

# Tillage

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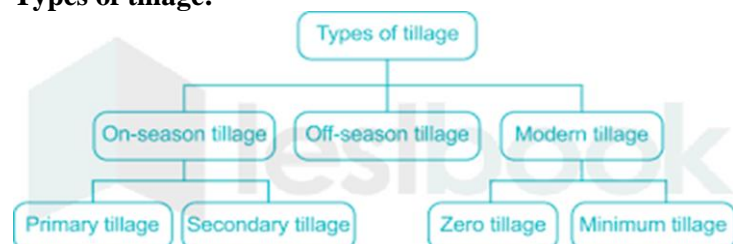
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## INTRODUCTION



It is a mechanical manipulation of soil to provide favorable condition for crop production. Soil tillage consists of breaking the compact surface of earth to a certain depth and to loosen the soil mass, so as to enable the roots of the crops to penetrate and spread into the soil. 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 the soil into fine particles. Tillage is the mechanical manipulation of soil with tools and implements for obtaining conditions ideal for seed germination, seedling establishment and growth of crops. Tilth is the physical condition of soil obtained out of tillage (or) it is the result of tillage. The tilth may be a coarse tilth, fine tilth or moderate tilth

## Types of tillage:



1. On season tillage
2. Off-season tillage
3. Modern 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.



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#### Types of On-season tillage

##### (A) Primary tillage

##### (B) Secondary tillage

- (A) **Primary tillage:** The tillage operation 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, borse plough, tractor and power tiller 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 manure and fertilizers. Harrowing and planking is done to serve those purposes.

- (B) Planking is done to crush the hard clods, level the soil surface and to compact the soil lightly. Harrows, cultivators, Gun takas and spade are used for secondary tillage. c. Layout of seed bed: This is also one of the components of preparatory tillage. Leveling board, buck scrapers etc. are used for leveling and markers are used for layout of seedbed.

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 after tillage. This is also called as inter cultivation or post seeding/ planting cultivation. 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

Conditioning of soil is called as off-season tillage. The purpose is to condition the soil suitably for the forthcoming main season crop. Post-Harvest Tillage, Winter or Summer Tillage and Fallow Tillage are various off-season tillage operations.



## 3- Modern Tillage

(A) **Zero Tillage** -G.B. Triplett is known as the **father of Zero tillage**.

It is extreme form of minimum tillage, in this tillage primary tillage is completely avoided and secondary tillage is restricted to seedbed preparation in the row zone only (started in USA, 1950)

- Evaporation losses will be higher under which type of tillage: **Zero tillage**
- In this 50-100% of residue keep are left on the surface.



(B) **Minimum tillage** – This concept was started in **1974 in the USA** because of the high cost of tillage due to steep **rises in oil prices**.

Aims of this tillage is to reduce tillage to the minimum necessary for ensuring a good seedbed (Started in USA.1974)

