Lecture No –11 and 12/Ex. No.11 Implements for inter-culturing operations

Hand tools, Improved hoes, Wheel hoe, Multipurpose hoe, Tractor drawn intercultural equipment's

The main objective of weed control are to improve the soil conditions for healthier growth of plant. Weeds growing with crops compete for moisture, light and nutrient. Hence it is essential to remove them.

Following are some of the weeding devices used by the farmers.

i) **Traditional hand tools**

ii) **Traditional and improved hoes**

iii) **Wheel hoes**

iv) **Animal drawn multipurpose hoe**

v) **Tractor drawn inter-culture equipment**

Traditional Hand Tools

I) KHURPI- It is a traditional hand tools and made by local artisans for the use on small and marginal farms. Khurpi is used in India may vary in their size, shape and weight but they have common basic part. i.e. a cutting blade and a small wooden handle for the grip. The khurpi with a long narrow blade is preferred for weeding around the flower plants, broadcasted crops and vegetable crops. However, a man can weed out about 0.025 ha in a day under normal working condition.

(2) Traditional and Improved hoes:

The hoe is a versatile form of implements used for many operations i.e. seed bed preparation, ridge making, channel shaping and weeding. It is also for removing plant roots, harvesting root crops and thinning drilled crops.

The two common types of hoe used by Indian farmers are:

(i) Hand hoes (ii) Animal drawn hoes.

Hand hoes are used to cultivate very small area of land by human labour. Among the indigenous type of hand hoes, the Kodali (narrow spade) is most popular one.

(i) Kodali: Kodali is similar to a phawara (broad spade), the difference being that instead of a wide thin cutting blade, a narrow long pointed thicker section blade is attached to the handle. The person working with it has to bend his body. It is used for inter cultivating maize and sugarcane crops, and for earthing up the potato crops sown in line. About 0.04 hectare can be covered in a day by one man.

(ii) Improved hand hoe: An improved hand hoe is operated in the standing position. It is provided with the long handle fitted in the middle of the cutting blade. One end of the blade is about 10 cm wide sharp edge and the other end is pointed narrow one for making small furrows. It can be used for cultivating and weeding very close to the individual plant. About 0.04 ha/day area covered.

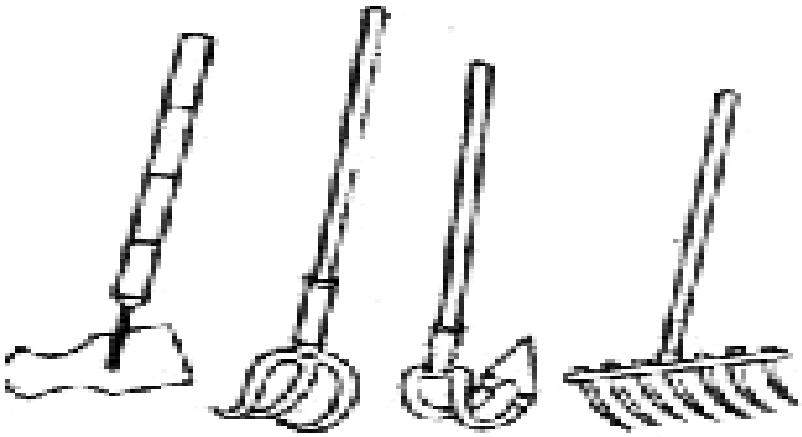
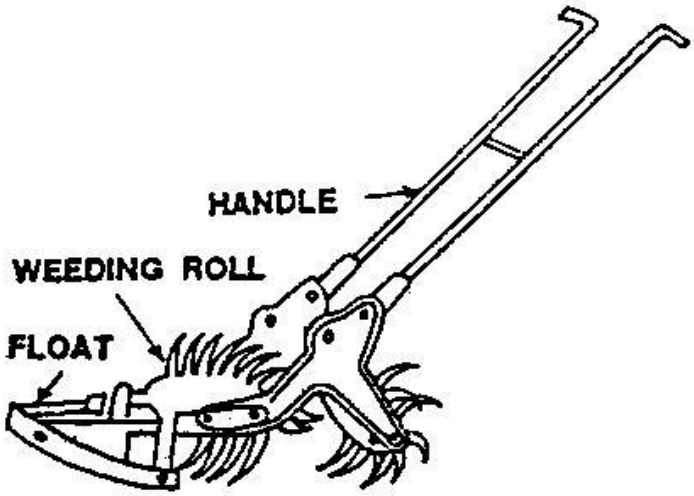


Fig. 13. 46 Hand hoes

(iii) The Grubber: The grubber is a manual pull type hoe suitable for weeding and inter culture of upland row crops in black cotton soil region. It is provided with three blades and the field capacity is 1/200 ha. per hour. (0.005 ha per hour)

(iv) Rotary paddy weeder: Rotary paddy weeder is best suited for uprooting the weed and burying them into soil. The operator moves the tools forward and backward in narrow rows of paddy crops. It gives higher output and drudgery of the operator is considerably reduced.



