



**WHEAT STRAW REAPER
(GN-61)**



भारत सरकार
कृषि मंत्रालय
(कृषि एवं सहकारिता विभाग)



**GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE
(DEPARTMENT OF AGRICULTURE & COOPERATION)**

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9. FIELD TEST

The straw reaper fitted with Mahindra Arjun 605 DI tractor at engine throttle setting corresponding to 2000 rpm was tested in the field for 36.0 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 splitted 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 0.516 to 0.562 ha/h. The speed of operation varied from 3.08 to 3.37 kmph and gear used was L-II in wheat harvested field. Fuel consumption varied from 5.51 to 6.77 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

WheatCrop 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	3.12 to 3.24	0.516 to 0.541	1.84 to 1.94	5.51 to 5.99	10.58 to 11.61	15.7 to 17.8	96.0 to 98.7	80.0 to 86.0
PBW-373	3.08 to 3.30	0.524 to 0.562	1.78 to 1.91	5.86 to 6.77	10.68 to 12.92	15.0 to 17.8	97.0 to 99.0	77.6 to 81.5
PBW-550	3.18 to 3.37	0.551 to 0.551	1.79 to 1.82	5.84 to 6.69	10.59 to 12.16	14.3 to 18.5	98.7 to 99.0	79.9 to 88.2

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 77.6 to 88.2%

The length of straw in wheat ranged from 14.3 to 18.5 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.

10 EASE OF HANDLING DURING OPERATION

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

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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 0.516 to 0.562 ha/hr. The forward speed of the tractor Mahindra Arjun 605 DI varied from 3.08 to 3.37 kmph and gear used was L-2 both as per field condition. Fuel consumption varied from 5.51 to 6.77 l/h(10.58 to 12.92 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 96.0 to 99.0%. The average length of straw observed from 14.3 to 18.5 mm. The straw recovery was from 77.6 to 88.2 %.

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 99.0. 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 used 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 at regular production level.
5. Adequate arrangements have to be made 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 catalouge 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

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APPLICANT'S COMMENTS

No comments received