POSTHARVEST MACHINERY, TOOLS AND EQUIPMENT

1.1 Food Grains

1.			
i.	**Name of Technology**	:	**PKV Mini Dal Mill**
ii.	**Application/ Use**	:	Pulse milling (pigeon pea, green gram, black gram, chick pea) at rural level
iii.	**Description of Technology** :  In the need of finished product, pulses produced in rural areas, are transported to urban areas, where commercial dal mills are situated. If the pulses are processed at rural level, this unnecessary taxation of transportation cost on producer can be reduced. In order to have solution to these problems a small enterprise at rural level is necessary for which the PKV Mini dal mill is developed and further refined for its multipurpose use (cleaning, grading of grains and polishing of split dal). It operates using two horse power single phase electric motor. Almost all pulses can be dehulled with this machine and the products are quite comparable with that of the available commercial dal mills. This plant is commercially manufactured and available in the market. The processing capacity of this dal mill is 100-125 kg/h for pigeon pea and 125-150 kg/h for green and black gram. The respective recoveries are 72-75% and 82-85%, which is higher to the tune of existing burr mill. It avoids dusty atmosphere and provides easy operation. The technology offers rural employment through micro enterprise. The present cost of PKV mini dal mill is Rs. 55000 and 538 units of PKV mini dal mill have been sold to various entrepreneurs so far.		
iv.	**Input/raw material**		Grain (pulses)
	a) Overall dimension		1.5 x 1.3 x 1.8 m
	b) Weight		170 kg
	c) Prime mover		2 hp electric motor
	d) Man power		1 skilled and 1 unskilled
	e) Land		200 m^2
	f) Investment		Rs. 55,000/-
v	**Output capacity**		125 kg/h
vi	**Unit cost (per machine)**		Rs. 50,000/- (including prime mover)
vii	**Suitability for crop/ commodity**	:	Pigeon pea, green gram and black gram
viii	**Efficiency**	:	72-75% recovery of dal (Pigeon pea) 82-85% recovery of dal (green gram, black gram, Bengal gram)
ix	**Unit cost of operation**	:	100-120 Rs/q
x	a) No. of Licensees	:	02
	b) Addresses of Licensees / Manufacturer	:	1. M/s Shriram Associates, J/27, phase 3, MIDC, Akola (MS) (M) 09823090002 (O) 0724-2258325 2. YMB agri Machineries, W/37-38, Phase 3 MIDC Akola (MS) (M) 09850303202 (O) 0724-2258184
xi	Contact Address		Research Engineer, AICRP on PHT College of Agricultural Engineering Dr. Punjabrao Deshmukh Krishi Vidyapeeth, Krishi Nagar, AKOLA - 444 104 (Maharashtra)

2.			
i.	**Name of Technology**	:	PKV Cleaner-Grader-polisher
ii	**Application/ Use**	:	Cleaning, grading and polishing of agricultural commodities
iii	**Description of Technology** : It consists of blower, rotary sieves and polisher. Hopper with feeding mechanism is provided for proper feeding of grain to rotary sieve. Before the grain reaches to sieve it is cleaned by blower and the size is graded through different sizes of sieves arranged in series. The stone and lumps are separated at the end. The machine can grade pigeonpea, green gram and black gram grains. Grading of pulse grains lead to better milling and higher dal recovery. Other pulses can also be graded by using proper sized sieve. Two screw conveyors are provided for polishing of pigeonpea dal. The machine has capacity of 4 to 5 q/h and it requires one horse power single phase electric motor.		
iv	**Input/raw material**		Pulse grains/ unpolished dal
	Overall dimension		2.10 X 0.86 X 1.60 m
	Weight		120 kg
	Prime mover		1 hp single phase electric motor
	Man power		1 skilled and 1 unskilled
	Land		25 m^2
	Investment		Rs. 24,500/-
v	**Output capacity**		400-500 kg/h
vi	**Unit cost**		Rs. 24,500/- (including prime mover)
vii	**Suitability for crop/ commodity**	:	Cleaning ,grading and polishing of agricultural produce
viii	**Efficiency**	:	Not available
ix	**Unit cost of operation**	:	Not available
x	**a) No. of Licensees**	:	01
	b) Addresses of Licensees / Manufacturer	:	1. YMB Agri Machineries, W/37-38, Phase 3 MIDC Akola (MS) (M) 09850303202 (O) 0724-2258184
xi	**Contact Address**		Research Engineer, AICRP on PHT College of Agricultural Engineering Dr. Punjabrao Deshmukh Krishi Vidyapeeth, Krishi Nagar, AKOLA - 444 104 (Maharashtra)

1.			
i.	**Name of the technology**	:	Vivek Thresher-cum-Pearler
ii	**Application/ Use**	:	Threshing and pearling of minor millets
iii	**Description of Technology** : Millets are important staple food grain in North Western Himalaya of India (NWHI). The threshing and pearling of millets involves severe drudgery for its growers. It is evident by arduous process of traditional threshing and pearling, which need five hours effort for threshing and pearling of 100 kg of finger millet grains. A lightweight millet thresher was developed for multipurpose uses, i.e., threshing, pearling, dehusking/dehulling and polishing at Vivekananda Institute of Hill Agriculture (ICAR), Almora, Uttarakhand, India. It works on the principle of impact and shear on the grain. 		
iv	**Input/raw material**	:	
	a) Overall dimension (L x B x H mm)	:	660×310×1040 mm
	b) Weight	:	45 kg
	c) Prime mover	:	electric motor
	d) Power (hp)	:	1 hp
	e) Man power	:	01
	f) Land	:	NA
	g) Investment		5.0 Lakh
v	**Output capacity**	:	Threshing capacity : 30-35 kg grain/hr. Threshing/ dehulling efficiency : > 98% Pearling capacity (Finger millet) : 45 kg grain/hr. Dehulling capacity (*Barnyard millet* : 4.0 – 5.0 kg/hr
vi	**Unit cost (per machine**		Cost of the Machine : Rs 10,650/-
vii	**Suitability for crop**		Millets
viii	**Efficiency**		>96 %
ix	**Unit cost of operation**		Pearling cost : Rs. 0.1 per kg* Dehulling cost : Rs 6.0 per kg Threshing cost : Rs. 0.20 per kg*
x	**Patent obtained/applied**	:	Patent Application No. 1199/DEL/05 dated 11.05.05)
xi	a) No. of Licensees	:	01
	b) Addresses of Licensees or Manufacturer	:	Punjab Agricultural Impliments Pvt Ltd., Railway Road, Saharanpur, UP – 247001
xii	**Contact Address**		Research Engineer, AICRP on PHT Vivekananda Parvatiya Krishi Anusandhan Sansthan, ALMORA – 263 601 (Uttaranchal)

2.			
i	**Name of the Technology**	:	VL Steaming Plant
ii	**Application/ Use**	:	Threshing and pearling of minor millets
iii	**Description of Technology** : For improving the Dehulling characteristics of barnyard millet grain, a low cost steaming plant has been developed. This machine has 5 parts 1. Funnel, 2. Perforated conical container inside the drum, 3. Drum 4. Sliding type opening and 5. Iron pot for water boiling. 		
iv	**Input/raw material**	:	
	a) Overall dimension (L x B x H mm)	:	610×9140×460 mm
	b) Weight	:	65 kg
	c) Prime mover	:	NA
	d) Power (hp)	:	NA
	e) Man power	:	NA
	f) Land	:	NA
	g) Investment		0.10 Lakh
v	**Output capacity**	:	45-50 kg/hr
vi	**Unit cost (per machine**		Cost of the Machine : Rs 1100/-
vii	**Suitability for crop**		Millets
viii	**Efficiency**		NA
ix	**Unit cost of operation**		NA
x	**Contact Address**	:	Research Engineer, AICRP on PHT Vivekananda Parvatiya Krishi Anusandhan Sansthan, ALMORA – 263 601 (Uttaranchal)

3.			
i	**Name of the Technology**	:	VL Paddy Thresher
ii	**Application/ Use**	:	Threshing of paddy
iii	**Description of Technology** : VL Paddy Thresher was designed, fabricated and developed for the purpose of threshing paddy grain. This is a manual-cum-power operated paddy threshing machine. It works on the principle of impact on the grain for the purpose of threshing. The threshing drum is fitted with a wire loop as a beating device, which provides impact on the grain. In this thresher, sitting arrangement has been made for the easy operation. Chain-sprocket power transmission system with 1:7 speed ratio has been applied for providing rotational speed to the thresher. Threshing capacity and efficiency are largely affected by stem height, panicle height and 1000 grain weight of paddy crop		
iv	**Input/raw material**	:	
	a) Overall dimension (L x B x H mm)	:	1030×630×975 mm
	b) Weight	:	42 kg
	c) Prime mover	:	Either one man or 0.5 hp Electric motor
	d) Power (hp)	:	0.5
	e) Man power	:	02
	f) Land	:	NA
	g) Investment		1.5 Lakh
v	**Output capacity**	:	60-100 kg/hr
vi	**Unit cost (per machine)**		Rs 3700/-
vii	**Suitability for crop**		Paddy
viii	**Efficiency**		> 98%
ix	**Unit cost of operation**		Rs 0.10 per kg paddy grain
x	**Contact Address**	:	Research Engineer, AICRP on PHT Vivekananda Parvatiya Krishi Anusandhan Sansthan, ALMORA – 263 601 (Uttaranchal)

