulley drive used for guide drum, threshing drum, blower and cutter bar assembly.
6. Safety instructions/ signals have to be displayed for threshing drum as per IS requirement.

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7. Adequate protection has to be made for propeller shaft for safety during operation.
8. The bearings are protected against the ingress of dust and foreign material.
9. Chaffer drum blades are tightened with double nuts to avoid its loosening.
10. Adequate provision has been made for making the adjustments of the moving parts.
11. Adequate provision has been made for lubricating/ greasing of the moving parts.
12. Shape of the toeing hook of the straw reaper are not as per the code IS:12362-(Part-I) 2007. The details of the same is given in fig.1.



15. LITERATURE

The manufacturer has developed specification of machine. Operator's manual, service manual, part's catalogue etc in single booklet. However, it needs to be modified in Hindi, English and other regional language's for guidance of users and service personnel's as per IS : 8132-1999.

TESTING AUTHORITY

(J. P. MANDAL) AGRIL. ENGINEER	
(P. K. CHOPRA) (SENIOR AGRICULTURAL ENGINEER)	
(A. N. MESHRAM) DIRECTOR	

APPLICANT'S COMMENTS

1. The dealer of the thresher/concave blade has been intimated in writing about the design & quality of blade which we will use in future.
2. The other deficiencies as pointed out in report will be removed in future at production level.