



**ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY**

**AUTONOMOUS INSTITUTION**

Approved by AICTE & Affiliated to Anna University

NBA Accredited for BE (ECE, EEE, MECH) | Accredited by NAAC with A+ Grade

Anjugramam - Kanyakumari Main Road, Palkulam, Varyoor P.O. - 629 401, Kanyakumari District.

## **Unit 2**

# **Primary And Secondary Tillage Implements**

Prepared by  
Jeshwin Giftson S P  
AP/AGRI



**Bund former:** It is used for making bunds or ridges by collecting the soil. Bunds are required to hold water in the soil, thereby one can conserve moisture and prevent run-off. The size of the bund former is determined by measuring the maximum horizontal distance between the two rear ends of the farming boards. Bund former consists of forming board, beam and handle.

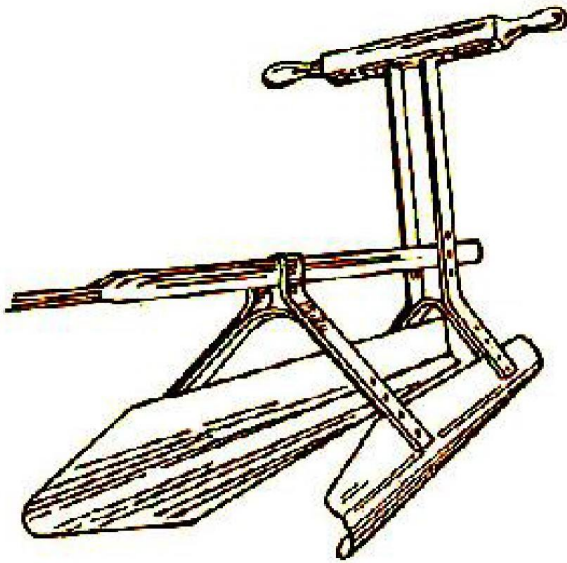
It makes bunds by gathering the top soil Bunds are formed in the field to prevent water run – off and to reduce soil erosion Two bund forming boards are fitted to a frame.

Distance between the bund forming boards is more at the front than at the back. Size of bund former is specified by the maximum horizontal distance between the two bund forming boards at the rear end. If two bund formers are used side by side, an irrigation channel is formed. Bund former is also used to form field boundaries. In dry land, bunds are formed across the slope to conserve soil moisture. In some bund formers the size of the bund is adjustable.

Bund former consists of:

1. forming board
2. beam
3. handle

Forming board is made of mild steel of thickness 1.6mm for light soil and 2mm for medium and heavy soils.



**Fig. 12. Bund former**

## **BULLOCK DRAWN BUND FORMER**

### **Features**

The implement consists of two blades, flat iron frame bent at an angle a handle attached to the frame with tie bars and wooden beam. The operator's handle is made of wood for providing better grip and convenience in operation and attached to the frame with the help of suitable brackets. The frame is bent at an angle and has holes for adjusting the space between the blades. The profile of blades is made to a shape so that bund formed is trapezoidal and remains stable. The blades are attached to the frame with fasteners. For operation, a pair of bullock pulls the implement, the blades gather the loose soil and accumulate it in the formed of bund.

**Ridger:** It is an implement importantly used to form ridges required for sowing row crop seeds and plants in well-tilled soil. The ridger is also used for forming field or channels, earthing up and similar other operations. Ridger is also known as ridging plough and double mould board plough. The ridger generally has 'V' shaped or wedge shaped share fitted to the frog. The nose or tip of share penetrates into the soil and breaks the earth. The mould boards lift, invert and also cast aside the soil, forming deep channels and ridges of the required size. A ridger consists of



**ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY**

**AUTONOMOUS INSTITUTION**

Approved by AICTE & Affiliated to Anna University

NBA Accredited for BE (ECE, EEE, MECH) | Accredited by NAAC with A+ Grade

Anjugramam - Kanyakumari Main Road, Palkulam, Varyyoor P.O. - 629 401, Kanyakumari District.

beam, clevis, frog, handle, mould boards, share and sliding share.

Prepared by  
Jeshwin Giftson S P  
AP/AGRI



A **ridger** consists of a beam, clevis, frog, handle, mouldboard, braces, share and sliding shoe

The ridger is also used for forming field channels or furrowers, earthing up and similar other operations. Ridger are also known as riding plough and double mould board plough.

The ridger generally has v shaped or wedge shaped share, fitted to the frog. The nose or the tip of the share penetrates into the soil and breaks the earth. The mould board lifts, inverts and cast aside the soil, forming deep channels and ridges of the required size.

Ridger is used to form ridges, for sowing row crop seeds and plants in well tilted soil.

It is an implement which cuts and turns the soil in two opposite directions.





**ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY**

**AUTONOMOUS INSTITUTION**

Approved by AICTE & Affiliated to Anna University

NBA Accredited for BE (ECE, EEE, MECH) | Accredited by NAAC with A+ Grade

Anjugramam - Kanyakumari Main Road, Palkulam, Varyyoor P.O. - 629 401, Kanyakumari District.

