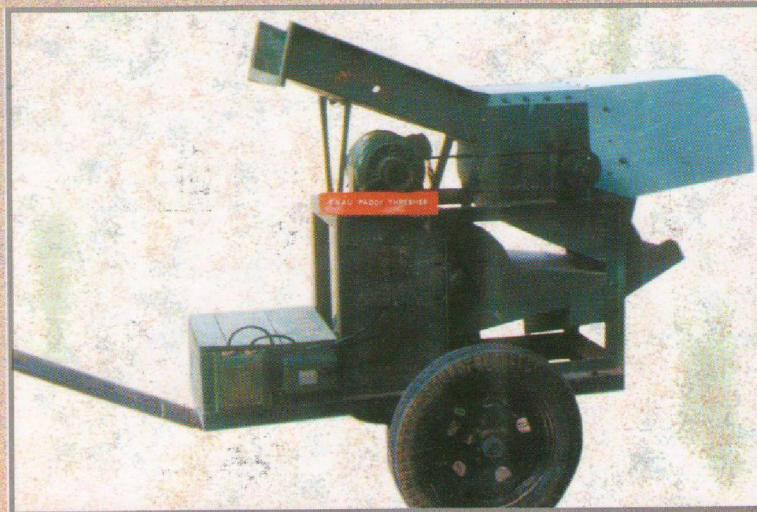


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PADDY THRESHER

- *A Success Story*



All India Coordinated Research Project on

Farm Implements and Machinery

Central Institute of Agricultural Engineering

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PADDY THRESHER

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PADDY THRESHER

1. Introduction

Rice is an important cereal crop and it is the major staple food. Rice is grown both as *rabi* and *kharif* crop. In some places rice is grown in three seasons. This shows the need for machinery the rice cultivation operations and threshing is one of the important operations carried out in its cultivation.

2. Traditional practices for threshing

Normally the crop is harvested manually, heaped at few places in the field and the heaps are collected to threshing floor and then the grains are threshed from crop. Threshing is commonly done by means of handbeating. The manual threshing of grain is slow and lot of drudgery is involved in this operation. Despite the availability of the combines harvesters and threshers on custom hiring, a large section of the farming community with small holdings still remain dependent on this method. A thresher was designed and developed for rice at TNAU, Coimbatore centre of AICRP on FIM.

3. Salient features of the machine

The paddy thresher consists of major components like main frame, feeding hopper, threshing drum, concave, blower, transport wheels, yoke and pole shaft.

3.1 Main frame

The main frame is fabricated to accommodate the cylinder concave assembly, cleaning sieves, blower and power transmission system. The frame is made of mild steel angle iron of 60 x 60 x 6 mm.

3.2 Feed hopper

A feed hopper of 930 x 780 x 250 mm is made from mild steel sheet (1.5 mm thick).

3.3 Threshing cylinder

The drum type threshing cylinder of 400 mm diameter and 465 mm length is made from mild steel sheet (2 mm thick). The cylinder surface is provided with four cast iron rasp bars having 23 nos. of helical teeth on each bar.

3.4 Concave

A semi circular concave is made from mild steel rods 6 mm diameter to form a gate.

