

## 1. TILLAGE IMPLEMENTS

### Improved Iron Plough



1. Function	:	Dry ploughing in all types of soil. The plough is provided with a mould board as an optional attachment for soil inversion.
2. Specifications		
i. Type	:	Bullock drawn implement
ii. Power requirement	:	A pair of bullocks
iii. Overall dimensions	:	3500 x 250 x 900 mm
iv. Weight	:	17 kg
v. Capacity	:	0.5 ha / day
3. General Information	:	The bullock drawn improved iron plough is made of mild steel except the pole shaft and hence it has longer life. As and when the share wears off, it can be pushed forward. Pole shaft angle and height of handle can be pushed forward. Pole shaft angle and height of handle can be adjusted according to field recruitments. The plough is provided with a mould as an optional attachment for soil inversion.
4. Cost of the unit	:	Rs. 1500/-

## Low Draft Chisel Plough



1. Function	:	Suitable for deep tillage upto a depth of 40 cm for opening hard soil pan.
2. Specification		
i. Type	:	Mounted implement
ii. Power requirement	:	35 to 45 hp tractor
iii. Overall dimensions	:	450 x 940 x 1250 mm
iv. Weight	:	42 kg
v. Capacity	:	1.4 ha / day at a spacing of 1.5m between rows
3. General Information	:	The chisel plough has a sturdy but light structure made of 3mm thick hollow rectangular tubular mild steel sections. The implement is simple in construction and has only three components namely frame, standard and share. The share has a lift angle of 20 degree, width of 25mm and length of 150mm. The implement is protected by shear pin which prevents damage from overloading.
4. Cost of the unit	:	Rs. 8500/-
5. Salient features	:	The implement could be used for deep tillage upto 40cm depth. Easily operated by any 35-45 hp tractor

## Para Plough



1	Function	:	For mulch tillage and moisture conservation under dry farming condition
2.	Specification		
	i. Type	:	Mounted implement
	ii. Power requirement	:	35 – 45 hp tractor
	iii. Capacity	:	0.20 ha per hour
3.	General Information	:	The para plough is a primary tillage implement used for deep ploughing without inversion. This enhances infiltration but reduces hazard of erosion. The implement consists of boxed frame structure with standard 3 point hitch and two bottoms one right hand and one left hand arranged facing outside. The plough shares are fabricated out of 12mm steel sheet. The plough bottom shanks are welded in such a way to make an included angle of 144.° The rake and bent angle of the plough are 22° and 32° respectively. Field trails with equipment showed that ploughing with para plough reduced the bulk density and increase the hydraulic conductivity
4.	Cost of the unit (Approx)	:	Rs. 10000/-
5.	Salient features	:	<ul style="list-style-type: none"> <li>• Increases the hydraulic conductivity of soil to an extend of 0.72 cm per hour.</li> <li>• Loosed the soil by 25% more at 32-45 cm depth than conventional treatment.</li> <li>• Conserve more moisture at 45 cm depth</li> <li>• Restricted moisture depletion upto 10 days after rain fall</li> </ul>

## Tractor Drawn Channel Former

1. Function	:	To form channels and beds at regular intervals for irrigation.
2. Specification		
i. Type	:	Mounted implement
ii. Power requirement	:	35-45 HP
iii. Overall dimensions	:	2200 x 1126 x 900 mm
iv. Weight	:	90 kg
v. Capacity	:	1.2 to 1.5 ha/hr
3. General Information	:	The unit consists of two inner blades of size 100 cm x 25 cm and two outer blades of size 130 cm x 25 cm. The front portions of the two inner blades are joint together such that they form an angle of 30° in between them. At the junction of these two inner blades a cultivator shovel is fixed to penetrate into the soil. The inner blades can be mounted 5 to 10 cm lower than the outer blades so that they form a furrow at a lower depth than the surface of the bed for the flow of irrigation water. The two outer blades are placed one on each side of the inner blades and at an angle of 60° to the direction of the travel. The soil collected in 105 cm width is formed as bund of size 35 cm on both the sides of the irrigation furrow formed by the inner blades.
4. Cost of the unit (Approx)	:	Rs. 12000/-
5. Salient features	:	Cost of forming irrigation channel at 5 m interval by Channel former : Rs. 165/ha. <ul style="list-style-type: none"> <li>• Manual labour : Rs. 385/ha.</li> <li>• Saving in cost : Rs. 220/ha</li> <li>• Saving in time : 11 man days/h</li> </ul>



## Tractor Drawn Trencher

1. Function	:	To form rectangular trench of 30 x 30 cm
2. Specification	:	
i. Type	:	Mounted implement
ii. Power requirement	:	35 to 45 hp Tractor
iii. Overall dimensions	:	160 x 940 x 1250 mm
iv. Weight	:	240 kg
v. Capacity	:	1700 m run per hour
3. General Information	:	The unit consists of two mould board bottoms placed in line one behind the other. The front and rear bottoms operate at a depth of 0-15 cm and 15-30 cm respectively. The two bottoms throw the removed soil in opposite directions and form vertical walls one on each side of the trench. The mould board shape is formed for easy lifting and throwing of soil away from the trench opened. A safety pin is provided to protect the unit from over loading. An adjustable bar point share is provided in addition to the trench bottom cutting share.
4. Cost of the unit	:	Rs. 22,000/-
5. Salient features	:	<ol style="list-style-type: none"> <li>1. It can also be used for laying drip irrigation pipes by opening trenches</li> <li>2. Application of manure in coconut fields</li> <li>3. Making drainage around the sugarcane</li> <li>4. Cost of operation is Rs. 0.10 per m run of trench as against Rs. 2.00 per m run using manual labour</li> <li>5. The cost, time and energy saved by machine trenching in comparison to manual trenching were 95, 99 and 53 per cent respectively.</li> </ol>

## Tractor Drawn Bed Furrow Former



1. Function	: Forms alternate beds and channels in ploughed fields.
2. Specification	
i. Type	: Mounted implement
ii. Power requirement	: 35 to 45 hp Tractor
iii. Weight	: 200kg
iv. Capacity	: 3-3.5 ha per day
3. General Information	: By using the furrow former in well ploughed and prepared the land, we can form beds of 30 cm top width with 'V' shaped channels of 14 cm in depth and 45 cm in top width. The distance between centre to centre of the bed for furrow obtained is 75 cm. The furrow former is lifted by the hydraulic control of the tractor at the head lands.
4. Cost of the unit	: Rs. 18,000/-
5. Salient features	: <ul style="list-style-type: none"><li>• The beds are suitable for planting crops like sorghum, maize, cotton etc.</li><li>• The bed and furrow system is ideally suitable for efficient irrigation and save water.</li><li>• It also facilitates intercropping and intercultural operations.</li></ul>

## Power Tiller Mounted Terracer cum Leveller



1. Function	: For land levelling, terracing and bund forming
2. Specification	
i. Type	: Mounted implement
ii. Power requirement	: 8 to 10 hp power tiller
iii. Overall dimensions	: 1000 x 780 x 580 mm
iv. Weight	: 35 kg
v. Capacity	: 0.08 m <sup>3</sup> of soil
3. General Information	: The unit consists of 1.0 m wide curved mild steel blade with a steel cutting edge at the bottom. It is attached to the front of the power tiller with the help of a mounting plate. Two solid side support arms made of 25 x 12.5 mm mild steel flat holds the unit rigidly during the operation. The lifting of the blade can be made by tail wheel adjustment of the rotary tiller while keeping the tilt angle constant. Two side guards are provided to avoid spilling of soil on both sides of the blade. Bottom skids made of 2 mm mild steel sheet are provided below the blade for maintaining uniform load.
4. Cost of the unit (Approx)	: Rs.5,000/-
5. Salient features	: <ul style="list-style-type: none"> <li>• Simple in design, construction and ease of operation and transport</li> <li>• Efficient for land levelling with a transportation efficiency of 86.6 per cent</li> <li>• Cost of moving 1 m<sup>3</sup> of soil to 1 m distance is Rs.3.30. Cost of bund forming is Rs.17.75/m<sup>3</sup> which is comparable with the manual bunding.</li> </ul>

## Power Tiller Operated Slasher cum Insitu Shredder



1	Function	:	For shredding vegetable residues of brinjal, chillies, bhendi, etc. left after harvest and parthenium, etc.
2.	Specification		
	i. Type	:	Power tiller Mounted implement
	ii. Power requirement	:	10 to 15 hp power tiller
	iii. Capacity	:	0.8 ha / day
3.	General Information	:	
4.	Cost of the unit (Approx)	:	Rs.10000 (attachment)
5.	Cost of operation	:	Rs.800 / ha
6.	Salient features	:	<ul style="list-style-type: none"> <li>• Suitable for any make of power tiller with 10-15 HP</li> <li>• Saving in time - 73%</li> <li>• Saving in cost - 75%</li> </ul>



## Tractor Operated Pit Digger for Sugar Cane Planting



1	Function	:	For digging pits
2.	Specification		
	i. Type	:	Mounted implement
	ii. Power requirement	:	35 – 45 hp tractor
	iii. Capacity	:	250 to 300 holes / hour
3.	General Information	:	
4.	Cost of the unit (Approx)	:	Rs.85000/-
5.	Cost of operation	:	Rs.300 / hour
6.	Saving in cost	:	63%
7.	Saving in time	:	97%
8..	Salient features	:	<ul style="list-style-type: none"> <li>• Dig two pits of 90 cm dia simultaneously at 1.5 m interval to a depth of 30 cm suitable for planting sugarcane setts</li> <li>• Planting of cane in 1.5 x 1.5 m spacing with pit method favours higher cane yield</li> <li>• Recommended as technology package under drip fertigation system for cane.</li> </ul>

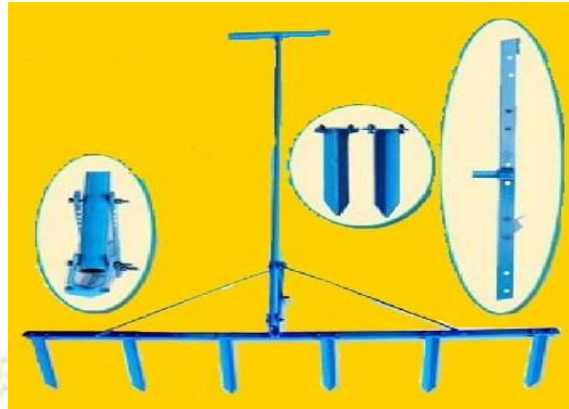
## Tractor operated Rotary Spading Machine



1	Function	:	For primary tillage
2.	Specification		
	i. Type	:	Mounted implement
	ii. Power requirement	:	35 – 45 hp tractor
	iii. Capacity	:	1.5 ha/day
3.	General Information	:	
4.	Cost of the unit (Approx)	:	Rs.1,00,000/-
5.	Saving in cost	:	26 to 38%
6.	Saving in time	:	96%
7.	Salient features	:	<ul style="list-style-type: none"><li>• For deep inter cultivation between rows under hard soils</li><li>• For use in rice fallow cotton &amp; coconut garden</li></ul>

## 2. SOWING EQUIPMENTS

### Manually Operated Line Marker (Pulses)



Total Weight	:	6 Kg
Bottom Rod ("L" Angle)	:	1.5 m
Spacing	:	15 cm to 150 cm
Marking Tyne Length	:	22.5 cm
Handle Rod Length	:	1.5 m (Similar to Cono weeder)
<b>Salient Features</b>		
<ul style="list-style-type: none"><li>• Easy to operate</li><li>• Mechanization</li><li>• Non availability of Labourers</li><li>• Adjustable Spacing – starting from 15 cm to 150 cm</li><li>• Reduced seed rate</li><li>• Suitable for small and marginal farmers</li><li>• Reduced cost of cultivation</li><li>• Optimum plant population</li><li>• Easy for inter cultural operation (Weeding, Spraying)</li><li>• Economically Viable</li><li>• Cost of the implement is Rs. 650 - 700/- only</li></ul>		

## Broadcaster



1. Function	:	To broadcast seeds and fertilizers.
2. Specification		
i. Type	:	Manually operated
ii. Power requirement	:	One labour
iii Overall dimensions	:	360 x 510 x 420 mm
iv. Weight	:	3.6 kg
v. Capacity	:	4 ha / day
3. General Information	:	The centrifugal type unit that is hung in front of the operator is used to broadcast seeds and granular fertilizers by rotating the handle. The material is put in the hopper in batches of 3 to 5 kg and the operator has to walk while rotating the handle. The material is spread over a 3.5 to 10 m width.
4. Cost of the unit	:	Rs. 3,000/-
5. Salient features	:	Suitable for broad casting small seeds like sesame, sorghum, etc. Large area can be sown in less time. Uniform distribution of seeds.



