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TILLAGE



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WHAT IS TILLAGE?

**Mechanical manipulation of soil with
an aim to create a good seed bed**



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OBJECTIVES OF TILLAGE

Develop a suitable seed bed

A granular structure of the soil to allow rapid infiltration of rain water

Provide adequate air capacity and exchange of air within the soil

Reduce resistance to root

To control weeds

To manage plant residue

To minimize soil erosion by contour tillage, listing and proper placement of trash

Establish specific surface configuration for planting, irrigation, drainage etc

To incorporate and mix fertilizer, pesticides
or soil amendments into soil



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Disadvantages of tillage

soil compaction

loss of organic matter

degradation of soil aggregates

**death or disruption of soil microbes
including arthropods, and earthworms**

**soil erosion where top soil is blown or
washed away**

Contributes to global warming



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TYPES OF TILLAGE

Primary tillage: initial major soil working operation to reduce soil strength, cover plants material and rearrangement of aggregates

Secondary tillage: subsequent tillage after primary tillage to create a refined seed bed



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Tillage methods

Conventional tillage

Reduced tillage

Conservation tillage

Minimum tillage

Zero tillage

Stubble-mulch tillage



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Conventional tillage

Normal tillage with both primary and secondary tillage implements.

It leaves 15 % or less crop residue on the field after tillage

Primary tillage by MB plough or disc plough, or rotavator

Secondary tillage by harrows, cultivator



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Reduced tillage

Reduced tillage is to reduce the number of tillage.

Reduced tillage systems leave between 15 and 30% residue cover on the soil or 560 to 1100 kg/ha of small grain residue during the critical erosion period. This may involve the use of a chisel plow, field cultivators, or other implements

Advantage:

Reduce soil compaction

8 Reduce cost, labour and time



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Conservation tillage

Conservation tillage is a tillage where at least 30% (1,100 kg/ha) of the crop residue is left on the field after tillage

Types:

Minimum tillage/ strip tillage

Zero tillage

Mulch tillage

Ridge tillage



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Minimum tillage

A strip of the land is tilled where the seeds are placed.

It is done by a strip till drill

A tillage unit tills a strip and a seeding unit follows and place the seeds.

Advantage:

Reduce soil erosion

Conserve moisture

Reduce compaction

Save fuel, time and labour

apply chemicals and fertilizer at the same time as tillage



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Zero tillage

Zero till or No till means there is no tillage of the soil to establish a seed bed. The farmer plants the crop directly into the previous year's crop residue. This means that fifty percent to one hundred percent of the previous crop remains on the soil surface throughout the growing season.