4.			
i	**Name of the Technology**	:	Dehuller for barnyard millet
ii	**Application/ Use**	:	Dehulling of barnyard millet
iii	**Description of Technology**: In the recent times barnyard millet (*Echinochloa frumentacea* L.), was dehulled manually in the absence of suitable mechanical device. Therefore, a 5 hp electric motor driven millet dehuller of capacity 40–50 kg h^{-1} was designed, developed and optimized for process and machine parameters. The special feature of this machine is application of canvas strip as an abrasive material on impeller and replaceable sieve arrangement in bottom of the dehulling chamber. The actual dehulling efficiency and broken grain obtained with optimized machine parameters (number of canvas strip over periphery of impeller = 9 and over hanging width of canvas strip =3 mm) and process parameters (peripheral speed=8.6 m s^{-1}; number of passes=5 and moisture content=8.4% db) were 88.3±2.8% and 6.1±1.1% respectively. The annual net present value (NPV), benefit cost ratio (BCR), internal rate of return (IRR) and payback period (PBP) of the machine were Rs. 1.23 million, 1.95, 13.6% and 9 months, respectively.		
iv	**Inputs**	:	
	a) Raw material	:	Barnyard millet
	b) Machinery		
	Overall dimension (L x B x H mm)	:	1140 × 1107 × 2120 mm
	Weight	:	168 kg
	Prime mover	:	Electric motor (5 hp)
	c) Man power	:	One
	d) Land	:	
	e) Investment		
v	**Output capacity**	:	45 - 50 kg/h
vi	**Unit cost (per machine)**	:	Rs 40, 000/-
vii	**Suitability for crop**		Barnyard millet
viii	**Efficiency**	:	98% (in 4-5 passes)
ix	**Unit cost of operation**	:	Rs 2/kg grain
x	Contact Address	:	Research Engineer, AICRP on PHT Vivekananda Parvatiya Krishi Anusandhan Sansthan, ALMORA – 263 601 (Uttaranchal)

5.			
i	**Name of the Technology**	:	Pedal operated winnower-cleaner-grader for millets
ii	**Application/ Use**	:	Winnowing of millets, pulses and other cereals such as wheat and paddy
iii	**Description of Technology** :  A winnower-cleaner-grader suitable for winnowing, cleaning and grading of millet, cereal and pulses crops in single pass has been designed and developed at Vivekananda Institute of Hill Agriculture, Almora, Uttarakhand. The major components of the machine were fabricated using fiber reinforced plastic material. It consists of a winnower, cleaning sieve and grading assembly. The total weight of the winnower cum cleaner cum grader is 60 kg. It can be operated by one person. The cleaning capacity of the machine is 250-300 kg/h for finger millet and 275-300 kg/h for barnyard millet. The average cleaning capacity of the machine for different crop is found to be 200-250 kg/h. The winnowing capacity of the machine is found to be 300-350 kg/h for finger millet and 350-400 kg/h for barnyard millet. The average winnowing capacity of the machine for different crop is found to be 300-350 kg/h. The cleaning efficiency of the machine for finger and barnyard millet is found to be 96 and 97%, respectively. The average cleaning efficiency of the machine for different crops is 97%. The winnowing efficiency of the machine for finger and barnyard millet is found to be 97 and 98%, respectively. The overall efficiency of the machine is found to be 97.5%.		
iv	**Inputs**	:	
	a) Raw material		Millets, wheat, paddy, lentil and soybean
	b) Machinery		
	Overall dimension (L x B x H mm)	:	1450 × 1450 × 1210 mm
	Weight	:	60
	Prime mover	:	Mannual
	c) Man power	:	0ne
	d) Land	:	-
	e) Investment	:	-
v	**Output capacity**	:	250 - 300 kg/h
vi	**Unit cost (per machine**	:	Rs 8,000=00
vii	**Suitability for crop**	:	Millets, wheat, paddy, lentil and soybean
viii	**Efficiency**	:	96%
ix	**Unit cost of operation**	:	Rs 0.04/kg grain
x	Contact Address	:	Research Engineer, AICRP on PHT Vivekananda Parvatiya Krishi Anusandhan Sansthan, ALMORA – 263 601 (Uttaranchal)

1.			
i.	**Name of the Technology**	:	3-in-1 Mini Groundnut Decorticator-cum-Sunflower Thresher and Maize Sheller
ii.	**Application/ Use**	:	Suitable particularly for small farmers for decortication of groundnut seed pods and threshing of sunflower and maize seeds required during sowing season.
iii.	**Description of Technology** : It is a small hand-operated device with a mild steel body. The ribbed threshing cylinder consists of rubber cushions to facilitate smooth shelling of the pods inside the shelling chamber. The pods are fed through a 500 g capacity hopper. When the handle is rotated, the pods get shelled inside the shelling chamber and both the shell and kernel fall through the sieve at the bottom of the shelling chamber to be separated manually. The equipment is provided with two separate inter-changeable attachments for maize shelling and sunflower threshing which can be fitted to the shaft at the far end of the shaft. 		
iv.	**Input/raw material**	:	Well dried and graded groundnut pods
	f) Overall dimension	:	58 x 30 x 45 cm
	g) Weight	:	8 Kg
	h) Prime mover	:	-
	i) Man power	:	One labour
	j) Land	:	Not required
	f) Investment	:	Rs. 850/-
v.	**Output capacity**	:	15 kg groundnut pods / hour; 12-15 kg shelled maize or sunflower seeds
vi.	**Unit cost (per machine)**	:	Rs.850/-
vii.	**Suitability for crops/commodity**	:	Groundnut, sunflower, maize
viii.	**Efficiency**	:	-
ix.	**Unit cost of operation**	:	-
x	(a) No. of Licensees to whom the technology has been transferred		One
	(b)Selected Addresses of Licensee or Manufacturer	:	M/s Dollar Engineering Industries Pvt. Ltd. #3, Adjacent to BIS, Tumkur Road, 1st Stage, Peenya, Bangalore - 560 058, India.
xi	**Contact Address**	:	Research Engineer, AICRP on PHT University of Agricultural Sciences, J- Block, GKVK Campus, BANGALORE - 560 065 (Karnataka)

2.			
i.	**Name of the Technology**	:	Safe Storage of Pulses using Sand Layer
ii.	**Application/ Use**	:	Provides total control of bruchid infestation in stored pulse grains
iii.	**Description of Technology** : The technology developed is a two stage process involving extended sun-drying of pulse grains on a concrete threshing yard /black tarpaulin /black polyethylene sheet for 25 hours (spread over 3-5 days) in a single grain layer. The dried pulse grain is stored in a plastic or metal bin with one inch thick layer of sand spread uniformly on the top surface of the grain. Then the storage bin is closed with a tight lid without any disturbance to the sand layer till the end of storage period. 		
iv.	**Input/raw material**	:	Concrete threshing yard/black tarpaulin/black polyethylene sheet for drying; plastic or metal drum of suitable capacity with tight lid for storage and well sieved river sand.
v.	**Capacity**	:	Technology can be used for storage of pulses up to 1.0 tonne
vi.	**Unit cost (per machine)**	:	Depends on the cost of the bin and black tarpaulin /black polyethylene required for drying
vii.	**Suitability for crops/commodity**	:	Pulses
viii.	**Commercialization status**	:	Transferred to farmers
ix.	**Contact Address**	:	Research Engineer, AICRP on PHT University of Agricultural Sciences, J- Block, GKVK Campus, BANGALORE - 560 065 (Karnataka)

3.			
i.	**Name of the Technology**	:	2-in-1 Maize Sheller-cum-Sunflower Thresher
ii.	**Application/ Use**	:	This gadget can be used for shelling maize cobs or for threshing sunflower earheads. It has been designed to cater to the threshing needs of small and marginal maize growers especially for seed production.
iii.	**Description of Technology** : It is motor driven equipment with separate inter-changeable attachments for shelling maize cob / threshing sunflower ear-heads. A shaft driven by an electric motor rotates at about 200 rpm. On both ends of the shaft, either the maize shelling (tubular sheller) or sunflower threshing attachments (disc with pins) are fixed. Individual cob / ear-head is shelled / threshed manually and the seed damage is bare minimum making it suitable for seed production. 		
iv.	**Input/raw material**	:	Maize cobs (desheathed) / sunflower ear-heads
	a) Overall dimension	:	40 x38 x105 cm
	b) Weight	:	32 kg
	c) Power	:	0.25 hp single phase motor
	d) Prime mover	:	-
	e) Man power	:	Can be operated by one or two people simultaneously
	f) Land	:	Not required
	f) Investment	:	Rs. 4000/- (without motor)
v.	**Output capacity**	:	1 quintal of threshed maize grains per hour for 2 persons
vi.	**Unit cost (per machine)**	:	Rs. 4000/- (without motor)
vii.	**Suitability for crops/commodity**	:	Maize and sunflower
viii.	**Efficiency**	:	-
ix.	**Unit cost of operation**	:	-
x	(a) No. of Licensees to whom the technology has been transferred		One
	(b)Selected Addresses of Licensee /Manufacturer		M/s Dollar Engineering Industries Pvt. Ltd. #3, Adjacent to BIS, Tumkur Road, 1st Stage, Peenya, Bangalore - 560 058, India.
xi	**Contact Address**	:	Research Engineer, AICRP on PHT University of Agricultural Sciences, J- Block, GKVK Campus, BANGALORE - 560 065 (Karnataka)

i.	**a. Type of Technology**	:	Post Harvest Gadget
	b. Technology developed	:	Portable Winnower
ii.	**Application/ Use**	:	For winnowing of agricultural produce after threshing
iii.	**Description of Technology** : The winnower consists of an axial flow fan operated by a 1 hp motor enclosed in a casing with adjustable shutter. The shutter can be tilted up or down to adjust the direction of the air-flow. The winnowing fan assembly is mounted on a tall frame with caster wheels to facilitate easy mobility of the unit especially in rural environment. 		
iv.	**Input/raw material**	:	Threshed agricultural produce (uncleaned)
	a) Overall dimension	:	68 x 68 x137 cm
	b) Weight	:	40 kg
	c) Power	:	1 hp motor
	d) Machinery	:	Nil
	e) Prime mover	:	-
	f) Man power	:	Two labourers
	g) Land	:	Not required
	f) Investment	:	Rs. 13,500/-
v.	**Output capacity**	:	5 quintals of grain / h
vi.	**Unit cost (per machine)**	:	Rs. 13,500
vii.	**Suitability for crops/commodity**	:	Cereals, pulses and oilseed
viii.	**Efficiency**	:	-
ix.	**Unit cost of operation**	:	-
x.	**Patent obtained/applied**	:	Not applied
xi.	**Commercialization status**	:	Commercialized
	(a) No. of Licensees to whom the technology has been transferred		One
	(b)Selected Addresses of Licensee / Manufacturer		M/s Dollar Engineering Industries Pvt. Ltd. #3, Adjacent to BIS, Tumkur Road, 1st Stage, Peenya, Bangalore - 560 058, India.
xii.	**Contact Address**	:	Research Engineer, AICRP on PHT University of Agricultural Sciences, J- Block, GKVK Campus, BANGALORE - 560 065 (Karnataka)