## Gorru



1. Function	:	Line sowing and fertilizer application for crops like groundnut, sorghum, cowpea, bengal gram, green gram, black gram, etc. in three rows simultaneously.
2. Specification		
i. Type	:	Bullock drawn implement
ii. Power requirement	:	A pair of bullocks, an operator and two persons
iii. Overall dimensions	:	1080 x 1180 x 925 mm
iv. Weight	:	45 kg
v. Capacity	:	1 ha / day
3. General Information	:	The gorru consists of a simple frame on which hitch bracket, handle, furrow openers and furrow closure are mounted. The furrow openers are very similar to country plough having adjustable / replaceable share points. A square bar provided at the rear covers the seed which can be easily lifted by means of a rope when clods or trashes are accumulated. Two bowls each having three holes are mounted at a convenient height for manually metering the seeds and fertilizers respectively. The three holes of the each bowl are connected to the three furrow openers by plastic pipes. Provision is made in the furrow openers to place the seed and fertilizer side by side and at different depths. The seed and fertilizer rates and their uniformity in the rows depend mainly on the skill of the operators. Three persons are required, one to operate the unit, one to meter the fertilizer and the other to meter the seeds.
4. Cost of the unit	:	Rs. 4,000/-
5. Cost of operation	:	Rs. 190 / ha
6. Salient features	:	As it is provided with three furrow openers similar to country plough, the coverage is about 3 times more comparing with the country plough.

## Bullock Drawn Seed Planter



1. Function	:	Line sowing of crops like groundnut, sorghum, cowpea, Bengal gram, green gram, black gram, etc. in three rows simultaneously.
2. Specification		
i. Type	:	Bullock drawn implement
ii. Power requirement	:	A pair of bullocks
iii. Overall dimensions	:	1080 x 1180 x 925 mm
iv. Weight	:	65 kg
v. Capacity	:	1 ha / day
3. General Information	:	The unit consists of a simple frame on which a seed box, hitch brackets, handle, clutch mechanism and furrow closer are mounted. The entire units are mounted on two wheels. The furrow opener is similar to country plough in which adjustable/replaceable share is provided. The provision of cup feed mechanism facilities metering of seeds without breakage. The power to operate the seed metering mechanism is taken from the ground wheel through clutch. The provision of clutch facilitates to stopping the seed dropping at head lands. A square bar is provided at the rear to cover the seeds.
4. Cost of the unit	:	Rs. 8,000/-
5. Salient features	:	The seed to seed distance in a row can be adjusted.  By changing the size of the cup different crops/ varieties of seed can be sown.

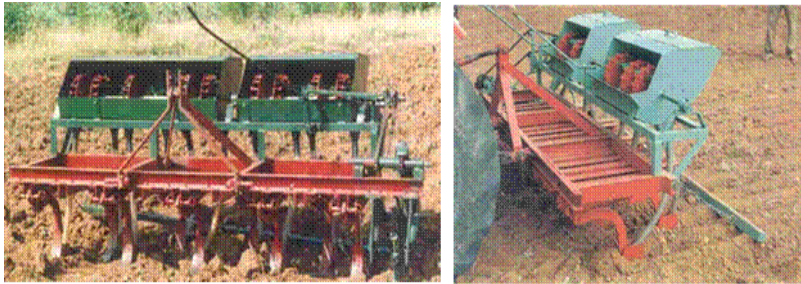
## Power Tiller Drawn Cup Feed Seeder



1. Function	:	To sow seeds like groundnut, maize, sorghum and pulses.
2. Specification		
i. Type	:	Power tiller drawn
ii. Power requirement	:	10 – 12 hp
iii. No. of rows	:	4
iv. Row spacing	:	25 – 60 cm (adjustable)
3. General Information	:	The attachment consists of seed box with cup feed metering mechanism, lifting arrangement, seed cut of clutch, tool bar, hoe type furrow openers and seating attachment, all mounted on an easily detachable articulated double wheeled frame. The cup feed seed mechanism is driven by chain and sprocket from the tail wheel. The lifting of tool bar disengages the clutch transmitting power to the seed metering shaft. The spacing between furrow openers and the depth of sowing are easily adjustable.
4. Cost of the unit	:	Rs. 20,000/-
5. Salient features	:	Suited for all the makes of 10-12hp power tiller. Coverage is 0.2ha per hour Operator can ride comfortably while sowing with the unit.



## Tractor Drawn Cultivator Seed Planter



1. Function	:	For sowing groundnut and other seeds
2. Specification	:	
i. Type	:	Tractor mounted
ii. Overall dimensions	:	2500 x 1030 x 1240 mm
iii. Weight	:	410 kg
iv. No. of rows	:	9
v. Row spacing	:	Adjustable
vi. Hill spacing	:	Adjustable
3. General Information	:	Seed box along with cup feed type seed metering mechanism is mounted on the cultivator frame and the seeds are dropped in the furrows opened by the cultivator shovels. Side wings are provided to the shovels for proper placement of seeds at the required depth. Power to operate the seed metering discs is taken from the ground wheel through a clutch. A square bar is provided at the rear to close the seeds in the furrows. The seed to seed distance can be changed by changing the sprockets provided in the metering shaft. The operator can stop seed dropping by disengaging the clutch provided. Highly suitable for sowing groundnut without damage to kernels.
4. Cost of the unit	:	Rs. 45,000/-
5. Salient features	:	<ul style="list-style-type: none"> <li>• Coverage : 4.0 ha per day</li> <li>• Power requirement : 35 hp tractor</li> <li>• Cost of operation : Rs. 250/ha (Rs. 350/ha for conventional method)</li> <li>• Suitable for sowing groundnut, bengal gram, maize, sorghum, soybean and pulses in larger areas in short time before the soil moisture gets depleted</li> <li>• The breakeven point is 9.65 ha / year.</li> </ul>



## Tractor Drawn Ridger Seeder



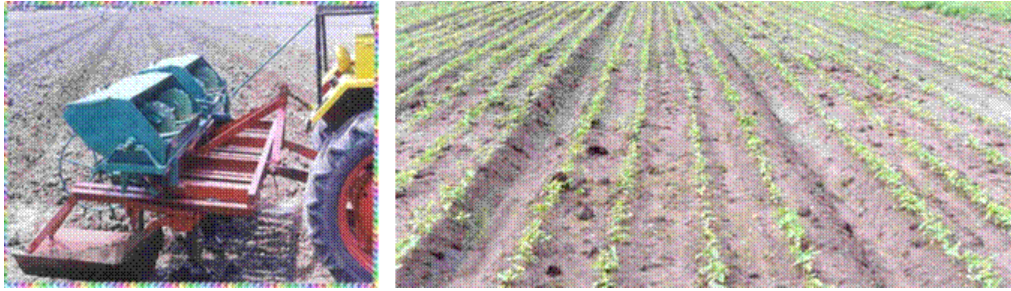
1. Function	: For ridge forming and sowing simultaneously
2. Specification	
i. Type	: Tractor mounted
ii. Power requirement	: 35 hp tractor
iii. Overall dimensions	: 2400 x 1750 x 1100 mm
iv. Weight	: 300 kg
v. Capacity	: 0.40 ha per hr
3. General Information	: The unit consists of a tilling mechanism having 6 numbers of cultivator types with shovels, a ridging mechanism having 3 numbers of adjustable ridgers and a planter having seed hopper with cup feed seed metering device for seed, ground wheel, transmission system and row markers. Separate furrow openers and closers are eliminated in this unit. By fixing the ridger bottoms and cultivator tynes to the appropriate holes provided in the main frame, the row spacing can be altered. The plant spacing can be varied by changing the sprockets or the number of cups in the seed metering disc. The desired depth of seed placement can be obtained by moving the seed tube.
4. Cost of the unit (approx)	: Rs. 45,000/-

## Basin Lister cum Seeder



1. Function	:	To form intermittent basins in dry land for moisture conservation and simultaneous sowing.
2. Specification		
i. Type	:	Tractor mounted
ii. Power requirement	:	35 hp tractor
iii. Overall dimensions	:	2320 x 1930 x 1140 mm
iv. Weight	:	500 kg
3. General Information	:	The basin lister consists of three trenchers of width 30 cm, cams, cam shaft, cam follower, ground wheels and frame. Each trencher fitted with a cam follower gets lifted up by the cams at equal intervals. The cams are mounted on a common axle at 120 degree difference and supported by ground wheels. The power to rotate the cam is transmitted from one of the ground wheels. The basin lister unit is attached to the standard nine tined cultivator. The seed box along with cup feed type seed metering mechanism is mounted on the cultivator frame and the seeds are dropped in between the basins. Seeds are sown in 4 rows at 45 cm apart. The same implement can be used to form broad beds separated by furrows by removing the basin lister attachment from the cultivator.
4. Cost of the unit	:	Rs. 50,000/-
5. Salient features	:	<ul style="list-style-type: none"> <li>• Increased moisture retention of 10 per cent is achieved</li> <li>• Significant increase in crop yield is observed</li> <li>• Results in 32, 96 and 18 per cent saving in cost, time and energy respectively when compared to conventional method.</li> <li>• An area of 3.5 ha can be covered per day</li> </ul>

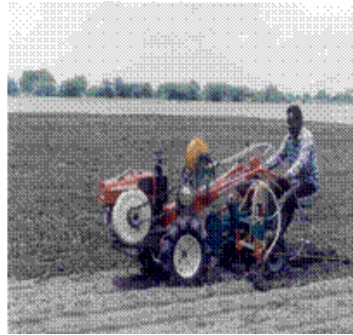
## Improved Broad Bed Former cum Seeder



1. Function	:	Forms raised bed and sows simultaneously
2. Specification	:	
i. Overall dimensions	:	2020x 2050 x 1100 mm
ii. Weight	:	370 kg
iii. No. of furrows	:	2
iv. Row and hill spacing	:	Adjustable
Capacity/ha/day	:	3.2
3. General Information	:	The implement will form broad beds separated by furrows and simultaneously undertake sowing in rows on the bed formed. The unit can be hitched to the 3 point linkage of tractor. This unit consists of a sheet metal float which forms the broad beds separated by furrows at an interval of 160 cm. Over the sheet metal frame, seed hoppers and cup feed seed metering mechanism are provided. The drive for the seed metering device is taken from a projecting spoke type ground wheel which trails behind the furrow openers, on the bed. The furrow openers are made of cultivator shovels provided with wings. The depth of furrow opener can be adjusted with respect to bed surface.
4. Cost of the unit	:	Rs. 45,000/-
5. Salient features	:	Suitable for sowing groundnut, bengal gram, maize, sorghum and pulses in raised beds. Saving in cost : 57% Saving in labour and time : 95%



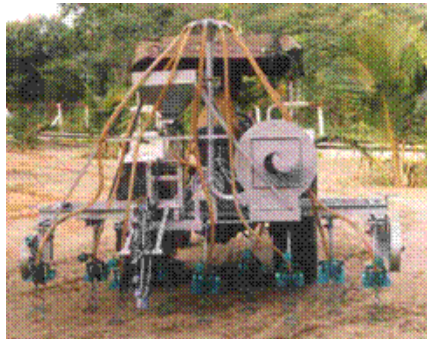
## Power Tiller Operated Air Assisted Seed Drill



1. Function	:	For sowing small seeds like sesame, cumbu, horse gram and sorghum
2. Specification		
i. Type	:	Power tiller mounted implement
ii. Power requirement	:	8 to 10 hp Power tiller
iii. Capacity	:	2 to 2.5 ha/day
3. General Information	:	
4. Cost of the unit (Approx)	:	Rs.20,000/-
Cost of operation	:	Rs.100/hr
5. Salient features	:	<ul style="list-style-type: none"> <li>• Spacing between the rows can be adjusted from 30 to 60 cm.</li> <li>• Suitable for all makes of 10 to 12 hp power tiller.</li> <li>• Savings in time: 80%</li> <li>• Savings in sowing cost: 50%</li> </ul>



## Tractor Drawn Air Assisted Seed Drill

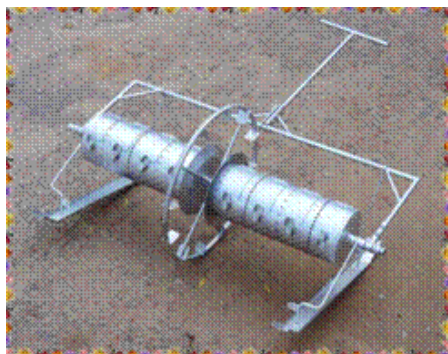


1. Function	:	To drill small seeded crops like, sesame, ragi, maize.
2. Specification		
i. Type	:	Tractor mounted
ii. Power requirement	:	35 – 45 Hp tractor (PTO operated )
iii. Capacity	:	5 ha per day
3. General Information	:	The unit consists of an air blower and drive, seed hopper and feeding device, seed distributor head, seed tubes, furrow opener ground wheel and furrow closer. The above components mounted on a 9 tyne cultivator. Blower is used to blow air through a vertical distributor tube to the distributor head. Seed is metered by the ground wheel into the air stream in controlled manner. The stream of seed is distributed to the 9 furrow openers by the distributor head. This ensures uniform drilling of fine seeds.
4. Cost of the unit	:	Rs.35,000/-
5. Salient features	:	<ul style="list-style-type: none"> <li>• Cost of operation : Rs. 150/ha</li> <li>• Saving cost : 55%</li> <li>• Saving in time : 92 %</li> </ul>

