

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या / No.: Machine 23/225
माह / Month: May, 2015



“SAI” CHAFF CUTTER (POWER OPERATED)

Ref. copy



समयेव करो

भारत सरकार
GOVT OF INDIA
कृषि मन्त्रालय

MINISTRY OF AGRICULTURE
कृषि एवं सहकारिता विभाग

DEPARTMENT OF AGRICULTURE AND COOPERATION

उत्तर पूर्वी क्षेत्र कृषि यंत्र प्रशिक्षण एवं परीक्षण संस्थान

NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE

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1. SCOPE OF TEST

The scope of test was as under:

- (i) Checking of specification & other data furnished by the applicant.
- (ii) Conformity to requirements against the relevant Indian Standards.
- (iii) Field test to find out: -
 - (a) Quantity of work
 - (b) Quality of work
 - (c) Power consumption
 - (d) Labour requirement
 - (e) Ease of operation, adjustments & safety provisions
 - (f) Wear of critical components

2. METHOD OF SELECTION

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

3. TEST PROCEEDURE

For testing of power operated Chaff Cutter, the following Indian Standards were referred:

- (i) IS: 11459-985 : Specification for Power Operated Chaff Cutter
(Reaffirmed in 2012)
- (ii) IS: 15542-2005 : Power-Operated Chaff Cutter-Safety requirements
(Reaffirmed in 2010)
- (iii) IS: 1511-1979 : Specification for blades for Manually Operated
(Reaffirmed in 2000) Chaff Cutter
- (iv) IS: 7897-1975 : Test code for Chaff Cutter
(Reaffirmed in 2012)

4. SPECIFICATIONS**4.1 General**

| | | |
|---------------------|---|--|
| Manufacturer | : | M/s. Shivam Agro Industries, Nr Maheshwari Protiens, Nagra Road, Ratlam-457001, Madhya Pradesh |
| Name of machine | : | Chaff Cutter (Power Operated) |
| Type | : | Cylinder, chute fed, through-away type |
| Make | : | Shivam Agro Industries |
| Model | : | Sai |
| Serial No. | : | Not specified |
| Year of manufacture | : | Not specified |

| | | |
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Suitability : Chopping of green or dry fodder/grass for animal feed
 Test conducted on : Sugarcane tops

4.2 Constructional details (Refer Fig. 1)

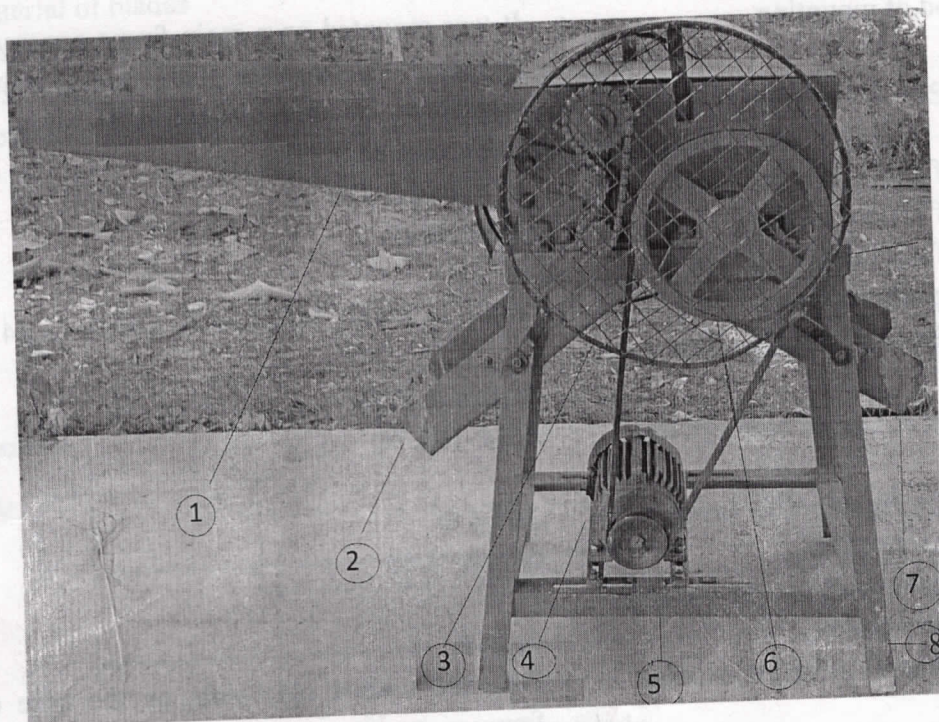


Fig. 1: Schematic view of Chaff Cutter

KEYWORDS

- | | |
|-----------------------|------------------------|
| 1. Feeding chute | 5. Motor frame |
| 2. Uncut fodder chute | 6. Driven pulley |
| 3. Guard | 7. Fodder out-let tray |
| 4. Electric motor | 8. Stand |

4.2.1 Stand Type

: Four legged made out of MS angle iron. The legs were joined by means of welding with each other with another supporting angle iron.

