Cost-effective farming for improving soil organic carbon

The Challenge

Soil organic carbon (SOC) is vital to providing nutrients to crops and maintaining suitable soil structures for cultivation. Increasing SOC levels may contribute to mitigating climate change as advocated by the French '4 per 1000' initiative, which aims to increase soil carbon levels by 0.4% annually. The role of soil management in adaptation is also of policy interest. By reducing surface runoff and increasing soil water retention, soil management might also contribute to natural flood management (NFM) and drought resilience.

Policy Implication

Soil management measures that have positive social benefits may have mixed or uncertain impacts on farm businesses, and policy intervention is necessary to overcome these barriers. Knowledge transfer is needed and should be tailored to particular crops and environmental circumstances. Coordinated implementation of a range of NFM measures is also necessary to achieve benefits at catchment scale. Financial assistance may be necessary to meet capital costs and offset short term private costs where benefits need multiple years to mature.

Research

Researchers identified a range of soil management approaches to contribute to improved farm productivity and deliver other benefits like water management. These were assessed against their impacts on cropping yields, cultivation costs and input costs, and the potential to increase the levels of SOC across European countries.

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Results

In Scotland, minimum tillage (except for potatoes) was found to be most cost-effective due to either yield improvements or reduced costs. Other measures were found to result in lower yield zero tillage, loss of revenue from straw (residue management) or displacement of winter for spring crops. Residue management had the largest negative impacts.

There were a number of barriers to uptake of these measures, including resistance to adopting 'non-traditional' approaches, lack of a market or use for resulting products (cover crops), lack of advice (use of manures), and loss of revenues (residue management).

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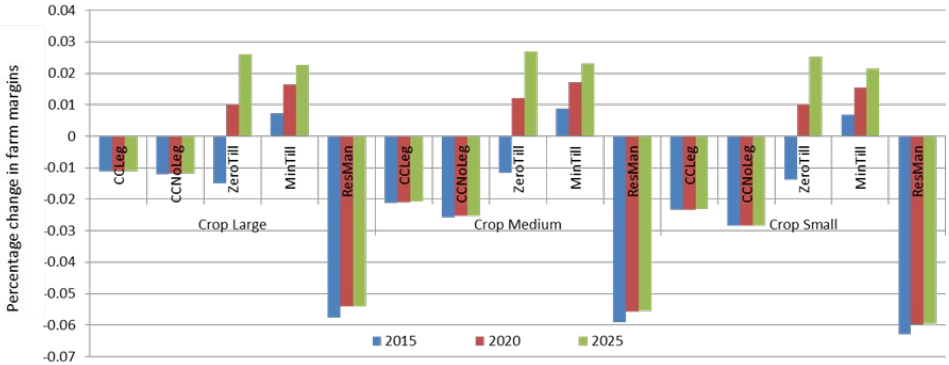

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About

The Land Economy, Environment and Society (LEES) Research Group is one of the largest groupings of economists and social scientists working in the rural, agricultural and land based sectors in the UK. Our vision is to be recognised as one of the leading centres for agricultural and wider rural economic and social research globally, benefiting the land use sector, the environment and rural communities.