## Improved Direct Paddy Seeder

1. Function	:	For uniform seed distribution with respect to time and for maintaining uniform plant population per metre square
2. Specification		
i. Power requirement	:	Manually operated
ii. Overall dimensions	:	2000 x 1500 x 640 mm
iii. Weight	:	10 kg
iv. Coverage, ha per day	:	1.1
3. General Information	:	The unit consists of a seed drum, main shaft, ground wheel, floats, furrow openers and handle. The seed drum is hyperboloid shape (truncated cone) with 200 mm diameter having 12 mm flat spikes of 25 mm length kept parallel to the axis of rotation. The slopes of the cone facilitate the free flow of seeds towards the metering holes. Nine numbers of seed metering hole of 10 mm diameter were provided along the circumference of the drum at both the ends at a row-to-row spacing of 200 mm. Two floats were provided on either side to restrict the sinkage and to facilitate easy pulling of the unit.
4. Cost of the unit (approx)	:	Rs. 4800/-
5. Salient features	:	<ul style="list-style-type: none"><li>• Uniformity in seed sowing and plant population.</li><li>• Reduction in seed rate and the cost of thinning is reduced.</li><li>• Hill dropping of seeds is achieved and continuous drilling is eliminated.</li></ul>

## Rice Cum Daincha Seeder



1. Function	:	It shows paddy in 3 rows and green manure in 3 rows simultaneously.
2. Specification	:	
i. Power requirement	:	Manually operated
ii. Overall dimensions	:	1650 x 1600 x 690 mm
iii. Weight	:	15 kg
iv. Coverage, ha per day	:	0.8 ha per day
3. General Information	:	The seeder has two drum hoppers, two skids, a ground wheel and a handle. Paddy seed rate can be adjusted from 72 – 75 kg per ha. The seeder simultaneously sows pre germinated paddy seeds and daincha seeds in alternate rows and puddled soil. The advantage of this seeder is avoidance of separate cultivation of green manure crop.
4. Cost of the unit (approx)	:	Rs. 6000/-
5. Salient features	:	<ul style="list-style-type: none"> <li>• Uniformity in seed sowing and plant population.</li> <li>• Reduction in seed rate and the cost of thinning is reduced</li> <li>• Hill dropping of seeds is achieved and continuous drilling is eliminated.</li> <li>• Growth of competitive weeds is checked due to green manure crop.</li> </ul>



## Rice Transplanter



1. Function	:	For transplanting mat type paddy seedlings. Suitable for all transplanted type paddy varieties.
2. Specification		
i. Type	:	Manually operated
ii. Power requirement	:	One operator and one labour to transport mat seedlings
iii. Overall dimensions	:	1230 x 1250 x 835 mm
iv. Weight	:	17 kg
v. Capacity	:	0.25 ha / day
3. General Information	:	The machine consists of a seedling tray, forks, handle and skids. By pressing the handle, the forks pick-up the seedlings and plant them in 6 rows. For every stroke of the handle the seedling tray moves side wards for uniform picking of seedlings by the forks. The operator has to pull the machine while punching the handle at the desired spacing. The Row to row spacing is 200 mm.
4. Cost of the unit	:	Rs. 7500/-
5. Salient features	:	Planting can be done in 6 rows at a time.

## Seed cum Fertilizer Drill for Paddy

1	Function	:	For direct sowing of paddy and simultaneous application of fertilizer
2.	Specification		
	i. Type	:	Mounted implement
	ii. Power requirement	:	35 – 45 hp tractor
	iii. Capacity	:	3 ha/day
3.	General Information	:	
4.	Cost of the unit (Approx)	:	Rs.45000/-
5.	Salient features	:	<ul style="list-style-type: none"><li>• The seed rate and fertilizer rate can be adjusted</li><li>• Can be operated by a 35 HP tractor</li><li>• By applying the required quantity of fertilizer at root zone, better crop growth and more yields is obtained.</li><li>• Saving in cost:65%</li><li>• Saving in labour:84%</li><li>• Cost of operation: Rs.800 / ha</li></ul>

## Sugarcane Sett Cutter

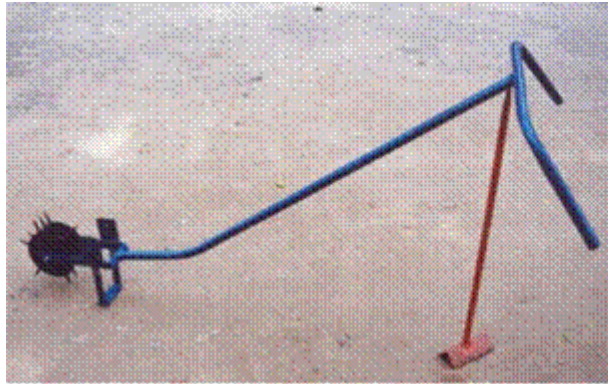


1	Function	:	For cutting sugarcane sett with single bud
2.	Specification		
	i. Type	:	Motor operated
	ii. Power requirement	:	-
	iii. Capacity	:	One sett / second
3.	General Information	:	-
4.	Cost of the unit (Approx)	:	Rs.2750/-
5.	Salient features		<ul style="list-style-type: none"><li>• Reduce the cost of seed cane</li><li>• Additional income from the budless internodes</li><li>• Saving in cost: 45%</li><li>• Saving in time: 70%</li><li>• Cost of operation: Rs.240 / ha</li></ul>



### 3. WEEDING & INTERCULTURAL

#### TNAU Improved Dry Land Weeder



1. Function	: For weeding in row crops for removing shallow rooted weeds. It has been designed ergonomically for easy operation. Useful in dry land and garden land crops and is ideal at a soil moisture content of 8 to 10 per cent.
2. Specification	
i. Type	: Manually operated
ii. Power requirement	: A man labourer
iii. Overall dimensions	: 1100 x 650 x 1050 mm
iv. Weight	: 3 kg
v. Capacity	: 0.05 ha / day
3. General Information	: This is a long handled tool and consists of one number of 25 mm diameter and 1200mm long conduit pipe over which 520mm long handle is fitted. At the bottom of the central pipe frame , two arms made of 250 X 25 X 3 mm of MS plates are fitted. At the extreme end of the arm 120 mm diameter star wheel is fixed. A cutting blade is fitted to the arm 200mm to the back of the star wheel the star wheel facilitates easy movement of the tool. The operating width of the blade is 120 mm.
4. Cost of the unit	: Rs. 600/-
5. Salient features	: Useful in dry land and garden land crops. Ideal to remove shallow rooted weeds. The workable moisture content has to be 8 to 10 %

## Power Rotary Weeder

1. Function	:	For mechanical control of weeds in crops such as sugarcane, tapioca, cotton and orchards.
2. Specification	:	
i. Type	:	Self propelled
ii. Power requirement	:	8.38 hp Diesel engine
iii. Overall dimensions	:	2400 x 1750 x 1100 mm
iv. Weight	:	200 Kg
v. Capacity	:	1 - 1.2 ha per day
3. General Information	:	A 8.38 hp diesel engine operates the weeder. The engine power is transmitted to ground wheels through V belt-pulley. A tail wheel is provided at the rear to maintain the operating depth. Weeding is done by the rotary weeding attachment. The rotary weeder consists of three rows of discs mounted with 6 numbers of curved blades in opposite directions alternatively in each disc. These blades when rotating enable cutting and mulching the soil. The width of coverage of the rotary tiller is 500 mm and the depth of operation can be adjusted to weed and mulch the soil in the cropped field.
4. Cost of the unit (approx)	:	Rs. 100,000 /-
5. Salient features	:	<ul style="list-style-type: none"><li>• Useful for weeding between rows of crops like tapioca, cotton, sugarcane, maize, tomato and pulses whose rows spacing is more than 45 cm</li><li>• Attachments like sweep blades, ridger, trailer can be used with the machine.</li></ul>

## Weeding cum Earthingup Equipment



1. Function	:	For weeding and intercultural operations in between row crops
2. Specification	:	
i. Type	:	Mounted type
ii. Power requirement	:	35 hp tractor
iii. Overall dimensions	:	400 x 636 x 1665 mm
iv. Weight	:	143 kg
v. Capacity	:	1.6 ha per day
3. General Information	:	One third of the cost of cultivation is spent on weeding alone when carried out with manual labour. Both mechanical and chemical weeding are effective for controlling weeds. Mechanical weed control kills the weed between the rows of crop and also keeps the soil surface loose. An inter cultivator cum earthing up equipment was developed and fitted to a standard tractor drawn ridger. Three number of sweep type blades are affixed to the ridger frame for accomplishing the weeding operation in between standing rows of crops. Three ridger bottom which are fitted behind the sweep blade, work on the loosened soil mass and aid in earthing up by forming ridges and furrows.
4. Cost of the unit (approx)	:	Rs. 15,000
5. Salient features	:	<ul style="list-style-type: none"> <li>• Weeding and earthing up operations are simultaneously performed in a single pass; row to row distance between the sweep blades and the ridger bottoms are adjustable (45, 60, 75 and 90 cm).</li> <li>• Weeding efficiency is 61 per cent.</li> </ul>

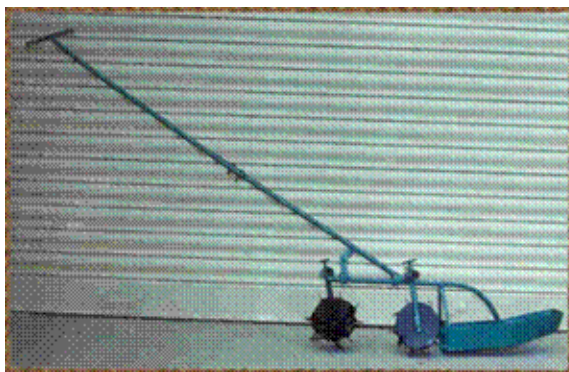


## Tractor Operated Multi Row Rotary Weeder



1. Function	:	For weeding and intercultural operations in between row crops like sugarcane, cotton, maize
2. Specification		
i. Type	:	Mounted type
ii. Power requirement	:	35 hp tractor
iii. Overall dimensions	:	400 x 636 x 1665, mm
iv. Weight	:	143 kg
v. Capacity	:	2.0 ha per day
3. General Information	:	The multi row rotary weeder consists of a set of cutting blades, which penetrate in to the soil, cause removing the weeds in the crop rows The power train consists of a gearbox containing a set of bevel gears having transmission ratio 2:1. The driving shaft of gearbox was coupled with PTO shaft of the tractor and driven shaft is coupled with rotary units by means of chain and sprocket power transmission systems. The “L” shaped cutting edge has been sharpened for easy cutting and fixed at an optimum angle of inclination of 50° to horizontal. The cutting blade has also been used as an inclined plane for elevating and converging the soil to the rotating blades to perform cutting the weeds and pulverizing the soil.
4. Cost of the unit (approx)	:	Rs. 1 00,000
5. Salient features	:	<ul style="list-style-type: none"> <li>• Weeding and earthing up operations are simultaneously performed in a single pass; row to row distances between the rotor groups are adjustable.</li> <li>• Weeding efficiency is 71 per cent.</li> <li>• The saving in cost and time were 73.12 and 81.5 per cent respectively as compared to conventional method of manual weeding.</li> </ul>

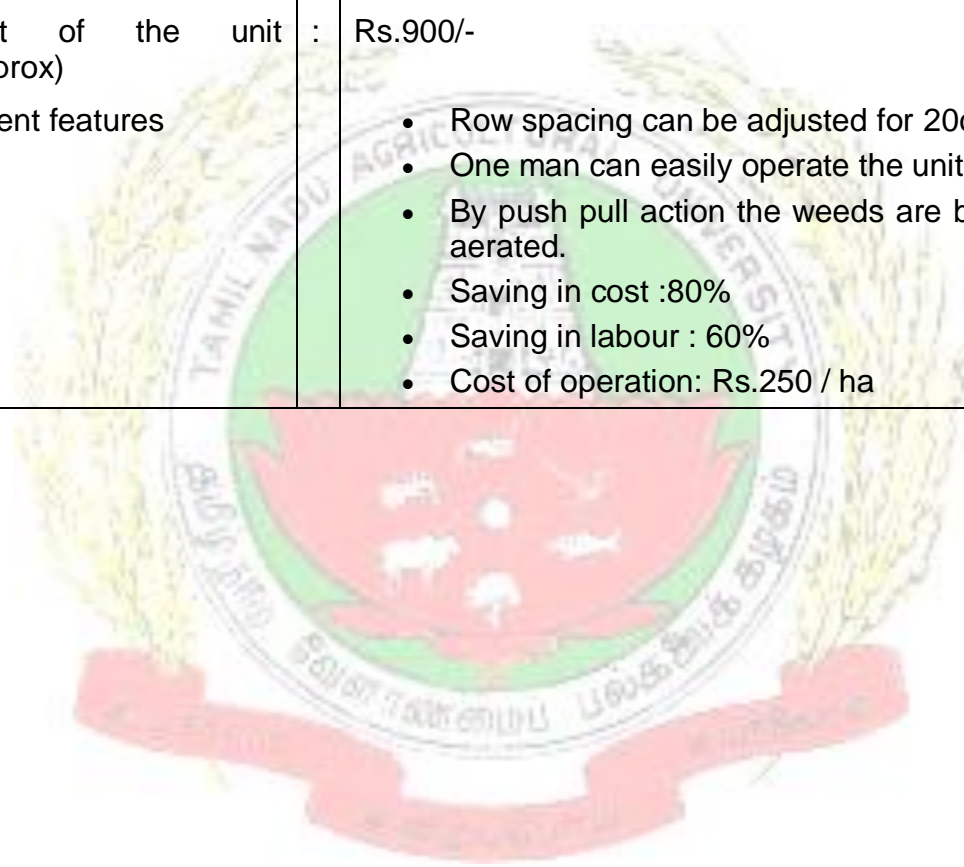
## Cono Weeder



1. Function	:	For weeding between rows of paddy crop
2. Specification		
i. Type	:	Manually operated
i. Number of rotors	:	Two
ii. Number of operators	:	One
iii. Overall dimensions	:	37 cm x 1.4 m
iv. Weight	:	5 to 6 kg
3. General Information	:	The cono weeder has two conical rotors mounted in tandem with opposite orientation. Smooth and serrated blades mounted alternately on the rotor uproot and burry weeds because the rotors create a back and forth movement in the top 3 cm of soil, the cono weeder can satisfactorily weed in a single forward pass without a push pull movement.
4. Cost of the unit (approx)	:	Rs. 1500/-
5. Salient features	:	<ul style="list-style-type: none"> <li>• Easy to operate by a single operator</li> <li>• The weeder does not sink in puddled soil</li> <li>• Field capacity 0.18 ha/day</li> </ul>

