



Old and New Concept of Tillage

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Introduction

Tillage is as old as Agriculture. The Father of tillage is 'Jethro Tull'. Tillage is physical manipulation of soil with tools and implements for getting a good seed bed for crop production. For higher crop production good tillage is necessary. Due to rise in prices of oil and increased use of heavy machinery on the soil, this causes heavy damage to soil. A New concept of tillage had been developed that is Modern concept of tillage which includes: minimum tillage, zero tillage, stubble mulch tillage.

Keywords: Tillage, zero tillage, stubble mulch tillage, ploughing, harrowing, till planting

Tillage objectives

- To remove unwanted plants from the field.
- To prepare granular soil structure for good seed bed.
- To remove stones, stubbles and also crushing the clods.
- To minimize soil erosion.
- To cut and mix crop residue.
- Provide soils aeration to the seed and root zone.
- Friable soil for good seed emergence.
- To make soils pest and pathogen free.
- Provides proper light to seedlings by weed free field.
- Better root elongation and proliferation.



Classification of Tillage

Primary: It is the first major operation of tillage in which soil is plough deeply to remove hard pans, weeds, stubbles, kill insect pest and rearrange soil aggregates. It is mainly done with the help of ploughs and the operation known as ploughing. Implements used in primary tillage are: indigenous plough, mould board plough, disc plough, sub-soil plough, chisel plough etc.



Secondary: Secondary tillage is just lighter and finer operations done in the field after primary tillage. It is mainly done to remove weeds which may re-grow after primary tillage. Secondary tillage require less power as compare to primary tillage as it is done only on the surface soil. Some of the secondary tillage implements are: disc harrow, blade harrow, cultivator, clod crusher leveler etc.

Layout Seedbed: This is preparation of seedbed for sowing. This is mainly done by leveler or pulverizer.



Modern Concept of Tillage

During seventies, in USA, due to steep rise in oil prices was the immediate cause for introduction of modern concept of tillage. In addition, there were many problems in conventional tillage like repeated use of heavy machinery destroy soil structure which causes hard pans and leads to soil erosion and energy is also wasted. To avoid these problems practice of minimum tillage, zero tillage and stubble mulch tillage can be evolved.

Minimum Tillage: In this type of tillage, primary tillage is done but secondary tillage is restricted to seed bed preparation. Its aim to reduce tillage to the minimum necessary level. Skip the operations which require more cost but not give much benefit and combine operations like seeding and fertilizer application.

Zero Tillage: In this type of tillage, primary tillage is avoided and secondary tillage is done only in row zone only for seed bed preparation. This type of tillage is also called no till. In zero tillage there is more use of herbicide; vegetation is destroyed by the application of non selective herbicides like paraquat, diquat, etc. Till planting is mainly used in zero tillage. This machinery completes 4 task in one go.

- Firstly it clean the narrow strip then
- Open the soil then
- Place the seed and
- Then finally cover the seed.

Stubble Mulch Tillage: It is a new system approach to protect the soil protected all the time either growing the crop or by crop residue left on the surface during no crop period. It is the system in which crop residue can be managed with tools and implements that helps in killing the weeds and loosening the soil.

Conclusion

In this article we studied about both conventional and conservation types of tillage. Conservation tillage is more beneficial than

conventional tillage because in conservation tillage we can minimize some operations or we can do 4 operations in one run by the use of till planter, fertization etc. This is helpful in conserving soil moisture; reduce soil erosion, soil degradation, fuel and labour. On the other hand conventional tillage is not good for physical condition of soil, due to continuous use of heavy machineries on the soil degrade the physical condition of soil and also not affordable to every farmer. On large area of agriculture land crop yield become higher in conservation tillage as compare to conventional tillage. Organic farmers are encouraged to adopt conservation tillage to preserve soil quality and fertility and to prevent soil degradation – mainly erosion and compaction.

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