## **Unit 2**

# **Primary And Secondary Tillage Implements**

Prepared by  
Jeshwin Giftson S P  
AP/AGRI



## **Leveller**

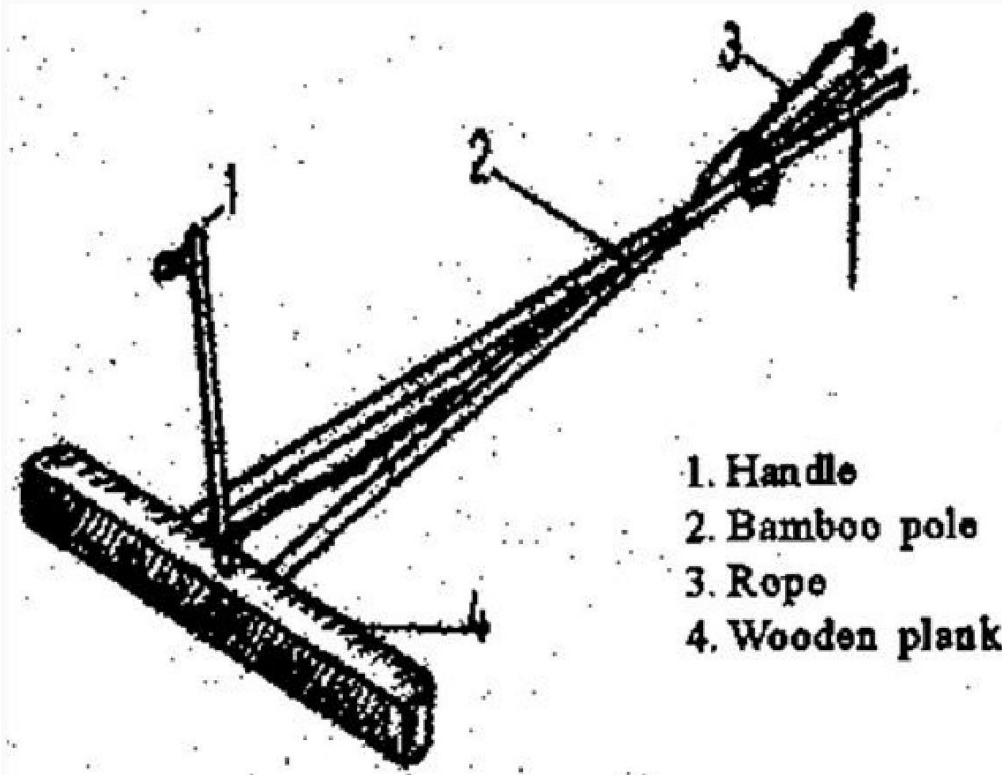
Land leveling is an essential farm operation in especially irrigated areas. Land leveling helps in uniform application and infiltration of irrigation water. The problems of water logging and soil erosion are reduced considerably. The farm equipments can be operated easily and efficiently in leveled fields. Leveling of field is highly desirable for the proper working of mechanical harvesters also. There are different types of animal drawn and tractor drawn levelers used in our

country.

- In irrigated areas land leveling is an essential operation of farming. Leveled fields receive uniform penetration of irrigation water with high efficiency.
- The possibility of water logging and soil erosion is reduced considerably.



- The entire leveled field becomes ready to receive timely agricultural operations like ploughing, seeding and interculturing without any delay.
- Smooth fields also facilitate the operation of field equipment and are highly desirable for using mechanical harvesters.
- Land leveling is usually done in the slack season when the field is free from crops, and the Labours and bullocks are idle.
- Wooden logs or planks are the most common type of land levelers used by Indian farmers.
- They are operated in ploughed land to collect loose soil from high spots and to dump it into depressions.
- While operating in the field, the leveler is raised from the rear to take more cut and then it is tilted upside down to fill up the low spots elsewhere.
- The other improved type of land leveler which is used on the medium size farms, is called the leveling karaha or scraper.
- The scraper essentially consists of a bowl or 'U' shaped steel sheet made of 3 mm thick metal. Its cutting edge is generally made of high carbon steel.
- It is also provided with a wooden handle in the middle or two handles on the sides at the rear end.
- Provision is made at the front end for hitching. For taking the wear an extra steel sheet is welded underneath at the centre.
- The implement is pulled by a pair of bullocks. Two men are needed to operate it. One man controls the bullocks and the other man does the loading and unloading.
- The amount of work done in a day depends upon various factors such as hardness of the soil, transportation distance (lead) and volume of the soil cut each time.
- If the soil is hard, it is always helpful to loosen the soil first by ploughing or by any other means and then proceed with leveling.
- Tractor mounted type or animal operated improved levelers are also used in India.
- The laser guided leveler operated by tractor. The laser guided leveler has a transmitter which is fitted outside the field to be leveled.
- The leveler is fixed with a receiver of the laser beam.
- It works automatically and the operator need not adjust the leveling blade.



## Basin lister

- It is a soil conservation equipment especially useful in dry farming areas receiving meagre rainfall. The equipment has one to three plough bottoms with ground wheels.