## Two Row Finger Type Paddy Rotary Weeder

1	Function	:	For weeding in paddy row crops
2.	Specification		
	i. Type	:	Manual operated
	ii. Power requirement	:	-
	iii. Capacity	:	0.35 ha / day
3.	General Information	:	
4.	Cost of the unit (Approx)	:	Rs.900/-
5.	Salient features		<ul style="list-style-type: none"><li>• Row spacing can be adjusted for 20cm and 25 cm</li><li>• One man can easily operate the unit continuously</li><li>• By push pull action the weeds are buried and soil aerated.</li><li>• Saving in cost :80%</li><li>• Saving in labour : 60%</li><li>• Cost of operation: Rs.250 / ha</li></ul>





## Battery operated portable wetland weeder



1. Function	:	For weeding in SRI field
2. Specification		
i. Type	:	Manual operated
ii. Power requirement	:	
iii. Capacity	:	0.2 – 0.3 ha/day
3. General Information	:	
4. Cost of the unit (Approximate)	:	Rs.8000/-
5. Salient features		<ul style="list-style-type: none"><li>• Easy to operate compared to cono weeder</li><li>• Operated without experiencing any drudgery</li><li>• Weeding efficiency: 95%</li><li>• Cost of operation: Rs.625/ha</li></ul>

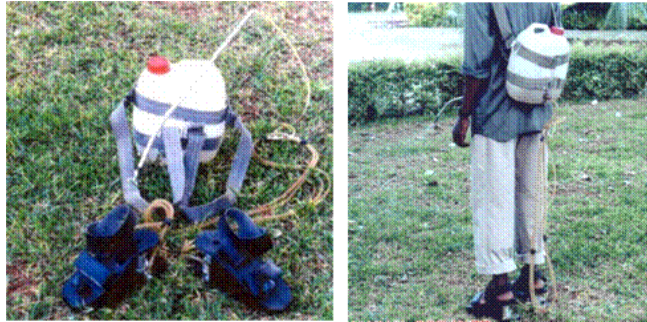
### 3. PLANT PROTECTION EQUIPMENT

#### Battery operated Low Volume Sprayer



1. Function	:	For spraying chemicals on crops like paddy, groundnut, pulses and vegetables. It requires 50 litres of water per hectare.
2. Specification		
i. Type	:	Knapsack
ii. Power requirement	:	6 V rechargeable battery
iii. Overall dimensions	:	380 x 250 x 725 mm
iv. Weight	:	17 kg with pesticide
v. Capacity	:	1.5 ha / day
3. General Information	:	A 10 liter pesticide tank and a 6 volt rechargeable battery are mounted on a suitable frame which is carried on the back of the operator. The chemical is taken from the tank to the spinning disc fitted with the direct current micro motor. A cut-off valve is provided to regulate the flow. The weight of the modified battery sprayer is about 17kg with pesticide. The pesticide application rate of the sprayer is 50 litres per hectare.
4. Cost of the unit	:	Rs. 2000/-
5. Salient features	:	This sprayer is suitable for any crop like paddy groundnut, pulses and vegetables. Repairs and maintenance problems are less. Reduced water requirement.

## Foot Wear Operated Sprayer



1. Function	:	For spraying chemicals on garden crops.
2. Specification		
i. Type	:	Knapsack
ii. Power requirement	:	Energized by the walking action
iii. Weight	:	10 kg with pesticide
iv. Capacity	:	0.2 ha / day
3. General Information	:	The foot wear operated manual sprayer consists of two shoe assembly which encloses two small reciprocating pumps in each. The pumps are made up of aluminium and actuated by the walking action of the operator. The sprayer consists of chemical tank which is carried on the back of the operator and lance and nozzle assembly. The main advantage of the unit is that the operator need not do the energizing action of pumps as in conventional sprayer. His walking action itself will pressurize the fluid and a fine spray pattern is obtained. The drudgery and tiredness of operator is reduced to a great extend.
4. Cost of the unit	:	Rs. 1000/-
5. Salient features	:	<ul style="list-style-type: none"> <li>• No separate action is required by the operator except in guiding the nozzle.</li> <li>• Eco friendly</li> <li>• Easy to maintain and repair</li> <li>• Suitable for ULV and LV applications</li> </ul>



## Power Tiller Operated Boom Sprayer



1. Function	: For row crop spraying
2. Specification	
i. Type	: Power tiller mounted
ii. Power requirement	: 8 to 10 hp power tiller
iii. Overall dimensions	: 1550 x 5000 x1550 mm
iv. Weight	: 12 kg
v. Capacity	: 1 ha per hr
3. General Information	: The boom sprayer attachment consists of two aluminum hollow sections (50 x 25 mm) of 4 m length with 16 numbers of nozzles. The nozzles are spaced at 450 mm apart. A reciprocating pump (40 m x 25 mm) is mounted on the power tiller with the help of a stand. The drive is transmitted from the clutch pulley of the power tiller through 'v' belt. A 25 mm dia heavy-duty alkathene suction hose carries the spray chemical from the tank kept in the power tiller trailer to the pump inlet. The delivery line from the outlet of the pump is divided into two lines by means of a two way cock to each of the two aluminium sections. The spray boom with nozzles are carried by two persons with a "belly rest" and "neck belt" provisions for easy handling and spraying of chemicals on the crop foliage. A regulator valve with a by-pass line to the tank is also provided in the delivery line to control the excess pressure and discharge rate.
4. Cost of the unit (approx)	: Rs.35,000/-
5. Salient features	: Light in weight and easy handling Suitable for spraying in row crops Results in 55 per cent saving in cost as compared to knapsack power sprayer

## Sprayer for Coconut Tree



1. Function	:	To spray chemicals in coconut trees and orchards
2. Specification		
i. Type	:	Mounted implement
ii. Power requirement	:	35 hp tractor
iii. Overall dimensions	:	65 x 65 x 1950 mm
iv. Weight	:	200 kg
v. Capacity	:	35 trees per hour
3. General Information	:	The unit has a telescopic (62 and 37 mm ) G.I. pipes which can extend from 9 m to 14 m height by winding a cable. The telescopic G.I. pipes are mounted on a 'L' angle frame work hitched to the tractor through the three point linkage connection. At the base of the frame, a 200 lit capacity chemical tank is mounted. The commercially available ASPEE triplex reciprocating pump is mounted on a base plate near the PTO shaft of the tractor. At the top of the 37 mm G.I. pipe, two spray guns with nozzles for cone or jet spray are hinged so that they can be moved up and down by ropes from the ground level. In addition the spray guns can be rotated about the vertical axis of the telescopic pipe arrangement. These features of the sprayer ensure that the entire canopy area of the tree is easily sprayed.
4. Cost of the unit (approx)	:	Rs. 80,000/-
5. Salient features	:	The total height of spray is 55 feet.  For easy transport, the unit can be kept in a horizontal position by folding the frame with telescopic pipes and the same can be erected vertically by winding a cable.

## Areca Sprayer



1. Function	:	To spray chemicals in Arecanut trees. The spray fluid is supplied from a rocker arm sprayer. Suitable for spraying trees upto a height of 18 meters.
2. Specification		
i. Type	:	Manually operated and easily transportable
ii. Power requirement	:	A team of three persons
iii. Overall dimensions	:	600 x 600 x 1500 mm
iv. Weight	:	22 kg
v. Capacity	:	20 trees per hour
3. General Information	:	The sprayer has a telescopic aluminium boom which can extend from 8m to 16m height by winding a cable. The boom is mounted on a supporting frame. The entire boom can be rotated to spray in all directions around the boom. The nozzle can be angled up or down by a remotely actuated pneumatic actuator. The spray fluid is supplied from a rocker arm sprayer. A team of three persons will be required for spraying operation.
4. Cost of the unit	:	Rs. 15000/-
5. Salient features	:	It can be used for spray chemicals for arecanut trees Suitable for spraying trees upto a height of 18 meters.



## Corcyra Moth Collector



Function	:	For mass production of biological control agents. Used for collection of corcyra moth with minimum health hazard. Productivity is increased as collection time is reduced. Ensures collection of moth without damage.
Specification		
i. Type	:	Vacuum cleaner principle
ii. Power requirement	:	1/4 hp motorized blower
iii. Overall dimensions	:	200 x 200 x 600 mm
iv. Weight	:	2 kg
v. Capacity	:	4600 moths per hour
General Information	:	The collection device can be operated by attaching it with vacuum cleaner or suction side of any motorized blower of ¼ hp. The device sucks the insects from the rearing trough, gently separates it from the air stream and collects it into a container. The main component of the unit is a cyclone separator. The tube attached to the inlet of the cyclone separator forms the insect suction tube. The top of the unit is provided with a shutter to regulate the vacuum created at the end of the suction tube. This ensures collection of the insects with minimum force. The bottom of the cyclone separator has a transparent jar in which the insects are collected.
Cost of the unit	:	Rs. 7,000/-
Salient features	:	Used for collection of corcyra moth with minimum health hazard  Productivity is increased as collection time is reduced.  Ensure collection of moth without damage.

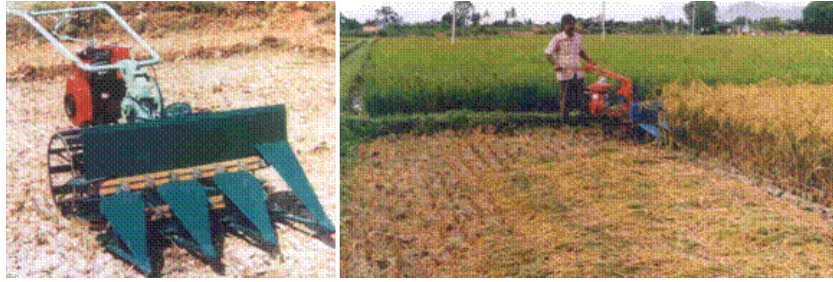
## 4. HARVESTING EQUIPMENTS

### Self Propelled Vertical Conveyor Reaper



1	Function	: For harvesting paddy
2.	Specification	:
	i. Overall dimensions (L x W x H), mm	2200 x 950 x 1100
	ii. Type	: Self propelled engine
	iii. Power requirement	: 3.0hp
	iv. Capacity	: 0.125 ha h <sup>-1</sup>
3.	General Information	: Vertical conveyor reaper (0.75 m) of TNAU is light in weight and hence shifting the reaper from one field to another is easy. Operating the reaper is fatigue free. The total cost of the machine is well within the purchasing power of the small farmers. It is highly cost economical when compared to other paddy harvesters and combine and manual harvesting.
4.	Cost of the unit (Approx)	: 60,000
5.	Salient features	: -

## Paddy Repear Harvester



1. Function	:	For harvesting and windrowing non-lodging paddy varieties. It is a self propelled unit and width of coverage is 0.75 m.
2. Specification	:	
i. Type	:	Self propelled
ii. Power requirement	:	3 hp kerosene engine, 1 operator and 2 women labourers to collect and bundle the cut crop
iii. Overall dimensions	:	2200 x 850 x 1170 mm
iv. Capacity	:	1 ha / day
3. General Information	:	The machine consists of gear box, ground wheels, handle, cutter bar assembly, star wheels and gathering header assembly. The crop should be manually harvested along the four sides of the field for a width of 0.5m and cleared from the field for providing space to the machine. At one corner an area of 2 x 1.5m should be manually harvested to place the machine initially in the field. Since the harvested crop is discharged at the right side of the reaper the harvested should be turned always to the left side.
4. Cost of the unit (approx)	:	Rs.1 00,000/-
5. Salient features	:	<ul style="list-style-type: none"> <li>• Fuel consumption - 1 litre/ha</li> <li>• Height of cut - 50 mm</li> <li>• Labour - 1 operator and 2 women labourers (to collect and bundle the cut crop)</li> </ul>

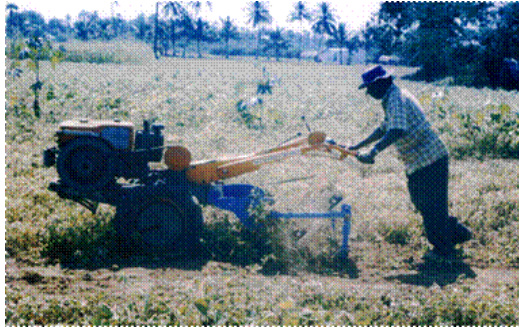


## Mini Combine Harvester for Paddy



1. Function	:	For combined operations of Harvesting, threshing and winnowing
2. Specification		
i. Type	:	Self propelled
ii. Power requirement	:	-
iii. Overall dimensions	:	-
iv. Weight	:	-
v. Capacity	:	1 ha / day
3. General Information	:	
4. Cost of the unit (approx)	:	Rs.3,00,000/-
5. Cost of operation	:	Rs.1300 / ha
6. Special features		<ul style="list-style-type: none"> <li>• Suitable for small and marginal farmers</li> <li>• Can be easily transported to inaccessible fields</li> <li>• Saving in cost: 80%</li> <li>• Saving in labour: 91%</li> </ul>

