

1.Introduction

1.1 Arunachal Pradesh

a) General Information:

Arunachal Pradesh attained its statehood on 20th February 1987. Arunachal Pradesh (Land of the Dawn-Lit Mountains) is situated in the North-Eastern part of India with 83743 sq. kms area and has a long international border with Bhutan to the west (160 km), China to the north and north-east (1,080 km) and Myanmar to the east (440 km). It is situated between latitude 26° 30' N and 29° 30' N and longitude 91° 30' E and 97° 30' E. Its main rivers are Siang, Kameng, Subansiri, Kamla, Siyum, Dibang, Lohit, Noa - Dihing, Kamlang, Tirap. The population of Arunachal Pradesh is 10, 97,968 (according to 2001 census). The state has the lowest density of 13 persons per sq. km. The sex ratio of Arunachal Pradesh at 893 females to 1000 males is lower than the national average of 933. Total literacy of the State rose to 44.24% from 41.59% in 1991. Arunachal Pradesh is considered as one of the world's biodiversity spots owing to the geographical diversity and corresponding climatic conditions and a wide variety of wild life flora and fauna. The land is mostly mountainous with the Himalayan range along the northern borders criss-crossed with ranges running north- south.

a) Agro and sub agro-climatic zones

Arunachal Pradesh lies in Eastern Himalayan zone of India. Arunachal Pradesh has four sub agro- climatic zones and four distinct agro-climatic zones and five river valleys: the Kameng, the Subansiri, the Siang, the Lohit and the Tirap.

a) Cropping Pattern

The soil and climatic condition of the state offers an ideal condition for the production of a wide variety of fruits and vegetables. In the valleys and foothills, tropical fruits like pineapple, oranges and banana are produced, while in cold and high altitude areas, temperate fruits like apple, peach, plum, etc. are grown. Vegetables are grown in all areas,

the plains, the foothills, in the valleys and on the high hills. Besides fruits and vegetables, there are vast potential for the cultivation of coffee and more tea in Arunachal Pradesh.

c) Scope of Farm Mechanization :

Arunachal Pradesh with a massive 94% rural population, is the largest state in the North-East India. Consequently, the economy of the state is based of agriculture. Jhum cultivation and Terrace farming are the major patterns that the farmers employ to uplift agriculture in Arunachal Pradesh. Most of the agriculture operations are performed by using animate power sources. In Jhum cultivation only hand tools are used such as spade, khurpi, sickle, dibbler, daw, grass slacer etc. Lands are prepared by cutting down with the help of fawrah or spade and sowing is done manually by dibbling. Out of 83,743 sq. kms of agriculture land in Arunachal Pradesh occupies only 1.10 lakh hectares under Jhum cultivation and 90 lakh hectares under permanent cultivation. The topography and climate of Arunachal Pradesh is conducive for the cultivation of rice, millet, wheat, pulses, sugarcane and potatoes. Since most of the farm, operations in Arunachal Pradesh are done by manually or using animal power hence, there is great scope of selective mechanizing by introducing improved hand tools such as improved sickles, dibblers, weeders, etc. in order to reduce drudgery. The seed bed preparation operations should be mechanized by promoting animal/power tiller drawn equipment.

1.2 Assam

a) General Information:

The gateway to the North-East, Assam is one of the oldest state of India known for scenic beauty, as a land of blue hills and beautiful rivers. Assam lies beneath the foothills of the Eastern Himalayas and is bounded on the North West by Bhutan and to the North and North East and South East are bounded by east Arunachal Pradesh, Nagaland, and Manipur, to the south by Mizoram and Meghalaya and to the west by Bangladesh and Tripura.

Assam, extending from 89° 42' E longitude to 96° E longitude and 24° 8' N latitudes to 28° 2' N latitudes in the latitude is a North Eastern state of India. Assam is located at the central part of the North-East India with an area of 78,438 sq km (having 20% hilly region). Its total population is 2,66,38,407 out of which 1,37,87,799 are males and 12850,608 are females. The minimum temperature ranges from 6° to 8°. The maximum temperature varies from 35° to 38° C which may further be reduced to even lower temperature due to frequent rains.

b) Agro and sub agro-climatic zones

Assam lies in Eastern Himalayan zone of India, and it has five sub agro-climatic zones. Paddy, Tea, Banana, Orange, Potato, Lemon, Coconut, Arcanuts and other vegetables are grown across the state in all the five agro-climatic zones. Apart from this, fruits like mango, guava, litchi, pineapple and jackfruit are grown in the central and upper Brahmaputra valley zone whereas in the lower Brahmaputra valley and the Barak valley zones Arcanut production finds prominent place.

The state is composed of plains and river valleys. It can be divided into three principal regions:

1. The Brahmaputra valley in the north
2. The Barak valley in the south and
3. The Cachar hills that divide these two regions.

c) Cropping Pattern:

Out of 78,438 sq km area of the Assam only 39,88,600 ha area is under cultivation. There are two distinct seasons, *kharif* (July to October), and *rabi* (October to March). The zone is ideally suitable for growing Paddy horticultural crops viz. Mango, jack fruit, guava, banana, litchi, citrus; papaya, pears, bear, vegetables, potato and tomato. Tea is the most important non-food crop of the Assam and contributes significantly to its economy.

d) Scope of Farm Mechanization:

The total farm power available in the state is 0.75 HP/ha. Most of the agriculture operations are performed by using animate power sources. The stationery farm power sources, viz; irrigation pump and electric motor are commonly used in irrigated area and use of mechanical mobile farm power sources is negligible.

The availability of human power is 0.375 kW/ha., animal power 0.525 kW/ha and mechanical power is 0.20 kW/ha. Since most of the farm operations in Assam are done using animal power, hence, there is great scope of selective mechanizing in Assam where, small hand tools are being used causing human drudgery. The seed bed preparation operations should be mechanized by promoting animal drawn equipment. For land preparation in Assam only cultivators are used. While there is great scope of using other improved type of tractor drawn land preparation implement like; M.B. plough, Disc plough, Rotavator, etc. and improved sickle for harvesting and tubular maize sheller for shelling. For irrigated areas animal drawn M.B. Plough, disc harrow, animal drawn Bakhar Blade, animal drawn Puddler, animal drawn three tyne cultivator; for sowing, animal drawn seed cum fertilizer and tractor drawn Potato Planter and Digger cum Elevator, Zero-till drill, Strip-till drill, Vegetable transplanter; for spraying medicine, Aero-blast sprayer, for harvesting, Potato harvester, Self-propelled vertical conveyor reaper; for threshing Multi-crop, thresher etc. should be promoted in the state.

1.3 Manipur

a) General Information

In 1972 the Government of India conferred the status of a state to Manipur. Situated between latitudes 23.80°N to 25.68°N and longitudes 93.03°E to 94.78°E, Manipur covers a total geographical area of 22,327 Sq. Km. Of the total area, about nine-tenths constitute the hills which surrounds the remaining one-tenth valley. Manipur has a population of 2,388,634. Of this total, 58.9% live in the valley and the remaining 41.1% in the hilly region. The average annual rainfall on the plaetau and sub-plaetau region is **1,881mm**. It is one of the border States in the North-Eastern part of India, bounded by Nagaland on the north, Assam on the west and Mizoram on the south and along the east it shares a 398 Km. long international boundary with Myanmar. Main food grains crops are paddy, wheat, maize and pulses.

b) Agro and sub agro-climatic zones

Manipur lies in Eastern Himalayan zone of India. In this zone most of the area is covered by heavy terrain where methods of cultivation is different from the plain area.

c) Cropping Pattern

Agriculture being the main occupation of the people of Manipur. The cultivated area is about 7.41% only of the total geographical area of the State. The zone is ideally suitable for growing horticultural crops viz. Mango, Jack Fruit, Guava, Banana, Litchi, Citrus; Papaya, Pears, vegetables, potato and tomato, Spices, Root & Tuber crops, Aromatic & Medicinal plants, etc. Fruits like- Banana, Pineapple and Citrus etc. take a major share in area and production. Among the vegetables, brinjal, tomato, chillies, Cabbage, cauliflower and capsicum hold great promise. Besides these crops, Mushroom, Root & Tuber crops are also grown.

d) Scope of Farm Mechanization

The total farm power available in state is 1.044 kW/ha. Most of the agriculture operations are performed by using animate power sources. The stationery farm power sources, viz irrigation pump and electric motor are commonly used in irrigated area and use of mechanical mobile farm power sources is negligible. The availability of human power shares 27% of total, animal power 71% and mechanical power 1.9%. Since, most of the farm operations in Manipur are done by using animal and human power, hence, there is great scope of selective mechanizing in the field of agriculture where, small hand tools are being used resulting to human drudgery. The seed bed preparation operations should be mechanized by promoting animal drawn equipment. Improved animal drawn and manual operated equipments like- M.B. plough, ridger, blade harrow, puddler, leveller, improved sickle, zero tillage seed drill, tubular maize sheller, rotary maize sheller may be introduced in Manipur. Population of Power tiller may be increased in plain area. Hand tools may be popularized as gender friendly equipment for weeding, cleaning, etc. Pedal operated thresher may be popularized in hill area for threshing paddy. Potato Planter, zero-till drill, strip-till drill, vegetable transplanter, aero-blast sprayer, potato planter, potato harvester, self-propelled reaper, multi-crop thresher etc should be promoted in the state for plain area.

1.4 Meghalaya

a) General Information:

Meghalaya emerged as a full-fledged state within the union

of India on 21st Jan., 1972. Meghalaya is endowed with a rich variety of flora and fauna. The state basically has an agrarian economy with 80 percent of its total population dependent primarily on agriculture for livelihood. It is situated between latitude 25° 30' N and longitude 91° 00' E. Meghalaya is situated in the North-Eastern part of India with 22429 sq. kms area and has a long international border with Bangladesh to the south-west. Assam to the north-east. The temperature range is approximately 2 degree centigrade to 36 degree centigrade depending upon the altitude ranging between 300 mts above mean sea level (MSL) to 2000 mts above MSL. The state presents a paradox of containing in it the station with the highest mean annual rainfall in the world (Cherrapunji). The total population of the state is 23,06,069 where Males - 11,67,840 and Females - 11,38,229.

b) Agro and sub agro-climatic zones

Meghalaya lies in Eastern Himalayan zone of India. The state has vast potential for developing horticulture due to agro-climatic variations, which offer much scope for the cultivation of temperate, sub-tropical and tropical fruits and vegetables.

b) Cropping pattern

Besides the major food crops of rice and maize, Meghalaya is known for its oranges (Khasi Mandarin), pineapple, banana, jackfruits, temperate fruits like plums, peaches and pears etc. The popular cash crops, which are traditionally cultivated, include turmeric, ginger, black pepper, areca nut. Strawberry, flowers, etc. are grown commercially. Temperate zones of Meghalaya face climatic barriers against agricultural growth. High soil erosion also reduces fertility.

d) Scope of Farm Mechanization

Most of the agriculture operations are performed by using animate power sources. Traditional tool and equipments are common in the field of agriculture, despite of vast scope of improved gender friendly hand tools for hilly region. The economy of the state is based on agriculture. Jhum cultivation and Terrace farming are the major patterns that the farmers employ to uplift agriculture in Meghalaya. In Jhum cultivation only hand tools are used such as spade, khurpi, sickle, dibbler, daw, grass slacer etc. Lands are prepared by cutting down with the help of fawrah or spade and sowing is done manually by dibbling. The average size of land holding of Meghalaya is 1.33 ha. and irrigate crop area is 22.1% ha. The available farm power in Meghalaya is 1.072 kw/ha against the required

power 2.5 kw/ha. Share of Power in national level is Mechanical Power-3%, Bullock Power-73%, Human Power-24%, Electrical Power- 0.07%.

1.5 Mizoram

a) General Information:

Mizoram emerged as a full-fledged state within the union of India in the year 1986. Mizoram State lies between 21°58'N and 24°35' N Latitudes and 92°15'E and 93° 29' E Longitudes. It is located in the North-Eastern region of India, bordering Myanmar in the east and Bangladesh in the west. According to the 2001 census, total population of Mizoram was 8,91,058. The number of females per 1000 males in 2001 was 938 as against 933 National level. The State's topography is, by and large, mountainous with precipitous slopes forming deep gorges culminating into several streams. It is generally cool in summer and not very cold in winter. The temperature varies between 20°C and 30°C during summer and between 11°C and 21°C in winter. Rain fall in the state varies between 1900 mm and 3000 mm.

Agriculture in Mizoram is the primary sector of the state's economy. Although, the rugged terrains are not very conducive to the cultivation of crops, the even distribution of land, the fertile temperate soil facilitates extensive jhum cultivation. A number of crops like paddy, beans, cucumber, maize, arum, sesame, mustard and cotton are grown by practicing jhum or shifting cultivation.

b) Agro and sub agro-climatic zones

Mizoram lies in Eastern Himalayan zone of India. The State's topography is, by and large, mountainous with precipitous slopes forming deep gorges culminating into several streams and rivers.

c) Cropping Patter

Paddy is one of the most important crops that is cultivated in the state of Mizoram. In paddy cultivation, primitive methods of harvesting is used. After the completion of the harvesting of paddy, the seeds of the other crops are inseminated in the ground. No. remarkable mechanical means of harvesting of paddy is used till now. Besides paddy, crops like

sugarcane, cotton, tapioca, oilseeds, mustard, sesame, soybean and pulses like cowpea, French and rice beans also contribute towards the economy of Mizoram. Horticulture also adds substantially to the state's economy. There are a couple of imminent irrigation projects that are coming up in Mat valley, Champhai and North Vanlaiphai.

d) Scope of Farm Mechanization:

The average size of land holding is 1.29 ha. The irrigated crop area in Mizoram is 14 % and present available power is 0.576 kw/ha against required power 2.0 kw/ha. In national level sharing of mechanical power in the field of agriculture is 2.16 % and bullock power is 45 %. The present data of tractor density in Mizoram is 1.41 per 1000 ha. These data indicates that, most of the agriculture operations are performed by using animate power sources. The stationary farm power sources, viz irrigation pump and electric motor are commonly used in irrigated area and use of mechanical mobile farm power sources is negligible. Since, most of the farm operations in Mizoram are done by using animal power hence, there is a great scope of selective mechanizing in all over the state where, small hand tools are being used resulting to human drudgery. The seed bed preparation operations should be mechanized by promoting animal drawn equipment. Disc harrow and improved blade harrow are used for land preparation and improved sickle for harvesting and tubular maize sheller for shelling. For irrigated areas animal drawn M.B. Plough, disc harrow. animal drawn Bakhar Blade, Puddler, manual rice seeder, animal drawn three tyne cultivator, animal drawn seed cum fertilizer and animal drawn Potato Planter, zero-till drill, strip-till drill, vegetable transplanter, aero-blast sprayer, potato planter, potato harvester, self-propelled reaper, multi-crop thresher, etc should be promoted in the state.

