



FACULTY OF AGRICULTURAL SCIENCES & ALLIED INDUSTRIES

Tillage and tilth

Tillage is the mechanical manipulation of soil with tools and implements for obtaining conditions ideal for seed germination, seedling establishment and growth of crops.

The word tillage is derived from ‘**Anglo-Saxon**’ words Tilian and Teolian , meaning to plough and prepare soil for seed to sow , to cultivate and to raise crops. Jethrotull, who is considered as father of tillage suggested that thorough ploughing is necessary so as to make soil into fine particles.

Tilth

Tilth is the physical condition of the soil obtained out of tillage (or) it is the result of tillage. The tilth may be a coarse tilth fine tilth or moderate tilth

Objectives of tillage

The main objectives of tillage are as follows:-

1. To prepare a good seed bed which helps the germination of seeds.
2. To create conditions in the soil suited for better growth of crops.
3. To control the weeds effectively.
4. To make the soil capable for absorbing more rain water.
5. To mix up the manure and fertilizers uniformly in the soil.
6. To aerate the soil
7. To provide adequate seed-soil contact to permit water flow to seed and seedling roots.
8. To remove the hard pan and to increase the soil depth.

TYPES OF TILLAGE

Tillage operations may be grouped into

1. On season tillage
2. Off season tillage

1. On season tillage

Tillage operations that are done for raising crops in the same season or at the onset of the crop season are known as on-season tillage. They may be preparatory cultivation and after cultivation.

A. Preparatory tillage

This refers to tillage operations that are done to prepare the field for raising crops. It consists of deep opening and loosening of the soil to bring about the desirable tilth as well as to incorporate or uproot weeds and crop suitable when the soil is in a workable condition.

Types of preparatory tillage

- a. Primary tillage
- b. Secondary tillage

a. Primary tillage

The tillage that is done after the harvest of crop to bring the land under cultivation is known as primary tillage or ploughing. Ploughing is the opening of compact soil with the help of different ploughs. Country plough, mould board plough, Bose plough, tractor and power tillers drawn implements are used for primary tillage.

b. Secondary tillage

The tillage operations that are performed on the soil after primary tillage to bring a good soil tilth are known as secondary tillage. Secondary tillage consists of lighter or finer operation which is done to clean the soil, break the clods, and incorporate the manures and fertilizers. Harrowing and planking is done to serve those purposes. Harrows, cultivators, Guntakas, and spade are used for secondary tillage.

B. After cultivation (inter tillage)

The tillage operations that are carried out in the standing crop after the sowing or planting and prior to the harvesting of the crop plants are called inter tillage. It includes harrowing, hoeing, weeding, earthing up, drilling or side dressing of fertilizers etc. Spade, hoe, weeders, etc are used for inter cultivation.

2. Off season tillage

Tillage operations done for conditioning the soil suitably for the forthcoming main season crop are called off-season tillage. Off season tillage may be post harvest tillage, summer tillage, winter tillage and fallow tillage.

Special purpose tillage

Tillage operations intended to serve special purposes are said to be special purpose tillage. They are:-

a. Sub-soiling

To break the hard pan beneath the plough layer, special tillage operation (**chiseling**) is performed to reduce soil compaction. Sub soiling is necessary once in 4-5 years.

b. Clean tillage

Refers to working of the soil of the entire field in such a way no living is left undisturbed. It is practiced to control weeds, soil borne pathogen and pests.

c. Blind tillage

It refers to tillage done after seeding or planting the crop (in a sterile soil) either at the pre emergence stage of the crop plants or while they are in the early stages of growth.

d. Dry tillage

Dry tillage is practiced for crops that are sown or planted in dry land condition having sufficient moisture for germination of seeds. Dry tillage is done in a soil having sufficient moisture (21-23%).

e. Wet tillage or puddling

The tillage operation that is done in a land with standing water is called wet tillage or puddling. Puddling operation consists of ploughing repeatedly in standing water until the soil becomes soft and muddy. Puddling creates an impervious layer below the surface to reduce deep percolation losses and to provide soft seed bed for planting rice. Wet tillage destroys the soil structure.

Wet tillage is only means of land preparation for transplanting semi-aquatic crop plant such as rice.

