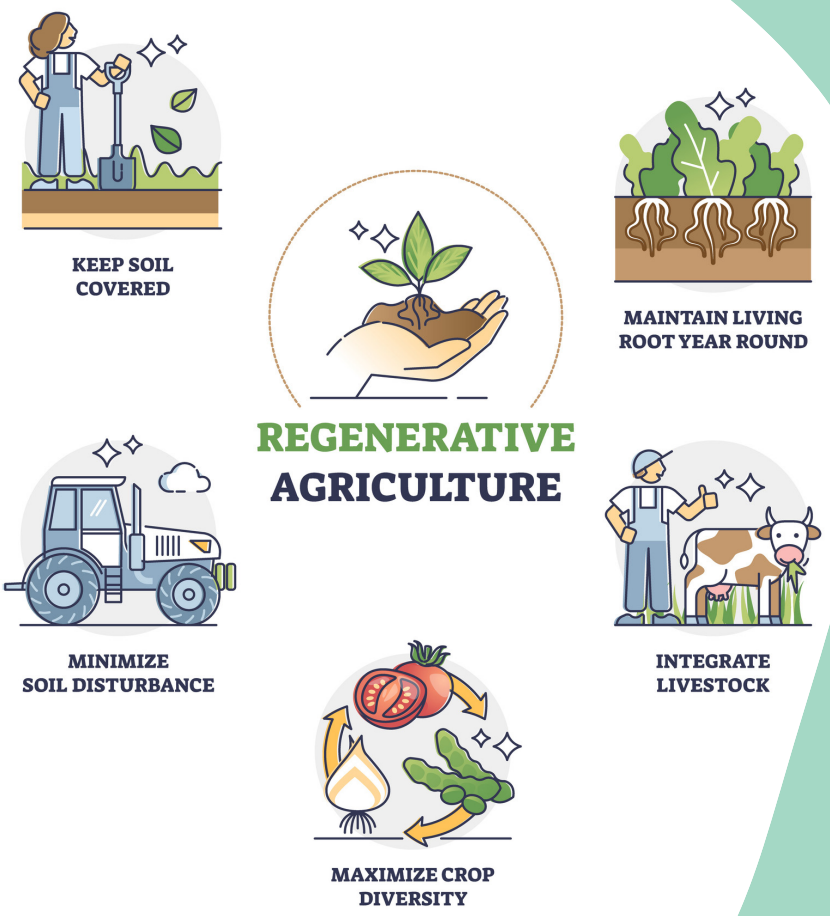
HEALTHY SOIL
HEALTHY FOOD
HEALTHY PEOPLE

The how and why of supporting regenerative agriculture

The H3 project (Healthy soil, Healthy food, Healthy people) seeks to transform food systems 'from the ground up'.

This is one of a series of policy and practice briefs summarising the findings of the H3 project in accessible language and drawing out their implications for government, business and civil society.



Background

'Regenerative agriculture' aims to regenerate rather than degrade agricultural soils and ecosystems and is usually defined by these five principles:

- Minimize soil disturbance
- Keep soil covered
- Maintain living roots
- Integrate livestock
- Maximize crop diversity.

Although regenerative agriculture is increasingly popular, there is no agreed definition of what a regenerative farm is, and so far, little high quality evidence of whether regenerative agriculture delivers the expected environmental and agronomic benefits.

H3 worked with farmers in England to study its effects on food production, biodiversity and soil health (Berthon et al., 2024).

Method

We worked with two clusters of farmers to co-design an experiment quantifying the effects of moving to regenerative agriculture. Seventeen commercial farms were involved, from either South West (mixed farms on chalky soils) or Eastern Eastern (arable farms on heavy clay soils). Appropriate practices and principles for each context were identified and a flexible practice-based scoring system developed *(Figure 1)* to measure the extent to which farms are regenerative.

We measured:

- soil quality – the number of earthworms and proportion of fine earth in large (>2mm) water-stable aggregates (a measure of good soil structure and organic matter content)
- biodiversity – numbers of winter birds, pollinators and natural enemies (beetles, spiders and wasps)
- food production and quality – total yield and grain micronutrient content
- variable costs – for fuel, fertiliser and plant protection products
- the views and experiences of farmers.