1.6 Nagaland

a) General Information:

In January 1961 the Government of India conferred the status of a state to Nagaland, but, the state of Nagaland was officially inaugurated on December 1st, 1963. Nagaland is a vibrant hill state located in the extreme North Eastern end of India, bounded by Assam to the west, Arunachal Pradesh and part of Assam to the north, Burma to the east

and Manipur to the south. Its Longitude lies at 93°02' E to 95°15' E and latitude: 25°6' N to 26°4' N. The population of Nagaland is 1.99 million according to 2001 census. The sex ratio of Nagaland at 900 females to 1000 males is lower than the national average of 933. The state of Nagaland has an area of 16579 sq. km making it one of the smallest states of India. Annual rainfall varies from 1,800–2,500 mm, concentrated in the months of May to September. Temperatures range from 21 °C to 40 °C. Agriculture in Nagaland is considered a prime source of revenue for the state. The crops that have a high yield in the state of Nagaland include rice, tobacco, oilseeds, pulses, fibers, potato and sugarcane.

b) Agro and sub agro-climatic zones

Nagaland lies in Eastern Himalayan zone of India. In this zone most of the area is covered by heavy terrain where methods of cultivation are different from the plain area.

c) Cropping pattern

Out of the net area of 16,579 sq. kms, only 20 % is occupied by paddy cultivation in Nagaland. The zone is ideally suitable for growing crops like coffee, tea and cardamom. Potato and sugarcane are the two prime cash crops that generate revenue for the Nagaland economy. Then there are many vegetables that are grown by the peasants of Nagaland like that of carrots, chillies, onion, melon, spinach leaf, cucumber, brinjal, tomatoes and mustard.

d) Scope of Farm Mechanization:

The total farm power available in the state is 0.336 kW/ha against required power 1.5 kW/ha. Most of the agriculture operations are performed by using animate power sources. The stationary farm power sources, viz irrigation pump and electric motor are commonly used in irrigated area and use of mechanical mobile farm power sources is negligible. The availability of human power is 53.1 %, animal power 45.9 % and mechanical power is 1.0 %. Since most of the farm operations in Nagaland are done using animal power hence, there is great scope of selective mechanizing in the tribal belt where small hand tools are being used resulting to human drudgery. The seed bed preparation operations should be mechanized by promoting animal

drawn equipment as well as power operated implements. Ridger plough, disc harrow and improved Bakhar blade may be introduced for land preparation and improved sickle for harvesting and tubular maizesheller for shelling. For irrigated areas animal drawn M.B. Plough, disc harrow. Animal drawn ridger, animal drawn Blade harrow, animal drawn Puddler, manual Rice Transplanter, Manual rice seeder, animal drawn three tyne cultivator, animal drawn seed cum fertilizer and Potato Planter, zero-till drill, strip-till drill, vegetable transplanter, aero-blast sprayer, potato planter, potato harvester, self-propelled vertical conveyor reaper, multi-crop thresher etc should be promoted in the state.

1.7 Tripura

a) General Information:

Tripura was given the status of a separate state of the Indian Union on 21st, January 1972. Tripura is the third smallest state of the country. The state extends between 22° 56' N & 24° 32' N and 90° 09' E & 92° 10' E. The amount of total annual rainfall in the state varies between 1500 mm to 2500 mm. The maximum and minimum temperatures during winter are 27° C and 13° C and during summer are 35° C and 24° C respectively. The population of Tripura is 3.20 million and sex ratio is 948 male against 933 female. Tripura is surrounded by Bangladesh on the north, west and east. The Indian states of Assam and Mizoram lie to the east of Tripura. The major crops grown in the state are: rice, ragi, jowar, maize, and pulses besides oilseeds and number of cash crops. Cashew, coconut, areca nut, cardamom, chillies, cotton, sugarcane and tobacco are among the other crops produced in the state.

b) Agro and sub agro-climatic zones

The ICAR has categorized the Tripura under Agro climatic zones of Humid Eastern Himalayan Region. The State of Tripura enjoys a typical monsoon climate with variations ranging from Sub-tropical to temperate conditions in hilly areas.

c) Cropping pattern

The economy of Tripura is primarily agrarian. The primary sector i.e. Agricultural contributes about 64% of total employment in the state and about 48% of the State Domestic Product (SDP). A variety of Horticultural/ Plantation Crops are produced in Tripura like Pineapple,

Oranges, Cashewnut, Jackfruit, Coconut, Tea, Rubber, Forest, Plantations etc. There is ample scope for increasing the area under such plantations as well as the productivity.

d) Scope of Farm Machinery:

The total farm power available in the state is 0.99hp/ha which is quite lower as compared to the national level. As the farm power is limited, most of the agricultural operations are performed by using animate power source. Engine and electric motors are rarely used in irrigated area as a source of power. Since most of the farm operation is done by manual power and in the hilly region by conventional hand tools, there is a vast scope of using improved type of hand tool in the field of agriculture. The major crops grown in the state are: rice, ragi, jowar, maize, and pulses besides oilseeds and number of cash crops. Cashew, coconut, areca nut, cardamom, chilies, cotton, sugarcane and tobacco are among the other crops produced in the state. The seed bed operation should be mechanized by introducing small size tractor and power tiller as a source of farm power. For sowing seed, improved type of seed drill and zero tillage seed drill may be used. For harvesting of paddy, self propelled reapers and for threshing multicrop thresher may be introduced. In the hilly region, pedal operated thresher may be used. Harvesting of coconut and areca nut may be mechanized by introducing coconut harvester (climber). For irrigated area animal drawn M.B. Plough, disc harrow, bullock drawn puddler, paddy seeder may be used. As potato is one of the major crop in this area, potato cultivation should be mechanized by introducing potato planter, potato digger cum elevator.

2. Suggested Agricultural Machinery and Equipment for Different Cropping Patterns

Sl.No.	Type of Machines	Price per unit (Rs. in lakh)	Description of the Equipment (Page No.)
1	Tillage Implements		21
	M.B plough	0.25-0.40	22
	Disc plough	0.30-0.45	23

Sl.No.	Type of Machines	Price per unit (Rs. in lakh)	Description of the Equipment (Page No.)
	Tractor mounted cultivator	0.20	24
	Disc Harrow	0.26-.60	25
	Rotavator	0.70-0.10	26
	Post-Hole Digger	0.70-1.20	27
2	Sowing and Fertiliser Application Equipment 28		
	Seed-cum-fertilizer drill	0.35	29
	Zero-till drill	0.35	30
	Raised bed planter	0.45	31
	8-row mat type rice transplanter	2.00	32
	Sugarcane Cutter Planter	0.60	33
	Vegetable Transplanter	0.50	34
3	Interculture Equipment 35		
	Dryland Peg Weeder	0.012	36
	Wheel hand hoe	0.012	37
	Cono Weeder	0.020	38
	Self-propelled power weeder	0.800	39
4	Plant Protection Equipment 40		
	Knapsack sprayer	0.025	41
	Knapsack power sprayer	0.12	42
	Tractor mounted boom sprayer	0.50	43
	Aero-blast Sprayer	0.85	44
5	Harvesting Equipment 45		
	Self-propelled vertical conveyor reaper	0.80	46
	Tractor mounted vertical conveyor reaper	1.00	47
	Self-propelled riding type reaper	1.50	48

Sl.No	Type of Machines	Price per unit (Rs. in lakh)	Description of the Equipment (Page No.)
	Self-propelled -reaper binder	2.50	49
	Self-propelled combine harvester	0.80	50
	Shrub master	2.50	51
6	Threshing equipment		52
	Multi-crop thresher	1.00	53
	Axial- flow paddy thresher	0.80	54

a) Rice - Rice

Sl.No.	Type of Machines	Price per unit (Rs. in lakh)	Description of the Equipment (Page No.)
1	Tillage Implements		21
	Disc plough	0.32	23
	Disc Harrow	0.45	25
	Rotavator	0.70	26
2	Sowing Equipment		28
	Paddy transplanter	2.0	32
3	Interculture Equipment		35
	Cono Weeder	0.002	38
	Self-propelled Power Weeder	0.80	39
4	Plant Protection Equipment		40
	Knapsack sprayer	0.025	41
	Knapsack power sprayer	0.120	42
5	Harvesting Equipment		45
	Self-propelled Reaper	1.00	46
	Self-propelled reaper binder	2.50	49
	Track type combine harvester	24.0	50

Sl.No.	Type of Machines	Price per unit (Rs. in lakh)	Description of the Equipment (Page No.)
6	Harvesting Equipment		45
	Self-propelled Reaper	1.00	46
	Self-propelled reaper binder	2.50	49
	Track type combine harvester	24.0	50
7	Threshing Equipment		52
	Axial- flow paddy thresher	0.70	54

b) Sugarcane – Oilseeds

Sl.No	Type of Machines	Price per unit (Rs. in lakh)	Description of the Equipment (Page No.)
	Tillage implement		21
	M.B plough	0.27	22
	Disc plough	0.32	23
	Disc Harrow	0.46	25
	Rotavator	0.70	26
	Sowing Equipment		28
	Seed-cum-fertilizer drill	0.40	29
	Raised bed planter	40.00	31
	Sugar cane cutter planter	1.00	33
	Interculture Equipment		35
	Cono Weeder	0.02	38
	Self-propelled Power Weeder	0.80	39
	Plant Protection Equipment		40
	Knapsack sprayer	0.025	41
	Knapsack power sprayer	0.12	42
	Tractor mounted boom sprayer	0.50 0.85	43
	Aero-blast sprayer		44
	Threshing Equipment		52
	Multi- crop thresher	1.0	53
Axial flow paddy thresher	0.70	54	

3. Land Development Equipment

3.1 Terrace Blade

3.2 Sub-Soiler

3.1 TERRACE BLADE



Features:

Terrace blade attached to tractor with the 3-point linkage system and is hydraulically controlled. It consist of replaceable blades attached to curved steel body, side wings and indexing arrangement for tilting and angling of the blade. The blade has provision of reversing back for filling

Specification

Blade length (mm)	1950 - 2458
Height (mm)	978
Blade offset (mm)	305
Forward angular adjustment (deg)	0°, 15°, 30° and 45° RH to LH
Weight (kg)	210-260
Power requirement (hp/kW)	35-50/26.25-37.5, tractor

Uses: The terrace blade is used for grading, leveling of fields, filling of depressions and smoothening of field for irrigation.

Cost (Rs): 30,000-40,000

3.2 SUB-SOILER



Features:

it consists of a beam made of high carbon steel, beam supports which are flanged at upper and lower edges for rigidity, hollow still adaptor welded to bottom end of the beam to accommodate the share base, share base having square section, share plate made from high carbon steel and shank drilled and counter bored for set board which secures the base in the adaptor. Sub-soiler is used where land is not cultivated from many years. It is used to break the hard pan. It breaks the subsoil. It takes depth up to 60 cm.

Specification:

Length (mm)	600
Width (mm)	490
Height (mm)	1325
Maximum working depth (mm)	535-600
Weight (kg)	62-125
Power Requirement(hp/kW)	55/41.25 and above

Uses: it is used to break hard pan of the soil and helps the water to seep in to the soil for improving drainage. A mole ball can be attached to create a small tunnel in the soil, which serves as drainage channel for water.

Cost (Rs) : 20,000-60,000

4. Tillage Implements

4.1 M.B plough (Animal Drawn)

4.2 M.B Plough (Tractor Drawn)

4.3 Disc plough

4.4 Animal Drawn Cultivator

4.5 Tractor Mounted Cultivator

4.6 Disc Harrow (Animal Drawn)

4.7 Disc Harrow (Tractor Drawn)

4.8 Rotavator

4.9 Post-Hole Digger

4.10 Bund Former (Animal Drawn)

4.11 Paddy Puddler (Animal Drawn)

4.1 M.B. PLOUGH (ANIMAL DRAWN)



Features:

It is manually operated implements and it consists of body, share, beam, handle, shear is narrow steel bar attached to the upper surface of the shoe longitudinally along with centre line and handle are generally attached to the body of the plough. The shear is attached to the shoe which penetrates into the soil and breaks it open. M.B.Plough is primary tillage implements.

Specification

Length(mm)	3100-3200
Width(mm)	229-300
Weight(kg)	30-40
Power sources	A pair of bullock
Area covered (ha/hr)	0.062-0.255
No of bottom	01

Uses: This is used for primary tillage operation. It cuts trash and buries it completely. It is also used for turning green manure crop for decaying under the soil, which adds humas to the soil. It is also used for turning and mixing compost, farmyard or lime into the soil.

Cost (Rs) :

4.2 M.B PLOUGH



Features:

It is tractor operated implement and it consists of share point, share, mould board, landside, frog, shank, frame and hitch system. The share point is of bar type and is made from high carbon steel or low alloy steel. The share is also made from high carbon steel or low alloy steel. Both are hardened and tempered to suitable hardness (about 45 ARC). The working of the plough is controlled by hydraulic system of the tractor. Mould board plough is a primary tillage implement.

Specification:

No. Of bottom	2 - 4
Length (mm)	1778-2392
Width (mm)	889-1194
Height (mm)	1092-1092
Weight (kg)	253-386
Capacity (ha/day)	1.5-2.0
Power requirement(hp/kW)	30-40 /22.5-30

Uses: This is used for primary tillage operations. It cuts trash and buries it completely. It is also used for turning green manure crop for decaying under the soil, which adds humus to the soil. It is also used for turning and mixing compost, farmyard manure or lime into the soil.

Cost (Rs) : 25,000-40,000

4.3 DISC PLOUGH



Features:

The plough consists of common main frame, disc beam assemblies, rockshaft category-1 or category-2, a heave spring loaded furrow wheel and a gauge wheel. In some model disc plough is designed to operate as 2, 3 or 4 bottoms, by adding or removing sub beams the sub beam assemblies according to requirement. The disc angle ranges from 40-45° to obtain the desired width of cut and the tilt angle ranges from 15-25° for penetration. Disc plough is used for primary tillage and it is specially used where M.B. Plough is not useful such as hard and dry soil.

Specification:

Number of furrows	2-4
Disc size (mm)	600-800
Width (mm)	889-1194
Length (mm)	1180-2362
Weight (kg)	236-376
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/kW)	25-50/18.75- 37.5, tractor

Uses: Disc plough is used for primary tillage and is especially useful in hard and dry, trashy, stony or stumpy land conditions and in soil where scoring is a major problem

Cost (Rs) : 30,000-45,000

4.4 CULTIVATOR (ANIMAL DRAWN)



Features:

Cultivator consists of a frame, shovel, tyne, beam, handle, cultivator are primarily used for intercultural operation which the crop has come up a few centimetres above the ground. But cultivator also used for opening the land, preparing the seed bed and sowing of the seed as well as secondary tillage implements.

Specification

No of tynes	03
Cutting width(mm)	400-550
Cutting depth (mm)	60-90
Power sources	A pair of bullock
Weight(kg)	20-25

Uses: Shovel type cultivator is used for seed bed preparation, also used for intercultural operation by adjusting the tynes as per row spacing.