## Power Tiller Operated Groundnut Harvester



1. Function	:	For harvesting groundnut
2. Specification		
i. Type	:	Power tiller operated
ii. Power requirement	:	10 to 12 hp
iii. Overall dimensions	:	-
iv. Weight	:	-
v. Capacity	:	0.8 ha / day
3. General Information	:	-
4. Cost of the unit	:	Rs.12,000/-
5. Cost of operation	:	Rs.700 / ha
6. Salient features	:	<ul style="list-style-type: none"> <li>• Suitable for harvesting all varieties of groundnut</li> <li>• Suitable for all makes of 10 to 12 hp power tiller</li> <li>• Saves time and labour</li> <li>• Savings in time: 90%</li> <li>• Savings in cost: 30%</li> </ul>

## Tractor Drawn Groundnut Harvester



1.	Function	:	For harvesting and windrowing groundnut crop at soil moisture levels of 8 -15 %.
2.	Specification		
	i. Type	:	Mounted implement
	ii. Power requirement	:	35-45 hp tractor
	iii. Overall dimensions	:	2050 x 2100 x 1150 mm
	iv. Weight	:	300 kg
	v. Capacity	:	2.0 ha / day
3.	General Information	:	The groundnut harvester consists of a soil loosening tool, a pick conveying mechanism and gatherer windrower. The soil engaging tool is made of 50 mm thick x 100 mm wide x 180 mm length straight mild steel blade. The tool at 150 rake angle is fixed to a main frame through shanks at both side. The pickup conveying mechanism of length 1200mm is made of to 600mm endless ship chains spaced 1800 mm apart. At the rear a gatherer windrower the conveying crop.
4.	Cost of the unit (approx)	:	Rs. 35,000/-
5.	Salient features	:	Harvesting and soil separation efficiency is 99 and 95%.  Saving in labour cost and time is 32 and 96 % respectively.

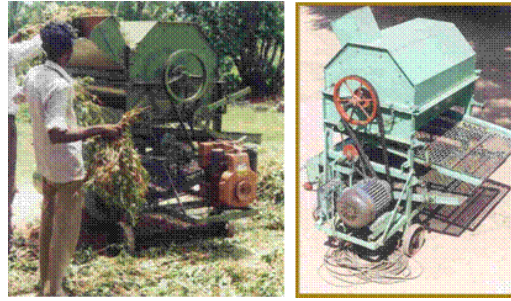


## Impact type Groundnut Stripper



1. Function	:	To remove groundnut pods from vines
2. Specification		
i. Type	:	Operated by 2.5 HP kerosene engine
ii. Overall dimensions	:	
iii. Weight	:	
3 Capacity	:	0.4 ha / day
General Information	:	Operator assisted by two helpers Suit to the requirements of medium and small farmers The vines are not fed into the stripper hence the fodder value of the vines is maintained
4. Cost of the unit (approx)	:	Rs.28,000/-
5. cost of operation (Stripping)	:	Rs.833 per ha.
5. Salient features	:	<ul style="list-style-type: none"> <li>• Stripping efficiency : 100%</li> <li>• Damage to pods : less than 2%</li> <li>• Saving in labour : 37%</li> <li>• Saving in cost : 17%</li> </ul>

## Groundnut Thresher



1. Function	:	Separation of groundnut pods from harvested plants																					
2. Specification																							
i. Type	:	Spike tooth , axial flow and oscillating sieves																					
ii. Overall dimensions	:	2050 x 1650 x 1570 mm																					
iii. Weight	:	430 kg																					
iv. Cylinder speed	:	225 rpm																					
v. Blower speed	:	1500 rpm																					
3. General Information	:	The thresher is an axial flow type and consists of feed hopper, spike-tooth cylinder, concave, oscillating sieves and blower. The pegs are arranged in 10 rows on the cylinder. The cylinder is enclosed with the concave made of wire mesh with sieve opening of 80 x 25 mm size. Below this cylinder and concave assembly two oscillating sieves are fitted to separate the pods from leaves, soil and other dust materials. The blower fitted in between the two sieves helps to blow out the leaves.																					
4. Cost of the unit (approx)	:	Rs. 60,000/- without prime mover																					
5. Salient features	:	<table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Capacity</td> <td style="padding-right: 20px;">:</td> <td>150 kg pods/hour</td> </tr> <tr> <td>Labour requirement</td> <td style="padding-right: 20px;">:</td> <td>2 men &amp; 2 women</td> </tr> <tr> <td>Pod damage</td> <td style="padding-right: 20px;">:</td> <td>1 to 3 %</td> </tr> <tr> <td>Cleaning efficiency</td> <td style="padding-right: 20px;">:</td> <td>92 %</td> </tr> <tr> <td>Threshing efficiency</td> <td style="padding-right: 20px;">:</td> <td>98 %</td> </tr> <tr> <td>Saving in cost</td> <td style="padding-right: 20px;">:</td> <td>32%</td> </tr> <tr> <td>Saving in time</td> <td style="padding-right: 20px;">:</td> <td>70%</td> </tr> </table>	Capacity	:	150 kg pods/hour	Labour requirement	:	2 men & 2 women	Pod damage	:	1 to 3 %	Cleaning efficiency	:	92 %	Threshing efficiency	:	98 %	Saving in cost	:	32%	Saving in time	:	70%
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Saving in time	:	70%																					

## Power Tiller Operated Turmeric Harvester



1. Function	:	For harvesting turmeric rhizomes
2. Specification		
i. Type	:	Mounted type
ii. Power requirement	:	8 -10 hp power tiller
iii. Overall dimensions	:	400 x 636 x 1665 mm
iv. Weight	:	67 kg
v. Capacity	:	0.6 ha per day
3. General Information	:	The unit consists of a blade with three bar points for easy penetration into the soil. To the rear end of the blade six slats spaced at mm apart are hinged at both ends. The oscillating motion for the slats is obtained through eccentric provided on either side of the unit. The eccentrics are connected to a shaft provided at the top portion of the unit. The power is transmitted from the clutch pulley of the power tiller to a reduction gear box mounted near the hitch bracket assembly of the power tiller. From the gear box the power is transmitted to the shaft of the turmeric digger unit through V belt transmission. The pneumatic wheels are replaced with a pair of special type cage wheels to accommodate the height of ridges.
4. Cost of the unit	:	Rs. 14,000/-
5. Salient features	:	65 % saving in cost and 90 % saving in time. Damage caused to the rhizomes is 0.5 % as compared to 4.2 % in manual harvesting. The undug rhizomes left in the field is 0.8 % as compared to 4.8 % in manual harvesting.



## Tractor Drawn Turmeric Harvester



1. Function	:	For harvesting Turmeric rhizomes
2. Specification		
i. Type	:	Mounted type
ii. Power requirement	:	35 - 45 hp Tractor
iii. Width of the digger	:	120 cm
iv. Capacity	:	1.6 ha per day
3. General Information	:	The unit consists of a blade with five bar points for easy penetration into the soil. The blade is fixed at an inclination of 200 to a cultivator frame with straight tynes at both ends. It can be hitched to the tractor through three – point linkage connection provided in the front portion of the unit. The rake angle of the blade can be adjusted by moving the blade through a clevis provided at the bottom of the two tynes. At the rear end of the clevis two converging slats are fixed to convey the harvested turmeric with the soil on to the lift rods without spilling to the side ways. To the rear end of the blade seven lift rods of 250 mm length are provided. For digging, the bar points with the blade penetrate into the soil, lift the turmeric rhizomes from the soil. The soil slip back to the ground and the dug out rhizomes deposited at the centre of the unit.
4. Cost of the unit	:	Rs. 25,000/-
5. Salient features	:	Results in 70 per cent saving in cost and 90 per cent in time when compared to manual digging. Extent of damage caused to the rhizomes is very much less (2.83 per cent).

## Fodder Sorghum Harvester



1. Function	:	Harvesting and windrowing the fodder sorghum															
2. Specification																	
i. Overall dimensions	:	1100 x 1210 x 1280 mm															
ii. Weight	:	93 kg															
iii. Width of cutter bar	:	100 cm															
3. General Information	:	It is a modified version of IRRI reaper consisting of cutter bar assembly, gathering header, star wheels, conveyors, hitch frame attachment with an adjustable skid. The whole unit is attached to an IRRI designed power tiller. The front assembly has been suitably modified with one more set of gathering header assembly consisting of headers with star wheel assembly, conveyor flat belt with lugs provided at a height of 45 cm from the existing conveyor unit. The additional header assembly is fixed exactly above the lower header assembly. The main frame supporting all above components are also suitably modified. The power for the top conveyor belt is taken by extending the shaft from lower conveyor belt.															
4. Cost of the unit	:	Rs. 1 10,000/-															
5. Salient features	:	<table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Operated by</td> <td style="padding-right: 20px;">:</td> <td>5.4 hp light weight diesel engine</td> </tr> <tr> <td>Coverage</td> <td style="padding-right: 20px;">:</td> <td>0.75 ha/day</td> </tr> <tr> <td>Saving in labour</td> <td style="padding-right: 20px;">:</td> <td>85%</td> </tr> <tr> <td>Saving in cost</td> <td style="padding-right: 20px;">:</td> <td>43%</td> </tr> <tr> <td>Saving in time</td> <td style="padding-right: 20px;">:</td> <td>85%</td> </tr> </table>	Operated by	:	5.4 hp light weight diesel engine	Coverage	:	0.75 ha/day	Saving in labour	:	85%	Saving in cost	:	43%	Saving in time	:	85%
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## Maize Husk cum Sheller



1	Type	:	Power operated
2	Overall dimension	:	3000 x 710 x 1450 mm
3	Capacity	:	100 quintals of cob/day
4	Power required	:	7.5 hp electric motor / diesel engine or tractor pto power
5	General Information	:	The machine consists of a hopper, rotor, sieve, blower, auger and an elevator. The removal of sheath and shelling of cob take place in the rotor sieve assembly. The shelled kernels are carried by the auger to one end and then elevated to the desired level for direct collection in bags. Shelling Efficiency is 98%.
6	Cost of the unit	:	Rs.1,00,000/-



## Castor Sheller



1. Function	:	For shelling and cleaning castor pods
2. Specification	:	
i. Type	:	Power operated
ii. Power requirement	:	0.5 hp electric motor or one person
iii. Overall dimensions	:	1320 x 1050 x 800 mm
iv. Weight	:	72.5 kg
v. Capacity	:	165 kg /h
3. General Information	:	Traditionally castor is shelled manually after drying under sunlight, either by beating with It consists of feeding hopper, rubber coated disc type shelling unit and a blower. Castor is fed to the shelling unit through feed hopper. It is suitable for shelling and winnowing of dried castor pods. The unit can be either operated manually or with a 0.5 hp electric motor. It saves 88 per cent labour and operating time and 69 per cent on cost of operation compared to conventional method of manually beating or rubbing with wooden plank.
4. Cost of the unit (approx)	:	Rs. 15,000 /

## Coconut Tree Climber



1. Function	:	To harvest the coconuts
2. Specification		
i. Type	:	manual operated unit
ii. Power requirement	:	One male
iii. Overall dimensions	:	
iv. Weight	:	
v. Capacity	:	50 to 60 trees / day
3. General Information	:	
4. Cost of the unit	:	Rs.3000/-
5. Cost of operation (approx)	:	Rs.1.50 / tree
6. Salient features	:	<ul style="list-style-type: none"> <li>• Useful for climbing coconut trees for harvesting nuts, cleaning and other operations</li> <li>• Any unskilled person including ladies can climb the coconut trees using this unit</li> <li>• Requires 1.5 minutes to climb a tree of 30 to 40 ft height</li> </ul>

## Oil Palm Harvesting Tool



1. Function	: For harvesting of oil palms
2. Specification	
i. Type	: Manual operated unit
ii. Power requirement	: One male
iii. Overall dimensions	: -
iv. Weight	: -
v. Capacity	: 144 bunches / day
3. General Information	:
4. Cost of the unit (approx)	: Rs.800/- including 10 feet aluminium pole
5. Cost of operation	: Rs.1.11 / fresh fruit bunch
6. Salient features	: <ul style="list-style-type: none"> <li>• The sickle can be attached to as well as detached from long aluminium poles of various lengths as per the height of the tree</li> <li>• The operator can work for long time continuously without fatigue</li> <li>• Saves cost and time</li> <li>• 50% more bunches harvested than conventional method</li> <li>• Savings in time: 51%</li> <li>• Savings in cost: 33%</li> </ul>



## Tractor Operated Fruit-Shake Harvester



1. Function	:	For harvesting fruits by shaking branches
2. Specification		
i. Type	:	Mounted implement
ii. Power requirement	:	35 – 45 hp tractor
iii. Capacity	:	-
3. General Information	:	-
4. Cost of the unit (Approx)	:	Rs.3500/-
5. Cost of operation		Rs.8 per 100 kg
6. Salient features	:	<ul style="list-style-type: none"><li>• Harvest fruits by shaking branches</li><li>• Tractor PTO operated</li><li>• Suitable for tamarind, lime and other such fruits</li><li>• Harvesting efficiency: 85%</li><li>• Saving in time: 95%</li></ul>

## Mulberry Stem Cutter



1. Function	:	To cut the mulberry stem for planting
2. Specification		
i. Type	:	Hand cum pedal operated unit
ii. Power requirement	:	One male
iii. Overall dimensions	:	750 x 600 x 1050 mm
iv. Weight	:	26 kg
v. Capacity	:	2400 stems per hour
3. General Information	:	The unit consists of a wooden platform in which a cutting knife is fixed by means of a hinge. The knife is operated by means of a long handle. Stems are placed on the platform at an angle of 45° and they are cut by pressing the handle. The handle reaches its original position by the action of a spring attached to the other end.
4. Cost of the unit (approx)	:	Rs.4,000/-
5. Salient features	:	The stems are cut easily without damage.