Size of angle iron (mm) : 52 x 46 x 5
 Size of supporting angle iron (mm) : 47 x 52 x 5
 Height of platform from GL (mm) : 780
 Size of platform (mm) : 315 x 560
 No. & size of slots for fitting the chaff cutter assembly (mm) : Four, 11.9 x 20.4

RB: Rotating blade, FB: Fixed blade

Remark: Percent rate of wear of rotating and fixed blades were observed as 0.32 to 0.38 % and 0.26 %

7.2 Wear of blade on dimensional basis

| Sl. No. | Blade | Location of measurement from LHS | Width (mm) | | Difference of width (mm) | Wear (%) | |
|---------|-------|----------------------------------|------------|-----------------|--------------------------|--------------|--------|
| | | | Initial | After operation | | After 26.9 h | Hourly |
| 1 | RB 1 | At hole no.1 | 65.60 | 64.40 | 1.2 | 1.02 | 0.07 |
| | | At hole no.2 | 63.45 | 62.33 | 1.1 | 1.73 | 0.06 |
| 2 | RB 2 | At hole no.1 | 63.52 | 61.91 | 1.2 | 2.53 | 0.09 |
| | | At hole no.2 | 63.81 | 62.41 | 1.4 | 2.19 | 0.08 |
| 3 | FB | At hole no.1 | 48.50 | 47.54 | 0.96 | 2.0 | 0.07 |
| | | At hole no.2 | 48.30 | 47.35 | 0.95 | 2.0 | 0.07 |

RB: Rotating blade, FB: Fixed blade

Remark: Percent rate of wear of rotating and fixed blades were observed as 1.52 to 1.90 % and 2.0 %.

8. DEFECTS, BREAK DOWNS & REPAIRS

Nil

9. SUMMARY OF OBSERVATION, COMMENTS & RECOMMENDATIONS

9.1 Quantity of Cut

- The feed rate was observed as 313.0 to 385.4 kg/h.
- The quantity of cut fodder received was measured as 309 to 381.6 kg/h
- The corrected quantity of cut was recorded as 83 to 128 kg/h
- The quantity of cut per unit energy consumed was recorded as 266 to 326 kg/kWh.
- The corrected quantity of cut per unit energy consumed was recorded as 72 to 109 kg/kWh.

9.2 Quality of cut

The quality of cut was determined from the deviation of measured length of cut from the theoretical length of cut. The variation was recorded as 55 to 62 %, which is very high and the quality of cut was ranged from -1.57 to -1.03, which is considered to be poor.

9.3 Power requirement

- 9.3.1 The No-load power consumption of the chaff cutter was recorded as 0.36 kW, which is considered as normal.
- 9.3.2 The capacity of the prime mover as provided with the machine is found to be adequate.

| | | |
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9.4 Performance Index

The overall performance of the chaff cutter was determined by its performance Index and it was measured as -512.1 to -273.9. This is considered low.

9.5 Long Run Test

During and after the completion of long run test, no breakdown in the cutter head, feeding mechanism, transmission system & body of the chaff cutter was noticed. Major repairs were also not found during the entire course of test.

9.6 Labour Requirement

Two labourers were required for continuous operation of the chaff cutter, one for feeding the fodder crop and the other for shifting the cut chaff.

9.7 Ease of operation, adjustments and safety provisions

- The machine is easy for installation and operation.
- The adjustment of clearance between the fixed and rotating blade is easy to perform.
- The machine is power operated and can also be operated manually.
- The cutter head and main power transmission is guarded by providing a safety cover.
- The feed rollers are provided with spring loaded arrangement.
- The Chaff Cutter is provided with side wire mesh guard and top cover plates to protect the feed rollers.

The machine should also be provided with the following arrangements as per IS: 15542-2005 (Reaffirmed in 2010) which are essential from safety point of view of the operator:

(1) Feeding chute: The feeding chute shall be provided with the following safety Provisions.

- (a) The provision for changing the angle of placement of chute (trough)
- (b) At the rear side of chute (trough), a support shall be given.
- (c) The length of chute should be 900 mm minimum.
- (d) The chute should be made of MS sheet having thickness not less than 1.6 mm.
- (e) The chute must be covered up to a minimum of 450 mm near feed roll side.


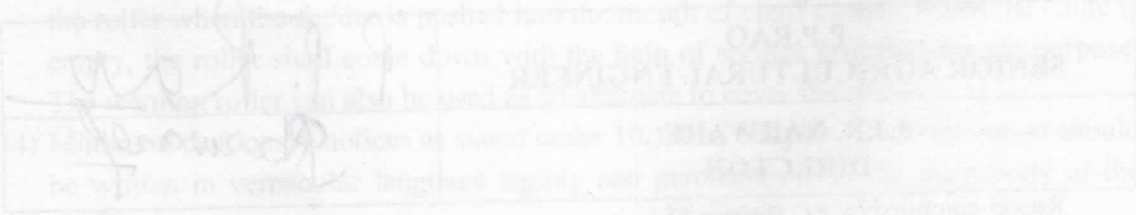
(2) Provision to change the direction of rotation of feed rollers should be made.

(3) A warning roller which is a sort of idler roller with spring may be fitted just before the feeding rollers to warn the operator while feeding the fodder crop into the chaff cutter. The upward movement of the warning roller shall be controlled by the cam which lifts the roller when the fodder is pushed into the mouth of chaff cutter. When the chute is empty, the roller shall come down with the help of springs provided for the purpose. The warning roller can also be used as an alternate to cover the chute.

(4) Minimum cautionary notices as stated under 10.1.1 of Chapter 5.0 of this report should be written in vernacular language legibly and permanently on the main body of the chaff cutter.

10. APPLICANT'S COMMENTS

| Para No. | Our Reference | Applicant's Comments |
|----------|---------------|-------------------------|
| 10.1 | 4.2.2.1 | Can be expanded to 3 hp |
| 10.2 | 4.2.2.2.2 | 2 option 3 blades also |



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