Cost (Rs) :

4.5 TRACTOR MOUNTED CULTIVATOR



Features

Cultivator consists of a frame, tynes (fixed or spring loaded) having reversible shovels and 3-point hitch system. Cultivators are primarily used for intercultural operation after the crop has come up a few centimeters above the ground. But cultivator is also used for opening the land, preparing the seed bed and sowing of the seeds as well cultivators for the secondary tillage are available as animal drawn and tractor drawn. In medium and light soil duck foot type cultivators are also used for primary tillage operation.

Specification:

Duck foot type cultivator	
Number of sweep	5-7
Length (mm)	1980-2310
Width (mm)	839-1150
Height (mm)	1000-1050
Weight (kg)	200-300
Power requirement (hp/kW)	25-50/18.75-37.5, tractor
Shovel type cultivator	
Number of tynes	7-11
Cutting width (mm)	1500-2400
Cutting depth (mm)	175-225
Weight (kg)	127-350
Power requirement (hp/kW)	25-60/18.75- 45, tractor

Uses: Duck foot type cultivator is used for tillage operation, destruction of weeds and retention of soil moisture. Shovel type cultivator is used for seed bed preparation, also used for intercultural operation by adjusting the tynes as per row spacing.

Cost (Rs) : 15,000-25,000

4.6 DISC HARROW (ANIMAL DRAWN)



Features:

The animal drawn disc harrow consists of two gang placed end to end. Which throw the soil in opposite direction, Disc harrow are secondary tillage implements. It is used after primary tillage. It is used to break the clods developed during primary tillage operation.

Specification

Length(mm)	1040-1320
Width (mm)	959-1015
Weight, kg	65-68
Power sources	A pair of bullock
Area covered (ha/hr)	0.13-0.28
Height(mm)	770-845
No of disc	3x3
Dia of disc(mm)	409-412

Uses: It is used for secondary tillage operation for breaking clods and preparing seed bed for sowing purpose.

Cost (Rs) :

4.7 DISC HARROW



Features:

The tractor mounted disc harrow consists of two gangs of discs mounted one behind the other. The disc on front gang throws soil outwards and the rear gang inward. Therefore, no soil remains uncut by the offset disc harrow. Disc harrow is secondary tillage implement. It is used after the primary tillage. It is used to break the clods developed during primary tillage operation.

Specification:

Length (mm)	1980-2260
Width (mm)	1150-1900
Height (mm)	1143-1350
Number of discs	10-16
Diameter of discs (mm)	457-660
Pitch of discs	228-280
Weight (kg)	330-490
Capacity (ha/day)	2.5
Power requirement (hp/kW)	20-60/15-45, tractor

Uses: It is suitable for secondary tillage operation for breaking clods and preparing seed bed for sowing purpose.

Cost (Rs) : 25,000-60,000

4.8 Rotavator



Features:

It consist of a steel frame, 3-point hitch system, a rotary shaft on which blades are mounted, power transmission system and a gearbox. The blades are of L-shape, made from medium carbon steel or alloy steel, hardened and tempered to suitable hardness It uses the power from tractor PTO. Rotavator is used as both primary and secondary tillage operations. A good seedbed and pulverization of the soil is achieved in a single pass of the rotavator. It is used in both dry land and wet land conditions. It is also suitable for incorporating straw and manure in the field. The power requirement will vary depending upon the width of the rotavator.

Specification:

Weight (kg)	230-310
Working width (mm)	1200-1720
Working depth (mm)	80-100
Rotor speed (rpm)	210-240
Capacity (ha/hr)	0.38-0.5
Power Source(hp/kW)	30-65 /37.5-48.75, tractor

Uses: It is used as both primary as well as secondary tillage operations. It is also useful for puddling the field before paddy transplanting.

Cost (Rs) : 70,000-1,00,000

4.9 POST-HOLE DIGGER



Features:

It consists of a frame, three point hitch system and a auger. For operation of auger, it gets drive from tractor PTO shaft. The diameter and the depth of hole can be changed by changing auger assembly. It is used to dig pits for planting trees as well as digging pits for fencing purpose.

Specification:

Field capacity (pits/h)	12
Size of the augers (mm)	200, 250, 300
Cost of operation (Rs./pit)	12-15
Power Source (hp/kW)	35 /26.25, tractor

Uses: Used for digging holes for plantation/horticulture crops. Also used to dig holes for farm fencing.

Cost (Rs) : 70,000-1,25,000

4.10 BUND FORMER (ANIMAL DRAWN)



Features:

The implements consists of two blades, flat iron frame bent at an angle a handle attached to the frame with tie bars and wooden beam.

Specification

Length(mm)	870-960
Width (mm)	570-650
Weight, kg	25-27
Power sources	A pair of bullock
Area covered (ha/hr)	0.10-0.295

Uses: it is used for making bund for irrigation purpose

Cost (Rs) :

4.11 PADDY PUDDLER (ANIMAL DRAWN)



Features:

It is a helical blade type of puddler suitable for puddling in wetland condition and also for cutting and mixing of green manure crop. The implement consists of tow angle iron brackets carrying a bush. These blade are imparted a twist along their length to form a helix. The handle for the operation is made of wood and help in comfortable operation.

Specification

Length(mm)	1000-1200
Width of blade (mm)	220-240
Weight, kg	40-50
Power sources	A pair of bullock
Area covered (ha/hr)	0.12-0.15

Uses: It is used for puddling wetland and also for cutting and mixing of green manure crops.

Cost (Rs) :

5. Sowing and Fertiliser Application Equipment

- 5.1 Fertilizer Broadcaster
- 5.2 Seed-cum-fertilizer drill (Animal Drawn)
- 5.3 Seed-cum-fertilizer drill
- 5.4 Zero-Till Drill
- 5.5 Raised bed planter
- 5.6 Rice Transplanter (Manualy operated)
- 5.7 8-Row Mat Type rice Transplanter
- 5.8 Sugarcane Cutter Planter
- 5.9 Vegetable Transplanter
- 5.10 Potato Planter (Semi autometric)
- 5.11 Potato Planter (Autometric)

5.1 FERTILIZER BROADCASTER (MANUAL OPERATED)



Features:

It consists of a hopper with tapered bottom, a circular disc having 8 section is fitted on a vertical shaft below the fertilizer hopper and is rotated by a handle through gear arrangements. The gear ratio between the handle and the spreading disc. A metered quantity of the fertilizer through adjusting 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.

Specification

Length(mm)	280-285
Width(mm)	410-450
Height(mm)	441-450
Power sources	Manual,
Weight(kg)	5-10
Hopper capacity ,kg	12-15

Uses: it is suitable for broadcasting granular fertilizer like urea, DAP etc. in the field uniformly. The effective width of coverage is about 630 cm.

Cost (Rs) :

5.2 SEED CUM FERTILIZER DRILL (ANIMAL DRAWN)



Features:

The seed cum fertilizer drill consists of a seed box, fertilizer box, seed and fertilizer metering mechanism, seed and fertilizer rate adjusting, chain and sprockets, transport cum power transmitting wheel. The fluted roller are driven by a shaft which gets power from wheel. Fluted roller fixed in the seed box, received the seed into longitudinal grooves and drop them in the seed tube attached to the furrow opener.

Specification

Seed metering mechanism	Fluted roller
Dia(mm) and no of flutes	50 and 3
Seed box capacity ,kg	15-18
Fertilizer box capacity, kg	18-20
Power sources	A pair of bullock
Length(mm)	2700-2900
Width(mm)	800-900
Weight, kg	70-115
No of furrow opener	03
Size of feed shaft(mm)	650-680

Uses: Seed cum fertilizer drill are used for sowing of paddy, wheat and other cereal crop in already prepared field.

Cost (Rs) :

5.3 Seed-Cum-Fertilizer Drill



Features

The seed cum fertilizer drill consists of a seed box, fertilizer box, seed and fertilizer metering mechanisms, seed/ fertilizer rate adjusting lever, chain, sprockets, and transport cum power transmitting wheel. The fluted rollers are driven by a shaft which gets power from wheels. Fluted rollers fixed in the seed box, receive the seeds into longitudinal grooves and drop them in the seed tube attached to the furrow opener. 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 to be dropped can be varied. Fertilizer rate can be varied by increasing or decreasing the opening at the bottom of the fertilizer box with the help of a lever.

Specification

Seed metering mechanism	Fluted roller
Furrow opener	Reversible shovel
Diameter and No. of flutes	42.7-49.2 and 9-11
Seed box capacity (cm ³)	66241-10308
Fertilizer box capacity (cm ³)	63310-10141
Power source (hp/kW)	5/26.25, tractor
Length (mm)	1940-2310
Width (mm)	970-1560
Weight (kg)	224-328
Height (mm)	1070-1350
No. of furrow opener	9-13
Size of feed shaft (mm)	16-19

Uses : Seed cum fertilizer drills are used for sowing of wheat and other cereal crops in already prepared field.

Cost of Machine: 35,000/-

5.4 Zero-Till Drill



Features

Zero-till drill consists of frame, seed box, fertilizer box, seed metering mechanism, fertilizer metering mechanism, seed tubes, furrow opener seed/fertilizer adjusting mechanism and transport cum power transmitting wheel. The frame is made from mild steel box section. The tynes are mounted with the help of clamps, to obtain infinite row spacing. The main difference between no-till drill and conventional drill is that it has inverted T-type furrow opener fixed on the tyne instead of reversible shovels type furrow openers. The main advantage of inverted t-type furrow opener's is non formation of clods, lower draft requirement and easier penetration in the soil.

Specification

Seed metering mechanism	1070-1350
Furrow opener	Through chain and sprockets
Power transmission	Gravity feed or corrugated roller
Fertilizer metering mechanism	Fluted roller
No of furrow opener	Inverted T -type
Seed box capacity (cm ³)	20-22.3
Fertilizer box capacity (cm ³)	66241-10308
Power requirement(hp/KW)	35/26.25, tractor
Width (mm)	1960-2310
Height (mm)	970-1560
Weight (kg)	224-328
Size of fertilizer shaft (mm)	9-13

Uses : Zero- till-drills are used for sowing wheat crop in unprepared field after harvesting of paddy. It saves Rs. 2000-3000 per hectare and one pre irrigation of the field is avoided.

Cost of Machine: 35,000/-

5.5 Raised bed planter



Features:

It consists of a seed box, fertiliser box, seed and fertiliser metering mechanism, 3-ridgers, chain, sprockets, transmission wheels, seed/fertiliser cut-off levers and rollers for compacting the beds. The planters form the flat ridges on which seeds are sown. As seeds are sown on the ridges hence root growth is better and increased yield is obtained. The furrows formed are used for irrigation purpose. It is suitable for sowing wheat, maize, peas etc. Vegetable seed can also sown by this planter.

Specification

Suitability	Wheat, maize, peas, pulses etc.
Power Source	45 hp tractor
Weight (kg)	230
Overall dimensions (mm) (LxWxH)	1200x2200x1200
Working width (mm)	1800
Capacity (ha/h)	0.26

Uses: Sowing wheat on beds for economical use of irrigation water and fertilizer in light and medium soils.

Cost (Rs) : 45,000

5.6 PADDY TRANSPLATER (MANUALLY OPERATED)



Features:

It is manually operated implements it consists of two wooden floats, a main frame that supports the seedling tray, mat pusher, tray movement mechanism, and picker bar assembly and handle. The tray movement mechanism is provided with the help of a chain and free wheel.

Specification

Length(mm)	850-865
Width (mm)	750-780
Weight, kg	25-26.5
Power sources	One man
Area covered (ha/hr)	0.0389-0.075

Uses: it is used for transplanting paddy seedlings in puddles soils.

Cost (Rs) :

5.7 8-ROW MAT TYPE RICE TRANSPLANTER



Features:

It is a single wheel driven and fitted with diesel engine. The machine is riding type and it transplants seedlings from mat type nursery in eight rows in a single pass. The drive wheel receives power from the engine through V-belt, cone clutch and gearbox. A propeller shaft from the gear box provides power to the transplanting mechanism mounted over the float. The tray containing mat type nursery for rows is moved sideways by a scroll shaft mechanism, which converts rotary motion received from the engine through belt-pulley, gear and universal joint shaft into linear motion of a rod connected to the seedling tray having provision to reverse the direction of movement of tray after it reaches the extreme position at one end. Fixed fork with knock out lever type planting fingers (cranking type) are moved by a four bar linkage to give the designed locus to the tip of the planting finger. It is used to transplant paddy in the puddled field. Self-propelled mat type paddy transplanters are also available.

Specification

No's of rows	6-8
Length (mm)	2410
Width (mm)	2130
Height (mm)	1300
Row spacing(mm)	238
Distance between hills (mm)	140 &170
Weight (kg)	320
Working capacity (ha/h)	0.57
Prime mover (hp/kW)	4.4/3.3, Air cooled, diesel engine

Uses: It is used for transplanting of paddy seedlings.

Cost(Rs) : 1,75,000-10,00,000

5.8 SUGARCANE CUTTER PLANTER



Features:

Machine consists of furrow opening unit, sett cutting unit, fertilizer application unit, chemical application unit, sett covering unit and seed box. The furrow-opening unit has two ridgers mounted on the frame for opening the furrow. The machine has two-sett cutting units one for each row. For the operation, two labourers sitting on the machine feed complete sugarcane one by one into the sett cutting unit by picking from the cane from the hopper. The rotating blades cut the setts automatically before dropping into the furrows. Fertilizer and chemicals are also applied simultaneously along with the setts, before covering of furrows.

Specification

Length (mm)	2070
Width (mm)	1850
Height (mm)	2100
Row to row spacing (mm)	600-1050
Number of seed box	2
Fertilizer metering system	Gravity type
Number of furrow openers	2
Field capacity (ha/h)	0.2
Weight (kg)	475
Power source (hp/kW)	35/26.25, tractor

Uses: It is used for sowing of sugarcane. It cuts the seed setts, opens the furrows, places the setts into the furrows, drops fertilizer, treats setts and covers the setts simultaneously.

Cost (Rs) : 50,000-60,000

5.9 VEGETABLE TRANSPLANTER



Features:

The machine consists of seedling tray, seat for the operator, furrow opener, compaction wheels, finger guide tunnel, picker wheel type metering mechanism. Picking forks has spring mounted rubber flappers, which opens before passing through the tunnel and closes during its passage. These flappers open again at the bottom end of the tunnel to release the seedlings in a furrow. The inclined wheels compact the soil around the seedlings. Two persons one for each row sitting on the machine is required to place the seedlings in the flappers when these open at the top position. The root side of the seedlings is kept towards the operator.

Specification

Length (mm)	1850
Width (mm)	1520
Height (mm)	1160
Number of rows	2
Metering mechanism	Picker wheel type
Number of picking fingers	10
Type of pickers	Rubber flappers
Row spacing (mm)	600
Watering arrangement	Two nozzles
Diameter of ground wheel (mm)	520
Machine weight(kg)	225
Power source (hp/kW)	35/26.25, tractor

Uses: Vegetable transplanters are used for transplanting seedlings of vegetables such as, brinjal, cauliflower, chillies, tomatoes etc.