## Power Tiller Operated Lawn Mower



1. Function	:	For mowing lawn grass
2. Specification	:	
i. Type	:	Mounted type
ii. Power requirement	:	8 -10 hp power tiller
iii. Overall dimensions	:	400 x 636 x 1665 mm
iv. Weight	:	79 kg
v. Capacity	:	0.8 ha per day
3. General Information	:	The cylindrical lawn mower attachment to power tiller consists of 750 mm width and 235 mm diameter cylinder fitted with 12 numbers of helical steel blades on its periphery. A horizontal ledger plate with a concave groove is provided beneath the cylinder. The rotating cylinder and the stationary ledger plate are fitted in a frame, which in turn is attached to the power transmission case and rotary driving shaft support arms. The power is transmitted from the power tiller rotary drive shaft to the cylinder shaft through chain and sprocket. A tail wheel is provided for controlling the height of cut. The unit is attached to the power tiller rotary hitch bracket assembly of the transmission case and the rear portion of the unit derives support from the power tiller handle through two support arms. During the operation in the field, the grass is cut when it is passed through the clearance between the rotating cylinder and the ledger plate and the cut grass is blown off. A shield is provided to protect the operator against throwing of cut grasses and stones.
4. Cost of the unit	:	Rs.16,000/-
5. Salient features	:	The unit is simple to operate and easy to handle Suitable for maintenance of lawns Results in 50 per cent and 64 per cent saving in cost and time respectively



## Lawn / Shrub Mowing Attachment to Power Weeder



1. Function	:	The machine is capable of cutting grasses on the farm roadsides and mowing lawns.
2. Specification		
i. Type	:	Self propelled
ii. Power requirement	:	3 hp petrol / kerosene engine and an operator
iii. Capacity	:	400 to 500 sq.m per hour for a single pass
3. General Information	:	<p>The weeds and grasses grown along the farm roadsides and in the bunds which needs periodical cleaning is the major problem faced by the farmers. Moreover, these grasses and weeds are not to be uprooted fully to ensure and prevent soil loss due to rain and wind. Similar aspect prevails in the landscaping process also like lawns. The commercially available units for lawn mowing and grass cutting are costing heavily.</p> <p>Two curved and sharpened high carbon steel blades of total length 38cm are mounted on a vertical shaft. A 3 hp petrol start kerosene run engine powers the self propelled traction unit and the lawn mover. The power is taken from the gearbox through v-belt, pulley and through a 90° conversion gearbox. The speed conversion ratio from the engine to the blades is 16:10. The traction wheel is replaced with 18” diameter and 1.5”thick six spoked rigid wheel for easy maneuverability. The front and back sides of the blades are covered with rubber and metal sheets respectively as a precaution to avoid the stones throwing away by the blades during operation. Width of coverage of the unit is 450 mm and the height of cut is 25 mm.</p>
4. Cost of the unit	:	Rs.35,000/

## Sugarcane Detrasher



1	Function	:	For de-trashing the sugarcane leaves
2.	Specification		
	i. Type	:	Manual operated
	ii. Power requirement	:	-
	iii. Capacity	:	-
3.	General Information	:	-
4.	Cost of the unit (Approx)	:	Rs.100/-
5.	Cost of operation	:	Rs.900 / ha
6.	Salient features	:	<ul style="list-style-type: none"><li>• Labour requirement is less</li><li>• Easy for handling</li><li>• Reduced cost of de-trashing</li><li>• Used for all varieties of cane</li><li>• Also removes the sprouted buds</li><li>• Easy collection of de-trashed leaves</li></ul>

## 4. MISCELLANEOUS EQUIPMENTS

### Hand cum Pedal Operated Chaff Cutter



1. Function	: To cut the chaff into bits for easy assimilation by animals. It is ideal for cutting green fodder, dry fodder and paddy straw. Uniform sized chaff bits can be obtained
2. Specification	
i. Type	: Manually operated
ii. Power requirement	: Manual
iii. Overall dimensions	: 920 x 540 x 1225 mm
iv. Weight	: 40 kg
v. Capacity	: 300 kg green fodder/hour
3. General Information	: The improved chaff cutter consists of a feeding tray, curved blade fixed on to a spring loaded lever and a suitable frame work. It was observed that the operator feels more comfortable, and experiences less fatigue in working on this improved machine to cut fodder. Since both hand and leg forces are synchronized to effect cutting of the hour.
4. Cost of the unit(approx)	: Rs. 6000/-
5. Salient features	: Operated by hand and leg simultaneously with minimum effort. Uniform sized pits can be optioned Ideal for cutting green fodder, dry fodder and paddy straw.



## Power Tiller Operated Axial Flow Pump



1. Function	:	To lift water from open water sources
2. Specification	:	
i. Type	:	Axial flow type
ii. Power requirement	:	8 to 10 hp power tiller
iii. Overall dimensions	:	300 x 750 x 620 mm
iv. Weight	:	26 kg
v. Capacity	:	2500 litres per minute at 3.0 m head
3. General Information	:	The unit consists of a specially designed axial flow impeller which is secured to a pump shaft and encased inside a 19 cm diameter mild steel discharge tube .The impeller has two mild steel sheet-metal vanes welded to a threaded hub and has an average pitch of 20 degree. The impeller shaft runs in a long nylon bearing housed in mild steel tube which is welded to the pump assembly at an inclination of 30 degree. The pump can be coupled to the power tiller engine pulley through a flexible shaft supported by a frame near the power tiller engine and it is aligned perfectly by fixing the pump in desired position through hinge and adjustable frame. Behind the axial flow impeller is a set of diffusion vanes which serve to straighten the spiral flow from the impeller for improved efficiency.
4. Cost of the unit (approx)	:	Rs. 16,000/-
5. Salient features	:	Highly suitable for lifting water from open water sources Capacity is 2 to 3 times higher than that of centrifugal pumps for lifts between 1.0 and 3.0 meters and hence high efficiency at lower lifts

## Power Tiller Operated Heavy Duty Auger Digger



1. Function	:	To dig holes for planting tree saplings
2. Specification		
i. Type	:	Screw auger type
ii. Power requirement	:	8 to 10 hp power tiller
iii. Overall dimensions	:	400 x 635 x 1635 mm
iv. Weight	:	50 kg
v. Capacity	:	25 -30 holes per hour
3. General Information	:	It consists of a spiral auger of 225 mm dia and 100 mm pitch actuated by a rack and pinion arrangement. The drive for the circular motion of the auger is effected through belt pulley and bevel gear transmission with a ratio of 1:1 from the engine pulley of the power tiller directly. The entire assembly is mounted on a rectangular frame with necessary bearings and fixtures. The hand wheel provided at the side of the unit can be effectively used for the depth control. For increased size of holes, replaceable type larger diameter auger bits of 250, 275 and 300 mm can be used. A balancing frame attached to the hitch bracket assembly in the rear and a support wheel fitted in the front portion of the unit counter the down suction offered by the auger while digging, ensure easy movement in the field, reduction of drudgery and easy manoeuvrability.
4. Cost of the unit (approx)	:	Rs. 35,000/-
5. Salient features	:	Results in 16.0 and 91.0 per cent saving in cost and time when compared to manual digging of holes It can reach spots where tractor entry and manoeuvrability are difficult

## Coir Pith Applicator



1. Function	:	For subsoil mulching
2. Specification	:	
i. Type	:	Tractor operated, built around the chisel plough
ii. Power requirement	:	35 to 45 hp tractor
iii. Overall dimensions	:	840 x 1000 x 12390 mm
iv. Weight	:	50 kg
v. Capacity	:	0.5 ha per day
3. General Information	:	The subsoil coir pith mulching machine was built around chisel plough which formed the tool for loosening the soil and also provided a frame for mounting the attachment. Coir pith was fed from a hopper through a rotary vane type feeding device and was funneled into the furrow bottom. A pair of furrow opener wings hold the furrow opener behind the chisel plough for placement of the subsoil mulch. The rotary vane type metering device was manually operated and ensured uniform placement of coir pith inside the furrow. The unit was found to have a draft of 500 kg under red soil conditions and 600 kg under black soil conditions.
4. Cost of the unit	:	Rs. 12000/-
5. Salient features	:	The uniformity of feed rate was found to be at 90 %

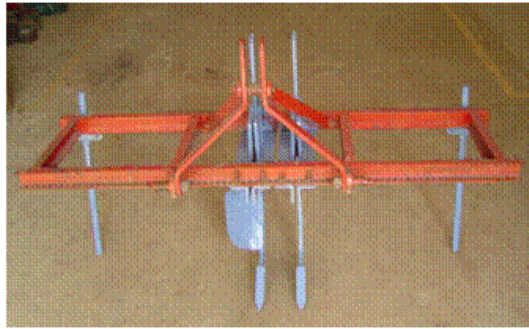


## Subsoiler Attachment for Stump Removal



1. Function	:	To remove roots
2. Specification	:	
i. Type	:	Tractor mounted implement
ii. Power requirement	:	Tractor mounted
iii. Overall dimensions	:	
iv. Weight	:	
v. Capacity	:	
3. General Information	:	
4. Cost of the unit	:	Rs.10,500 (including subsoiler)
Cost of operation	:	Rs.2.00 per stump
5. Salient features	:	<ul style="list-style-type: none"><li>• Complete removal of roots</li><li>• Tractor operated equipment</li><li>• Attachment to chisel plough</li></ul>

## Banana Clump Remover



1. Function	:	To remove banana clumps
2. Specification		
i. Type	:	Tractor mounted
ii. Power requirement	:	
iii. Overall dimensions	:	
iv. Weight	:	
v. Capacity	:	4 ha / day
3. General Information	:	
4. Cost of the unit (approx)	:	Rs.10,000/-
Cost of operation	:	Rs.500 / ha
5. Salient features	:	A tractor operated implement to remove banana clumps. Labour required :2 (1 driver + 1 helper). Savings in time :85% Savings in labour: 90%

## Cotton Stalk Puller



1. Function	: For pulling cotton stalks
2. Specification	
i. Type	: Tractor PTO (Power take off) driven implement
ii. Power requirement	: -
iii. Overall dimensions	: -
iv. Weight	: -
v. Capacity	: 0.8 - 1.2 ha / day (Rs.250 / hr)
3. General Information	:
4. Cost of the unit (approx)	: Rs.60,000/-
5. Salient features	: Counter rotating pulling wheels. Row to row distance can be adjusted from 0.75 to 1.2 m. Savings in time: 97% Savings in cost: 31%



## 4. COMMERCIAL EQUIPMENTS

### Tractor Drawn Disc Plough



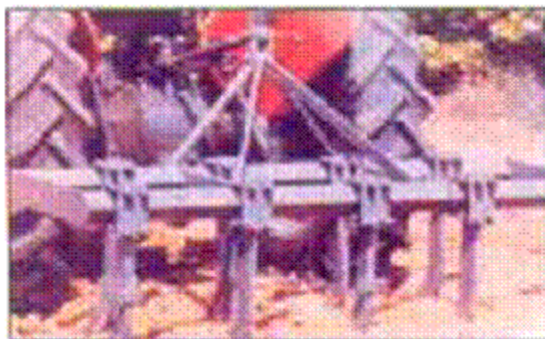
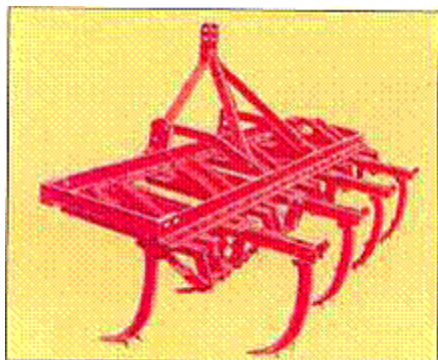
1 Function	: For primary tillage and is especially useful in hard and dry, trashy, stony or stumpy land conditions and in soil where scouring is a major problem.
2 Specifications	
Number of furrows	: 2- 4
Disc size (mm)	: 600-800
Length (mm)	: 1180-2362
Width (mm)	: 889-1194
Height (mm)	: 1092-1118
Width of cut per disc (mm)	: 200-300
Adjustable working width (mm)	: 600-1200
Working depth (mm)	: up to 300
Power requirement (hp)	: 25-50, tractor
Weight (kg)	: 236-376
3 General Information	: The plough consists of common mainframe, disc beam assemblies, rockshaft category -1 or category -2, a heavy spring loaded furrow wheel and a gauge wheel. In some models disc plough is designed to operate as 2, 3 or 4 bottom, by adding or removing the sub beam assemblies according to requirement. The disc angler angles from 40 to 45 to obtain the desired width of cut and the tilt angle ranges from 15 to 250 for penetration. The discs of the plough are made of high carbon steel or alloy steel and the edges are hardened and sharpened. The discs are mounted on tapered roller bearings. Scrapers prevent soil build up in the discs in sticky soils. The furrow slice rides along the curvature and is pulverized to some extent before being thrown.

