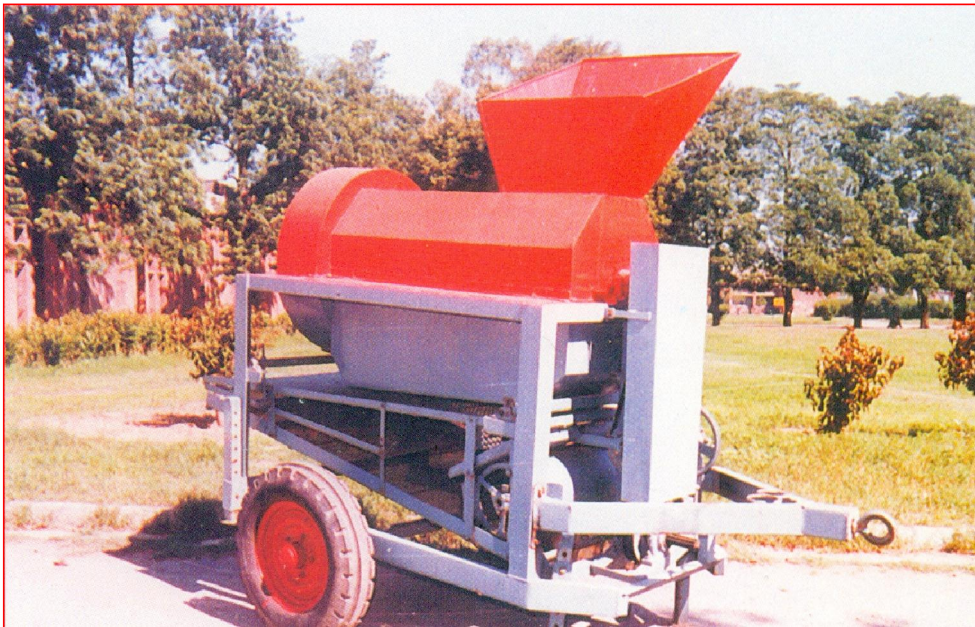


PAU SUNFLOWER THRESHER

A SUCCESS STORY



All India Coordinated Research Project on
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PAU SUNFLOWER THRESHER

Introduction

India has the third largest area under sunflower (2.1 million ha) and accounts for 10% of the world acreage.

Sunflower, an oilseed crop, is grown in Maharashtra, Karnataka, Tamil Nadu, Andhra Pradesh, Uttar Pradesh and Madhya Pradesh. Power operated sunflower thresher (3.75 kW capacity) has been developed at ANGRAU, Hyderabad centre of AICRP on FIM which has good output capacity (200 kg/h) and efficient threshing. An axial flow sunflower thresher has been developed by the PAU centre of AICRP on FIM, giving 6-9 q/h output and 100% threshing efficiency.

Traditional Threshing Practices

The separation of seed from sunflower head is generally done manually (beating with stick), bullock trampling and tractor treading. These processes are cumbersome, time consuming and total losses are also high which directly affect the quality of produce.

Salient Features of the Sunflower Thresher

It consists of a feed hopper, bar type cylinder, thrower, two sieves, concave and a blower. It works on axial flow principle. The cylinder of length 1500 mm has two portions, the first one of 1300 mm for threshing and the second of 200 mm for straw throwing. The threshing portion has raised spikes. The cylinder-concave clearance is 40 mm and is uniform throughout its length. The cylinder is of hexagonal shape and is fitted with seven louvers at a spacing of 180 mm. The louvers are made of 3 mm thick MS sheet and have a depth of 70 mm. The cleaning system consists of a centrifugal blower and three sieves inclined at an angle of 7-15°.

Evolution of the Design

The thresher was developed at PAU, Ludhiana during 1988-90. The designed prototype was tested in the laboratory and functional testing was conducted at research farm to determine total losses, power consumption, output capacity, threshing and cleaning efficiency. The prototypes were sent for multi-locational trials all across the country for conducting feasibility testing for different varieties of sunflower. During 1997-2002 at UAS, Raichur centre of AICRP on FIM extensive field tests were carried out on farmers' fields. Based on the feedback, modifications were incorporated in the thresher.

