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LECTURE 11

Conservation agriculture strategies in agriculture



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Principles of conservation agriculture:

- Continuous minimum mechanical soil disturbance.
- Permanent organic soil cover.
- Diversified crop rotations in case of annual crops or plant associations in perennial crop.



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Concept of conservation agriculture:

- Excessive tillage degrades soil in long run.
- If soil is not tilled for many years produce a layer of mulch.
- This favours biological tillage.
- This may increase weed and pest infestation.
- To break the chain of infection crop rotations are adopted in CA additionally helps as biological pumps.



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| Conventional Agriculture | Conservation Agriculture |
|--|--|
| Excessive mechanical tillage and soil erosion | No-till or drastically reduced tillage |
| High wind and soil erosion | Low wind and soil erosion |
| Residue burning or removal | Surface retention of residues |
| Water infiltration is low | Infiltration rate of water is high |
| Kills established weeds, but stimulates more weed seeds to germinate | Weeds are a problem in the early stages of adoption but decrease with time |
| Mono-cropping, less efficient rotations | Diversified and more efficient rotations |
| Productivity of grains in long run are declining order | Productivity of grains in long run are in incremental order |
| Uses ex-situ FYM/Composts | Use in-situ organics/composts |



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- **Advantages of Conservation Agriculture**
 - Time saving and thus reduction in labour requirement
 - Reduction in costs
 - More output per low input
 - Organic matter increases
 - In soil water conservation
 - Improvement in soil structure
 - Reduction soil erosion
 - Improves carbon sequestration



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Limitations of Conservation Agriculture

- Lack of initial knowledge .
- Initial nervousness to switch from plough based farming.
- Misconception on herbicide usage.



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Constraints for adopting

- Lack of appropriate seeders for small and medium scale farmers
- Wide spread use of crop residues for livestock, feed and fuel
- Burning of crop residues
- Lack of knowledge about the potential of CA to agricultural leaders, extension agents and farmers
- Skilled and scientific manpower