## Tractor Mounted Disc Harrow



1. Function	: For primary and secondary tillage
2. Specification	
i. Type	: Tractor mounted
ii.Length (mm)	: 1980-226
iii.Width (mm)	: 1150-1900
iv.Height (mm)	: 1143-1350
v.Number of discs	: 10-16
viDiameter of discs (mm)	: 457-660
vii.Pitch of discs	: 228-280
viii.Weight (kg)	: 330-490
ix.Power requirement (hp)	: 20-60, tractor
x.Capacity (ha/day)	: 2.5
3. General Information	: The tractor mounted disc harrow consists of two gangs of discs mounted one behind the other. The discs on the front gang throw soil outward and the rear gang inward. Therefore, no soil remains uncut by the offset disc harrow. The harrow consists of a sturdy frame, discs arranged in two gangs, and three-point linkage. Discs are important component of the harrow and are made from high carbon steel or alloy steel; the cutting edges are hardened and tempered to suitable hardness. The gangs can be moved in either direction on the hitch frame. The rear gang can be moved the same amount as the front gang. When operating in orchards or plantations, the harrow can be offset to the right or left, thus enabling soil to be thrown towards or away from the trees. The offset -feature makes it possible to work under low- hanging branches. Discs with notches on the outer rim are also available for operation in weed – infested fields. Three point hydraulic linkage and hydraulic control makes it highly manoeuvrable.

## Spring Tyne Cultivator



1. Function	:	For seedbed preparation both in dry and wet soils. It is also used for interculture purpose by adjusting the tynes in wider row crops. It is also used for puddling purposes.
2. Specification	:	
Type	:	Tractor mounted
Source of power (hp)	:	35, tractor
Length(mm)	:	1960-300
Width (mm)	:	970-1560
Height (mm)	:	1070-135
Number of tynes	:	9-13
Diameter of spring wire(mm)	:	9.5
Number of coils in spring	:	28
Number of springs per tyne	:	2
Working Width(mm)	:	2100-300
Working Depth (mm)	:	140-170
Under Frame Clearance (mm)	:	450-550
Capacity (ha/h)	:	0.35-0.5
Type of shovels	:	Reversible shoe type
Weight (kg)	:	120-30
3. General Information	:	Cultivator consists of a frame, tynes with reversible shovels, land wheel, hitch system and heavy-duty springs. The function of springs is to save the cultivator tynes from breaking when some hard object comes in contact with the shovel or under the tyne. The shovels are made of heat-treated steel for longer life. The implement is mounted type and is controlled by the hydraulic system of the tractor.



## Rigid Tyne Cultivator



1. Function	: For loosening and aerating the soil and preparing seed beds quickly and economically. It is useful for subsoil cultivation and also eliminates the use of plough even for hard soils.
2. Specification	: Tractor mounted
Type	: 850
Length (mm)	: 2000
Width (mm)	: 1010
Height (mm)	: Mounted Implement
Type	: 235
Weight (kg)	: 35 -40, tractor
Power requirement (hp)	: 9
Number of tines	: 470
Under frame clearance (mm)	: 4
Capacity, ha/day	: It is a tractor-mounted implement and consists of mainframe made of box section, rigid tines, Uclamps and shovels. The clamping of tines makes possible to adjust the distance between them according to crop rows. The shovels are made from medium carbon steel or low alloy steel, hardened and tempered to suitable hardness. The shovels are mounted on the tynes with fasteners and can be replaced easily on wearing or becoming dull. The depth of operation is controlled by the hydraulic system of the tractor. The shovels can be replaced by duck foot sweeps for shallow tillage.
3. General Information	

## Tractor Drawn Ridger



1. Function	: For making furrows and ridges for sugarcane, cotton, potato and other row crops.
2. Specification	
Type	: Tractor drawn
Length(mm)	: 1000-2000
Width (mm)	: 600-2000
Height (mm)	: 1000-1100
Wingspan adjustment(mm)	: 350-500
Number of base	: 2-5
Row spacing (mm)	: Adjustable 610 to 860
Weight (kg)	: 150-230
Power requirement (hp)	: 30-50, tractor
Capacity (ha/day)	: 2
3. General Information	: The ridger is used in sugarcane growing area of the country. It consists of rectangular frame made of mild steel angle or channels action, 3 -point hitch assembly, shanks and ridger body. The ridger body consists of two mould boards, share, point and tie bars to vary the wingspan of ridgers. The share point is made from medium carbon steel or low alloy steel, hardened and tempered to about 42 HRC. Upon wearing or becoming dull the share point can be replaced. The ridger is operated in tilled soil by a tractor, the share point penetrates in the soil, ridger body displaces the soil to both sides and a furrow is created. The soil mass between furrows forms a ridge. The depth of operation is controlled by hydraulic system of the tractor.

## Post Hole Digger - Tractor Operated



1. Function	:	To dig holes for planting tree saplings
2. Specification	:	
Type	:	Screw auger type
Overall dimensions (L x W x H), mm	:	2390 x 840 x 1430
Auger diameter, mm	:	450
Weight, kg	:	240
Cost of equipment, Rs.	:	65,000
Power source	:	Tractor
Fuel used	:	Diesel
Horse power required, kW or hp	:	35 hp
Diameter of hole, mm	:	450
Maximum depth of operation, mm	:	900
Labor required	:	1 operator, 1 helper
Cost of operation Rs ha <sup>-1</sup>	:	3200 (for owned tractor), 7244 (for hired tractor)
Capacity, pits h <sup>-1</sup>	:	90
Power transmission system (Indicate speed at different points)	:	Gear box transmission ratio- 1:2
3. General Information	:	Tractor Post Hole Diggers is supplied with a heavy-duty gear box and PTO shafts. Minimum Horse Power required to run this implement is 35 HP and above.



## Rotovator



1. Function	:	For use in dry as well as wet land cultivation
2. Specification		
Type	:	Tractor operated
Power source (hp)	:	35 or above, Tractor
Length (mm)	:	1760-2080
Width (mm)	:	950-1050
Height (mm)	:	935-1110
Working width of rotovator (mm)	:	1000-2000
Shape of blade	:	L-Shape
Thickness of blade (mm)	:	7-10
Diameter of rotor shaft (mm)	:	70-90
Rotor diameter (mm)	:	420-435
Revolution of rotor shaft (rpm)	:	210-237
Weight (kg)	:	280-415

## Seed cum Fertilizer Drill



1. Function	:	For sowing of groundnut, pulses and other cereal crops in already prepared field.
2. Specification		
Type	:	Tractor operated
Power source (hp)	:	35, tractor
Length (mm)	:	1940-2310
Width (mm)	:	970-1560
Height (mm)	:	1070-1350
Seed metering mechanism	:	Fluted roller or Bhadson type
Fertilizer metering mechanism	:	Gravity feed or corrugated roller type
Power transmission	:	Through chain and sprockets
Number of furrow opener	:	9-13
Furrow opener	:	Reversible shovel
Seed box capacity (cm <sup>3</sup> )	:	66241-10308
Fertilizer box capacity (cm <sup>3</sup> )	:	63310-10141
Weight (kg)	:	224-328
3. General Information	:	The seed cum fertilizer drill machine consists of seed box, fertilizer box, seed metering mechanism, fertilizer metering mechanism seed tubes, furrow openers, seed rate adjusting lever and transport cum power transmitting wheel. The fluted rollers are driven by a shaft. Fluted rollers, which are mounted at the bottom of the seed box, receive the seeds into longitudinal grooves of fluted roller and expel them in the seed tube attached to the furrow openers. By shifting the rollers sideways, the length of the grooves exposed to the seed, can be increased or decreased and hence the amount of seed sown is changed .The seed cum fertilizer drill is popular in northern region of the country.

## Naveen Dibbler



1. Function	:	For sowing of bold seeds such as peas and also for gap filling in rows
2. Specification		
i) Type	:	Manually operated
ii) Weight (kg)	:	2.5
iii) Capacity (hills/ h)	:	300- 400
3. General Information	:	The automatic dibbler is manually operated hand tool which consists of a seed hopper, cell type roller for metering of seeds, spring actuated jaws for penetration in the soil, pipe and handle .All the parts are made from mild steel except seed roller, which is fabricated from good quality wood. For its operation, the dibbler is held in both hands and jaws are pushed into the soil to the desired depth at an angle of 20 degrees with vertical. The dibbler is given a jerk at the handle in the forward direction, which rotates the roller in seed hopper and releases one or two seeds depending upon the size of cell. At this moment the jaws also open and allow the seed to fall in the cavity created by the jaws. The dibbler is raised and moved to the next position of sowing. Upon raising of the dibbler the roller returns to original position and jaws also close.



## Manually Operated Fertilizer Broadcaster

1. Function	:	For broadcasting granular fertilizers like urea, DAP etc in the field uniformly.
2. Specification	:	
Type	:	Manually operated
Power source	:	One person
Hopper bottom shaped	:	Cone
Length (mm)	:	280
Width (mm)	:	410 -415
Height (mm)	:	441 -450
Hopper capacity (kg)	:	12-15
Shape of metering hole	:	circular
Spreading disc spinner diameter, (mm)	:	225 -273
Vertical clearance from hopper bottom(mm)	:	24 -44
No of fins	:	8
Weight (kg)	:	3.8 -10
3. General Information	:	It consists of a hopper with tapered bottom, with a side slope of about 46 degrees. A circular disc having X sections is fitted on a vertical shaft below the fertilizer hopper and is rotated by a handle through gear arrangement. The gear ratio between the handle and the spreading disc is 1:8.4. A metered quantity of the fertilizer through adjustable opening falls on the disc, which spreads uniformly due to centrifugal force. Machine is mounted on the shoulders and is operated at a forward speed of about 2.0 km/h.

## Self Propelled Power Weeder



1. Function	:	For weeding and intercultural operations in upland row crops like groundnut, maize, soybean pigeon pea, etc
2. Specification	:	
Type	:	Self propelled
Overall dimensions (mm)	:	2300 x 1000 x850
Engine	:	3 hp petrol- start- kerosene-run
Chassis	:	70 x70 mm box section chassis
Wheels	:	Two steel lugged drive wheels of 500 mm diameter and 110 mm width mounted on on hexagonal shaft. Tread width ajustment from400 to 650 mm.
Height (mm)	:	441 -450
Weeding tool	:	120 and 150 mm V-shaped, 900 sweep blades
Weight (kg)	:	100
3. General Information	:	The self propelled weeder consists of a box section chassis, 3-hp petrol -start- kerosene run engine, transmission system, drive wheels, tool mounting bar of 70 x 70 mm size. The engine, gearbox and tool mounting bar are fixed to main chassis. The engine is mounted on front side of the chassis on proper foundation. The gearbox with transmission system is mounted in the middle of chassis. Two steel lugged drive wheels of 500 mm diameter and 110 mm width are mounted on both ends of hexagonal shaft connected to transmission box. The wheel tread(spacing between two wheels) can be adjusted from 400 to 650 mm to suit the row to- row spacing of different crops. The spacing between sweeps is easily adjusted by sliding the tynes on tool mounting bar to suit the crop row spacing. A lever operated clutch! idler pulley is used for tightening! loosening of V -belt, transmitting the power from engine to transmission box. For operation, the tynes are adjusted to the raised position so they do not dig into the ground and the weeder is transported to the field. The tynes are adjusted according to the row spacing of the crop and depth of operation

## Wheel Hoe



1. Function	:	For weeding and interculture of vegetables and other crops sown in rows
2. Specification	:	
Overall length (mm)	:	1400- 1500
Overall width (mm)	:	450- 500
Overall height (mm)	:	800- 1000
Number of tynes	:	3 Nos
Wheel diameter (mm)	:	200- 600
Working depth (mm)	:	Upto 60
Weeding tool	:	120 and 150 mm V-shaped, 900 sweep blades
Weight (kg)	:	4- 12
3. General Information	:	<p>The wheel hoe is a widely accepted weeding tool for weeding and intercultural in row crops. It is a long handled tools operated by push and pull action. As the name implies, the general construction of wheel hoe comprises of wheel assembly, miniature tool frame, a set of replaceable tools and handle assembly. The number of wheel varies from one to two and the diameter depends upon the design. The frame has got a provision to accommodate different types of soil working tools such as straight blade, reversible blades, sweeps, V -blade, tine cultivator, pronged hoe, miniature furrower, spike harrow (rake) etc. which can be operated by a single person. The handle assembly has a provision to adjust the height of the handle to suit the operator. All the soil working components of the tool are made from medium carbon steel and hardened to 40-45 HRC. The other assemblies of the wheel hoe are made from structural mild steel and thin walled mild steel pipes. The working depth of the tool can be adjusted with the help of clamp or through the plate with multiple holes provided in the frame and welded to the tool assembly. The handle height is also adjustable. Some of the designs are provided with a pulling ring in the frame, which enables it to be operated by two persons. For operation, the working depth of the tool and handle height is adjusted and the wheel hoe is operated by repeated push- pull action which allows the soil working components to penetrate into the soil and cut/uproot the weeds in between the crop rows. With this action, the weeds also get buried in the soil.</p>