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5.			
i	**Name of the Technology**	:	Technique for the control of stored grain insects in milled rice
ii	**Application/ Use**	:	Eco friendly control of storage insects in milled rice
iii	**Description of Technology**: This technology is useful for preventing or containing the insect infestation in milled rice at house-hold level. The technology involves mixing of pea protein (1%) or commercially available Ayurvedic Zandu Parad® tablet @1% (not powdered) with milled rice grains and storing the rice in a plastic or metallic container. Recent research on protein-enriched pea flour (Protein-enriched pea flour -protein 60%, starch 30%) showed that it has both toxic and repellent properties, while Zandu Parad tablet (made from Parad 60 mg and Khatika 120 mg; each tablet weighing 2g) is known to have repellent properties. Moreover, pea protein is not commercially available. Zandu Parad Tablets can be separated by hand picking the tablets before washing the rice for cooking and the pea protein is washed out in water just before cooking.    *Sitophilus oryzae* *Tribolium castaneum*		
iv	**Inputs**	:	
	a) Raw material	:	-
	b) Equipments	:	Metal or plastic container of suitable size of up to 10-20 kg capacity.
v	**Output capacity**	:	-
vi	**Unit cost**	:	For 10 kg rice, a plastic container may cost about Rs 60/- to Rs 80/- but the container is reusable; 100 g of Zandu parad tablets (50 no.) are required that will cost about Rs 30/-
vii	Suitability for crops/commodity	:	Milled Rice
viii	Efficiency	:	Zandu Parad tablet prevented build-up of insect infestation in milled rice for three months.
ix	Unit cost of operation	:	Zandu parad tablets are available in market @ Rs 33 for 60 tablets and are currently used as ayurvedic medicine.
x	**Commercialization status**	:	Technology ready for transfer
xi	Contact Address		Research Engineer, AICRP (PHT), University of Agricultural Sciences, GKVK, Bangalore – 560065 (Karnataka)

i	**Name of the Technology**	:	**On-Farm Paddy Dryer**
ii	**Application/ Use** • On-Farm Paddy dryer can be used to dry high moisture paddy even during long spells of rainy and cloudy days during monsoon season there by reducing discolouration to the grains due to high moisture and grain quality can be preserved without much deterioration. • The dryer has been successfully tested for drying 5 tons of high moisture paddy at different locations during different seasons from an initial moisture content of 22-24% to a final moisture content of 12-14% within a time of 6-8 h with a tempering time of 2-3 h • This dryer has potential to reduce post harvest losses due to immature green paddy grains • Germination tests resulted that germination was satisfactory. • Milling tests were conducted and results were found to yield lower broken percentage (<3-4%). • Farmers can store the dried produce in the rural godowns till remunerative prices prevail in the market.		
iii.	**Description of Technology** :  On-farm paddy dryer is a Mobile – Flat and fixed bed – Non Mixing type Paddy dryer (Mixing mechanism is Optional). Paddy dryer consists of drying chamber and plenum chamber. Ambient air which is sucked by a blower is heated to a set temperature while drawn through an indirect type of heat exchanger fired by a fuel burner. Heated air is distributed in the plenum chamber and is directed to the drying chamber due to the configuration of the plenum. Since, drying takes place in a fixed deep bed, drying proceeds from bottom layer to the top layer leaving the moisture laden air at the top drying chamber. Intermittent tempering of the grain during /after drying equalizes the moisture distribution within the grain and aid in uniform drying. Dried grains can be discharged through gravity outlets provided.		
iv.	**Input/raw material**	:	High Moisture Wet Paddy
	a. Overall dimension	:	7.7 m x 2.4 m x 1.6 m
	b. Weight	:	Empty weight 5.4 tons
	c. Prime mover/ machine	:	15 kVA Diesel generator or 3 phase A/C current
	d. Man power	:	Six persons (Manual loading mechanism) Two persons (Elevator loading mechanism)
	e. Land	:	-
	f. Investment	:	Rs. 17.5 lakhs
v	**Output capacity**	:	5 tons/ batch
vi	**Unit cost (per machine)**	:	Rs. 17.5 lakhs
vii	**Suitability for crop/ commodity**	:	Paddy and other cereal crops
viii	**Efficiency**	:	**Thermal efficiency :** 58% (For Rabi Trial) **Drying Time :** 29% -12.5% MC = 14.5 h 26%-12% MC = 9.0-11.0 h

			24%-12%MC =6.0- 8.0 h
ix	**Unit cost of operation**	:	**Total operating costs :** **Kharif :** Rs. 3937/ batch or Rs. 59/ bag of 75 kg or Rs. 0.78/kg **Rabi :** Rs. 2287/ batch or Rs. 34/ bag of 75 kg or Rs. 0.46/kg **Total costs :** **Kharif :** Rs. 6019/ batch or Rs. 90/ bag of 75 kg or Rs. 1.20/kg **Rabi :** Rs. 4369/ batch or Rs. 65/ bag of 75 kg or Rs. 0.87/kg
x	a) No. of Licensees	:	01 (Developed on Collaborative mode)
	b) Addresses of Licensees or Manufacturer	:	M/s. Kardi Dryers Pvt .Ltd 284,Avvai Shanmugam Salai,Chennai-600086 Phone No:044-26880001, Cell:09791664050 www.kardidryers.com
xi	**Contact Address**	:	Research Engineer, AICRP on Post Harvest Engineering & Technology Acharya N. G. Ranga Agricultural University, Bapatla-522 101 ; Guntur (Dist), Andhra Pradesh Ph: 08643-225180, phtcbapatla@gmail.com.

1.			
i	**Name of the Technology**	:	Multi purpose grain mill
ii	**Application/ Use**	:	Grinding cereals, pulses, and spices
iii	**Description of the Technology:** It is 1.0 HP single phase, electric motor operated equipment for grinding of cereals, coriander and pulses to produce flour/grits, powder, and split, respectively. The grains with 8-10% moisture content (wet basis) with low oil contents are most suitable. The mill consists of hopper, feed adjuster, vertical grinding wheels, etc. The overall dimensions of the equipment are 840x580x670 mm and weight is 69 kg. 		
iv	**Input/raw material**	:	Cereals, pulses and coriander
	a) Power (hp)	:	1 H.P. 1-phase, 220 V, AC motor
	b) Man power	:	2-5 man-h/q
	c) Land	:	2x2 m area
	d) Investment		Rs. 15000/-
v	**Output capacity**	:	Cereal/Pulses flour 11-20 kg/h Coriander 10 kg/h Split pulses 50-70 kg/h
vi	**Unit cost (per machine)**	:	Rs. 9500/-
vii	**Suitability for crop/ commodity**		cereals, pulses, and spices
viii	**Efficiency**		88 %
ix	**Unit cost of operation**		17/- per q
	a) No. of Licensees	:	12 Farmer-cum-Processor and Entrepreneurs
	b) Addresses of Licensees or Manufacturer	:	(i) M/s Yashoda Engineering Laghu Udyog, Shed No. 12, Sector–1, Industrial Area, Govindpura, Bhopal – 462023, M.P. (ii) M/s Vinod Enterprises, Plot No. 104, Sector-1, Industrial Area, Govindpura, Bhopal – 462023, M.P. (iii) M/s Shri Manak Industries Plot No. 70-B, Sector-H, Industrial Estate Govindpura, Bhopal-462023, M.P.
xii.	Contact Address	:	Research Engineer, AICRP on PHT Agro-Produce Processing Division Central Institute of Agricultural Engineering, Nabibagh, Berasia Road, BHOPAL - 462 038 (Madhya Pradesh)

2.			
	Name of the Technology	:	**Manual double screen cleaner with sack holder**
ii	**Application/ Use**	:	For cleaning/ grading of cereals, pulses and oilseeds
iii	**Description of Technology** : CIAE Manual double screen cleaner is a batch type hand operated equipment to replace traditional practice of horizontal/vertical sieving to clean the grains. It separates impurities like stubbles, chaff, dirt and broken from wheat, bengal gram, soybean and other cereals and pulses crops. It consists of a mainframe scalper/grading screen, draper rod, handle, shutter etc. and operated by hanging it an any elevated point with ropes. A batch of 5-10 kg is fed into the cleaner, which sieves the grain due to swinging action of the cleaner. The hanging ropes support complete load/ weight of the equipment and grain. The sack holder holds the sack in vertical open position for easy loading of cleaned grains. Its height can be adjusted to the size of the sack and suitable for all types of materials. 		
iv	**Input/raw material**	:	Cereals, pulses and oilseeds
	a) Weight	:	17.6 kg
	b) Prime mover	:	
	c) Power (hp)	:	Manual
	d) Man power	:	01
v	**Output capacity**	:	150-225 kg/h
vi	**Unit cost (per machine)**	:	Rs. 4,000
vii	**Suitability for crop/ commodity**		Wheat, Soybean, Chickpea, Pigeon pea, Green gram, Lentil etc.
viii	**Efficiency**		99 – 99.8 %
ix	**Unit cost of operation**		Rs. 75 per ton
x	a) No. of Licensees	:	03
	b) Addresses of Licensees or Manufacturer	:	(i) M/s Shri Manak Industries Plot No. 70 – B, Sector – H, Industrial Estate Govindpura, Bhopal 462 023 (ii) M/s. Yashoda Engineering Laghu Udyog, Shed No. 12, Sector – I, IndustrialEstate, Govindpura, Bhopal 462 023 (iii) M/s. Vinod Enterprises 104, Sector – I, Industrial Estate Govindpura, Bhopal 462 023
xi	Contact person	:	Research Engineer, AICRP on PHT Central Institute of Agricultural Engineering Nabibagh, Berasia Road Bhopal- 462038