Cost (Rs) : 35,000-40,000

5.10 POTATO PLANTER



Features:

it consists of a frame, furrow opener, seed box, two revolving magazines or two belt conveyors with cup, seats, seed tubes and a ground wheel for transmitting power to the shaft the diameter of wheel can be varied by adjusting length of lugs on the wheel. The machine is mounted on a 3-point linkage of a tractor two person seating on the machine fill the seeding cups by picking tubers from the hopper.in rotary magazine type planter

Specification

Length(mm)	1100-1190
Width(mm)	804-840
Weight(kg)	34-38
Power sources	A pair of bullock
Area covered (ha/hr)	0.085-0.226

Uses:

Cost (Rs) :

5.11 POTATO PLANTER (AUTOMATIC)



Features:

The automatic potato planter consists of hopper, potato metering device, furrow opener, soil gather and drive wheel system to operate the metering system. The metering system consists of spring loaded fingers fixed on a rotating disc. These fingers pick up a well-graded tuber from the hopper. The pressure of the fingers is selected as are the size of the potatoes. The fingers holding potato or mounted on a disc, received power from ground drive wheels. The potatoes held by the fingers are carried by the discs and released in furrows. The row -to- row spacing and plant-to-plant spacing can be adjusted as requirement. Fully automatic potato planters are also available with cup type endless belt metering mechanism. In this planter potatoes drop from main hopper to the cups, which are carried and drop to the furrow as per the spacing fixed. Plant-to-plant spacing is regulated through the drive wheels mechanism. The cups provided on the belt can accommodate assorted potatoes to some extent. The fully automatic potato planters are also commercially manufactured from 2 to 4 rows.

Specification

Length (mm)	2030-2035
Width(mm)	1625-1630
Height (mm)	1420-1475
No of furrow opener	02
Row to row spacing, mm	610-660
Seed to seed spacing, mm	125-200
Seed hopper capacity, kg	150
Fertilizer capacity, kg	50
Weight, kg	310-345
Power sources, hp	35-45 above

Uses: it is used for planting of potato in rows.

6. Interculture Equipment

6.1 Dryland Peg Weeder

6.2 Wheel Hand Hoe

6.3 Cono Weeder

6.4 Self-Propelled Power Weeder

6.5 Ridger (Animal drawn)

6.1 DRYLAND PEG WEEDER



Features:

The dry land weeder (peg type) is manually operated weeder suitable for operation between the crop rows. It consists of a roller, which has two mild steel discs joined by mild steel rods. The small diamonds shaped pegs are welded on the rods in a staggered fashion. The complete roller assembly is made of mild steel. The V shaped blade follows the roller assembly and is mounted on the arms.. The height of the blade can be adjusted according to the working depth. The arms are joined to the handle assembly, which is made from thin walled pipes. The height of the handle can also be adjusted according to the requirement of the operator. For removing weeds it is repeatedly pushed and pulled in between the crop rows in the standing position. The diamonds shaped pegs penetrate into the soil and the rolling action pulverize the soil. The blade in the push mode penetrates into the soil and cuts or uproots the weeds.

Specification

Overall length (mm)	1680
Overall width (mm)	590
Overall height (mm)	1080
Diameter of the peg wheel (mm)	220
Working width (mm)	150
Weight (kg)	8-10

Uses: The weeder is used for removing weeds in vegetable gardens, basins of orchard trees and Vineyard plantations. It is also used for breaking the soil crust and creation of soil mulch.

Cost of Machine: Rs.800/-

6.2 WHEEL HAND HOE



Features:

The wheel hand hoe is a widely accepted weeding tool for doing weeding and interculture in row crops. It is a long handled tools operated by pushing and pulling action. The number of wheel varies from one to two and the diameter depends upon the design. The frame has provision to accommodated 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. It can be operated by a single person. All the soil working components of the tool are made from medium carbon steel and hardened to 40-45 HRC. 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.

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
Weight (kg)	4- 12

Uses: For weeding and intercultural operations in vegetables and other crops sown in rows.

Cost (Rs) : 1200/-

6.3 CONO WEEDER



Features:

The weeder consists of two rotors, float, frame and handle. The rotors are cone frustum in shape, smooth and serrated strips are welded on the surface along its length. The rotors are mounted in tandem with opposite orientation. The float, rotors and handle are joined to the frame. The float controls working depth and does not allow rotor assembly to sink in the puddle. The cono weeder is operated by pushing action. The orientation of rotors create a back and forth movement in the top 3 cm of soil and thus uproots weeds.

Specification

Width (mm)	370
Height (mm)	1400
Type	Manually operated
Weight	5 to 6
Number of rotors	2
Capacity (ha/day)	0.18
Power Requirement	One person

Uses: The cono weeder is used to remove weeds between rows of paddy crop efficiently. It is easy to operate and does not sink into the puddle.

Cost (Rs) : 1500-2000

6.4 SELF-PROPELLED POWER WEEDER



Features:

It consists of a frame on which tool bar, furrow openers, engine, handles having breaks, clutch and two steel wheels are fixed. It is a self-propelled type power weeder. It is run by 3hp/2.35kw petrol-start, kerosene-run engine. The CIAE self-propelled power weeder is suitable for weeding and intercultural operations in upland row crops like groundnut, maize, soybean, pigeon pea etc. sown at row to row spacing of more than 30 cm.

Specification

Suitability for use in	Sugarcane, Cotton, Maize, Tapioca, Banana, Coconut etc.
Working width, mm	350-370
Field Capacity, (ha/h.)	
i. Weeding	0.06
ii. Earthing	0.14
Power source (hp/kW)	3/2.35, engine

Uses: It is used for weeding and earthing operations in standing crops

Cost (Rs) : 80,000

6.5 RIDGER (ANIMAL DRAWN)



Features:

It is an implement which cuts and turn the soil in two opposite direction. It consists of beam, clevis, frog, handle, mould board, braces, share, and sliding shoe. The ridger generally has V-shaped or wedge-shaped shear, fitted to the frog. The nose or tip of the share penetrate into the soil and break the earth.

Specification

Length(mm)	1100-1190
Width(mm)	804-840
Weight(kg)	34-38
Power sources	A pair of bullock
Area covered (ha/hr)	0.085-0.226

Uses: Ridger is used for form ridges, for sowing row crop seed and plants in well tilled soil. The ridger is also used for forming field furrow channels, earthing up and similar other operation.

Cost (Rs) :

7. Plant Protection Equipment

7.1 HAND COMPRESION SPRAYER

7.2 KNAPSACK SPRAYER

7.2 KNAPSACK POWER SPRAYER

7.3 TRACTOR DRAWN BOOM SPRAYER

7.4 AERO-BLAST SPRAYER

7.1 HAND COMPRESSION SPRAYER



Features:

Hand compression sprayers are either pressing retaining or non-retaining type. The pressure retaining type has an advantage that air charged once may last for week, but requires sturdy tank and high pressure. Non-retaining type is the most commonly used hand compression sprayer. It consists of an airtight metallic tank, air pump, lance fitted with trigger type or shut off valve, gooseneck bend a pair of shoulder mounted straps and nozzle. All the parts are made from brass alloy and the tank is fabricated to withstand high pressure up to the order of 18 kg/cm² pressurized by hand plunger pump, which remain inside the tank or from a compressor. The pressure inside the tank is usually maintained at 3-4 kg/cm² a single person can operate the sprayer. For maintain proper atomisation of the spray liquid, the tank requires frequent pressurization. The discharge and atomisation decreases with decrease in pressure.

Specification

Diameter of tank(mm)	200-210
Height of tank(mm)	670-675
Capacity of tank (lit)	6-16
Weight(kg)	7.5-8
Field capacity(lit/hr)	0.4-0.5

Uses: It is used for kitchen garden, nurseries, vegetable gardens, flower crops and field crops.

Cost (Rs) :

7.2 KNAPSACK SPRAYER



Features:

Knapsack sprayer consists of a pump and a air chamber permanently installed in a 9 to 22.5 liters tank. The handle of the pump extending over the shoulder or under the arm of operator makes it possible to pump with one hand and spray with the other. It has a spray lance fitted with nozzle and has two straps for mounting the sprayer at the back of the operator. Uniform pressure can be maintained by keeping the pump in continuous operation.

Specification

Tank capacity (l)	9-22.5
Pump cylinder inner diameter (mm)	39-42
Number of piston in pump cylinder	One
Pressure chamber capacity (ml)	572-660
Cut off valve passage diameter (mm)	5
Lance length (mm)	725
Nozzle type	Hollow cone
Spray angle	78 degree
Size of filling hole (mm)	94.9
Pump discharge (mm)	610-896
Capacity (ha/day)	0.7-1.00
Power required	One person

Uses: : For spraying insecticides and pesticides on small trees, shrubs and row crops.

Cost (Rs) : 2,500

7.3 KNAPSACK POWER SPRAYER



Features:

It consists of a frame on which a high density polyethylene tank, fuel tank, engine, delivery pipe, shock proof cushion, and a spray hose. The pump adopts horizontal gear driving. It is powerful and stable in pressure. As it is oil-soaking type, the lubricating effect of crank box is positive. It adopts double cylinder pump, which raises operational efficiency. The piston is heat treated and wear resistant. 'V' packing adopts special materials so it is durable. The engine has electronic ignition, which is easy to be operated and maintained. Its engine has high power to weight ratio. It uses gasoline as a fuel and produces one power stroke for each 1800 of crank rotation. Pressure is controlled by oil valve; spraying pressure is changeable freely and up to 30 kgf/cm². Its structure is rigid; materials are excellent and easy to maintain. It can also be used for dusting and ULV application.

Specification

Length (mm)	650
Width (mm)	450
Height (mm)	570
Weight (kg)	9.8
Plunger	1 No. Double acting
Cylinder	2 Nos.
Spraying volume (lit)	4.8-5.2
Pressure (kg/cm ²)	20-25
Capacity (ha/day)	1.5
Power Source (hp/kW)	1-3/0.75-2.25, engine

Uses: It is suitable for spraying pesticides and fungicides on rice, fruits and vegetable crops.

Cost (Rs) : 7000- 10,000

7.4 TRACTOR DRAWN BOOM SPRAYER



Features:

The sprayers essentially consists of a tank which is made of fibre glass or plastic, pump assembly, suction pipe with strainer, pressure gauges pressure regulators, air chamber, delivery pipe, spray boom fitted with nozzles. These are hydraulic energy sprayers. They utilize PTO power of the tractor to operate the pump of the sprayer. Basically the spray boom can be arranged in two ways; ground spray boom and overhead spray boom. The overhead spray boom is designed for tall field crops and the planting is done in such a way that it leaves an unplanted strip of about 2.5 m width for operation of the tractor. Therefore a planted strip may be 18-20 m wide and after every planted strip a fallow strip has to be left for tractor operation. For ground spray boom the planting has to be done in rows keeping in view track width of the tractor. It is suitable for use when the crop height is small.

Specification

No's of nozzle	21
Spray swath	10.2 m
Spacing between two nozzles	460 mm
Tank capacity	400 Liter
Weight	150 kg
Adjustment range of boom height	300 to 1260 mm
Field capacity	8 ha/day (with 21 nozzles)
Power requirement(hp/kW)	35/262.5, tractor

Uses: For spraying in vegetables, gardens, flower crops, vineyards & tall field crops like sugarcane, maize, cotton, sorghum, millets etc.

Cost (Rs) : 50,000

7.5 AERO-BLAST SPRAYER



Features:

The machine consists of tank of 400 litres capacity, pump, fan, control valve, filling unit, spout adjustable handle, pressure regulator and spraying nozzles to release the pesticide solution in to stream of air blast produced by the centrifugal blower. The air blast distributes chemical in the form of very fine particles throughout its swath, which is on one side of tractor. The major portion of swath is taken care of by the main blast through the main spout and the auxiliary nozzles cover the swath area near the tractor. The sprayer is mounted on the tractor 3-point linkage and is operated by tractor PTO. The orientation of air outlet can be adjusted for its direction and width of coverage.

Specification

Overall Dimension (mm)	1100x1300x2050 (LxWxH)
Weight (kg)	230
Flow rate (l/min.)	120
Spray swath (m)	13-15
Capacity (ha/h)	1.5-2.0
Power Source	35/26.25, tractor (hp/kW)

Uses: It is used for spraying plant protection chemicals on horticulture plants, tall crops like cotton, sunflower etc.

Cost (Rs) : 85,000

8. Harvesting Equipment

8.1 Self-Propelled Vertical Conveyor Reaper

8.2 Tractor Mounted Vertical Conveyor Reaper

8.3 Self-Propelled Riding Type Reaper

8.4 Self-Propelled-Reaper Binder

8.5 Self-Propelled Combine Harvester

8.6 Shrub Master

8.7 Potato Digger (Animal Drawn)

8.8 Potato Digger cum elevator

8.9 CHAFF CUTTER (MANUALLY OPERATED)

8.1 SELF- PROPELLED VERTICAL CONVEYOR REAPER



Features:

It consists of crop row divider, star wheel, cutter bar, and a pair of lugged canvas conveyor belts and a handle fitted with clutch and brakes. This type of machines cut the crops and conveys it vertically to one end and windrows the crops on the ground uniformly. Collection of crop for making bundles is easy and it is done manually. Self-propelled walking type, self-propelled riding type and tractor mounted type vertical conveyor reaper are also available. These types of reapers are suitable for crops like wheat and rice. In this reaper there is no shattering of the crop.

Specification

Dimensions (l x w x h), (mm)	2570 x 1850 x 1250
Weight (kg)	85
Number crop dividers	6
Type of cutting unit	Cutter bar with serrated V-shaped blades
Power source	8-10 hp
Capacity (ha/h)	0.20-0.40
Power Requirement (hp/kW)	5/3.75, engine

Uses: It is used for harvesting of wheat and rice crop.

Cost (Rs) : 1,00,000

8.2 TRACTOR MOUNTED VERTICAL CONVEYOR REAPER



Features:

The machine consists of a 76 mm pitch reciprocating cutter bar assembly, seven crop row dividers, two vertical conveyor belts fitted with lugs, pressures springs, pulleys and gearbox for the power transmission system. The crop row dividers are fitted in front of the cutter bar assembly and the star wheels are mounted over the crop row dividers. The machine is mounted in front of the tractor and the power to the machine is given from tractor PTO with the help of intermediate shaft running beneath the chassis of the tractor and a coupling shaft. Height of the machine above ground is controlled by tractor hydraulic with the help of pulleys and steel ropes. After the crop is cut by the cutter bar, it is held in a vertical position and delivered to one side of the machine by lugged belt conveyors and fall on the ground in the form of a windrow perpendicular to the direction of movement of machine.

Specification

Suitability	Wheat & Paddy
Overall dimensions (mm)	2380x990x560(LxWxH)
Weight (kg)	180
Working width (mm)	2200
Capacity (ha/h)	0.3-0.4
Power Requirement (hp/kW)	25/17.5 tractor

Uses: Useful for harvesting of wheat and paddy.

