

The potential of cover crops for improving soil function

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Cover crops can be grown over the autumn and winter ensuring green cover throughout the year. They have been described as improving soil structure, reducing soil erosion and potentially even a form of grass weed control. These crops retain nutrients within the plant, potentially making them available for future crops, as well as increasing soil organic matter. Over the last three years, we have investigated how different cover crop regimes affect soil quality. Three separate experiments over each autumn/winter period have investigated how different cover crops affect soil biology, physics and chemistry, with each experiment building on the previous one.

There have been significant effects of cover crops on soil structure, as well as significantly lower weed biomass and increased yields in the following crop - in comparison to bare stubble. For example, the effect of drilling the cover crops on soil structure in comparison to a bare stubble control that had not been driven on by machinery was quantified, and over the winter period the soil structure of the cover crop treatments changed, with compaction reduced in the cover crop treatments, whilst the bare stubble control remained unchanged. Weeds were found in significantly lower biomass in the cover crop mixes in comparison to the bare stubble control, and significantly lower weed biomass continued to be found in the following spring oat crop where the cover crops had been, indicating a weed suppressive effect that has a continued legacy in the following crop. The following spring oats have shown similar results in the last two years, with higher yields in the previous cover crop areas compared to the bare stubble controls. Overall, these results are indicating that cover crops have the potential to provide improvements to soil quality, reduce weeds and improve yields. We discuss the economic implications.