3.			
i	**Name of the Technology**	:	**Groundnut cum castor decorticator**
ii	**Application/ Use**	:	For shelling of groundnut or castor
iii	**Description of Technology** : It is manually operated equipment to separate kernels from groundnut and castor pods. The unit consists of frame, handle, oscillating arm and separate sieve for groundnut and castor. The pods are fed in batches of 5 kg and crushed in between concave and oscillating arm having cast iron/ nylon shoes to achieve shelling. 		
iv	**Input/raw material**	:	Groundnut or castor pods
	a) Weight	:	15 kg
	b) Man power	:	01
v	**Output capacity**	:	60-68 kg/h
vi	**Unit cost (per machine)**	:	Rs. 2,200
vii	**Suitability for crop/ commodity**		Groundnut, Castor
viii	**Efficiency**		93 – 98%
ix	**Unit cost of operation**		Rs. 180 per ton
	a) No. of Licensees	:	04
	b) Addresses of Licensees or Manufacturer	:	(i) M/s Shri Manak Industries Plot No. 70 – B, Sector – H, Industrial Estate Govindpura, Bhopal 462 023 (ii) M/s. Yashoda Engineering Laghu Udyog, Shed No. 12, Sector– I, Industrial Estate, Govindpura, Bhopal 462 023 (iii) M/s. Vinod Enterprises 104, Sector-I, Industrial Estate, Govindpura, Bhopal 462 023 (iv) M/s Venkatesh Agro Engineering Works, C-30, Additional MIDC, Jalna, Maharashtra– 431203
xii.	Contact person	:	Research Engineer, AICRP on PHT Central Institute of Agricultural Engineering Nabibagh, Berasia Road Bhopal- 462038

4.			
i	**Type of Technology**	:	Equipment
	Technology developed	:	Pedal cum Power operated grain cleaner
ii	**Application/ Use**	:	To remove foreign matters and impurities from the threshed grains, viz., cereals, pulses and oilseeds
iii	**Description of the Technology :** It is pedal cum power operated grain cleaner equipment to separate dust, dist, stones, straw, chaff etc and grade the cereals and pulses. It consists of 0.5 h.p. single phase electric motor, main frame, hopper, feeding mechanism, sieve box, scalping and grading sieves, eccentric unit, centrifugal blower, bicycle drive unit, etc. The overall dimensions of the machine are 1600x500x1000 mm and weight is 100-110 kg. The machine has top and bottom screens that can be changed according to the requirement of the grain to be cleaned. The machine gives cleaning efficiency of 99%. Its operating cost is Rs. 7.5/q. 		
iv	**Input/raw material**	:	Cereals, pulses, and oil seeds
	a) Power (hp)	:	0.5 h.p. single phases electric motor
	b) Man power	:	0.4 man-h/q
	c) Land	:	6x3 m area
	d) Investment		1500.00 (machine, Motor, continuer etc)
v	**Output capacity**	:	330-800 kg/h
vi	**Unit cost (per machine)**	:	Rs. 8500/-
vii	**Suitability for crop/ commodity**		Cereals, pulses and oilseeds
viii	**Efficiency**		99 %
ix	**Unit cost of operation**		Rs. 7.5/q.
x	a) No. of Licensees	:	12
	b) Addresses of Licensees or Manufacturer	:	(i) M/s Vinod Enterprises, Plot No. 104, Sector-1, Industrial Area, Govindpura, Bhopal – 462023, M.P. (ii) M/s Shri Manak Industries Plot No. 70-B, Sector-H, Industrial Estate Govindpura, Bhopal-462023, M.P. (iii) M/s M.P. Iron Industries Behind Zake Hotel, Quazi Camp, Berasia Road, Bhopal-462001 M.P
xi	Contact Address	:	Research Engineer, AICRP on PHT Central Institute of Agricultural Engineering Nabibagh, Berasia Road Bhopal- 462038

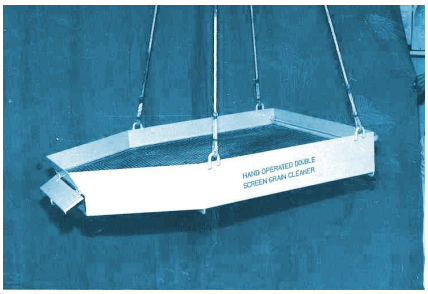
5.			
	Name of the Technology	:	Dhall mill
ii	**Application/ Use**	:	Dehusking and splitting of pulses (pigeon pea, black gram, green gram and lentil).
iii	**Description of the Technology:** It is 2 hp three phase electric motor operated equipment for dehusking and splitting of pigeon pea, black gram, green gram and lentil. It consists of carborendum roller, feed hopper, concave and dhal outlet. The pulses to be milled are firstly soaked in water for 30 minutes, sub dried and later on fed into the unit to achieve complete milling in two passes. The overall dimensions of the machine are 770x630x1020 mm and weight is 90 kg. The operating speed of roller is 900 rpm. The machine gives milling efficiency of 88% with broken grain in the range of 3-5%. The operating cost for pulses milling is Rs. 17/q. 		
iv	**Input/raw material**	:	Pulses (pigeon pea, green gram, black gram, and lentil)
	a) Power (hp)	:	2 hp electric motor
	b) Man power	:	1 man-h/q
	c) Land	:	5x5m closed room/shed
v	**Output capacity**	:	100 kg/h
vi	**Unit cost (per machine)**	:	Rs. 13,500 without motor
vii	**Suitability for crop/ commodity**	:	Pigeon pea, black gram, green gram and lentil
viii	**Efficiency**		88%
ix	**Unit cost of operation**		Rs. 17/q
x	a) No. of Licensees	:	12
	b) Addresses of Licensees or Manufacturer	:	(i) M/s Yashoda Engineering Laghu Udyog, Shed No. 12, Sector–1, Industrial Area, Govindpura, Bhopal – 462023, M.P. (ii) M/s Vinod Enterprises, Plot No. 104, Sector-1, Industrial Area, Govindpura, Bhopal – 462023, M.P. (iii) M/s Shri Manak Industries Plot No. 70-B, Sector-H, Industrial Estate Govindpura, Bhopal-462023, M.P.
xi	Contact Address		Research Engineer, AICRP on PHT Central Institute of Agricultural Engineering Nabibagh, Berasia Road Bhopal- 462038

6.			
i	**Name of the Technology**	:	Groundnut decorticator (hand operated)
ii	**Application/ Use**	:	To separate kernels from groundnut pods
iii	**Description of the Technology:** It is manually operated equipment to separate kernels from groundnut pods. The unit consists of frame, handle, oscillating arm and sieve with oblong holes. The pods are fed in batches of 2 kg and crushed in between concave and oscillating arm having cast iron or nylon shoes to achieve shelling. The overall dimensions of the machine are 500x270x640 mm and weight is 5.7 kg. The size of sieve in the concave is 45x9 mm. The machine gives shelling efficiency in the range of 93-98% with broken kernels in the range of 2.30 to 2.65%. Its operating cost is Rs. 24/q.		
iv	**Input/raw material**	:	Groundnut pods (whole)
	a) Man power	:	2.5 man-h/q
	b) Land	:	2x1 m
	c) Investment		Rs. 750/-
v	**Output capacity**	:	35-40 kg/h
vi	**Unit cost (per machine)**	:	2400/-
vii	**Suitability for crop/ commodity**		Groundnut
viii	**Efficiency**		93-98%
ix	**Unit cost of operation**		Rs. 750/-
xi	**Commercialization status**	:	Farmer-cum-Processor and Entrepreneurs
	a) No. of Licensees	:	12
	b) Addresses of Licensees or Manufacturer	:	(i) M/s Vasundhara Krishi Yantra Udyog Nishatpura, Berasia Road, Bhopal, M.P. (ii) M/s Vinod Enterprises, Plot No. 104, Sector-1, Industrial Area, Govindpura, Bhopal – 462023, M.P. (iii) M/s Jay Kay Enterprises Plot No. 163, C-Sector Indrapuri, Bhopal-462022 M.P.
xii.	Contact Address	:	Research Engineer, AICRP on PHT Central Institute of Agricultural Engineering Nabibagh, Berasia Road Bhopal- 462038