Cost (Rs) : 50,000

8.3 Self-Propelled Riding Type Reaper



Features:

The riding type vertical conveyor reaper is a self-propelled unit in which the operator rides on the machine. Drive is given by means of two large pneumatic wheels and steering is by rear idlers. The prime mover is a 6 hp/4.5 kW diesel engine. Convenient clutch, break, steering, hydraulic system and simple power transmission are provided for ease of operation. It consists of crop row divider, star wheel, cutter bar (76.2 mm), conveyor belt and wire spring etc. This reaper has two forward and one reverse speed.

Specification

Length (mm)	3185
Width (mm)	1900
Height (mm)	1450
Weight (kg)	1530
Operating speed (km/h)	3.0-3.5
Total grain losses (%)	5.0-5.9
Field capacity (ha/h)	0.25-0.30
Fuel consumption (l)	0.90-1.15
Field efficiency (%)	60-70
Labour requirement (man-h/ha)	5-6
Power requirement (hp/kW)	6/4.5, engine

Uses: It is suitable for harvesting rice, wheat, soybean and other cereals and oilseed crops.

Cost (Rs) : Rs.1,20,000/-

8.4 Self-Propelled-Reaper Binder



Features:

It consists of a frame, cutter bar, handles fitted with clutch and brakes, seat for the driver, two drive wheels, one wheel below the seat for steering, crop gathering unit and twine. The cutting unit of this type of reapers may be disc type or cutter bar type. After cutting, the crop is conveyed vertically to the binding mechanism where it is tied by the twine and released to the ground in the form of bundles. Self-propelled walking type models are available but these are not popular due to high cost of twine. Reaper binders are suitable for rice and wheat.

Specification

Overall dimensions(mm)	3600×1850×1200
Cutting width (mm)	1220
Cutting height (mm)	50 - 70
Rope requirement	1 spool/acre
Fuel consumption(l/h)	1
Working Capacity(ha/h)	0.4
Power Requirement (hp/kW)	10.2/7.5, Air-cooled, Diesel engine

Uses: Harvesting and binding of grain crops is done in single operation.

It is useful for harvesting Wheat, Paddy, Oats, Barley and other grain crops having height upto 85 to 110 cm.

Cost (Rs) : 2,50,000

8.5 SELF-PROPELLED COMBINE HARVESTER



Features:

Various designs of combine harvester having 2 to 6 m long cutter bar are commercially available. The function of a combine harvester is to cut, thresh, winnow and clean grain/seed. It consists of header unit, threshing unit, separation unit, cleaning unit and grain collection unit. The function of the header is to cut and gather the crop and deliver it to the threshing cylinder. The reel pushes the straw back on to the platform while the cutter bar cuts it. The crops are threshed between cylinder and concave due to impact and rubbing action. The threshed material is shaken and tossed back by the straw rack so that the grain moves and falls through the openings in the rack onto the cleaning shoe while the straw is discharged at the rear. The cleaning mechanism consists of two sieves and a fan. The grain is conveyed with a conveyor and collected in a grain tank.

Specification

Suitability	Wheat and Paddy
Overall dimensions (mm)	816x465x382 (LxWxH)
Working width (mm)	4313
Capacity (ha/hr)	0.8-1.0 (wheat)& 0.6 (paddy)
Power Source (hp/kW)	105/78.75, engine

Uses: Useful for harvesting, threshing and loading of wheat and paddy crop simultaneously.

Cost (Rs) : 14,00,000

8.6 SHRUB MASTER



Features:

It consists of cutting blades (swinging flails) fixed to the rotating bar, gear box for transmission of power at right angle, universal joints with telescopic shaft to connect the tractor PTO and gearbox, adjustable side skirts for controlling cutting height of shrubs or grass, safety guard and hitching frame. It is operated by tractor PTO. The bar having cutting blades fixed at the ends is mounted on the gearbox shaft. Thus, the vertical shaft of the gearbox provides rotary motion to the bar. The cutting blades mounted on the bar swing open to the cutting position due to centrifugal force as the bar rotates in the horizontal plane. The cutting takes place purely through impact and flails need not be sharp-edged. The blades are made of medium carbon steel or alloy steel and hardened.

Specification

Overall dimension(mm)	2000×1660×1000
No's of Blades	2
Cutting width	1600 mm
Total weight	350 kg
Power drive	PTO operated
Power Requirement (hp/kW)	25/17.5 or above.

Uses: It is used for the clearance of shrubs, monsoon growth in forests, fields, verges, helipads and general clearance of grasses in fields.

Cost (Rs) : 40,000

8.7 POTATO DIGGER (ANIMAL DRAWN)



Features:

It is an animal drawn digger useful for digging exposing potato tubers. It consists of a ridger shaped bottom with welded extension rods on its wings. A handle is provided at the rear for guiding the implements while in operation. It is suitable for digging potato tubers after removal of vines from the field.

Specification

Length(mm)	630-650
Width (mm)	320-330
Weight, kg	8-10
Power sources	A pair of bullock
Area covered (ha/hr)	0.030-0.035
No of ridge bottom	01

Uses: it is used for digging potato tubers after removal of vines from the field.

Cost (Rs) :

8.8 POTATO DIGGER CUM ELEVATOR



Features:

The tractor Pto operated potato digger cum elevator of a convex/ triangular shape-cutting blade, elevator rollers generally made of iron bars, power transmission device and a tractor hitching system. The crescent shape blade helps in digging of the potatoes, which are carried to the shaking conveyor belt and finally delivered at the rear of the machine in windrows form. These are collected manually. The shaking belt helps in removal of the soil. These machine can also be used for harvesting onions. In some models have discs are mounted in the front to cut haulm or for guiding the blade along the rows.

Specification

Length (mm)	2050-2060
Width(mm)	1180-1195
Height (mm)	1065-1070
No of furrows	2
Working width(mm)	1070
Size of disc(mm)	510-515
Weight, kg	500-525
Power source, hp	35-45 above

Uses: Potato diggers cum elevators are used for harvesting and exposing the potato tubers.

8.9 CHAFF CUTTER (MANUALLY OPERATED)



Features:

The chaff cutter machine consists of a through, cutting blade, fly wheel, cover plate, feed rolls, share plate, handle and stand. The blades are made of high carbon steel or alloy steel hardened and tempered to suitable hardness. The cutting edges are made sharp. These cutting blades are mounted on the flywheel. Hand operated machine two persons operate machine, one feeds the forage or grass in the feeding trough and another rotates the flywheel with handle.

Specification

No of blade	02
Dia of flywheel (mm)	900-1200
Chaff length(mm)	16-32
Power sources	Manual, two man
Weight(kg)	80-85

Uses: it is used for chopping of grass, fodder and fodder crop.

Cost (Rs) :

9 . Threshing Equipment

9.1 Paddy Thresher (Manually operated)

9.2 Multi-crop Thresher

9.3 Axial-Flow Paddy Thresher

9.1 PADDY THRESHER (MANUAL OPERATED)



Features:

It consists of wire-loop type threshing cylinder, power transmitting system, mild steel body and foot pedal. The threshing cylinder consists of wire-loop U shape embedded in wooden or metallic strips joined to two discs. A shaft carries the threshing cylinder and is connected to the transmission system. The transmission system consists of meshed gears or sprocket-chain mechanism. The larger gear or sprocket is connected to foot pedal with link. The foot pedal is always in raised position. On pressing the pedal the threshing cylinder starts rotating. For continuous rotation of the cylinder. The pedal is lowered and raised repeatedly.

Specification

Length(mm)	1150-1250
Width(mm)	600-650
Height(mm)	600-630
Power sources	One man
Weight(kg)	30-35
Output capacity (kg/hr)	45-50

Uses: It is used for threshing rice crop.

Cost (Rs) :

9.2 MULTI-CROP THRESHER



Features:

The thresher consists of frame, threshing cylinder, cylinder casing, concave, oscillating sieves, pulley, belts, four wheels, aspirator blower, winnowing and cleaning attachment. The threshing cylinder is fitted with peg-tooth beaters fitted on the cast iron rings. The main shaft on which threshing cylinder is fixed is supported at two ends by heavy pedal bearings. Various pulleys of different sizes are fitted on this shaft to transmit power to the winnowing and fan attachment. Adjustments for cylinder and blower speeds and concave clearance are provided to make the machine suitable for threshing various crops. For threshing paddy, soybean, maize, sorghum etc., the crop moves axially and is threshed due to impact and rubbing action and the straw is blown away. While threshing wheat, the crop is not allowed to move axially. It is threshed due to impact and rubbing action between cylinder and concave and the straw is broken into small pieces. The grain falling through the concave onto the sieves is cleaned, collected and bagged.

Specification

Overall dimensions (mm)	1950x1650x1450 (LxWxH)
Weight (kg)	460
Capacity (kg/ha)	1000-1600
Power Requirement(hp/kW)	5/3.75 electric motor or 7.5/5.265 diesel engine

Uses: It is used for threshing of Wheat, Paddy, Sorghum, Gram, Maize, Soybean, Pigeon Pea, Sunflower, etc.

Cost (Rs) : 1,00,000

9.3 AXIAL-FLOW PADDY THRESHER



Features

It consists of a threshing cylinder, concave, cylinder casing, cleaning system and feeding chute. In axial flow concept, the crop is fed from one end, moves axially and the straw is thrown out from the other end after complete threshing of the crop. During threshing, the crop rotates three and half times around the cylinder and all the grains get detached. The threshing cylinder is of peg type. The casing of the thresher has 7 louvers for moving the crop axially. Two aspirator blowers and two sieves are provided for cleaning.

Specification

Length (mm)	2030
Width (mm)	3050
Height(mm)	1960
Feeding device	Feeding chute, manually
Length of feeding chute (mm)	905
Width of feeding chute (mm)	110
Type of cylinder	Spike tooth
Cylinder size, tip diameter x length(m m)	770 x 1500
Length of concave (mm)	840
Width of concave (mm)	570
Concave clearance (mm)	18-21
Type, size and number of blowers	Aspirator type, two blowers of 400 mm diameter and 160 mm width
Weight (kg)	730
Power requirement(hp/kW)	35/26.25, tractor pto

Uses: Used for threshing of paddy crop.

Cost of Machine : Rs.80,000/-

10. Post Harvest Technology Equipment

10.1 Groundnut Dicorticator (Manually operated)

10.2

10.1 GROUNDNUT DECORTICATOR (MANUALLY OPERATED)



Features:

The groundnut decorticator is simple equipment's and easy to install and operate. The decorticator consists of angle iron frame the two side of which are covered with mild steel sheet. A perforated mild steel sieve the opening of which are deigned to suit a particular grade of groundnut.

Specification

Length(mm)	516-800
Width (mm)	275-400
Weight, kg	15-20
Power sources	One man
Area covered (ha/hr)	80-200

Uses: it is used for to shell groundnut pods and separate karnels.

Cost (Rs) :

POTATO SLICER (MANUALLY OPERATED)



Features:

It is manually operated, it consists of a rotating disc, which carries radial knives and revolves on a vertical shaft. Over this disc, vertical cylinders are mounted for feeding the potatoes. It is mounted on a frame made of mild steel angle sections and rotated with a handle provided on the top. It consists of mainframe, four cylinder and pressing device. It can accommodate potato up to 75mm diameter.

Specification

Length(mm)	625-630
Width(mm)	600-620
Weight(kg)	30-32
Power sources	One man
Capacity (kg/hr)	30-35
Labour requirement(man-hr/qt)	3.3

Uses: It is used for slicing of potatoes for making chips and wafers.

Cost (Rs) :

POTATO PEELER (MANUALLY OPERATED)



Features:

The potato peeling machine consists of an indented cylinder, which has protruding rasps on the inner surface. Potato to be peeled are put inside the cylinder and rotated gradually. Due to the presence of the rasps. The peel gets removed. It is a batch type machine. Water is used to wash away the tiny peels before the peeled potatoes are taken out of the machine. Since potato are free to rotate inside the cylinder, potato assorted sizes can be fed into the machine. It consists of mainframe, handle, rotating drum with notches, water inlet, top cover etc.

Specification

Length(mm)	560-600
Width(mm)	450-460
Weight(kg)	25
Power sources	One man
Capacity (kg/hr)	30-35
Labour requirement(man-hr/qt)	3.3
Peeling efficiency (%)	77-80
Peeling losses (%)	4-5

Uses: It is used for removing the outer skin of different sizes of potatoes, which can be used for further processing to produce value added products like chips, wafers etc.

Cost (Rs) :

PADEL-CUM-POWER OPERATED GRAIN CLEANER



Features:

The machine consists of an angle iron frame on which the other components are mounted, grain hopper having slant bed with feed control mechanism, cleaning box with sieve, blower unit, power transmission system and cycle type pedalling unit. The cleaner can also be operated with electric motor in place of pedals. The eccentric mechanism on main shaft is driven by pedal shaft or motor shaft through sprocket-chain drive and provides reciprocating motion to the cleaning box. The pulley on blower shaft received the power from the main shaft pulley by V-belt. Air draft is created by the blowers; which is directed at the free falling grain from the hopper and thus separate the grain from the chaff or light impurities, the grain cleaner separate impurities from the grain on the basis of difference in size and weight. For operation the grain are filled in the hopper. The feed control mechanism is adjusted so that the grain falls in the form of sheet in the cleaning box.

Specification

Length(mm)	1600	
Width(mm)	500	
Weight(kg)	100	
Power sources	One person or 0.5 hp Single phase motor	
Recommended sieve sizes(mm)	Top sieve	Bottom sieve
Wheat or Sorghum	5	2x20
Soybean	8	3.2x20
Gram	6.5	3.2x20
Capacity, pedal operated (kg/hr)	Gram-500, wheat-350, Soybean-600	
Capacity, power operated (kg/hr)	Gram-800, wheat-500, Soybean-900	
Purity of clean grain (%)	99.0-99.8	

Uses: It is used for cleaning and grading of wheat, soybean, gram, pigeon pea, sorghum, and other similar crops.

Cost (Rs) :

MAIZE SHELLER (POWER OPERATED)



Features:

The machine consists of a threshing cylinder, concave and centrifugal blower mounted on a frame. Crop feeds manual. The threshing cylinder is of spike tooth type. Round bars are used as spikes, which are fitted on circular ring. The head comes out through the opening at the far end of threshing drum. A blower is used for cleaning the grain.

Specification

Length(mm)	560
Width(mm)	1020
Weight(kg)	80-120
Power sources	2-3 hp Single phase motor
Dia of Main Shaft(mm)	34.5
Cylinder Dia(mm)	142-305
Concave opening Size (mm)	11
Cylinder concave clearance(mm)	16
No of blower	1
Threshing capacity(qt/hr)	20-25
Cleaning efficiency	95-98

Uses: It is used for maize cobs and the chaff is removed by winnowing.

