



**ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY**

**AUTONOMOUS INSTITUTION**

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# **AI3501 FARM EQUIPMENT AND MACHINERY**

## **UNIT 1**



### Tractor Drawn Cultivator:

Cultivator is an implement used for finer operations like breaking clods and working the soil to a fine tilth in the preparation of seedbed. Cultivator is also known as tiller or tooth harrow. It is used to further loosen the previously ploughed land before sowing. It is also used to destroy weeds that germinate after ploughing. Cultivator has two rows of tynes attached to its frame in staggered form. The main object of providing two rows and staggering the position of tynes is to provide clearance between tynes so that clods and plant residues can freely pass through without blocking. Provision is also made in the frame by drilling holes so that tynes can be set close or apart as desired. The number of tynes ranges from 7 to 13. The shares of the tynes can be replaced when they are worn out.



## **Sweep Cultivator**

In stubble-mulch farming, it is difficult to prepare the land with ordinary implements due to clogging. Sweep cultivator is the implements useful under this condition. It consists of large inverted V shaped blades attached to a cultivator frame. These blades run parallel to soil surface at a depth of 10 to 15 cm. They are arranged in two rows and staggered. Sweep cultivator is used to cut up to 12 to 15cm depth of soil during first operation after harvest and shallower during subsequent operations. It is worked frequently to control weeds. It can also be used for harvesting groundnut.

## **Harrows**

Harrows are used for shallow cultivation in operations such as preparation of seedbed, covering seeds and destroying weed seedlings. Harrows are of two types: disc harrow and blade harrow. '

## **Disc Harrow**

The disc harrow consists of a number of concave discs of 45 to 55 cm in diameter. These discs are smaller in size than disc plough, but more number of discs are arranged on a frame. These discs are fitted 15cm apart on axles. Two sets of discs are mounted on two axles. All the discs revolve together with axles. The discs cut through the soil and effectively pulverise the clods.



## **Blade Harrow**

Blade harrows are used for different purposes like removal of weeds and stubbles, crushing of clods working of soil to shallow depth, covering the seeds, inter cultivation and harvesting of groundnut etc. The blade harrows useful for inter cultivation are discussed later. Blade harrows are two types viz. indigenous and improved.

### **Indigenous Blade Harrows**

The general design of an indigenous blade harrow which is known as *guntaka* consists of a beam to which two pegs are attached at the ends. A blade is attached to these two pegs. Two shaft poles and a handle are the other parts of *guntaka*. Depending on the beam length and weight, they are known by different names and used for different purposes.

### **Plank and Roller**

Plank is a very simple implement and consists of a heavy wooden beam of 2 m in length. In addition, shafts and handle are fixed to the beams. When it is worked most of the clods are crushed due to its weight. It also helps in micro levelling and slight compaction necessary after sowing. Rollers are used mainly, to crush the hard clods and to compact the soil in seed rows.



## **Implements for**

### **Layout of seedbed**

Country plough, ridge plough, bund former

Implements for sowing

Plough, seed drill, ferti-cum seed drill, mechanical seed drill

### **Implements for intercultivation**

Wooden plough, small blade harrow, weeders- rotary weeders

### Inter tillage:

The tillage operations are done in the field after sowing or planting and before harvesting crop plants. i.e., during field duration. This is also known as inter cultivation or post-seeding of the planting cultivation. It includes harrowing, hoeing, weeding, earthing up, raking, riding, and furrowing. Inter tillage is shallower in nature.

The crop to emergence keeps the field free from weeds for a significant period by killing germinated but pre-emerged or emerging weeds. Intertillage helps incorporate crop-dressed fertilizer to the earth up in a direct-seeded wetland and transplanted paddy field. It includes paddling and bushing of rice land by inducing tillering.