7.			
i	**Type of Technology**	:	Equipment
	Technology developed	:	Solar cabinet dryer
ii	**Application/ Use**	:	Drying of perishables, semi-perishables and wet processed food materials
iii	**Description of the Technology:** It is equipment for drying of high moisture perishable, semi-perishable and wet processed food material using solar energy. It is suitable for drying chilly, cauliflower, leafy vegetable, pea, potato chips etc. with reduced drying time because of aspirator. It consists of wooden cabinet, glass covers, aspirator, etc. The overall dimension of the machine is 2210x1130x980 mm and weight is 125 kg. The dryer can accommodate four number of drying trays. 		
iv	**Input/raw material**	:	Vegetables, viz., chilli, potato chips, cauliflower, leafy vegetable etc.
	a) Man power	:	Manually operated for loading & unloading of material
	b) Land	:	8x4 m plateform/open space
	c) Investment		Rs. 8500/-
v	**Output capacity**	:	3-5 kg/batch
vi	**Unit cost (per machine)**	:	Rs. 8,500/-
vii	**Suitability for crop/ commodity**		Chilly, cauliflower, leafy vegetable, pea, potato chips
viii	**Efficiency**		Thermal efficiency is 50%.
ix	**Unit cost of operation**		Rs. 75/q of material
x	**Patent obtained/applied**	:	No
xi	**Commercialization status**	:	Farmer-cum-Processor and Entrepreneurs
	a) No. of Licensees	:	12
	b) Addresses of Licensees or Manufacturer	:	(i) M/s Agro Fab Engg. Enterprises 1, Jogipura, Near Thana Talayya Bhopal – 462001 M.P. (ii) M/s Vinod Enterprises, Plot No. 104, Sector-1, Industrial Area, Govindpura, Bhopal – 462023, M.P. (iii) M/s Yashoda Engineering Laghu Udyog, Shed No. 12, Sector–1, Industrial Area, Govindpura, Bhopal – 462023, M.P.
xii.	Contact Address	:	Research Engineer, AICRP on PHT Central Institute of Agricultural Engineering Nabibagh, Berasia Road Bhopal- 462038

8.			
i	**Type of Technology**	:	Equipment
	Technology developed	:	Straw baler
ii	**Application/ Use**	:	To compress the straw to make bales
iii	**Description of the Technology:** It is 3 hp three phase electric motor operated compression and bailing machine. During compression both sides' compression plates move forward and compress the straw in the compression chamber until automatically stopped by the timing switch. The bales are tied manually by inserting needle with wire in the start mode at the bottom, top and side portion. The compression plate is released and bales are taken out. The size of the bale prepared by this machine is 4000x800x2000 mm of 20 kg weight in the compression ratio of 3:1. The operating cost of the machine is Rs. 24/q of bales. 		
iv	**Input/raw material**	:	Paddy straw or locally available grasses
	a) Overall dimension (L x B x H mm)	:	
	b) Weight	:	
	c) Prime mover	:	
	d) Power (hp)	:	3 h.p, 3-phase, 1440 rpm electric motor
	e) Man power	:	2 man-h/t
	f) Land	:	15x5 m area
	g) Investment		Rs. 45000/-
v	**Output capacity**	:	6-8 bales/h (size of bales: 520x450x450 mm and weight: 20 kg)
vi	**Unit cost (per machine)**	:	Rs. 45000/-
vii	**Suitability for crop/ commodity**		Paddy straw or locally available grasses
viii	**Efficiency**		**Not applicable**
ix	**Unit cost of operation**		Rs. 24/ q
x	**Patent obtained/applied**	:	No
xi	**Commercialization status**	:	Ready for commercialization
	a) No. of Licensees	:	Nil
	b) Addresses of Licensees or Manufacturer	:	Not applicable
xii	Contact Address	:	Research Engineer, AICRP on PHT Central Institute of Agricultural Engineering Nabibagh, Berasia Road Bhopal- 462038

1.2 Group: Food grains and oil seeds

9.			
i	**Type of Technology**	:	Equipment
	Technology developed	:	Manual double screen cleaner
ii	**Application/ Use**	:	Suitable for cleaning of cereals and pulses
iii	**Description of the Technology:**  It is a batch type hand operated equipment to replace existing traditional practices i.e. natural wind or horizontal/vertical sieving to clean the grains. It separates impurities, like stubbles, chaff, dirt, and broken of wheat, Bengal gram, soybean and other cereals and pulse crops. It consists of main frame scalper/grading screen, draper rod, handle, shutter, etc. and operated by hanging it on any elevated point with ropes. A batch of 5-10 kg is fed into the cleaner which later swings to and fro till the batch is sieved. The overall dimension of the equipment is 900x600x140 mm and weight is 17.6 kg. The machine has top (5-8.5 mm diameter sieve) and bottom screens (18x20 mm to 32x20 mm) that can be changed according to the requirement of the grain to be cleaned. The machine gives cleaning efficiency in the range of 99.0-99.8%. Its operating cost is Rs. 5.3/q.		
iv	**Input/raw material**	:	Cereals and pulses (wheat, Bengal gram, soybean, etc)
	a) Overall dimension (L x B x H mm)	:	
	b) Weight	:	
	c) Prime mover	:	
	d) Power (hp)	:	Manual
	e) Man power	:	0.5 man –h/q
	f) Land	:	2x2 m area
	g) Investment		Rs. 2000 with 5 sets of screen
v	**Output capacity**	:	150-225 kg/h
vi	**Unit cost (per machine)**	:	2000/-
vii	**Suitability for crop/ commodity**		Wheat, bengal gram, soybean and other cereals and pulses crops.
viii	**Efficiency**		99.0-99.8
ix	**Unit cost of operation**		5.30/- per q
x	**Patent obtained/applied**	:	No
xi	**Commercialization status**	:	Technology transferred to: Farmer-cum-Processor
	a) No. of Licensees	:	12
	b) Addresses of Licensees or Manufacturer	:	(i) M/s M.P. Iron Industries Behind Zake Hotel, Quazi Camp, Berasia Road, Bhopal-462001 M.P. (ii) M/s Jay Kay Enterprises Plot No. 163, C-Sector Indrapuri, Bhopal-462022 M.P. (iii) M/s Vasundhara Krishi Yantra Udyog Nishatpura, Berasia Road, Bhopal, M.P.
xii	Contact Address	:	Research Engineer, AICRP on PHT Central Institute of Agricultural Engineering Nabibagh, Berasia Road Bhopal- 462038

1.			
	Name of the Technology	:	Manually operated *Mahua* seed decorticator
i.	**Application/ Use**	:	Decortication of mahua seed
ii.	**Description of Technology :** The equipment consists of a rotary cylindrical drum (16 cm dia x 30 cm) with 6 nos. of wooden bars (30 cm x 2.5 cm x 2.5 cm each) fitted longitudinally along the periphery of the roller. A semicircular concave made up of 6 mm x 6 mm zigzag square bar with 9 mm gap is fitted below the roller assembly with a clearance adjustment varying from 10-20 mm. The upper half of the machine is housed with a M.S. sheet casing fitted with a hopper for feeding of the seeds. The decortication is done by compression and shear. The output capacity is 10 kg/h (batch type)		
iii.	**Input**	:	
	a) Raw material	:	Mahua seed
	b) Machinery		
	• Overall dimension	:	450 x 300 x 500 mm
	• Weight	:	14 kg
	• Prime mover	:	Manually operated
	c) Man power	:	1 No (same person feed and rotate handle)
	d) Land	:	-
	e) Investment	:	-
iv.	**Output capacity**	:	10 kg/h
v.	**Unit cost of operation**	:	Rs. 1.30 per kg
vi.	**Suitability for crops/commodity**	:	Mahua seed
vii.	**Efficiency**	:	86.1 %
viii.	**Unit cost (per machine)**	:	Rs. 800/-
ix.	**Patent obtained/applied**	:	-
x.	**Commercialization status**	:	Transferred to tribal SHG
	(a) No. of Licensees to whom the technology has been commercialized		Nil
	(b) Selected Addresses of Licensee / Manufacturer		Nil
xi.	**Contact Address**	:	Research Engineer, AICRP on Post harvest Technology College of Agricultural Engineering and Technology, Orissa University of Agriculture and Technology, Bhubaneswar- 751 003 (Orissa)

1.			
	Name of the Technology	:	Small scale sunflower oil dewaxing system
i.	**Application/ Use**	:	Waxes have low solubility in oil at low temperatures, tend to crystallize and cause turbidity when they crystallize. Therefore, waxes in the oil are eliminated by winterization during the refining process in order to obtain completely clear oil that is not affected by low storage temperatures.
ii.	**Description of Technology :** The unit consists of overhead tank, water cooler (40 liter capacity), centrifugal pump (0.5 hp) and cylindrical filtration unit (12.5 cm dia x 45 cm length). The water cooler (with temperature control arrangement) is used for cooling the oil to crystallize the wax. A centrifugal pump is connected to the cooler outlet to force the oil through a cylindrical filtration unit to filter the wax. Agitators are provided to slowly rotate the oil for efficient heat transfer in overhead heating tank and cooler. The clear oil is then transferred to the cooler for cooling the oil to 10-12°C with residence time of 4 h. The temperature of oil in the cooler is maintained by a digital controller. The cooled oil after crystallization is forced through the cylindrical filtration unit for filtration of wax by centrifugal pump.		
iii.	**Input**	:	
	Raw material	:	Sunflower
	Machinery	:	
	• Overall dimension	:	1800 x 600 x 2000 mm
	• Weight	:	115 kg
	• Prime mover	:	Centrifugal pump 0.5 hp Cooler 300 Watt
	c) Man power	:	1 no
	d) Land	:	-
	e) Investment	:	-
iv.	**Output capacity**	:	80 l/day
v.	**Unit cost of operation**	:	Rs. 3.30 per litre
vi.	**Suitability for crops/commodity**	:	Sunflower oil
vii.	**Efficiency**	:	72%
viii.	**Unit cost (per machine)**	:	Rs. 35,000/-
ix.	**Patent obtained/applied**	:	No
x.	**Commercialization status**	:	Ready for commercialization
	(a) No. of Licensees to whom the technology has been transferred		Nil
	(b) Selected Addresses of Licensee / Manufacturer		N.A.
xii.	**Contact Address**	:	Research Engineer, AICRP on Post harvest Technology College of Agricultural Engineering and Technology, Orissa University of Agriculture and Technology, Bhubaneswar- 751 003 (Orissa)