- The plough bottoms are lifted often during operation by the cam arrangement and by this furrows are formed in the field intermittently. The precipitated water is retained in the furrows, thus reducing the top soil erosion and conserving moisture.
- Several versions of basin listers are now available in India such as tractor drawn and power tiller drawn basin listers. An offset disc harrow drawn by tractor can be converted to a basin lister by shifting the center of rotation of the discs to one side. Seeds are sown in between the staggered pits.
- Basin Lister is an attachment fitted behind 9-tine tractor mounted cultivator. It is used for water harvesting and conservation of soil and moisture.
- The lister attachment consists of mild steel framework, ground wheels with lugs,
- lister bottoms (trencher), roller follower, cam, hitch bracket and reversible shovel.
- The cultivator tills the soil and the lister bottoms form the trenches.



## Wet land implements

### Puddler

It is a wetland implement used for the preparation of paddy fields in standing water of 50 to 100 mm depth after ploughing. It breaks the clods and churns the soil to a homogeneous mixture.

The purpose of puddling is to minimise water leaching, to destroy weeds by burying and decomposing them and to facilitate transplanting of paddy seedlings by making the soil softer.

High yielding varieties of paddy respond well to good quality puddling. The puddlers are operated by bullock, power tiller or tractors. Some of the bullock drawn puddlers available in India are

- Open blade puddler



**ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY**

**AUTONOMOUS INSTITUTION**

Approved by AICTE & Affiliated to Anna University

NBA Accredited for BE (ECE, EEE, MECH) | Accredited by NAAC with A+ Grade

Anjugramam - Kanyakumari Main Road, Palkulam, Varyoor P.O. - 629 401, Kanyakumari District.

- Straight blade Puddler
- Helical blade Puddler

Prepared by  
Jeshwin Giftson S P  
AP/AGRI



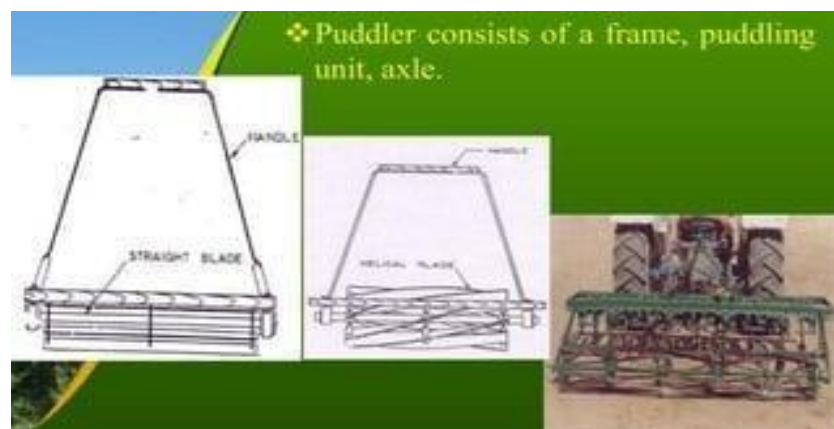
**i. Frame:** The frame consists of front, rear and side pieces made of steel or wood.

**ii. Puddling unit:** Puddling unit consists of blades made of mild steel. The blades are rigidly fixed radial arms

**iii. Radial arms:** This holds the blades in position. This is made up of mild steel plate.

**iv. Axle:** The axle is made up of mild steel bar of 25 mm in diameter.

**v. Beam:** The beam is made up of wood and is suitably placed in the frame with the help of bracer and the other end to the yoke to hitch the animal.



### **Green manure trampler**

- This implement is used to trample and press the green manure crops the paddy field.
- No soil inversion is required in this case
- There are two types of tramplers viz.,
  - Slat type and
  - Disc type
- In slat type trampler long radical slats of flats are fitted to a central axle through supporting discs.
- In disc type trampler, flat discs are fitted to a central axle with intermediate spacing.

### **Cage wheel**

This is an iron wheel, lugged with L angles. The tractor will not work satisfactorily in ploughing / puddling of rice fields due to slippage of rubber



**ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY**

**AUTONOMOUS INSTITUTION**

Approved by AICTE & Affiliated to Anna University

NBA Accredited for BE (ECE, EEE, MECH) | Accredited by NAAC with A+ Grade

Anjugramam - Kanyakumari Main Road, Palkulam, Varyyoor P.O. - 629 401, Kanyakumari District.

wheels. To overcome this difficulty iron wheels are introduced which are called cage wheels.. Cage wheels are of two types viz., half cage wheel and full cage

Prepared by  
Jeshwin Giftson S P  
AP/AGRI



wheel. The iron lugs provide required grip and facilitate easy movement of tractor in rice field. Half cage wheels are fitted to the rubber tyre wheels and used. . For full cage wheels, tyre wheels are removed and used The width of full cage wheel is 1 m and that of the half cage wheel is 0.5 m.



## **Rotavator**

It is widely considered as the most important implement as it provides fine degree of soil pulverization

The power from the tractor engine is transmitted to the rotary tiller through PTO of the tractor

A leveling board is attached to the rear side of the unit for leveling the tilled soil

Types of blades

L type

Twisted

Straight

Leveler

Rotary tiller(both notes have already been given)