



NOTE

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Reduced Tillage Systems

Reduced tillage aims to establish crops with the least amount of soil disturbance while maintaining or improving yields. Reduced tillage encompasses minimum tillage (shallow cultivation), strip tillage (cultivating strips to a conventional depth) and no tillage (no cultivation).

LandWISE field trials show strip tillage and no tillage systems are viable, and that yields need not be compromised. Local processors have also analysed yields from strip-till and no-till and conventionally cultivated crops. They found equivalent yields under all scenarios.

While reduced tillage can provide many benefits, it must be managed well. Certain key issues must be addressed regardless of the system adopted. In reduced tillage systems, three that stand out are soil compaction, residue management and weed control.

Soil compaction is the most common cause of low yields in the reduced tillage trials LandWISE has conducted. Soil should be in good condition as less remedial work is conducted under reduced tillage, and compaction must be removed with suitable equipment. Trials to date have shown that where compaction is managed, reduced tillage yields are as good as those under a conventional system.

Crop residue is deliberately retained under reduced tillage systems. Because residue is not buried, it must be either in a form that machines can handle or

machinery must be able to handle the residue as it is. Residue can also harbour pest and diseases. Monitoring for slugs, making use of crop rotations and planting disease resistant varieties are all essential in successful reduced tillage.

Alternative weed management strategies may be required. Mechanical weed control can be difficult under reduced tillage. This tends to place more reliance on effective stale seedbeds and chemical control options. However strip tillage and no tillage also offer excellent conditions for stale seedbed approaches.

Reduced tillage offers fewer opportunities to "fix up messes". So it requires the longer term effect of every process or action in a paddock to be carefully assessed. It must be thought of as a whole package; e.g. what amount of compaction damage are the bulls doing to the soil, and how will I manage that so that yield is not compromised.

Strip Tillage

Strip tillage involves cultivating only a strip of ground, sufficiently wide for crop establishment. The area between rows is left untilled, retaining a protective cover of crop residue on the surface. This is ideal for wind erosion control. Strip-till is suited to row crops like maize, corn, squash and tomatoes where precision planting and a warm, uniform seedbed are required to ensure successful, uniform germination.

Advantages are:

- reduced cultivation costs
- reduced cultivation time
- reduced fuel use
- excellent wind blow prevention
- greater soil strength for carrying harvesters
- improved moisture retention
- improved drainage

No tillage

Under no tillage, crops are planted directly into uncultivated ground. Crop residues or pasture may be present. Specialist equipment is used for planting, as it must penetrate uncultivated soil, achieve even planting depths, and accommodate residues and less even ground.

Advantages include:

- zero cultivation costs
- excellent wind blow prevention
- soil structure maintained
- greater soil strength so less compaction damage at harvest time

- drainage channels maintained in soil
- minimal soil disturbance leading to reduced weed germination

Minimum tillage

As the minimum tillage name suggests, soil cultivation is kept to the minimum necessary for crop establishment and growth. This reduces labour requirements and fuel costs and damage to soil structure.

Minimum tillage is not just “not ploughing”. It involves little if any soil inversion, relying on tined implements to work soil to a shallow depth. Residues are partially incorporated, but retained to provide surface protection.

Minimum tillage has reduced residue levels compared to no-till and strip-till. This can reduce relative pest and disease pressure, and the residue handling requirements of the drill/planter.