1.			
	Name of the Technology		Pearling of minor millets
I	**Application/use**		Pearling millets
Iii	**Description of technology:** An abrasive type conical shaped pearler has been developed. A tapered stone roller of 23 and 15 cm diameters with 30 cm length has been fabricated. A concave is fitted over the abrasive roller, an aspirator and a cyclone to separate the dust from the milled grain. The milling unit is operated by 3 hp motor and the aspirator is operated by one HP single phase motor. The minor millets dried at 12% and pearled at 1200 rpm were found to be optimum.		
Ii	**Input**		
	a) Raw material		Stone roller, aspirator, GI sheet
	b) Machinery		
	overall dimension		980 x 490 x 1120 mm
	weight		75 kg
	prime mover / power		Electrical motor, 3 hp motor
	c) man power		One
	d) land		-
	e) investment		Rs.75,000/-
iv.	**Out put capacity**		40kg per 8 hours of operation with three passes
v.	**Unit cost/machine**		Rs.50,000/-
Vi	**Suitability for crops/commodity**		Minor millets- Fox tail millet, little millet, common millet
vii	**Pearling efficiency**		70%
viii	**Unit cost of operation**		Rs.4.5 /kg of minor millet
Ix	**Patents obtained/applied**		-
X	**Commercialization status**	:	Ready for commercialization
	a) No. of licenses to whom the technology has been transferred		4
	(b) Selected Addresses of Licensee/ Manufacturer	:	• M/s. SSM Machinery and Fabrication 43, NBC Nagar, G.N Mill (post), Coimbatore -641 029 • M/s. Universal Agro Industries, S.F.No.374/5, Near Bimetal Bearings, Maruthamalai Road, PN Pudur, Cimbatore - 641 041 • M/s. Valampuri Industries, New Thillai Nagar,Behind Bimetal Bearings, PN Pudur, Coimbatore – 641 041. • M/s. AG Industries, 1/460, Balaji Complex, Thoppampati Pirivu, Mettupalayam Road, Coimbatore - 641 031
Xi	**Contact Address**	:	Research Engineer, AICRP on PHT and Head, Agricultural Machinery Research Centre, Tamil Nadu Agricultural University, Coimbatore - 641 003

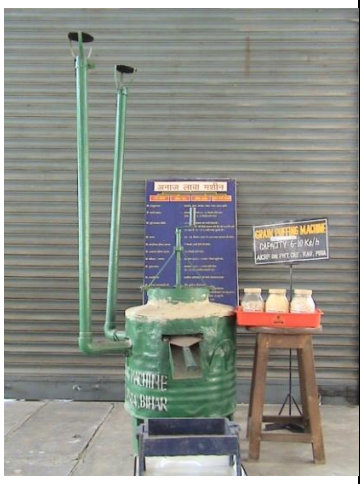
2.			No photo ?
i.	**Name of the Technology**	:	Mini Dhal Mill
ii.	**Application/ Use**	:	To split the grain legumes into dhal
iii.	**Description of Technology** : The dhal mill split all kinds of legumes into dhal. For making dhal all pulses have to undergo pre-milling treatments such as soaking in water, mixing with oil, drying, etc. It consists of a hopper to hold the pulse, an auger to feed the pulse to the dehusking chamber. In the dehusking chamber pulses flow between a rotating cast iron disc and a stationary rubber pad and get dehusked. Depending upon the size of the pulse, the clearance between the rotating disc and the rubber disc can be adjusted with the help of a hand wheel provided outside the dehusking chamber. By replacing the rubber disc with cast iron serrated disc, this can be used for pulverizing the dry grains into flour. The overall dimension of the unit is 385 x 365 x 865 mm.		
iv.	**Input/raw material**	:	Red gram, Green Gram, Bengal Gram, Black Gram
	a) Overall dimension	:	-
	b) Weight	:	-
	c) Prime mover	:	-
	d) Power		One hp single phase electric motor
	e) Man power	:	One Person
	f) Land	:	Nil
	f) Investment	:	Nil
v.	**Output capacity**	:	20 kg/h
vi.	**Unit cost (per machine)**	:	Rs.13, 000/-
vii.	**Suitability for crops/commodity**	:	Legumes
viii.	**Efficiency**	:	-
ix.	**Unit cost of operation**	:	Rs.5/h
x.	**Patent obtained/applied**	:	No
xi.	**Commercialization status**	:	Commercialized
	(a) No. of Licensees to whom the technology has been transferred	:	5 (Farmer –cum-Processor/ Entrepreneur)
	(b)Selected Addresses of Licensee / Manufacturer	:	1. M/s. Valampuri Industries, New Thillai Nagar, Behind Bimetal Bearings, PN Pudur, Coimbatore 2. M/s. AG Industries, 1/460, Balaji Complex, Thoppampati Pirivu, Mettupalayam Road, Coimbatore - 641 031 3. M/s. SSM Machinery and Fabrication 43, NBC Nagar, G.N Mill (post), Coimbatore -641 029 4. M/s. Universal Agro Industries, S.F.No.374/5, Near Bimetal Bearings, Maruthamalai Road, PN Pudur, Coimbatore- 641041
xii.	**Contact Address**		Professor and Head, Agricultural Machinery Research Centre, Tamil Nadu Agricultural University, Coimbatore - 641 003. Phone: 0422- 6611272; FAX: 0422-6611455; e-mail: processing@tnau.ac.in

3.			
i.	**Name of the Technology**	:	Household Paddy Parboiling Unit
ii.	**Application/ Use**	:	To parboil paddy uniformly at house hold/farm level
iii.	**Description of Technology** : The parboiling drum is made of galvanized iron sheet of 20 gauge thickness with a lid. The drum is divided into three equal portions. The top two-third portion retains paddy for parboiling and bottom one-third portion holds water to produce steam for parboiling. A perforated slanting sheet with perforated pipes separates the steam chamber from parboiling chamber. The lateral perforated pipes attached to the main steam pipe divides the entire parboiling chamber into a number of small compartments and helps for uniform and simultaneous parboiling of paddy. Perforated sloping floor helps for natural unloading of parboiled paddy. The water in the drum can be heated by burning firewood or any agricultural waste. After the completion of parboiling, the remaining hot water can be used for next batch.		
iv.	**Input/raw material**	:	Raw Paddy
	a) Overall dimension	:	-
	b) Weight	:	-
	c) Prime mover	:	-
	d) Power		5 kg of firewood/batch
	e) Man power	:	Two person
	f) Land	:	Nil
	f) Investment	:	Nil
v.	**Output capacity**	:	125 kg/ batch
vi.	**Unit cost (per machine)**	:	Rs.10, 000/-
vii.	**Suitability for crops/commodity**	:	Paddy
viii.	**Efficiency**	:	-
ix.	**Unit cost of operation**	:	Rs.10 /h
x.	**Patent obtained/applied**	:	No
xi.	**Commercialization status**	:	Commercialized
	(a) No. of Licensees to whom the technology has been transferred	:	Farmer –cum-Processor/ Entrepreneur
	(b) Selected Addresses of Licensee / Manufacturer	:	Nil
xii.	Contact Address	:	Professor and Head, Agricultural Machinery Research Centre, Tamil Nadu Agricultural University, Coimbatore - 641 003. Phone: 0422- 6611272; FAX: 0422-6611455; e-mail: processing@tnau.ac.in

4.			
i.	**Name of the Technology**	:	Household Insect Trap
ii.	**Application/ Use**	:	To remove insects from stored grains
iii.	**Description of Technology** : The basic characteristics of the stored product insects, viz., affinity towards air, tendency to move towards aerated region, wander in the grain and active during dusk and dawn have been exploited in the development of the trap. The stored grain insects, like red flour beetle, saw toothed beetle, rice weevil, paddy moth, turmeric beetle, drug beetle, pulse beetle, groundnut bruchid, dermestid beetles, flat grain beetles, etc with the behavior of wandering in the bulk grain, reach the insect trap. These insects enter the trap through the perforations and reach the stem of the trap. In the stem, as the insects cannot move upward and escape, they move towards the bottom and reach the pit fall placed at the bottom.		
iv.	**Input/raw material**	:	Cereals, pulses and Oil seeds
	a) Overall dimension	:	
	b) Weight	:	
	c) Prime mover	:	
	d) Power		
	e) Man power	:	
	f) Land	:	Nil
	f) Investment	:	Nil
v.	**Output capacity**	:	Suitable for storage bin holding up to 25-50 kg
vi.	**Unit cost (per machine)**	:	Rs.75/-
vii.	Suitability for crops/commodity	:	
viii.	Efficiency	:	
ix.	Unit cost of operation	:	
x.	**Patent obtained/applied**	:	No
xi.	**Commercialization status**	:	Commercialized
	(a) No. of Licensees to whom the technology has been transferred		One
	(b)Selected Addresses of Licensee /Manufacturer		M/s. K.S.N.M Marketing, Hallmark Arpee Centre, 320 N, NSR Road, Saibaba Colony, Coimbatore - 641 011
xii.	**Contact Address**	:	Professor and Head, Agricultural Machinery Research Centre, Tamil Nadu Agricultural University, Coimbatore - 641 003. Phone: 0422- 6611272; FAX: 0422-6611455; e-mail: processing@tnau.ac.in