## Hand Operated Sprayers/ Dusters



1. Function	:	It is ideal for small nurseries, rose plants, kitchen gardens and spraying wettable insecticides and fungicides
2. Specification	:	
Type	:	Manually operated
Diameter of the tank (mm)	:	130
Height	:	210
Weight (kg)	:	1.2
3. General Information	:	<p>The hand sprayer is a small capacity pneumatic sprayer. It consists of chromium plated brass tank having a capacity of 0.5 to 3 litres (one litre is more common) which is pressurized by a plunger pump. The air pump remains inside the tank. The sprayer has a short delivery tube to which a cone nozzle is attached. In some models, the nozzle is attached at the top of the tank with flow spring actuated lever, which regulates the flow of the spray liquid. For spraying, the tank is usually filled to three-fourths capacity and pressurized by air pump. The compressed air causes the agitation of the spray liquid and forces it out, on operation of the trigger or shut off type valve. Usually the chemicals with suspension characteristics cannot be effectively sprayed with this type of sprayer. For spraying wettable powders the sprayer is shaken frequently to prevent settling of the chemical. For operation, the spray nozzle is directed to the target after charging. It is fitted with mist spray nozzle with gooseneck bend. The pump assembly is made of brass and operated by one person</p>

## Power Tiller Mounted Orchard Sprayer



1. Function	:	For spraying of foliage, in orchard crops like pomegranate, orange, sweet lime and grapes
2. Specification	:	
Type	:	Power tiller operated
Power source(hp)	:	12-14, power tiller
Discharge(1/min)	:	36
Pressure (kg/cm <sup>2</sup> )	:	950
Drive	:	30-35
Type	:	Clutch pulley
Tank Capacity	:	200
Number of nozzels	:	6
Nozzel spacing	:	325
3. General Information	:	It consists of an HTP (horizontal triplex piston) pump, trailed type main chassis with transport wheels, chemical tank with hydraulic agitation system, cut off device and boom equipped with turbo nozzles. It is fitted with turbo nozzles with operating pressure of 9-18 kg/cm <sup>2</sup> . It generates droplets of 100-150 micron sizes. Depending upon the plant size and their row spacing, the orientation of booms can be adjusted. The spray booms are mounted behind the operator.

## Hand Rotary Duster



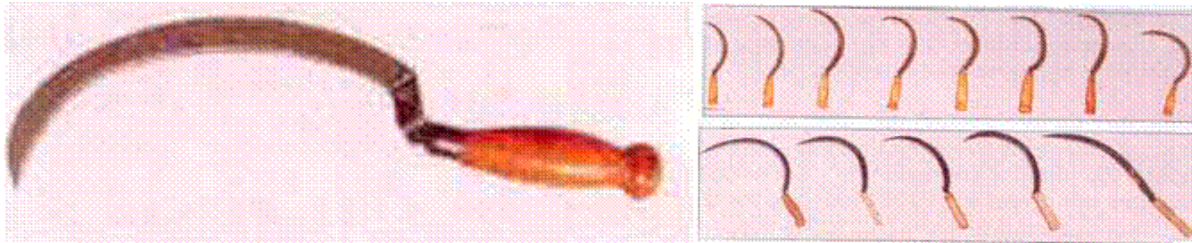
1. Function	:	For control of pests and diseases by use of chemicals in the dust forms in nursery, vegetable gardens, field crops, tea and coffee plantations, green houses, glasshouses and godowns.
2. Specification	:	
Type	:	Manually operated
Overall length (mm)	:	280
Overall width (mm)	:	330
Over all Height(mm)	:	330
Weight(kg)	:	3.5
Hopper capacity(1)	:	5
Field capacity	:	6 (field crops)
3. General Information	:	<p>The hand rotary duster is available in two models, shoulder mounted and belly mounted. It is a common type of duster being used by the farmers. The duster consists of a hopper, fan/blower, rigid/flexible discharge pipe, reduction gearbox, rotating handle, shoulder straps, and metering mechanism. The duster has mechanical agitator connected to the gearbox placed in the hopper, which chums the chemical and prevent clogging of the outlet. The adjustable orifice plate mounted below the hopper outlet controls the application rate. For operation, the hopper is filled 1/2 to 3/4th of the capacity of the hopper. This is mounted on the shoulder/belly with the help of adjustable straps. The discharge pipe fitted with spoon type deflector is directed towards the target continuously rotating the handle. The chemical in dust/powder form drops from the hopper in the discharge pipe having an air stream created by the blower. These dust particles emerging in, the form of cloud from the discharge pipe are carried to the plant where these settle on the leaves, stems and other parts.</p>



## Foot Sprayer

1. Function	:	The foot sprayer is all purpose sprayer, suitable for both small and large scale spraying on field crops, in orchards, vegetable gardens, tea and coffee plantations, rubber estates, flower crops, nurseries etc
2. Specification	:	Foot operated
Type	:	Foot operated
Overall length (mm)	:	440
Overall width (mm)	:	170
Over all Height(mm)	:	980
Weight(kg)	:	10.0
Hopper capacity(1)	:	14-8
Field capacity	:	1(with one lance) and 1.5-2.0(with two lances)
3. General Information	:	The foot sprayer is one of the ideal and versatile sprayers used for multipurpose spraying jobs.. The sprayer consists of a pump operated by the foot lever, suction hose with strainer, delivery hose, spray lance fitted with shut off pistol valve, gooseneck bend and adjustable nozzles. The sprayer does not have inbuilt tank, therefore an additional storage device or container is required to store the spray liquid in which the strainer of suction hose remain submerged It has provision for the two discharge lines, which increases its versatility and field capacity. The plunger pump being a positive displacement pump, builds up a high pressure to throw spray liquid to larger distances with a suitable boom. The pump barrel, lance and the spray nozzle are made from brass alloy. For operation the inlet pipe is placed in the storage container and one person continuously operates the pump by foot lever. There is a provision for the operator to hold the sprayer at the top by V-type fixture. The other person directs the lance to the target. For spraying tall trees up to a height of to m, a high jet or bamboo lance can be used.

## Improved Sickles of Different Designs



1	Function	:	The sickle is general purpose harvesting hand tool. It is used for the harvesting of vegetables, cereal crops and cutting of the grass and other vegetative matters.
2	Specifications	:	
	Overall length (mm)	:	260-420
	Overall width (mm)	:	145-200
	Overall height (mm)	:	25- 75
	Blade thickness (mm)	:	1.5-4, tapered to the cutting edge
	Length of cutting edge (mm)	:	130-210
	Hardness of the cutting edge	:	37-46 HRC
	Weight (g)	:	150-400
3	General information	:	Sickle is one of the most common hand tools used for harvesting of the crops, grass and cutting of other vegetative matters. It consists of curved steel edged blade fixed to the wooden handled the cutting edge may be plain or serrated depending upon the design. The curvature of the blade differs widely in plain edged and serrated sickles. The blade is fabricated from medium carbon or high carbon steel and hardened to resist wear. Manganese steel, tool and alloy steel can also be used to produce better quality sickles which have more than the sickles fabricated from the plain carbon steel. The blade has a knife section and thickness reduces towards the cutting edge. The tang of the blade is inserted in to the wooden handle for joining the blade to the handle. The wooden handle is either straight or bent at the end. For cutting, the part of the plant to be cut is held in one hand and sickle operated with other hand. Cutting is achieved by imparting translatory and rotary movement to the blade around the point of cut. This action leads to applying frictional and shearing force components required to achieve cutting.

## Bhendi Plucker



1	Function	:	For plucking of bhendi (ladies finger) from plant.
2	Specifications		
	Length (mm)	:	140
	Width (mm)	:	95
	Weight (kg)	:	0.15
	Capacity (kg/day)	:	50
3	General information	:	The tool is ergonomically designed. The plucker consists of two arms hinged together, cutting blades joined to open ends of arms and two rings joined to the arms. The blades are made of medium carbon steel or low alloy steel, hardened and tempered to suitable hardness. Panicles are cut individually using this tool. The operator is spared of drudgery, discomfort and itching to skin of his hands, which are associated with conventional method of manual plucking without any aid. It fits in to the hand properly with the help of two rings, one over thumb and another over index finger. Force to cut the pedicle is exerted by pressing these two fingers against each other. Pedicle is sheared between two straight blades, one of which is notched for better grip.



## High Capacity Multi crop Thresher (CIAE, Bhopal)



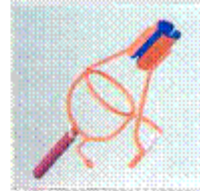
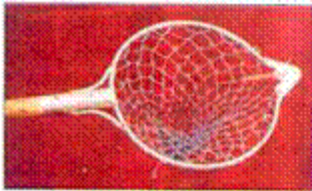
1 Function	: For threshing of wheat, maize, soybean, sorghum, sunflower, pigeon pea, gram, mustard and other similar crops.
2 Specifications	<ul style="list-style-type: none"> <li>Length x Width x Height (mm) : 3420x2430x2330</li> <li>Power Requirement (hp) : 35, Tractor or 20 Electric motor</li> <li>Cylinder : Spike tooth type 700 mm dia and 960 mm length</li> <li>Concave : 7,9 and 25 mm gap between square bars</li> <li>Sieves : Three (5, 9 and 11 mm)</li> <li>Cylinder speed (rpm) : 200-500</li> <li>Blower speed (rpm) : 800-900</li> <li>Shaker speed (rpm) : 350</li> <li>Feed roller speed (rpm) : 145</li> <li>Weight (kg) : 1200</li> </ul>
3 General information	: The high capacity multi-crop thresher consists of a spike tooth cylinder, three-aspirators, cleaning sieves and feeding system. For operation the dry crop is fed continuously in feeding hopper, loose or in the form of bundles. Feed rollers provided in the feeding hopper, push the crop into the threshing drum. The beaters or spikes on the threshing cylinder hit the crop and the impact causes detachment of grains from the ear heads of the crop. The straw and some unthreshed grains move around the cylinder. The rubbing action between the straw, threshing drum and concave threshes the rest of grains and the straw is broken in the form of chaff. Threshed grains, chaff and other foreign matters pass through the concave openings and fall on the oscillating sieve assembly. The aspirators suck and blow out the chaff and lighter impurities through outlet. Cleaning sieves further separate the heavy straw, bigger impurities, clean grain, broken grain through oscillating motion of sieve assembly. The secondary inlet of blower does final cleaning and clean grain is obtained at the main grain outlet.

## Power Operated Coconut Dehusker



1	Function	:	For dehusking of coconut
2	Specifications		
	Stationary concave width (mm)	:	250
	.Rotating drum width (mm)	:	250
	No of rollers	:	2
	Size of roller ( 1xdia) (mm)	:	280 x 955
	Number of teeth on rollers	:	15
	Frame (1 x b x h) (mm)	:	1020 x 380 x 970
	Length of knives (mm)	:	12
	Power source (hp)	:	3, Electric motor
3	General information	:	The machine is used for dehusking of coconut. It consists of semi-circular stationary concave and rotating drum with knives. The electric motor (3 hp) with 10: 1 speed reduction unit is used to drive the drum. The power is transmitted from motor to reduction unit using V -belt and further power from reduction unit to rotating drum is transmitted with chain and sprockets. During operation, the small knives bite the coconut fed through the inlet. At the outlet the nut is fed through two rollers to remove parts of husk remaining on the nut after dehusking.

## Manual Fruit Harvester



1	Function	:	For harvesting of fruits.
2	Specifications		
	Length (mm)	:	400
	Width (mm)	:	290
	Weight (kg)	:	0.45
	Capacity (kg/h)	:	65
	Power source	:	Manual single person
3	General information	:	It is a manual-harvesting tool with which individual fruit is first held between two jaws and then twisted to shear off the stock. The jaws are made of 14 gauge mild steel sheet. These are held together by a tension spring on a pivot fitted on 10 mm mild steel rod. A handle can be fitted to the tool. One of the jaws has a fever bracket and rope arrangement for operating the jaw. 3 mm thick rubber sheet padding is provided on inside of the jaws to avoid any skin damage while holding the fruits. After its detachment, fruit is released by pulling the cord in to a ring. A cloth conveyor or net is provided below the jaws for collection of harvested fruits at ground level without any damage. The tool is suitable for harvesting peach, pear and orange. Its field capacity is 250-300 fruits /man-h.



## Seed Treating Drum



1. Function	:	It is used for thorough mixing of chemicals like Agrosan and Sirason with seeds before sowing as a plant protection measure.
2. Specification		
Dimensions(l*w**h),mm	:	0.90 x 0.70 x 0.40
Weight(kg)	:	25
Tank capacity, (kg)	:	10
Drum size, diameter* length	:	300*600
Power source	:	One person
3. General Information	:	It consists of a drum mounted on a frame at 400 with horizontal and operated manually by a crank handle. It is used for thorough mixing of chemicals like Agrosan and Sirason with seeds before sowing as a plant protection measure. It saves 33 per cent labour, operating time and cost of operation over conventional method of mixing manually with hand. It costs Rs 1200/- and its cost of operation is Rs 1.7 /kg.