# IMPROVING SOIL HEALTH: taking the min-till approach

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Soil biology, soil structure and soil organic matter levels are all affected by the ways we till and plant the crops we grow. There is growing evidence that says adopting no-till or min-till systems can **improve soil health and function** and lead to **lower costs of production**.

## What are these systems?

No-till is used when seed is directly sown into un-cultivated soil and crop residue; min-till is used when strips of soil or soil near the surface are cultivated before seed is sown.

## What are the benefits?

- Less nutrient leaching, soil erosion and run-off when crops are direct drilled
- Soils better protected and more resilient to damage
- Improved soil organic matter levels
- Reduced costs of production e.g. lower diesel usage
- Less disruption to important soil processes and biology
- Reduced compaction from heavy machinery

## Cultivations affect:

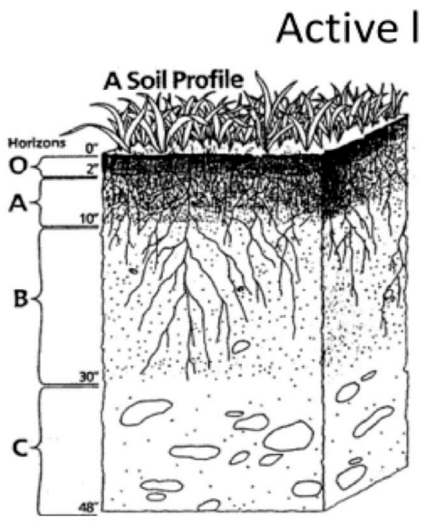
- soil water content, temperature and aeration
- the living organisms and the processes that go on within soil that keep it healthy

## Is your farm soil healthy?

Soil pH, and levels of nitrogen, phosphate and potash affect crop growth, but soil biology and soil health and function are often overlooked.

## So what's going on?

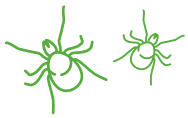
Take a look at this:




- Most of the action occurs in the first 2cm of soil
- All invertebrates living in top 10 cm of soil
- (Some worms and mammals further down than this)

### Direct impacts of soil biology ON soil... breaking down dead plants

- Microbes start the breakdown process.
- Mites and springtails consume it and waste products given back to growing plants to utilise!
- Mites eat and then excrete 50% of all leaf litter available (in a healthy soil).
- Earthworms take it into burrows and redistribute nutrients.



Channels which transport air and water in the soil are also formed by earthworms - so soil becomes more aerated, and better drained which can improve crop growth.

### Consider min-till and no-till:

- Soil organisms need the right conditions and min - or no-till allows them to thrive and create a healthier living soil which benefits crop growth.
- Min till or no till methods of establishment should be given careful consideration where appropriate.
- Choose min or no - tillage methods when soils are drier, stable, with good drainage and organic matter content.
- There are further benefits gained from lower fuel consumption, fewer cultivation passes and reduced labour costs.

### Further reading:

**Better soil management: reducing or stopping soil tillage:** Dr Will Stiles, IBERS Aberystwyth University

**Tillage systems and soil ecology;** Eileen J Kladivko, Soil and Tillage Research; 2001 vol61, pp61

**HGCA technical note:** No till - opportunities and challenges

**AHDB website:** Experiences with no-till

**SRUC Technical note:** Minimum tillage

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