(3) The wheel hoe:

The wheel hoe is another implement which is used for cultivating the land between rows. It consists of a wheel, two handles and a tyne to place the cutting tool on. Either a reversible shovel or a three-prong fork or rake or sweep is used as a cutting tool, depending upon the weed and moisture condition. A man operates the hoe in standing position by pushing through a short length each time. In a working day, 0.04 hectare can be covered.

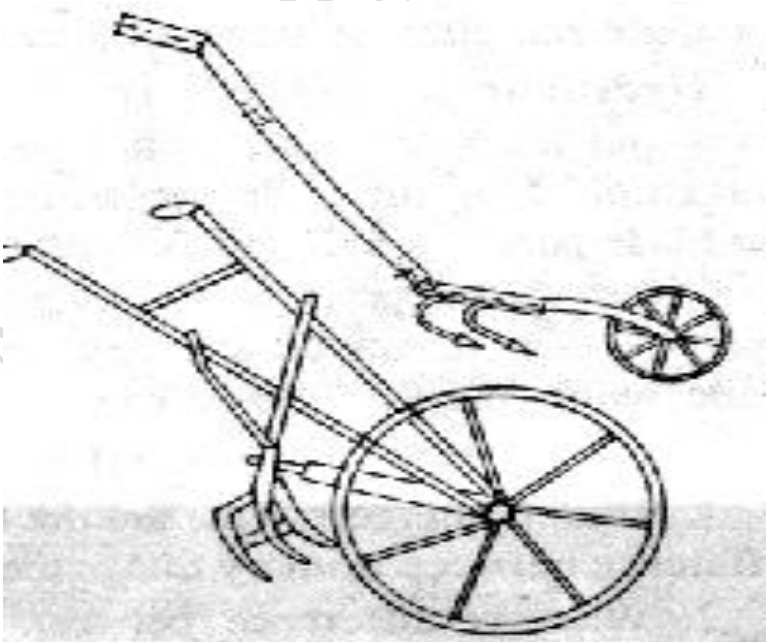


Fig. 13. 47 Wheel hoe

(4) Animal drawn hoe:

Animal drawn weeding implements are pulled either by single animal or a pair of animals. These implements may either be single row type or multi row unit. The three-type cultivator or **'Triphali', Akola hoe, Bardole hoe or two 'Blade hoe'** are most popular implements in different region for row crop interculture operations. It is essential to provide wider spacing (above 30 cm) for movement of animals and implements if animal drawn weeders are to be used.

The main parts of the blade hoe are: (i) Head piece (ii) Prong (iii) blade (iv) handle and (v) beam. The number of cutting blades on these hoes may be one or more. The prong makes an angle of about 45 º downward with the horizontal plane. At the end of each prong, the blade is attached. It loosens the upper surface of the soil and is generally used for inter-culturing sorghum, cotton, groundnut and other *kharif* crops. The hoe width is maintained between 25 and 75 cm depending upon the size of the bullocks and types of soil.

5. Sweep:

It is an intercultural implement for removing shallow rooted weeds in between rows. The sweep consists of V shaped shovels with bevel edged wings. The shovels are held by the tynes fixed to a frame by means of counter sunk bolts and nuts. When the sweep is used for secondary tillage, five or six tynes may be clamped with the shovels in line having no gap in between them (Fig.). By just skimming under the soil at a shallow depth of 2 to 3 cm, the sweep breaks the capillary in the soil pores and provides soil mulch. When the sweep is used for intercultural operations, the space between the shovels is adjusted to suit the row spacing of the crop and with different sizes of blades. The coverage is 1.75 to 2.5 ha/day. The salient features of the unit are: Suitable for all row crops and soils; provides soil mulch and conserves soil moisture. Suitable for inter cultural operations.

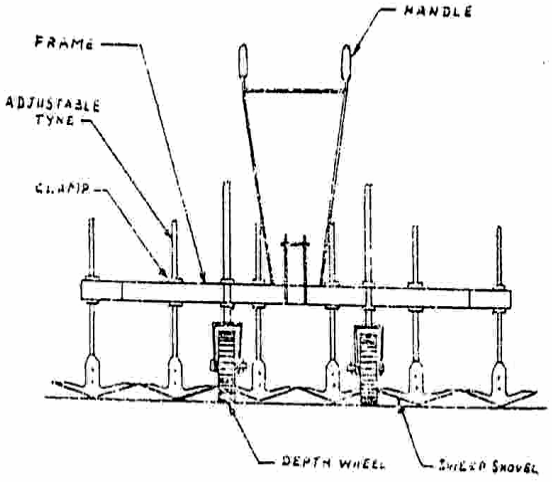


Fig. Sweep

6. Junior hoe:

It is an interculture equipment used primarily for weeding in between the rows of standing crops. It consists of reversible shovels with curved tynes attached to framework with hinge arrangement. A handle and beam are fixed to the framework for guiding and attaching the unit to the yoke. The spacing between the shovel can be adjusted according to the row spacing of the crop. The coverage is 1.5 ha per day.