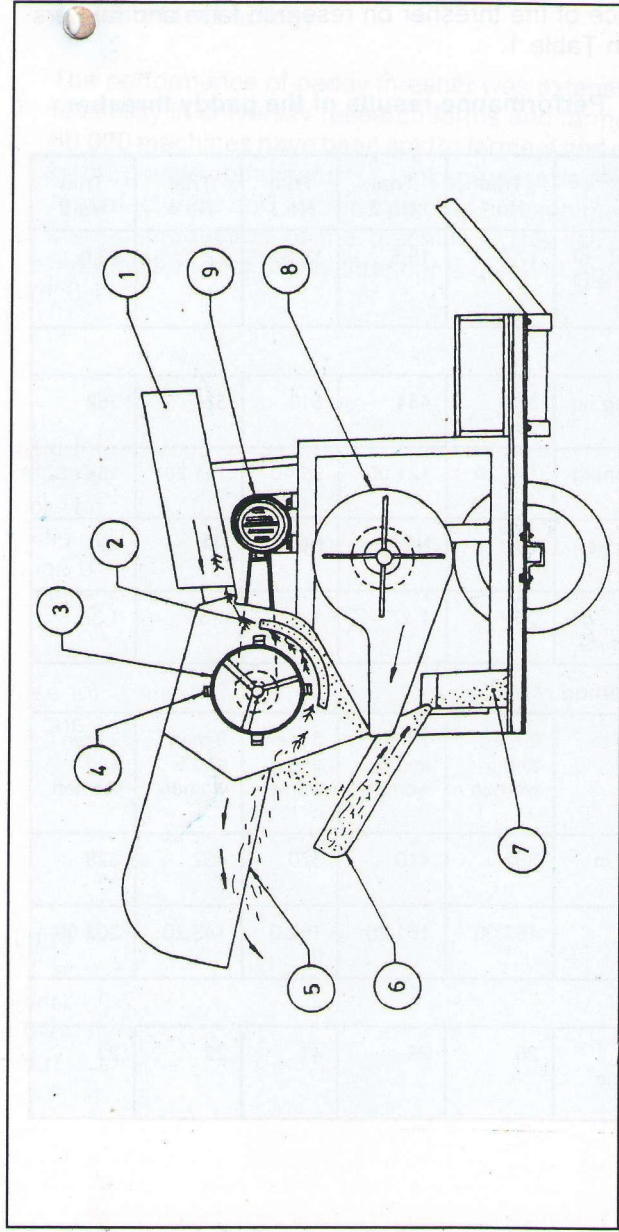
3.5 Blower

A centrifugal blower is provided for blowing of light weight plant materials coming along with threshed paddy from concave. The blower fan has 4 blades. The length of blade is 356 mm and width is 203 mm. Opening of 156 mm circular size is providing on either size of the blower. The clearance between blade tip and spiral casing varies from 6 to 15 mm. The size of the blower outlet is kept 425 x 60 mm. The paddy thresher is shown in Fig.1.

Transport wheels with pole shaft and yoke are provided for easy transporting of thresher with the help of a pair of bullocks and an operator.

Evolution / Design process

A paddy thresher was developed at TNAU, Coimbatore. In this thresher position of the concave is constant and hence the concave clearance is adjusted by raising or lowering the threshing cylinder. The straw after threshing is thrown out due to the centrifugal force from the unit and the threshed grains drop at the grain spout.



- | | | | | | | | |
|-----|----------------------|-----|--------------|-----|----------------|-----|----------|
| (1) | Feed hopper | (2) | Concave | (3) | Threshing drum | (4) | Rasp bar |
| (5) | Threshed paddy straw | (6) | Chaff & Dust | (7) | Grain outlet | (8) | Blower |
| (9) | Electric motor 5 hp | | | | | | |