Cost (Rs) :

DALL MILL (POWER OPERATED)



Features:

It is a 2.0 hp three-phase electric motor operated equipment's for dehusking and splitting of pigeon pea, black gram, green gram, and lentil. It consists of emery/corundum roller, feed hopper, and concave and dal outlet. The product to be milled first soak in water (preconditioning), sun dried and later on fed into the unit to achieve complete milling in two passes.

Specification

Length(mm)	770-780
Width(mm)	630-650
Weight(kg)	90-95
Power sources	Three phase electric motor
Capacity (kg/hr)	100-110
Milling efficiency (%)	88-90
Broken grain (%)	3-5
Operating speed(rpm)	900
Labour requirements (man-h/q)	1

Uses: It is used for dehusking and splitting of pigeon pea, black gram, green gram and lentil etc.

Cost (Rs) :

11. Special Mechines

EARTH AUGUR (MANUALLY OPERATED)



Features:

It is manually operated machine. It consist of drill, two stroke petrol engine, handle, stop drill lever, grip etc. all the engine control functions are integrated in the soil, handle the machine is controlled by finger pressure, the large surface control cushion rest against operator body or legs while drilling reduces vibration while allowing precision control the drill. The designed frame grip reduces vibration. This reduces fatigue allowing you to save your strength over longer periods. The brake is triggered by the operator as soon as the drill jammed in the ground. The jammed drill can then easily by unscrewed from the bore hole

Specification

Model no	BT-121
Drill dia(mm)	200
Depth of hole	2 feet
displacement	30 cm ³
Power output(hp/kw)	1.8/1.3
Weight(kg)	904
Petrol Tank volume	640cc
Spindle speed, rpm	190

Uses: It is used for drilling hole in soil for planting trees, fencing pole, gardening, etc.

Cost (Rs) : Rs 62,000/-

TEA PLUCKING MACHINE (MANUALLY OPERATED)



Features:

It is manually operated machine, air cooled, two stroke petrol engine, it consists of knife, blower

Specification

Model	AM-110VA	AM-110EB	VB New Z2	
Blade length(mm)	525		1210	17
Weight(kg)	3.4	6.2	13	1600
Working efficiency(kg/hr)	50-70	-	-	
Type	Air cooled two stroke			
Displacement(cm ³)		25.6	41.5	
Engine power (ps)		1.4	3.1	
Fuel tank capacity, lit	0.6	0.6	0.6	
Beg capacity (kg)	20	20	20	

Uses: it is used for plucking tea leaf.

Cost (Rs) : 85,000/-

10. LIST OF AGRICULTURE MACHINERY AND EQUIPMENT MANUFACTURERS IN N.E.STATES

ASSAM

1. Agro Processing Centre, Panjabari, Kamrup, Guwahati-781 001 (Assam)
2. Anoope Karmakar Blacksmithy, Ulubari, B.K. Kakati Road, Kampur, Guwahati-782 426 (Assam)
3. Arun Kumari Baruah Blacksmithy, Higuguri, Tinsukia-786 126 (Assam)
4. B. Karmokar Blacksmithy, Barpeta Bazar, Barpeta-781 301 (Assam)
5. Biswakarma Sharma, Blacksmithy, Sibasagar-785 640 (Assam)
6. Central Agril. Engg workshop, Ulubari, Kamrup, Guwahati-781 001 (Assam)
7. Chandra Dutta Blacksmithy, Korenga, Jorhat-785 008 (Assam)
8. Dept. of Agril. Engg, Assam Agril. University, Jorhat-785 013 (Assam)
9. Madon Gorodia Engg. Works, Amalpatty, Golaghat-785 621 (Assam)
10. Mild Steel & Engg. Works, ZooNerangi Road, Kamrup, Guwahati-781 014 (Assam)
11. Mohendra Bora Blacksmithy, Dhekoegarh, Jorhat-785 005 (Assam)
12. Mukheswar Senshowa Blacksmithy, Titabor, Tatigaon, Jorhat-785 005 (Assam)
13. Narayan Kamorkar Blacksmithy, Barpeta Bazar, Barpeta-781 301 (Assam)
14. Omprakash Sarmah Blacksmithy, Near ASTC, Dergaon, Golaghat-785621 (Assam)
15. P. Dutta Blacksmithy, Dehwal, Tinsukia-786 126 (Assam)
16. Pranjit Dutta Blacksmithy, Korenga-8, Jorhat-785 008 (Assam)
17. R.S. ENgg. works, Bengenakhowa, Golaghat-785 621 (Assam)
18. Rajiv Das Blacksmithy, Higuguri, Tinsukia-786 126 (Assam)
19. Rajkumari Sharma Black smithy, Barpeta, B.K. Kakati Road, Guwahati-782 001 (Assam)
20. Raju Bora Blacksmithy, Korenga, Jorhat-785 008 (Assam)
21. Ram Kumar Blacksmithy, Dehwal, Tinsukia- 786 126 (Assam)
22. Ritual Sarma Blacksmithy, Dhekial, Golaghat-785 621 (Assam)

23. Shivananda Sharma Blacksmithy, K.P. Chariali, Sibasagar-785 640 (Assam)
24. Shovan Kalita Blacksmithy, Dhekorgorah, Jorhat-785 008 (Assam)
25. Soroushona Saikia Blacksmithy, Titabor, Jorhat- jorhat- 785 005

MANIPUR

1. I. Birchandra Meitei Iron works, Sagolband Tera, Khuraijam Leirak Imphal- 795 001 (Manipur)
2. L. Kaoren Singh Blacksmithy, Wangkhei Thangjam Leirak, Imphal East-795 001 (Manipur)
3. L. Lajao Singh Blacksmithy, Wangkhei Thangjam Leirak, Imphal East-795 001 (Manipur)
4. L. Ningthemjao Blacksmithy, Wangkhei Thangjam Leirak, Imphal East-795 001 (Manipur)
5. Laisangthem Boba Blacksmithy, Wangkhei Thangjam Leirak, Imphal East-795 001 (Manipur)
6. Laisangthem Ibocha Blacksmithy, Wangkhei Thangjam Leirak, Imphal East-795 001 (Manipur)
7. Laisangthem Mani Singh Blacksmithy, Wangkhei Thangjam Leirak, Imphal East-795 001 (Manipur)
8. Laisangthem Tomba Blacksmithy, Wangkhei Thangjam Leirak, Imphal East-795 001 (Manipur)
9. Laisangthem Ibotombi Blacksmithy, Wangkhei Thangjam Leirak, Imphal East-795 001 (Manipur)
10. Laitongjan Rojit Singh Blacksmithy, Wangkhei Thangjam Leirak, Imphal East-795 001 (Manipur)
11. Nongthombam Ibotombi Singh Blacksmithy, Wangkhei Thangjam Leirak, Imphal East-795 001 (Manipur)
12. R.K. Laksna Singh Blacksmithy, Wangkhei Thangjam Leirak, Imphal East-795 001 (Manipur)
13. Soiban Ibotombi Singh Blacksmithy, sagolband Thangjam Leirak, Imphal East-795 001 (Manipur)
14. Th. Basanta Singh Blacksmith, sagolband Thangjam Leirak, Imphal East-795 001 (Manipur)
15. Th. Dhanajoy Blacksmith, sagolband Thangjam Leirak, Imphal East-795 001 (Manipur)

- 16.Th. Gyanendra Singh Blacksmithy, sagolband Thangjam Leirak, Imphal East-795 001 (Manipur)
- 17.Th. Joykumar Singh Blacksmithy, sagolband Thangjam Leirak, I i Imphal East-795 001 (Manipur)
- 18.Th. Mungayamba Singh Black smithy, sagolband Thangjam Leirak, Imphal East-795 001 (Manipur)
- 19.Tokpam Shyam Kishore Singh Blacksmithy, Wangkhei Thangjam Leirak, Imphal East-795 001 (Manipur)

MEGHALAYA

- 1.A. Lyngdoh Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
- 2.A. Tariang Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
- 3.Aitar Kharumnuid Blacksmithy, sohryngkham, East Khasi Hills-793 001 (Meghalaya)
- 4.Apprensingh Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
- 5.Arbor Blacksmithy, Laitlyngkot, Nongthemmai, East Khasi Hills-793 001 (Meghalaya)
- 6.B. Diengdoh Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
- 7.B. Kharkongor Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
- 8.Banri Kharmalki Blacksmithy, sohryngkham, Lulong, East Khasi Hills-793 001 (Meghalaya)
- 9.Bikstar Dkhar Blacksmithy, sohryngkham, Lulong, East Khasi Hills-793 001 (Meghalaya)
- 10.Booksingh Kharmujai Blacksmithy, sohryngkham, Mawdieja, East Khasi Hills-793 001 (Meghalaya)
- 11.Bravely Litton Blacksmithy, sohryngkham, Lulong, East Khasi Hills-793 001 (Meghalaya)
- 12.Brostar Sangma Blacksmithy, Rongjeng, West Garo Hills-794 001(Meghalaya)
- 13.C.H. Marak Blacksmithy, Darangiri, West Garo Hills-794 110(Meghalaya)

- 14.D. Lyngdoh Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
- 15.Dinostar Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
- 16.E. Kharkongor Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
- 17.H. Kharkongor Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
- 18.I.C. Steel Tool Works, Cherrapunjee, Maraikaphon, East Khasi Hills-799 205 (Meghalaya)
- 19.K. Kharkongor Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
- 20.K.R. Blacksmithy, Laitmawlong, Nongkynrih, East Khasi Hills-793 001 (Meghalaya)
- 21.K.Syiem Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
- 22.Khadsawphra Blacksmithy Industry, Mairang, Pyndemumiong, West Khasi Hills-793 001 (Meghalaya)
- 23.Kharkongor & Sons Agril. Tools and Equipments Industries, Myllem, East Khasi Hills-793 001 (Meghalaya)
- 24.Kharlukhi Industry, Myllem, Kyndong, East Khasi Hills-793 001 (Meghalaya)
- 25.Kharmalki Blacksmithy, Nongkrem, East Khasi Hills-793 001 (Meghalaya)
- 26.Kurbah Blacksmithy, Mawmaram, Nongthliew, West Khasi Hill-793 001 (Meghalaya)
- 27.L. Khyrim East Khasi Hills-793 001 (Meghalaya) Myllem, East Khasi Hills-793 001 (Meghalaya)
- 28.L. Kurkalang Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
- 29.L. Langstieh Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
- 30.Laitdom Blacksmithy, Mairang, West Khasi Hill-793 001 (Meghalaya)
- 31.Langstieh Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)

32. Listur Warjri Blacksmithy, Sohryngkham, Lulong, East Khasi Hills-793001 (Meghalaya)
33. M. Khyriem Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
34. M. Kurkalang Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
35. M. Sohtum Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
36. Maroit Blacksmithy, Mairang, Marol, West Khasi Hill-793 001 (Meghalaya)
37. Mir Kharmujai Blacksmithy , Sohryngkham, Lulong East Khasi Hills-793 001 (Meghalaya)
38. N. Kurkalang Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
39. N. Syiem Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
40. Niang Wallang Blacksmithy , Mairang, , West Khasi Hill-793 001 (Meghalaya)
41. Nongkhlaw Blacksmithy, Myllem, Pomkamaw, , East Khasi Hills-793001 (Meghalaya)
42. Nongkynrih Cutting & Lock Pad Industries Laitlyngkot, Nongkynrih, East Khasi Hills-793 001 (Meghalaya)
43. Nongrum Blacksmithy , Latryngew, Mawmihthied, East Khasi Hills-793001 (Meghalaya)
44. Nongsing Blacksmithy, Nongdom, Pynglung, East Khasi Hills-793001 (Meghalaya)
45. Nongthyrnan Myllem, East Khasi Hills-793 001 (Meghalaya), Blacksmithy, Maweit, Nongthyrnang, East Khasi Hills-793 001 (Meghalaya)
46. P. Diengdoh Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
47. P. Kharkongor Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
48. P. Khongjee Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
49. P. Shylla Blacksmithy, Mawkyrwat, Nonglang, West Khasi Hill-793 001 (Meghalaya)

50. Porton Kharbuli Blacksmithy , Sohryngkham, Lulong, , East Khasi Hills-793 001 (Meghalaya)
51. R. Khyriem Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
52. R. Kurkalang Blacksmithy, Myllem, East Khasi Hills-793 001 (Meghalaya)
53. R. Langstieh Blacksmithy , Myllem, East Khasi Hills-793 001 (Meghalaya)
54. Rajen Blacksmithy , Kherapara , West Garo Hills-794110, (Meghalaya)
55. Ravendra Sharma Blacksmithy, garobada, West Garo Hills-794110 (Meghalaya)
56. Robel Pariong Blacksmithy, Mairang, West Khasi Hill-793 001 (Meghalaya)
57. Rynjah Blacksmithy , Laitlyngkot , Nongkynrih, East Khasi Hills-793001 (Meghalaya)
58. S. Kharbani Blacksmithy , Myllem, East Khasi Hills-793 001 (Meghalaya)
59. S. Kharkongor Blacksmithy , Myllem, East Khasi Hills-793 001 (Meghalaya)
60. S. Kharmujai Blacksmithy, Sohryngkham, Lulong, East Khasi Hills-793001 (Meghalaya)
61. S. Kurkalang Blacksmithy , Myllem, East Khasi Hills-793 001 (Meghalaya)
62. S. Lyngdoh Blacksmithy , Myllem, East Khasi Hills-793 001 (Meghalaya)

TRIPURA

1. Ajit Karmakar Blacksmithy, Teliamura, West Tripura -799205 (Tripura)
2. Amarchan Karmakar Blacksmithy ,Narahura, West Tripura-799 205 (Tripura)
3. Amulya Karmakar Blacksmithy ,Narahura , West Tripura-799 205 (Tripura)
4. Anil Karmakar Blacksmithy ,Narahura West Tripura-799 205 (Tripura)

5. Babul Dev Blacksmithy ,Yogendra Nagar, West Tripura-799 205 (Tripura)
6. Balai Karmakar Blacksmithy, Dharmnagar, North Tripura -799205
7. Banamali Karmakar Blacksmithy, East Pratapgarh, West Tripura-799 001 (Tripura) Karmakar Blacksmithy
8. Benimadhav Karmakar Blacksmithy, East Laxmibil,, Bishalgarh , West Tripura-799 001 (Tripura)
9. Bhanu Karmakar Blacksmithy, Dhaleswar, West Tripura-799 001 (Tripura)
10. Bimal Kanti Karmakar Blacksmithy , Subhash Nagar, Bishalgarh , West Tripura -799 205 (Tripura)
11. Biswanath Karmakar Blacksmithy , Subhash Nagar, Bishalgarh , West Tripura -799 205 (Tripura)
12. Chandan Karmakar Blacksmithy, Sidhi Mohanpur , West Tripura -799 205 (Tripura)
13. Dilip Karmakar Blacksmithy, East Laxmibil, West Tripura -799205 (Tripura)
14. Diplip Karmakar Blacksmithy, East Pratapgarh, West Tripura-799 205 (Tripura)
15. Dulal Karmakar Blacksmithy, Manughat, North Tripura-799205 (Tripura)
16. Gauranga Karmakar Blacksmithy, Dharmanagar, North Tripura-799205(Tripura)
17. Gauranga Karmakar Blacksmithy, Yogendranagar, West Tripura-799205 (Tripura)
18. Gautam Karmakar Blacksmithy, Kumarghat, North Tripura-799205(Tripura)
19. Gupal Karmakar Blacksmithy, Yogendranagar, West Tripura-799205 (Tripura)
20. Gyanwandra Karmakar Blacksmithy, Morabari, Bishalgarh-799102 (Tripura)
21. Hardhan Karmakar Blacksmithy, Mohanpur, 799 211(Tripura)
22. Hardhan Karmakar Blacksmithy, Narahura, West Tripura-799 205 (Tripura)
23. Hardhan Karmakar Blacksmithy, Pratapgarh, West Tripura-799205 (Tripura)