i.			
ii.	**Name of the Technology**	:	Groundnut Kernel Testa Remover
iii.	**Application/ Use**	:	Groundnut kernels after removing testa can fetch higher prices in the market. Dairy analogues (milk, curd, paneer, etc.) from groundnut can be prepared after removing testa. Removal of testa with hand is costly and time consuming process.
iv.	**Description of Technology:** Groundnut has an outer thick woody shell. Inside, normally there are 2 or 3 embedded seeds (kernel). The seed consists of 2 cotyledons and the germ covered by an outer thin skin called the testa (red, brown, purple or white color depending upon the variety). Testa constitutes about 4 to 5 percent of the weight of the kernel. The cotyledons constitute the bulk of the seed in the range of around 92 to 94 percent of the weight. The germ constitutes around 3 to 4 percent of the seed weight. Consumers preferred to take groundnut without testa and probably ready to pay higher prices. Presently entrepreneurs are removing testa with hand which is time consuming process. The groundnut testa remover mainly consists of three units, viz., feeding, shelling and cleaning. The shelling unit was tested and constructed as per BIS NO.8824-1977. The coefficient of wholeness is more important than coefficient of hulling for increasing the shelling efficiency. The capacity of the machine is 40 kg/h. The processing cost of machine was calculated Rs.0.45 /kg.		
v.	**Input**	:	
	a. Raw material		
	b. Machinery		
	Overall dimension	:	1340 x 1220 x 600 mm.
	Weight	:	119 kg.
	Prime mover	:	Electric Motor
	c. Power		0.5 hp.
	d. Man power	:	2
	e. Land	:	12 x 10 ft.
	f. Investment	:	Rs. 35,000.00 + Operational Expenditure
vi.	**Output capacity**	:	40 kg/h
vii.	**Unit cost (per machine)**	:	Rs. 35000
viii.	**Suitability for crops/commodity**	:	Groundnut
ix.	**Efficiency**	:	Shelling efficiency 66.68%
x.	**Unit cost of operation**	:	Rs. 17 / h or Rs. 0.45 per kg.
xi.	**Patent obtained/applied**	:	No
xii.	**Commercialization status**	:	Ready for commercialization
	(a) No. of Licensees to whom the technology has been transferred		Nil
	(b)Selected Addresses of Licensee /Manufacturer	:	No
xii.	**Contact Address**	:	Research Engineer AICRP on PHT, College of Agricultural Engineering, Jawaharlal Nehru Krishi Viswa Vidyalaya Jabalpur- 482 004 (MP)

	Name of the Technology	:	Single Drum Rotary Screen Grain Pre-cleaner
ii	**Application/ Use**	:	Cleaning of grain prior to procurement in the grain market
iii	**Description of Technology :** The pre-cleaner basically consists of replaceable perforated rotary screen, a blower and a perforated vibratory discharge chute. All these parts are mounted on an angle iron frame which is supported on cast-iron wheels. The pre-Cleaner uses 1.5 hp electric motor. Power to the rotary screen is transmitted from the blower shaft. The single screen precleaner can be equipped with vibrating screens and work as grader with the capacity from 12 to 15 quintals per hour for wheat.  		
iv	**Input/raw material**	:	Wheat and Paddy
	a) Overall dimension	:	1.525 mm x 1.115 mm x 1.730 mm
	b) Weight	:	100 Kg
	c) Prime mover	:	Electric motor
	d) Power		1 kWh
	e) Man power	:	2
	f) Land	:	100 sq m
	g) Investment	:	Rs. 70,000/-
v	**Output capacity**	:	12 – 15 q/h
vi	**Unit cost (per machine)**	:	Rs. 70,000/-
vii	**Suitability for crops/commodity**	:	Wheat and paddy
viii	**Efficiency**	:	95%
ix	**Unit cost of operation**	:	Rs 0.25 /q
x	**Patent obtained/applied**	:	Nil
xi	**Commercialization status**	:	Commercialized
	(a) No. of Licensees to whom the technology has been transferred	:	01
	(b)Selected Addresses of Licensee or Manufacturer	:	M/s Hindsons Pvt Ltd.The Lower Mall, Patiala (Punjab)
Xii	**Contact Address**	:	Research Engineer, AICRP on PHT Department of Processing and Food Engineering, College of Agricultural Engineering Punjab Agricultural University Ludhiana-141004 (Punjab)

1.			
	Name of Technology	:	**Chulha for Grain Puffing Machine**
i.	**Application**	:	*Chulha* for grain puffing machine for better/easy transportation and demonstration of the grain puffing machine. This saves tremendous amount of time, labour and money consumed in building new *chulha* at each site for each demonstration/use of grain puffing machine. The unit has been successfully demonstrated in various *Kisan Melas* and Exhibitions held at RAU, Pusa, Bihar
ii.	**Description of Technology :** A useless metal drum of dia. 572 mm was cut at a height of 562.5 mm from the bottom. A passage was provided for the outlet of the puffing machine. A cut of size 235x200 mm was also made neat the bottom side of drum for firing the waste material in *chulha.* Two holes were provided for smoke exhaust and two conduit pipes of 25.4 mm dia. were fitted vertically into the smoke exhaust holes for proper exhaust of smoke in the air. Two cowls for chimneys (conduit pipes) were designed, fabricated and fitted to arrest the rain water. Three handles were also riveted outside the body of the drum for easy handling and transportations of whole assembly. To maintain a height of 190 mm from ground, three stands were provided. After fabricating the while *chulha*, puffing machine was placed inside the drum keeping its outlet outside the drum. All the three legs of the machine were welded with the bottom of the *chulha*. Finally *chulha* was constructed with the help of bricks and mud to seal the machine inside the fabricated drum permanently.		
iii.	**Input/raw material**		**Hardware material (M.S. Sheet, Angle, Flat, Rod, Pipe etc.)**
	a. Overall dimension (Lx b x h), mm		Diameter – 572mm, Height from ground – 190 + 563 mm
	b. Weight, kg		Not available
	c. Prime mover, H.P.		Not applicable
	d. Man power		1 skilled worker
	e. Land, m^2		Not applicable
	f. Investment		Rs. 4000/- approx for purchase of hardware material
iv.	**Output capacity**		Not applicable
v.	**Unit cost (per machine)**		N.A.
vi.	**Suitability for crop/commodity**		For puffing of paddy, rice, maize, peas, gram etc. in grain puffing machine encompassed in newly designed chulha
vii.	**Efficiency**		Not applicable
viii.	**Unit cost operation**		Not applicable
ix.	**Patent obtained/applied**	:	No
x.	**Commercialization status**	:	Ready for commercialization. Manufacturer identified.
	a) No. of Licensees		Nil
	b) Addresses of Licensees / Manufacturer	:	
xi.	**Contact Address**	:	Sr. Research Engineer, AICRP on PHT Faculty of Agricultural Engineering, Rajendra Agricultural University, PUSA (SAMASTIPUR) – 848125 (BIHAR)

i.	**Name of the Technology**	:	Process variables for Maize seed processing
ii.	**Application**	:	Maize is a very important crop of Bihar, which is grown round the year in this region. Seed processing is one of the most important activities in seed programmes. Seed processing is not only essential for proper harvesting, threshing, drying, cleaning and grading but also help in improvement of the seed quality called "value addition" through gravity separation, separation of weeds and diseased seeds, coating, colouring etc. It is also important in up-gradation of substandard seed lots, minimizing mechanical damage, seed extraction etc
iii.	**Description of Technology :** Technology has been developed for gravity separation of graded maize seeds of five varieties namely *Laxmi, Deoki, Suwan, Shaktiman* – I and *Cargil* using Lab. model of specific gravity separator with different feed rates and oscillating deck speeds. There was a maximum recovery of grade III seeds (44.850 – 79.525%) among all fractions followed by grade II seeds and light seeds in that order in all varieties. 		
iv.	**Input/raw material**	:	Graded grains/seeds to be separated
	a. Overall dimension (Lx b x h), mm	:	Depending upon the model of separator employed for processing
	b. Weight, kg	:	Depending upon the model of separator employed for processing
	c. Prime mover, H.P.	:	1.0 H.P. for Fan and 0.5 H.P. for Deck for 100kg/h capacity model of AGROSAW specific gravity separator
	d. Man power	:	1 or 2 skilled worker
	e. Land, m^2	:	Not applicable but housing required for installation of machine
	f. Investment	:	Depending upon the model of separator employed for processing
v.	**Output capacity**	:	Ranging from 75 kg/h to 4000 kg/h depending upon the model of cleaner-cum-grader
vi.	**Unit cost (per machine)**	:	Approx. Rs. 1,30,000/- for AGROSAW specific gravity separator of 100 kg/h capacity.
vii.	**Suitability for crop/commodity**	:	For Maize and other crops
viii.	**Efficiency**	:	Not applicable
ix.	**Unit cost operation**	:	Not applicable
x.	**Patent obtained/applied**	:	No
xi.	**Commercialization status**	:	Technology ready for commercialization or transfer to farmers / processors
	a) No. of Licensees	:	
	b) Addresses of Licensees / Manufacturer	:	Nil
xii.	**Contact Address**	:	Sr. Research Engineer, AICRP on PHT Faculty of Agricultural Engineering, Rajendra Agricultural University, Pusa (Samastipur) – 848125 (Bihar)

i.	**Name of the Technology**	:	Tungabhadra Winnower
ii.	**Application/ Use**	:	This is basically a winnowing fan for generating wind for cleaning of grains from chaff that can be operated using manual/electric/I.C.engine power depending upon available power source. This avoids the need for keeping the labour idle when no wind is blowing if winnowing is carried out manually on natural wind. Only a few demonstrations by the university have convinced farmers about the utility and hundreds of such machines in different versions are being manufactured in local workshops and sold in Tungabhadra command area. Now it is spreading to other areas also.
iii.	**Description of Technology :** This is a mechanical device consisting of a frame, 3-4 fan blades (1000-1250mm) fixed on the hub, an axle, bicycle pedal drive arrangement with seat, pulley belt transmission system and a grill partition. A pedal and chain transmission assembly for manual power and a pulley and belt arrangement for electric motor / IC engine power are provided to transmit the rotary motion to the fan blade assembly. An operator can easily generate the air flow with a velocity to clean the grains from chaff. 		
iv.	**Input/raw material**	:	Angle iron, fan blades, bicycle pedal drive assembly, pulley belt transmission system
	a) Overall dimension	:	1610 x 840 x 1790
	b) Weight	:	75 kg
	c) Prime mover/ Plant & Machinery	:	Nil
	d) Man power	:	One or two persons
	e) Land	:	Nil
	f) Investment	:	Rs. 3,500/-
v.	**Output capacity**	:	500-600 kg per hour
vi.	**Unit cost (per machine)**	:	Rs.3,500/-
vii.	**Suitability for crops/commodity**	:	All kinds of cereals, Pulses, Millets and oil seeds winnowing.
viii.	**Efficiency**	:	90 – 95 **%**
ix.	**Unit cost of operation**	:	Rs. 10-20 per hour
x.	**Patent obtained/applied**	:	Nil
xi.	**Commercialization status**	:	Commercialized
	(a) No. of Licensees to whom the technology has been transferred	:	One fabricator
	(b) Selected Addresses of Licensee/Manufacturer	:	-
xii.	**Contact Addresses**	:	Sr. Scientist & PI, AICRP on Post Harvest Technology Dept. of Processing and Food Engineering, College of Agricultural Engineering, UAS, Raichur.