Fig 1 Schematic diagram of paddy thresher

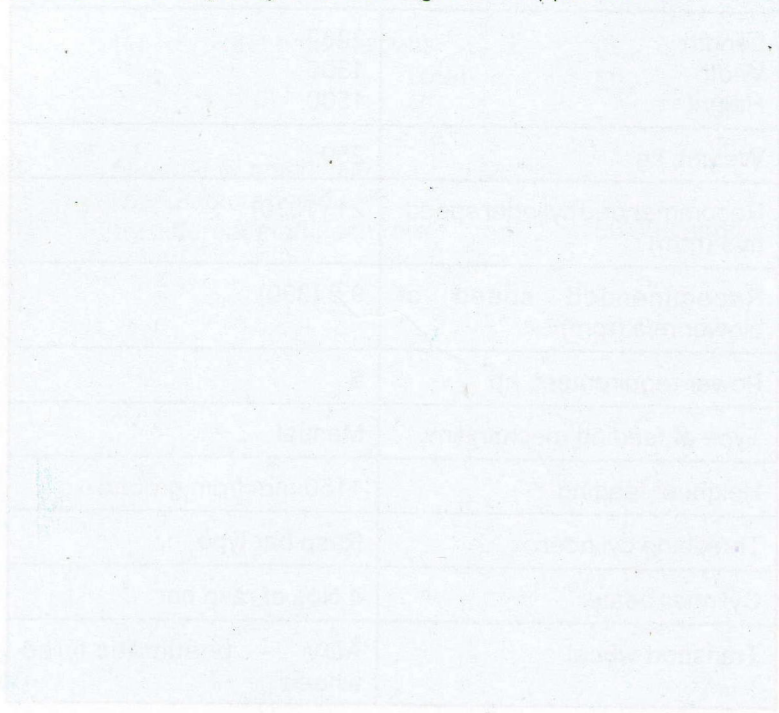
The performance of the thresher on research farm and farmers' field is shown in Table 1.

Table 1 Performance results of the paddy thresher

Particulars	Trial No.1	Trial No.2	Trial No.3	Trial No.4	Trial No.5
Moisture content of the grain at the time of threshing, % (wb)	17.0	19.5	18.8	22.1	28.0
Machine					
Rate of threshing in kg/h	312	484	516	526	362
Cost of threshing (1974), Rs/t	115.20	121.00	96.40	111.20	154.60
Percentage of broken grains	Nil	Nil	Nil	Nil	Nil
Percentage of unthreshed grains, %	0.57	1.17	1.4	1.35	1.38
Conventional Method					
Labour employed to thresh	2 men and 5 women	2 men and 5 women	3 men and 6 women	2 men and 5 women	2 men and 5 women
Rate of threshing in kgs/h	382	410	370	462	328
Cost of threshing, Rs/t	157.00	161.20	162.00	143.20	202.00
Economics					
Saving in cost of threshing per tonne of grain, %	26	25	41	22	23

Status of technology

The performance of paddy thresher was extensively tested for its feasibility in university research farms and farmers' fields. About 50,000 machines have been sold to farmers and different agencies by the private manufacturers. Linkage were developed with several manufacturers and at present about a dozen manufacturers have started production of the machine. The list of few prominent manufacturers of paddy thresher is given in Appendix-III.



Specifications of the Rice Thresher

Name of implement	TNAU Paddy Thresher
Crops for which suitable	Rice crop
Overall dimensions, mm	
Length	2230
Width	1300
Height	1500
Weight, kg	250
Recommended cylinder speed, m/s (rpm)	21 (1030)
Recommended speed of blower m/s (rpm)	9.5 (390)
Power requirement, hp	5
Type of feeding mechanism	Manual
Height of feeding	1150 mm from ground
Threshing cylinder	Rasp bar type
Cylinder beater	4 Nos. of rasp bar
Transport wheel	ADV - pneumatic tyred wheels

Production and supply of machine

1. Number of prototypes fabricated and sold by TNAU.
 - (i) KVK and other centres : 10
 - (ii) R&D organizations : 5
 - Total** : 15

2. Number of machines manufactured and sold by different manufacturers : 50,000 approx.

List of Manufacturers

1. M/s Kovai Engineering Works
88, Iyer Hospital Road
Sowripalayam
Coimbatore - 641 028
2. M/s LCT Industries
661, Trichy Road
Coimbatore - 641 005
3. M/s Swathi Industries
New Thillai Nagar, Maruthamalai Road
PN : Pudur (PO)
Coimbatore-641 034, Tamil Nadu
4. M/s KC Industries
Opp. to Alvernia Convent
Trichy Road
Coimbatore
5. M/s Sree Bhuvaneshwari Industries
168-C, Avanashi Road
Coimbatore-641 004
6. M/s Annapoorna Industries,
8-A, Iyer Hospital Road
Singanallur
Coimbatore-641 005
7. M/s Parvathi Industries
Avanashi Road
Coimbatore