24. Harendra Debnath Blacksmithy, Belonia, -South Tripura-799205 (Tripura)
25. Harendra Debnath Blacksmithy, East Pratapgarh, West Tripura-799205 (Tripura) West Tripura.
26. Jiban Karmakar Blacksmithy, Morabari, Bishalgarh-799 102, West Tripura (Tripura)
27. Jiban Karmakar Blacksmithy, Subhash Nagar, Bishalgarh-799102, West Tripura (Tripura)
28. Kalipada Karmakar Blacksmithy, East Laxmibil, West Tripura-799205 (Tripura)
29. Kamal Karmakar Blacksmithy, Kumarghat-799 264, North Tripura(Tripura)
30. Mahindra Karmakar Blacksmithy, Kanchanpur, , North Tripura-799 205(Tripura)
31. Manuranjan Karmakar Blacksmithy, Amarpur, South Tripura -799205(Tripura)
32. Mridul Saha Blacksmithy, , Mohanpur, West Tripura-799 205 (Tripura)
34. Nakul Karmakar Blacksmithy ,Manughat, North Tripura-799205 (Tripura)
35. Nanu Karmakar Blacksmithy, Pratapgarh, Agartala, West Tripura-799 205 (Tripura)
36. Narayan Karmakar Blacksmithy, East Laxmibil, West Tripura-799 205 (Tripura)
37. Narayan Gosh Blacksmithy , Sachindranagar, Jirania, West Tripura-799 205 (Tripura)
38. Nekan Karmakar Blacksmithy, , Narahura, West Tripura-799 205 (Tripura)

10. LIST OF AGRICULTURE MACHINERY AND EQUIPMENT MANUFACTURERS IN OTHER STATES

- 1.U.P. State Agro Industries Corporation Ltd, Lucknow (UP)
- 2.M/s Bhuvanewari Iron Industries, T.B. Road, Kadur-577 548 (Karnataka)
- 3.A.P. State Agro Industries Development Corporation Ltd, Hyderabad Branch Office- Industrial Estate, Bellary Road, Anantapur (AP)-515 004
- 4.The M.P. Agro Industries Development Corporation Ltd., Panchanan, 3rdF;oor, Malviya Nagar, Bhopal (M.P.)-462 003
- 5.Maharastra State Agro Industries Development Corporation Ltd., Rajan House, Prabha Devi, Mumbai-400025
- 6.M/s Paras Agro Engineering Works, Plot No.-D-91 MIDC, Nagarpur, Ahmednagar-414 001 (Maharastra)
- 7.M/s Bothra Foundry and Machine Works, Plot No.-35-40, Industrial Estate, Nagar Pune Road, Ahmednagar-414 001 (Maharastra)
- 8.M/s Bharat Chilling Rolls Industries, A-74, M.I.D.C, Khamgaon-444 303, District-Buldhana (Maharastra)
- 9.M/s Dandekar Brothers, New Timber Area, Shivajinagar, Sangli-416 416 (Maharastra)
- 10.M/s Pallavi Engineering Works, Bazarpath, AT and post poynad, Dist.-Raigad-402108 (Maharastra)
- 11.M/s Kerala Agro Machinery Corporation Ltd. Athani, Ernakulam, Kerala-683 585
- 12.M/s Zhejiang Sifang Group Corporation, 57, Yong Kang, Zhejiang, Jiangsu. The People's Republic of China-321315
- 13.M/s Jinyun Star Tractor & Engine manufacturing Works, No. 38v8, Jianchun Road, Xinjian, Jinyun, Zhejiang, People's Republic of China-321 400
- 14.M/s Changzhou Machinery & Equipment Imp. & Exp. Co. Ltd. (AMEC), 29, N, Huaide Road, Changzhou, Jingsu, People Republic of China-213 002
- 15.M/s Shandong Changlin Group, Qingdao Imp & Exp Co. Ltd., 25, Xianjiangar Road, EDTZ, Qingdao City, Shandong, People's Republic of China.
- 16.M/s Zhejiang Ting Neng Sheng Machine Co. Ltd. Hugjie Industry Zone, Yongkang City, Zhejiang Province, China
- 17.M/s Kerala Agro Machinery Corporation Ltd. Athani, Ernakulam, Kerala-683 585

- 18.M/s Bajaj Tempo Ltd. Pune-Mumbai Road, Akurdi, Pune-411 035
- 19.M/s Jiagsu Yueda Yancheng Tractor Manufacturer Co.ltd., 90, Wengang South Road, Yencheng, Jiagsu,China-224 002
- 20.M/s Changzhou Dongfeng Agricultural Machinery Group Co. Ltd. (CZDFAM), No. 10 Xinye Road, Changzhou, Jiagsu, China-213 012
- 21.M/s SIAM Kubota Industry Ltd.101/19-24 Moo 20 Navanakorn10 Rad Thailand
22. M/s KisanKraft Machine Tools Private Ltd., 32/5C Dasarahalli Village, Dasarahalli Main Road, H.A. Farm Post Office, Hebbal, Bangalore-24, Phone-08064561435, 08022330318
- 23.M/s VST Tillers Tractor Ltd., P.B. No. 4801, Mahadevapura Post, Whitefield Road, Bangalore-5600048, Karnataka
- 24.Govt. Agriculture Workshop, Junagar (UP)
- 25.M/s Swastic Engineering, G-32, MIDC Area, Jalgaon-425 003, Maharastra
- 26.M/s Santosh Brothers, M.G. Road, Bhood Bulandshahar-203001 (UP)
- 27.M/s Mamta Iron Works, Nursery Road, Mahadev Nagar, PO-Devsar 396 380, Billimora, Gujarat.
- 28.M/s Shri Ram Agricultural Implements, PO-Narayanagason-410 504Tal-Junner, Dist.-Pune (Maharastra)
- 29.M/s Godavari udyog, E 28.29, MIDC Industrial Area, GopalChawdi, Nanded-431 602
- 30.Kalra Agro Industries, Durga Nagar, Hisar Road, Ambala City-134003(Haryana)
- 31.M/s Bhuvanewari Iron Industries, T.B. Road, Kadur-577 548 (Karnataka)
- 32.A.P. State Agro Industries Development Corporation Ltd,Hyderabad Branch Office- Industrial Estate, Bellary Road, Anantapur (AP)-515 004
- 33.The M.P. Agro Industries Development Corporation Ltd,Panchanan, 3rdF;oor, Malviya Nagar, Bhopal (M.P.)-462 003
- 34.M/s Paras Agro Engineering Works, Plot No.-D-91 MIDC, Nagarpur, Ahmednagar-414 001 (Maharastra)
- 35.M/s Bothra Foundry and Machine Works, Plot No.-35-40,Industrial Estate, Nagar Pune Road, Ahmednagar-414 001 (Maharastra)
- 36.M/s Bharat Chilling Rolls Industries, A-74, M.I.D.C, Khamgaon-444 303, District-Buldhana (Maharastra)

- 37.M/s Dandekar Brothers, New Timber Area, Shivajinagar, Sangli-
(Maharashtra)
- 38.M/s Pallavi Engineering Works, Bazarpath, AT and post poynad,
Dist.-Raigad-402108 (Maharashtra)
- 39.M/s Kerala Agro Machinery Corporation Ltd. Athani, Ernakulam,
Kerala-683 585
- 40.M/s Zhejiang Sifang Group Corporation, 57, Yong Kang, Zhejiang,
Jiangsu. The People's Republic of China-321315
- 41.M/s Jinyun Star Tractor & Engine manufacturing Works, No. 38v8,
Jianchun Road, Xinjian, Jinyun, Zhejiang, People's Republic of
China-321 400
- 42.M/s Changzhou Machinery & Equipment Imp. & Exp. Co. Ltd.
(AMEC), 29, N, Huaide Road, Changzhou, Jingsu, People Republic of
China-213 002
- 43.M/s Shandong Changlin Group, Qingdao Imp & Exp Co. Ltd., 25,
Xianjiangar Road, EDTZ, Qingdao City, Shandong, People's
Republic of China.
- 44.M/s Bajaj Tempo Ltd. Pune-Mumbai Road, Akurdi, Pune-411 035
- 45.M/s Jiangsu Yueda Yancheng Tractor Manufacturer Co.ltd., 90,
Wengang South Road, Yencheng, Jiangsu,China-224 002
- 46.M/s Changzhou Dongfeng Agricultural Machinery Group Co. Ltd.
(CZDFAM), No. 10 Xinye Road, Changzhou, Jiangsu, China-213 012
- 47.M/s SIAM Kubota Industry Ltd.101/19-24 Moo 20 Navanakorn10
Rad Thailand
- 48.M/s KisanKraft Machine Tools Private Ltd., 32/5C Dasarahalli
Village, Dasarahalli Main Road, H.A. Farm Post Office, Hebbal,
Bangalore-24, Phone-08064561435, 08022330318
49. M/s VST Tillers Tractor Ltd., P.B. No. 4801, Mahadevapura Post,
Whitefield Road, Bangalore-5600048, Karnataka
- 50.Govt. Agriculture Workshop, Junagar (UP)
- 51.M/s Swastic Engineering, G-32, MIDC Area, Jalgaon-425 003,
Maharashtra
- 52.M/s Santosh Brothers, M.G. Road, Bhoad Bulandshahar-203001 (UP)
- 53.M/s Mamta Iron Works, Nursery Road, Mahadev Nagar, PO-
Devsar-396 380, Billimora, Gujarat.
- 54.M/s Shri Ram Agricultural Implements, PO-Narayanagason-410504
Tal-Junner, Dist.-Pune (Maharashtra)
- 55.M/s Godavari udyog, E 28.29, MIDC Industrial Area, GopalChawdi,
Nanded-431 602
- 56.Kalra Agro Industries, Durga Nagar, Hisar Road, Ambala City-
134003(Haryana)
- 57.M/s Sri Bhubaneswari Iron Industries, T.B. Road. Kadar (Karnataka)
- 58.M/S Gujrat Agro Industries Corpn Ltd Ahmedabad-380055
- 59.Department Of Agricultutal Engineering, Govt Of Assam.Hazrapar,
Tezpur (Assam 784001)
- 60.Himagrico Implements And Tools Jachh,Jassur,Kangra(H.P)
- 61.Magnificant EngineersTs-36,Sidco Industrial Estate, Kurichi,
Coimbatore-641021
- 62.Indian Institute Of Sugarcane Research, Lucknow
- 63.M/S Sheiram Agricultural Implements, At Post Narayangaon Tal.
Junner, Pune-410504 Maharashtra
- 64.M/S Welfab Industries At&Post Dhanora Taluka& District
Nandurbar(Maharashtra)
- 65.Perfect Tech Enterprise Farm Machinery and impliments, Sarita
viher, New Delhi
- 66.Pubert Z.I. Depierre-Brune B.P 25-85111
- 67.Tamil Nadu Agricultural University Farm Implements & And
Machinery Zonal Research Centre Collage Of Agricultural
Engineering Coimbatore-641003(T.N)
- 68.M/S Oleo-Mac Product, Emak Member Of The Yama Group Vai E
Fermi, S-42011 Bagnolo In Piano, Italy
- 69.M/S Flyriver Aluminum Industry Co. Ltd, Wangshontou Industrial
Zone, Wuyi,Zhejiang, Chaina-320210
- 70.M/S Sree Balaji Engineering Works, GNT Road Near Nava Bharat
Picvture Palace, Ongole-523002,Prakasam (AP)
- 71.Amar Agril Implements Works, Gill Road Janta Nagar, Ludhiana-141003
- 72.Green Planet 30, Rani Jhansi Road, New Delhi-110055
- 73.ADRIATICA Nachine Agricole Via Benedetto Croce, 3/D-47039-
Savignano Sul RubiconeFC- Italia
- 74.BCS India Pvt ltd Manngarh, Kohara-Machhiwara Road Kohara,
Ludhiana-141112
- 75.M/S Oleo-Mac Product, Emak Member Of The Yama Group Vai E
Fermi, S-42011 Bagnolo In Piano, Italy