i.	**a. Type of Technology**	:	Equipment
	b. Technology developed	:	Improved Groundnut decorticator
ii.	**Application/ Use**	:	Groundnut decortication is an important post harvest activity in this crop, in which rural women are involved as the main labour force. The developed technology helps to shell the groundnut pods and separate the kernels more efficiently. This equipment has become a boon to the farmers for its higher efficiency and drudgery reduction
iii.	**Description of Technology :** It consists of an oscillating sector with sieve bottom and a handle. Several cast iron peg (shoes) assemblies are fitted in the oscillating sector unit. The groundnut pods are shelled between the oscillating sector and the fixed perforated concave screen. The decorticated shells and kernels fall down through the perforated concave sieve. The kernel and husk are collected at the bottom of the unit and separated annually. The advantages of the developed technology are; Clearance between the concave and oscillating sector is adjustable to suit the different varieties, Concave sieves are also replaceable depending upon pod size, The oscillating sector of the unit is fixed with an offset to the axis of the trough for effective rubbing action. The efficiency of the unit is 98%.		
iv.	**Input/raw material**	:	MS sheet, cast iron peg (shoes), angle iron etc.
	a) Overall dimension	:	1170 x 900 x 370 mm
	b) Weight	:	32 kg
	c) Prime mover/ Plant & Machinery	:	Bending machine, welding machine
	d) Man power	:	One person
	e) Power	:	Manual
	f) Land	:	Nil
	g) Investment	:	Rs.2,500 / -
v.	**Output capacity**	:	50 kg per hour
vi.	**Unit cost (per machine)**	:	Rs. 3,500/-
vii.	**Suitability for crops/commodity**	:	Ground nut
viii.	**Efficiency**	:	90-95%
ix.	**Unit cost of operation**	:	Rs 0.65-0.75 per kg
x.	**Patent obtained/applied**	:	Nil
xi.	**Commercialization status**	:	Commercialized
	(a) No. of Licensees to whom the technology has been transferred		45 Farmers and One fabricators
	(b) Selected Addresses of Licensee/Manufacturer	:	-
xii.	**Contact address**	:	Sr. Scientist & PI, AICRP on Post Harvest Technology Dept. of Processing and Food Engineering, College of Agricultural Engineering, UAS, Raichur.

i.			

	Name of the Technology	:	Multi mill
i.	**Application/ Use**	:	Multipurpose use as dhal milling, grain polishing/pearling, deawning of seed spices
ii.	**Description of Technology:** A 75 kg/hr multi mill has been developed for multiple uses *viz*. dhal milling, grain pearling/ polishing and deawning of coriander. The machine consists of an abrasive tapered roller, an aspirator, separation sieve box, mixer/conveyor, oil/water tank and a motor. The unit can be utilized for grading of grains and imparting oil/water pretreatment.		
iii.	**Input**	:	
	a) Raw material	:	Pulses, grains, coriander
	b) Machinery	:	
	Overall dimension	:	1200 x 900 x 1800 mm
	Weight	:	220 kg approx
	Prime mover	:	Electric motor – single phase
	c) Power		2 hp
	d) Man power	:	one
	e) Land	:	NA
	f) Investment	:	50000/
iv.	**Output capacity**	:	75 kg/h
v.	**Unit cost (per machine)**	:	Rs. 40000/- (without motor)
vi.	**Suitability for crops/commodity**	:	Pigeon pea milling, wheat and maize pearling and coriander deawning / debearding
vii.	**Efficiency**	:	Pigeon pea milling : 76%, maize pearling : 91-93%, wheat pearling :93-96% ,coriander deawning : 82%
viii.	**Unit cost of operation**	:	Rs 100/q for dhal milling and Rs 70/q for deawning and pearling/polishing
ix.	**Patent obtained/applied**	:	NIL
x.	**Commercialization status**	:	Ready for commercialization
	(a) No. of Licensees to whom the technology has been transferred		No
	(b)Selected Addresses of Licensee /Manufacturer		N.A.
xii	Contact Person	:	Research Engineer, AICRP on PHT College of Technology & Argil. Engineering, Maharana Pratap University of Agricultural & Technology, Udaipur– 313 001 (Rajasthan)

ii.			
i.	**Name of the Technology**	:	Modified Maize dehusker Sheller
ii.	**Application/ Use**	:	The g **Dehusking & shelling of maize cobs**
iii.	**Description of Technology** : The developed maize dehusker sheller mainly consists of grated concave, and cleaner cum grader, blower, power transmission system and supporting frame main. Square cross section MS lugs and helical flights are welded on the periphery of cylinder for facilitating the desired operation & material movement. Perforated concave below the beater cylinder made of grated concave fabricated using MS bars to improve the separation and falling out the maize kernels along the trough without clogging into the shelling drum. A cleaner cum grader has been provided below the trough to improve the quality of shelled grains. The size of blower was reduced without affecting the cleaning efficiency i.e. removal of the small pieces of maize sheath. The capacity of the maize dehusker cum sheller was found to increase from 800 to 1000 kg/h. The blower helps in cleaning off the grain and blow away the light maize sheath. The cob heart stem & maize sheath are discharged from the tail end of the cylinder and fall on the opposite side of trough, along which grains are collected. Considering its importance, the Govt. of India is granting a cash subsidy worth Rs. 5,000 or 25% of the cost whichever is less. **Modifications:**		
iv.	**Input/raw material**	:	Maize
	a) Overall dimension	:	-
	b) Weight	:	-
	c) Prime mover	:	-
	d) Plant & Machinery	:	-
	e) Power		5 hp
	f) Man power	:	3 unskilled
	g) Land	:	-
	h) Investment	:	-
v.	**Output capacity**	:	1000 kg/hour
vi.	**Unit cost (per machine)**	:	Rs. 60000
vii.	**Suitability for crops/commodity**	:	Maize
viii.	**Efficiency** **a) Dehusking** **b) shelling**	:	 99% 97%
ix.	**Unit cost of operation**	:	-
x.	**Patent obtained/applied**	:	-
xi.	**Commercialization status**	:	Ready for commercialization
	a) No. of Licensees to whom the technology has been transferred		-
	b) Selected Addresses of Licensee or Manufacturer		-
xii	Contact address	:	Research Engineer, AICRP on PHT College of Technology & Argil. Engineering, Maharana Pratap University of Agricultural & Technology, Udaipur– 313 001 (Rajasthan)

i.	**a. Type of Technology**	:	Equipment
	b. Technology developed	:	Solar Heat Treatment Machine
ii.	**Application/ Use**	:	The machine has utility in physical control of stored grain insect pests by killing all stages through exposure to a lethal temperature for a particular duration. It has potential for replacement of insecticides and other chemicals used for killing the stored grain insect pests.
iii.	**Description of Technology:** The insecticides and other chemicals used for killing the stored grain insect pests have their residual effects on grains and sometimes become hazardous for human health. A machine with black body absorber at focal line of parabolic reflector, a screw auger and a hopper was developed to kill all stages of insect pests physically. The augur is rotated manually and has been designed such that the grains reach to the outlet in 2 minutes. The temperatures of black body and grains at outlet point rises up to 85 to 127 and 50 to 70 ºC, respectively. All cereals, pulses and oil seeds can be disinfected, further the treatment is fully effective against all stages of insect pests i.e. egg, larva, pupa and adult with 100 percent mortality. 		
iv.	**Input/raw material**	:	Grains to be stored
	a) Overall dimension	:	2750 mm x 1100 mm x 1650 mm
	b) Weight	:	40 kg
v.	c) Prime mover	:	
vi.	d) Plant & Machinery	:	Solar heat treatment machine, sack holder
	e) Power		Solar energy
	f) Man power	:	1 unskilled labour
	g) Land	:	50 Sqm
	h) Investment	:	Rs 20,000/-
	i) Operational efficiency		100%
vii.	**Output capacity**	:	40-50 kg/hr
viii.	**Unit cost (per machine)**	:	Rs 20,000/-
ix.	**Suitability for crops/commodity**	:	Cereals, pulses and oil seeds
	Efficiency	:	-
x.	**Unit cost of operation**	:	Rs 25 per quintal
xi.	**Patent obtained/applied**	:	NA
xii.	**Commercialization status**	:	Commercialized
	a) No. of Licensees to whom the technology has been transferred	:	One SHG /entrepreneur has adopted.
	b) Selected Addresses of Licensee or Manufacturer	:	1. M/s Kalpana Enterprises N.B. Complex, Pratapnagar,Udaipur-1
xii	Contact address	:	Research Engineer, AICRP on PHT College of Technology & Argil. Engineering, Maharana Pratap University of Agricultural & Technology, Udaipur– 313 001 (Rajasthan)