**Higham Suffolk regenerative farming trial has mixed results**

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Study team leader Professor Jon Storkey and the Rothamsted trials site Brooms Barn near Higham *(Image: Rothamsted Research)*

Early results from crop trials taking place in Suffolk suggest there are no quick, easy answers to restoring the ecosystem and soils drained of nutrients.

Disappointingly, regenerative practices are unlikely to be a quick fix for agriculture, early mixed results from new long-term experiments by agricultural research institution Rothamsted show.

Instead, careful study of the two sites - one of which is at Brooms Barn near Higham in west Suffolk and the other in Hertfordshire - suggest farmers will need to be patient to reap the rewards of using regenerative methods.

Approaches such as no-tillage and diversified cropping are not a short-term fix for more sustainable food production systems - but will require a long-term commitment, warn researchers.

An experimental setup of 24 cropping systems that combine a variety of regenerative agriculture practices was established at sites in Hertfordshire and Suffolk in 2017/18.

So far the short-term results show reduced tillage has resulted in lower wheat yields. The effect varied with crop rotation, the previous crop and the site.

However, plots with added organic matter saw a significant increase in spring barley yield - with an average boost of 8% - again with varied gain according to the site.

Ploughed crop plots tended to produce higher caloric yield overall than systems under reduced tillage, early studies have found, study team leader Professor Jon Storkey said.

“The initial results suggest that it takes time for regenerative approaches to restore the health of soils and the ecosystem. In addition, there may be a decrease in yields as the system transitions to a more sustainable state,” he said.

“With so many variables in play, only a long-term, integrated approach will be able to tell us what really works in regenerative farming.”

A long-term Broadbalk experiment at Rothamsted was set up in 1843 and  focused on how varying inputs of fertiliser affect crop yield.

This original research was hugely influential and helped establish many modern farming practices which have consistently delivered bountiful harvests and widespread food security.

But agriculture today is under pressure to reduce its environmental impacts and the new long-term experiments will look at how varying approaches to crop rotation, tillage, nutrition and crop protection can reduce inputs of pesticides and fertilisers, emissions of greenhouse gases and support biodiversity.

The aim is to collect extensive data. Rather than focusing purely on crop yield, with the new Large Scale Rotation Experiments (LSREs) study the "synergies and trade-offs" of each approach.

“Only by taking such a broad perspective can we hope to successfully inform the transition to more sustainable cropping systems across the planet,” said Professor Storkey.

“Inevitably trade-offs will need to be made between maximising crop yield and protecting the environment, but these experiments will help us better understand the system behaviour, and ultimately identify the optimal balance for multiple systems and approaches.”

The latest trials will use new computing and statistical analysiis which will provide an evidence base for "alternative pathways to sustainable agriculture", said Rothamsted.

It will also serve as demonstration site for encouraging the transition to more sustainable farming systems.

“We need to better understand cropping as a complex system. That way we can create models for predicting the system response to the multiple factors that will affect farming as our climate and food demands change," said the professor.

"This will be of use to farmers and policymakers in guiding decisions on how to modify existing systems to reconcile multiple objectives."