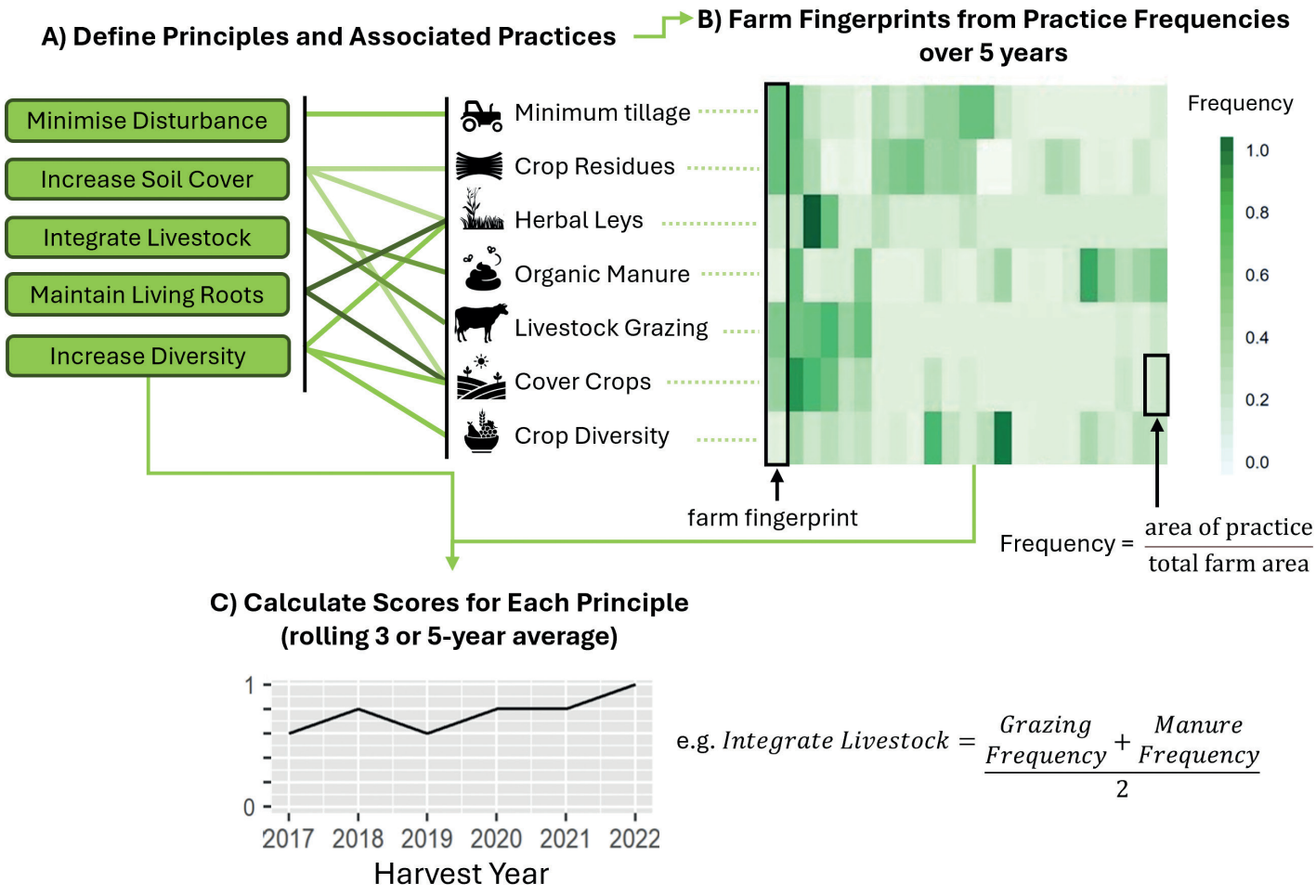


Figure 1. The H3 scoring system uses readily available data to derive a 'fingerprint' for each farm (H3 farms shown).
A) Principles and practices defined with farmers for a given context;
B) Consistency of each practice (rows) measured for each study area (vertical columns) over five years;
C) Principle scores derived annually, for each study area, representing the consistency of farms' adherence to practices contributing to that principle. (For further details see Berthon et al., 2025).

Key findings

- Every farm has a unique management 'fingerprint'. No farms consistently use all regenerative practices, but all farms use at least one.
- Regenerative agriculture can be defined on a scale showing consistency of adherence to regenerative principles. Each farm has a score, which can change over time.
- Outcomes depend on history, management details, and local context. For example, soil health benefits differ across soil types; regenerative systems can have lower yields, although this varies between years, crops and soil types.

Our results show that more regenerative farms have:

- improved soil health (up to 65% more worms, 60% more water-stable aggregates > 2mm), which happens rapidly in just a few years
- higher abundance of farm-dwelling birds, spiders, and parasitoid wasps
- lower mineral fertilizer, fuel, fungicide, and insecticide use.

Other findings:

- All farms used similar amounts of herbicide (e.g. glyphosate), regardless of how regenerative they were, dispelling concerns that regenerative farming could increase herbicide use.
- Effects on pollinators and natural enemies are strongly influenced by habitat features, such as hedgerows, woodland and flower strips.
- Weather has a huge effect on agronomic output – ***'You're only as good as the weather'***, remarked one farmer. We had very wet and very dry seasons during our research – such extremes are increasingly challenging for UK farmers.
- Yields were sometimes lower in regenerative farms, notably for winter wheat during challenging weather (2024 and 2025!) and clay soils. In good weather years and for winter oilseed rape, regenerative farms were as productive as conventional farms.
- Regenerative farmers are learning on the job and from one another, with limited expertise available from traditional advisors. They monitor their own outcomes on the farm. ***'If you are going to manage, you've got to measure'***, one farmer said. Another said, ***'there are no textbooks on how to do this.'***
- Regenerative farmers rely on local social networks, with many noting the importance of ***'looking over the hedge'*** at their neighbours' practices to provide useful benchmarks (quotes from Beacham et al. 2023).

Implications for policy incentives and practice

Designing flexible incentives

Regenerative agriculture and its outcomes differ according to farm context. The extent to which a farm is regenerative can be quantified using basic farm management information to provide a score structured around regenerative principles, and practices selected for the specific context. Incentives based on this would be more flexible than those prescribing individual practices

Funding knowledge exchange, demonstration and learning

Peer-to-peer learning among farmers and independent advice on how to farm regeneratively in each context are key elements of the transition. These should be supported by policies such as the Facilitation Fund (**See website**) previously available under the Countryside Stewardship Scheme.

Insuring farmers against risk

Regenerative agriculture entails learning new skills, working with rather than against nature, potentially with high upfront costs (e.g. new equipment) and more variable yields. Government support is needed, especially during the early years of moving to regenerative agriculture.

High input farming has buffered against climatic risks by overcompensating for weather uncertainty at serious cost to the health of our soils and farmed environments. Lower input strategies like regenerative agriculture bring additional risk, in return for securing the future of our soils. They also cushion us from food security threats created by dependence on fuel and fertilizer imports from unstable regions of the world.

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See website >>

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Key references

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See website >>

Other outputs

Sharing Experiences of Regenerative Agriculture
See website >>

'Making Research Work in Practice for Regenerative Agriculture' Groundswell 2024
See website >>

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