Performance of the Axial Flow Sunflower Thresher

The power operated sunflower thresher was tested at research farm at the designed threshing cylinder and blower speeds and concave clearance.



PAU Sunflower thresher in operation

The economics of operation were compared with local threshers. The savings in labour, time and cost of operation were compared with local thresher. Feedback from farmers on performance of sunflower thresher has proved very helpful in the design refinement. The performance results of the thresher are given in Table-1.

Table-1: Results of performance evaluation of PAU axial flow sunflower thresher

Parameters	PAU, Ludhiana	UAS, Raichur
Variety		KBSH-1
Moisture content of flower, % (db)	42-90	41.12
Moisture content of seed, % (db)	18-20	18-20
Ratio of weight of flower to seed	1:7	1:7
Threshing cylinder speed, rpm	300-350	560
Blower speed, rpm	-	820
Feed rate, kg/h	3500	2740
Threshing efficiency, %	100	99.29
Cleaning efficiency, %	90	89
Total grain losses, %	0.65-2.94	0.71

Parameters	PAU, Ludhiana	UAS, Raichur
Fuel consumption, l/h	2.5	3.5
Threshing capacity, kg/h	600-900	870
Cost of operation		
Rs/h	-	245
Rs/q	25	26.80
Labour requirement, man-h/q	0.6	-

Status of the Technology

The thresher has proved to be very useful for threshing bulk quantity of freshly harvested sunflower crop. The timeliness in threshing and savings in labour and cost generated interest for adoption of this thresher. During feasibility test of thresher at UAS, Raichur the total losses were within permissible limit. The UAS, Raichur centre also carried out frontline demonstration for KBSH-1, Mahyco-17, MSFH-17, RSFH-1 and Modern varieties of sunflower.

Table-2: Comparative threshing performance of PAU Sunflower thresher with conventional thresher

Parameters	PAU Sunflower thresher	Conventional thresher
Threshing capacity, kg/h	885	186
Threshing efficiency, %	99.5	97.5
Cleaning efficiency, %	89.05	95.5
Broken grains, %	0.05	2
Cost of operation, Rs/q	27.70	34.00

The thresher eliminated human drudgery and also provided quality produce. The sunflower thresher trials were organized for 460 h at UAS, Raichur and ANGRAU, Hyderabad Centres of AICRP on FIM. It saves 70-80% of labour and operating time and 40-50% in cost of operation. The axial flow thresher gave 3-4 times more output compared to conventional thresher. Six manufacturers are engaged in the production of this machine and more than 6000 machines have been sold to the farmers.

Specifications of sunflower thresher

Dimensions (lxbxh), mm	3230x2250x1390
Weight, kg	600
Cylinder size, mm	650 dia x 1500
Spike size, mm	50 x 10 flat, 125 No., 6-rows
Blower, centrifugal	1 No., 280 mm dia x 750 mm width
Threshing cylinder speed, rpm	300-350
Threshing capacity, kg/h	600-900
Concave clearance, mm	40
Power source	5 kW electric motor
Cost, Rs	26,000/-

List of manufacturers

1. M/s Amar Agril. Implements,
Gill Road,
Janta Nagar,
Ludhiana-141 003
2. M/s Bharat Industrial Corporations,
Akalsar Road,
Moga-142 001
3. M/s Madho Mechanical Works,
Focal Point,
Moga-142 001
4. M/s Sehra Motors & Tractors Engg. Works,
Nehru Garden Road,
Jalandhar (Punjab)
5. M/s Sherpur Agro Industries,
GT Road, Focal Point, Sherpur,
Ludhiana-141 001
6. M/s Sonalika Agril. Works,
Jalandhar By-Pass,
Hoshiarpur, Punjab