- 76.VST Tiller Tractors ltd Post Box No 4801 Whitefield road
Mahadevapura-560048
- 77.M/s Usha International Ltd., Plot No.3, Sector 32, Institutional
Area, Gurgaon. PIN – 122001Ph: 91 124 4583100,
Fax: 91 124 4583200, 91 124 2883300,
- 78.Plot No. 5, Sector - 41 Greater Noida Industrial Development Area,
Distt. Gautam Budh Nagar - 201 306 Uttar Pradesh, India.
- 89.M/s Oleo-Mac, 42011 Bagnolo in Piano (RE) Italy.
www.myoleomac.com
- 80.M/s Kirloskar Oil Engines Ltd.Laxmanrao Road, Khadki, Pune-
411 003Phone: 0212-310341. Fax: (0212) 313208
- 81.M/s Ujala Pumps Pvt. Ltd., F-83, RIICO Indusrial Area, Distt.-Alwar
(Rajasthan) Bhiwadi, Ph. No. 01493 221360, 09214200817.
- 82.M/s American Spring & Pressing works Pvt. Ltd., P.O. Box No.-
7602, Aspee House B.J. Patel Marg, Malad (W) Mumbai-400064
- 83.M/s RatnagiriImplex Pvt.Ltd., Annapurna House No. 1/14, 7th
Cross New Gunddadhalli, Mysore Road, Bangalore-560026
- 84.M/s Australian Agricultural Machinery Pvt. Ltd., Johnson street,
Dubbo NSW 2830, Australia
- 85.M/s Shixia Sprayer Co. Ltd., Shixia Industry, Dist-Huangyan
Zhejiag CHINA
- 86.M/s Padgilwar Agro Industries, 192-Wardhman Nagar, Nagpur-
44008 (Maharashtra)
- 87.M/s Adarsh Plant Protection Ltd., 604 GIDC, VitthalUdyog Nagar,
Anand-388121 (Gujarat)
88. M/s RatnagiriImplex Pvt.Ltd., Annapurna House No. 1/14, 7th
Cross New Gunddadhalli, Mysore Road, Bangalore-560026
- 89.M/s Fogggers India Pvt.Ltd., 303, Owner Industrial Estate, Gabriel
road, Mahim (W), Mumbai-400016
- 90.M/s Crystal Phosphates Ltd, G.I.-17, GT. Karnal Road, Industrial
Area, Azadpur, Delhi
- 91.M/s Padgilwar Agro Industries, 192-Wardhman Nagar, Nagpur-
44008 (Maharashtra)
- 92.M/s NavyugKrishiSadhan Pvt.Ltd., B.J. Patel Road, Malad (W),
Mumbai-400064 (Maharashtra)
- 93.M/s TaizhouFengtian Machine Co. Ltd., Sanjia Industry Zone,
Taizhou City, Zhejiang Province, China
- 94.M/s StichwellQualitex Pvt. Ltd., G-58, Sector-6. Noida-UP, PIN-301 001
- 95.M/s American Spring & Pressing works Pvt. Ltd., P.O. Box No.-
7602, Aspee House B.J. Patel Marg, Malad (W). Mumbai-400064
- 96.M/s Vinit Engineering Co., Plot No. 14 B, Parvati Industrial Estate
Market Yard Chowk, Opposite Adinath Society, Pune Satara Road,
Pune-411 001, Maharastra, Phone No.-9422331379, 24225806
- 97.Maharastra Agro Industries Dev. Corpn. Ltd. Rajan House,
Prabhadevi Mumbai
- 98.M/s Gujrat Agro. Ind. Corpn.ltd.Juhapur, Sarkhej Road,
Ahmednagar-380055
- 99.Himagrico Implements And Tools Jachh,Jassur,Kangra(H.P)
- 100.Karnataka Agro. Industries Corpn. Ltd.Hebbal, Bangalore-560024
- 101.M.P Agro Ind Dev Corp Ltd, Panchanan,3rd Floor.Malaviya Nagar,
Bhopal(Mp)-462003
- 103.M/s Bharat Engineering Works,Geethe Nagar, JASDAN-360050,
Rajkot (Gujrat)
- 104.M/s Vijoy Engineering & Electricals At Post: Narayangaon, Tal:
Junner, Pune-410504(Maharashtra)
- 105.M/s SMITA Industries, 191/C, Near Lockmanya Hospital,
Chinchwad, District:Pune-411 033 (Maharashtra)
- 106.U.P Depertment of Agricultura workshop chinhut,lucknow(U.P)
- 107.U.P State Agro Industries Corpn. Ltd. No 123/355, Fazalganj,
Kanpur(U.P)
- 108.M/s Star Enterprises, 03, Akash Building, Viveknagar, Akurdi,
PUNE-411 035 (Maharashtra)
- 109.Govt. Agriculture Workshop, Jaunpur (UP)
- 110.M/s Omkar Industries, Plot No. W-57, M.I.D.C.,Gokul Shirgaon,
Kolhapur- 416234 (Maharashtra)
- 111.M/s Ranjeet Industries, Block No 57, New Shopping Complex,
Ahmednagar-414001
- 112.M/s Chintamani Engineers, A/P Kaneri, Tal Karveer, KOLapur
Maharashtra-416234
- 113.M/s Kumar Indutries86, Karur main
Road,Naduppalayam,Vellottamparappu (PO) Erode(TK)&(DT)-
638154 Tamilnadu
- 114.M/s Dandekar Brothers Shivaji Nagar Sangli (Maharashtra)
- 115.M/s Acharya N.G. Ranga Agricultural Univercity, Rajendra Nagar,
Hydrabad-530030(A.P)

- 116.M/s Ganga industries Near Krishi Upaj nMandi A.B road Dewas (M.P)455001
- 117.Green Planet 30, Rani Jhansi Road, New Delhi-110055
- 118.M/s Honda Power Products ltd Sarnath Complex, 2nd Floor MP Board Office, link Road no 1 Shivaji nagar Bhopal 462016(MP)
- 119.TAS tillak Aakriti Service2, Garstin Place, Kolkata-700001
- 120.Kerala Agro Machinery Corpn Ltd Athani-683585 Ernakulam Kerala state
- 121.Acharya N.G. Ranga Agricultural University, Rajendra Nagar, Hyderabad-500 030 (AP)
- 122.M/s ASHA EXIM Pvt.Ltd 106, Royal complex, Bhutkhana chowk, Dhebar Road, Rajkot-360 002, Gujarat
- 123.M/s Field Worthy Equipments Pvt. Ltd., Patel Farm, Opp. Raison Tyre's Godown, NH-8, Ahmedabad-382 405, (Gujarat)
- 124.M/s Changzou machinery & Equipment Imp. & Exp. Co. Ltd., 29, Huaide Road, Changzou, Jiangsu, China-213 012
- 125.M/s Field Worthy Equipments Pvt. Ltd., Patel Farm, Opp. Raison Tyre's Godown, NH-8, Ahmedabad-382 405, (Gujarat)
- 126.M/s Guru Reaper Sales Corpn, Opp. B.D.O. Office, Link road, Manasa(Punjab)-151505
- 127.Bharat India Corpn, Akalser Road-Moga(PB)
- 128.BCS-S.P.A., Viale Mazzine, 161, 20081 Aabbiategrasso, Milano, Italy BCS India Pvt. Ltd.Mangarh, Kohara, Machiwara Road. Kohara, Ludhiana-141 112
- 129.M/sGanapati Engineering Company, D.No. 9-5-25, Opp. Saraswati Picture Palace, Guntur-522001 (AP)
- 130.M/s Bharat Heavy Machine 123/280, Sick line Factory Area Kanpur-208012
131. M/s Honda Siel Power Products Ltd., Plot No.-5, Sector 41 (Kasna), Greater Noida Industrial Development Area, Distt.- Gautam Budh Nagar (UP), PIN-201 306, Tel.: 0120 2341050

11. Government of India Initiatives for Promotion of Agricultural Mechanization

(a) Human Resources Development in Farm Mechanization:

Developing human resources and generation of self-employment by way of providing skill-oriented training in the agricultural sector is important aspect. Keeping this in view, Farm Machinery Training and Testing Institutes (FMTTIs) have been established at Budni (M.P.) in 1955, Hissar (Haryana) in 1963, Garladinne, District Anantapur in 1983 and Biswanath Chariali (Assam) in 1990. These Institutes have since then engaged in developing human resource for agricultural mechanization. The FMTTIs have been conducting different types of training programmes in the selection, operation, repair/maintenance and management of farm machinery for the benefit of nominees of Central/State Governments, Private Organization, retired/retiring Defence Personnel, technician, rural youth, farmers and engineering graduates. Trainees admitted under User Level Courses at these institutes are paid stipend @ Rs. 1200/- per month per trainee to cover boarding expenses for a month and to defray to and fro travel expenditure, on actual basis by ordinary mode of transport.

To supplement efforts of FMTTIs in human resource development and to train large number of farmers at nearby places with a view to develop and improve upon technical know-how of users of agricultural implements and machines for its proper and effective utilization, Outsourcing of training is being done through institutions identified by State Governments such as SAUs, Agricultural Engineering Colleges, ICAR institutions, Polytechnics, etc. Financial assistance @ Rs.5200/- per farmer per month is provided to institutions identified for training which includes stipend of Rs. 1200/- per farmer per month of training, actual to and fro travel expenses by ordinary mode of transport in ordinary class, upto maximum of Rs. 300/- per farmer, boarding and Lodging Charges @ Rs. 1200/- per farmer per month and Institutional charges (including stationary, training material, honorarium) @ Rs. 2500/- per farmer per month.

(b) Quality control of agricultural machines and implements:

Improved and quality agricultural implements and machines play a pivotal role in sustainable development of agriculture and enhancement of crop productivity. Therefore, identification of quality and need based agricultural machines/equipments are of paramount importance. Quality is also a critical factor in accessing competitive new markets for the manufacturers. The FMTTIs have been engaged in testing of agricultural machines and implements with the objectives of assessing suitability of machines to Indian conditions, educating clientele on comparative performance of various machines, providing data and material to extension workers for guiding farmers, helping financial institutions in more effectively financing their schemes of assistance for procurement of machinery. The institutes also assist in grant of BIS Certification, contribute to export promotion through assessing conformity of product to ISO/OECD specifications and carry out Batch Testing programme to help manufacturers in product improvement thereby providing better equipment to farmers.

The Budni institute is the only National Designated Authority in the country to test tractors as per the OECD Standards. The Budni and Hissar Institutes have also been authorized for certifying the self propelled machines against the statutory requirements under Central Motor Vehicle Rules and the facility for testing of engines for emission of exhaust gases has been commissioned at Budni institute.

With a view to make available quality agricultural implements and machines to the farmers under various Government assisted programmes and schemes, the State Governments have been advised to ensure the quality of machines before they are supplied to the farmers. Keeping in view the huge demand for testing, the testing of some equipment has also been decentralized and the State Governments may test the equipment, if considered necessary, through institutions such as any Department of SAU, any Engineering College, ICAR institutions, KVK or any other research institute designated by the State Governments to undertake such activity. The test reports released by these designated institutions may be relied upon by all the State Governments.

(c) Popularization of new technology agricultural machines:

For improving adoption of technologies for crop production, it is necessary to properly demonstrate utility of technologies to farmers for achieving higher production and productivity. Therefore, with objective of induction of improved/new technology in agricultural production system, demonstration of newly developed agricultural/ horticultural equipments at the farmers' fields have been introduced 100% grant-in-aid is given to the implementing agencies i.e State Governments/UTs and Government organizations like ICAR and SFCI for procurement and demonstration of identified equipment.

(d) Incentives for purchase of agricultural machines implements:

In order to make available various agricultural implements and machines at cheaper rates, assistance in the form of subsidy @ 25% to 50% of the cost of equipment/machine with permissible ceiling limits is available to all category of farmers for the purchase of various agricultural equipments under various schemes of the Department of Agriculture and Cooperation such as Macro Management of Agriculture, National Food Security Mission, Rashtriya Krishi Vikas Yojana, National Horticulture Mission etc.

(e) Incentives for setting up of Custom Hiring Centres of Agricultural Machines:

Incentives in the form of subsidy is supported through the RKVY and Macro Management Schemes so that the established Farm Machinery Banks would make available costly equipment to the farmer and would supplement the efforts of the Government in extending appropriate mechanization in the country, make available different input supply and services to needy farmers, provide gainful employment to rural unemployed youth, resulting in timeliness of farm operations thus ultimately leading to increase in production and productivity.

(f) Promotion of Post Harvest Management

The post harvest management is promoted by way of establishment of post harvest technologies in the production catchments under the bilateral agreement of ICAR and Self Help Group (SHG)/User

Groups (UG) of farmers/Cooperative Societies of Farmers/Non-Governmental Organizations (NGOs) with 40% assistance from the Government and remaining 60% coming from the beneficiary.

Establishment of low cost PHT with Government assistance @ 40% of the total cost of technology/project is also supported and the technologies involving initial project investment upto Rs. 2 lakh may be opted by individual farmer.

Demonstration of the crop/area specific post harvest technologies is also being undertaken through State Governments, All India Coordinated Research Projects on Post Harvest Technology Centres and KVKs of ICAR, CSIR Extension Centres and State Agricultural Universities. The Government provides 100 percent grant to meet the expenses towards purchase and establishment of technologies/equipments and contingency expenditures for demonstrations.

Financial assistance @ Rs. 2600/- per farmer per week and Rs. 3000/- per entrepreneur/scientist per week is also provided to the institutions identified for training of farmers, entrepreneurs and scientist on post harvest Management.

For details of the above initiatives please log in to <http://www.agricoop.nic.in>

12. Pattern of Maximum Permissible Assistance for Farm Mechanisation

Sl. No.	Name of Equipment/ Machine	Pattern of Assistance
1	Tractor	@ 25% of the cost limited to Rs.45,000/- tractors up to 40 HP
2	Power Tiller	@ 40 % of the cost, limited to Rs.45000/- Power tiller 8BHP & above@ 40 % of the cost, limited to Rs.25000/- Light weight Power tiller below 8BHP for hilly regions
3	Self propelled Reaper, paddy transplanter and other similar self propelled machines	@ 25 % of the cost, limited to Rs.40000/-
4	Specialized power driven equipment	i. @ 25 % of the cost, limited to Rs.15000/- Specialized power driven equipment potato planter, potato digger, groundnut digger, strip till drill, tractor drawn reaper, cleaner-cum-grader, dryer, stubble shaver, mobile fruit harvester, power weeder, mini rice mill, cultipacker, onion harvester with de-topping attachment, carrot harvester, motorized banana fibre making machine.ii. @ 40 % of the cost, limited to Rs.20000/- Zero-till-Seed -cum-fertilizer Drill, raised bed planter, sugarcane cutter planter/ring pit digger/post hole digger, rotavator, reaper / binder, happy seeder, vegetable transplanter / pneumatic vegetable seeder.NB: any extra equipment proposed by states would be considered by DAC under the appropriate category of resistance.

Sl. No.	Name of Equipment/ Machine	Pattern of Assistance
5	Manually operated implements/tools	@ 25 % of the cost, limited to Rs.2000/-
6	Animal driven implements	@ 25 % of the cost, limited to Rs.2500/-
7	Animal driven tool carrier	@ 25 % of the cost, limited to Rs.6000/- Animal driven specialized equipment viz. i.Multi tool bar /carrier/ tropicultor (with minimum four attachments) ii.Pre-germinated paddy seeder
8	Power driven equipment (Tractor/Power Tiller operated) Intended inclusion of all tractor and power tiller driven conventional equipment/ implement	i. @ 25 % of the cost, limited to Rs.10000/- for essential tractor driven implements viz. MB/Disc plough, harrow, cultivator, seed cum fertilizer drill. ii. @ 25 % of the cost, limited to Rs.10000/- for a set of power driven implements i.e. harrow cultivator and seed drill.
9	Power threshers (All types)	@ 25 % of the cost, limited to Rs.12000/-
10	Diesel/Electric pump sets	@ 50 % of the cost, limited to Rs.10000/- Diesel/Electric pump sets upto 7.5 BHP/5Kw
11	Cono Weeder	Assistance @ Rs. 3000 per farmer or 50% of the cost, whichever is less
12	Plantprotection Equipment: i.Manual ii.Power operated iii. Tractor mounted iv. Aero-blast sprayer	@ 25% of the cost limited to Rs. 800/-@ 25% of the cost limited to Rs. 2000/-@ 25% of the cost limited to Rs. 4000/-@ 25% of the cost limited to Rs. 25000/-
13	Combine harvester(Apart from the main farm equipment mentioned above, the financial	25% of the cost, limited to Rs. 1.50. lakh whichever is less (Keeping in view the fact that most of the combine harvesters (having

Sl. No.	Name of Equipment/ Machine	Pattern of Assistance
	assistance would be considered for combine harvesters owned by Group of farmers, Registered Cooperative societies, Agricultural Credit Societies, Multi Purpose Agricultural Farming Societies, Self Help Groups (SHGs), provided such groups are not part of any NGO. The combine harvester should have been recommended by Department of Agriculture & Cooperation under institutional financing.	12-14 feet cutter bar) being used by the farmers are in the price range of Rs. 7 lakh to Rs. 9 lakh per unit)

