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## Lecture 4

### Soil management Technology

## Management Practices to Improve Soil Health

### ➤ Controlling traffic soil surface:

#### 1. Soil compaction

Soil compaction occurs when soil is exposed to excessive foot and equipment traffic while the soil is wet and plastic. This traffic compresses the soil, reducing pore space and increasing bulk density. Soil compaction increases soil hardness, making it more difficult for plant roots to grow through the soil.

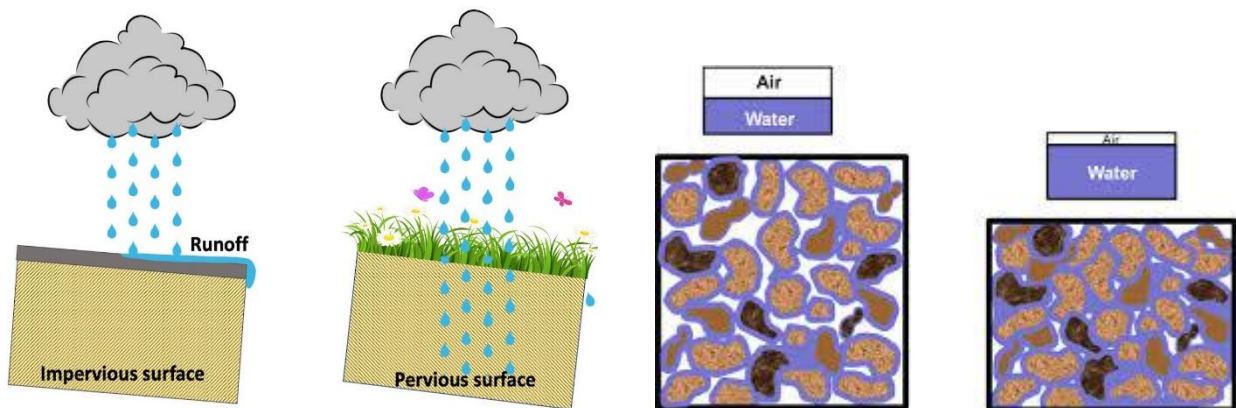


#### 2. Soil aeration

The process of soil aeration provides air supply underground by moving O<sub>2</sub> and CO<sub>2</sub> Between the earth pores and the atmosphere. It helps avoid oxygen starvation in crops and reduce harmful carbon dioxide levels in the subsurface air if they rise too high.



### 3. Water infiltration



### 4. Others

- macroporosity
- microporosity,...etc

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## 2. Tillage

Excessive tillage is harmful to soil health in a number of ways. Tillage increases oxygen in the soil, stimulating microbial activity, and results in the decomposition of organic matter. Tillage also disrupts soil aggregates, exposing particles of organic matter that had been physically protected within aggregates to microbial consumption



### Common Primary Tillage Implements

#### Moldboard Plow

- Inverts the soil to bury residues, terminate cover crops and perennial sod, and kill weeds



#### Disk Plow

- Concave disks mounted in a gang cut residue and invert soil laterally, loosening soil and mixing residue into the soil

- Soil disturbance and residue incorporation depends on the size, shape, and tilt angle of the disks



### Chisel Plow

- Curved shanks with chisel points are dragged through the soil without inversion
- Loosens surface soil, mixes some residue into the soil
- Soil disturbance and residue incorporation depends on the width and twist of chisel points

