



Module 1: Lesson 1 – Conventional Tillage

Introduction: What is Tillage?

Tillage is the mechanical manipulation of the soil in preparation for planting

Purpose

Seedbed Preparation

Weed Control

Residue Management

Soil aeration



Types of Tillage

- Primary Tillage - Deep and Heavy Soil Disturbance
- Secondary Tillage - Shallow and Fine Soil Preparation



What is Primary Tillage?

Primary tillage is the first soil tillage operation after the last harvest.

- Effects of primary tillage
 - Breaks up compacted soil layers
 - Buries weeds and crop residue
 - Enhances water infiltration
 - May cause soil erosion if done excessively
- Depth: Typically deeper
 - 6-24 inches
- Common primary tillage implements include
 - Moldboard Plow
 - Chisel Plow
 - Ripper/Subsoil Plow

Moldboard Plow



- Turns over the entire top layer of soil
- Best used in heavy residue fields and for breaking new ground or sod
- **Advantages:** Excellent weed control, completely buries residue
- **Disadvantages:** High fuel use, soil erosion risk

[Kibble Equipment - The Last Plow Sold by John Deere](#)

Chisel Plow



[2021 Wil-Rich Chisel Plow Video](#)

- Loosens soil but leaves residue on the surface
- Best used for breaking up compacted soil without excessive soil disturbance
- **Advantages:** Reduced soil erosion (compared to moldboard plow).
- **Disadvantages:** Doesn't fully bury weeds or residue

Ripper/Subsoil plow

- Uses deep shanks to break up soil deep below the surface without turning the soil over
- Best used for breaking up compacted soil layers
- **Advantages:** relieves soil compaction, improves drainage, preserves soil structure
- **Disadvantages:** High Horsepower requirements, does not mix residue.



What is Secondary Tillage?

Secondary tillage is the process of preparing soil for planting after primary tillage.

- Effects of secondary tillage
 - Breaks up large clods from primary tillage
 - Improves seed-to-soil contact
 - Reduces weed competition
 - Helps with moisture conservation
- Depth: Shallower
 - 2-6 inches
- Common primary tillage implements include
 - Field Cultivator
 - Disk Harrow
 - Rolling Baskets/Soil Conditioner

Field Cultivator

- Uses rows of shanks to aerate the soil while breaking up large clods
- Best used for preparing a smooth and even seedbed and for light weed control
- **Advantages:** helps incorporate herbicides and fertilizers, low fuel and horsepower requirements
- **Disadvantages:** Less effective in high-residue fields and has a limited penetration depth



Disk Harrow

- Uses rows of concave disks to slice through the soil and mix residue
- Best used for breaking clods of dirt and smoothing soil after primary tillage
- **Advantages:** good for incorporating residue and herbicides. Can be adjusted for different soil conditions
- **Disadvantages:** Multiple passes may be needed, high risk of compaction



Rolling Basket/Soil Conditioners

- Rollers with metal bars break up small clods and firm the soil surface
- Best used for final soil preparation before planting
- **Advantages:** Prevents soil crusting, enhances seed-to-soil contact
- **Disadvantages:** Very limited affect on soil compaction, requires secondary tillage for best results



[K-AG Basket Rollers | Farming - YouTube](#)

Summary

	Primary Tillage	Secondary Tillage
Depth	Deep (6-24 inches)	Shallow (2-6 inches)
Purpose	Initial soil preparation	Seedbed refinement
Tools Used	Plows, Subsoiler	Harrows, Cultivator
Timing	First operation	After primary tillage