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NOTE

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Choosing and preparing a paddock for reduced tillage

It's important to consider the condition of any paddock or field that you intend to crop using a reduced tillage system. By definition, reduced tillage offers less opportunities to "fix up" problems such as soil compaction or poor tilth, or to level a field out.

This LandWISE Note addresses key considerations, and will be particularly useful for growers contemplating reduced tillage for the first time.

Does the paddock have any problems?

When choosing a paddock to trial reduced tillage, start with a better performing paddock wherever possible. Choosing a paddock that hasn't performed well in the past is setting you up for failure. As your experience grows, you can then tackle the more difficult areas.

Will soil moisture levels be suitable at tillage/planting time?

Tilling at the optimum soil moisture level will give maximum soil fracturing and shattering, creating an optimum seed bed. Cultivating when the ground is too wet will cause smearing and damage soil structure. In certain conditions, surface soil is drier and working to a shallow depth may be possible.

When the machine is working dig down to the bottom of the tilled zone to make sure smearing isn't occurring. Use the "worm test" as a guide to soil moisture levels. Remember to test the soil at the operating depth of the tillage equipment. If there are areas within a paddock that are known to be too wet or too dry it may be best to eliminate them from your cropping schedule.


An example of compacted soil

The mole knife strip tillage machine can leave a smeared slot and mole drain if used in wet soil. There will be no soil bursting, and no suitable seed bed produced. It is better to wait until the soil dries out sufficiently for adequate cultivation.

Using conventional equipment in wet conditions will also cause severe soil damage. Often there is no planting date benefit, as multiple passes over a number of days are needed to remedy damage and prepare soil for planting.

Is the paddock free of compaction?
Untreated soil compaction has been the most common cause of yield losses in the LandWISE trials. Compaction may be caused by over wintering stock, heavy harvesting equipment or previous machinery impacts.
Under reduced tillage, compaction will remain in untilled ground. This will restrict root growth and cause crop loss. It is also a significant impediment to direct drilling. If compaction damage is evident, remedial measures such as sub-soiling / aerating will need to be carried out.

When direct drilling, the drill needs to be able to:

- penetrate the soil surface to the depth required
- place the seed at the depth required
- create a suitable amount of tilth

If you are unsure whether the drill will do this, test it out a week or so beforehand.

Will the fallow period be long enough?

A standard recommendation is to have 4-6 weeks fallow when using reduced tillage systems. This is particularly important when cropping in fields from pasture. A longer fallow – up to 6 weeks, is needed to reduce pest pressure.

The mole knife strip-till machine requires 4-6 weeks fallow after spraying out pasture. This allows the grass roots to break down. Too short a fallow period and the roots will prevent the soil from shattering into small aggregates. This leads to poor seed to soil contact and reduced germination.

A thick thatch from old pasture can also create problems for no till drilling.

It is helpful to seek advice from your drilling contractor before you begin.

Reduced Tillage Starts at Harvest

After harvest, leave the paddock in a condition suitable for reduced tillage. This is particularly important when planning to use reduced tillage next season. It is also important for the maintenance of soil health (and is just as important for conventional tillage!).

The soil should have compaction removed. Often autumn is the best time for deep ripping as the deeper soil is drier and shatters well. Do not rip wet soils. Removing compaction should enable the soil to drain properly over winter. Otherwise it will become anaerobic, soil organisms will drown, and it will take longer to dry out in the spring.
If leaving a field fallow, ensure the surface is left flat. Rolling down or otherwise leaving surface clods reasonably small, allows natural weathering to do much of the cultivation needed. Big, blocky clods weather unevenly, and cause non-uniformity in subsequent operations and crops.

A smooth paddock allows for the seed to be direct drilled to a consistent depth and makes all following operations easier. If a paddock does need levelling then cultivating in the autumn lessens the risk of wind erosion events.