

2023
**Research
Summary**



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In 2021-22 the Organic Research Centre (ORC) worked on 22 projects advancing research and knowledge exchange in the organic and agroecological sector. In doing so we worked with over 200 partners from across the UK and Europe.

Despite the ongoing complications of accessing European funding following Brexit, we were very pleased that amongst these projects were four new Horizon Europe funded projects covering the topics of agroforestry, resilient livestock systems, organic seed and plant breeding, and mechanical weed control. The barriers UK farmers face in adopting agroecological practices such as lack of support, knowledge and experience, are universally common across Europe, so it is vitally important that we continue to collaborate with our European peers on such projects.

Closer to home we are very grateful for the support of various charitable trusts and individuals who have funded both our research and our knowledge exchange work. The Dulverton Trust is supporting a project looking at optimum shelter belts while the Elizabeth Gilmour Charitable Foundation is funding research into living mulches and John Pain, an individual philanthropist is supporting a project that is looking at the current marketing of organic produce. More details on these projects can be found in the Research Report. Other trusts such as the Esmée Fairbairn Foundation and the Rothschild Foundation are assisting the translation of such projects into real world application by supporting our knowledge exchange programme.

The following pages give an overview of our current research work and details of all these projects can be found [on our website](#).

Agromix and ReForest Projects

These projects are focused on mixed farming and agroforestry, which is the integration of trees with crops and/or livestock on the same land area. Agroforestry, if well managed, captures carbon, regenerates soil, and increases biodiversity. In addition, implementing agroforestry allows farmers to diversify their production, reducing their dependence on the success of certain products, thus improving their income stability.

The projects will develop, test and improve models and user-friendly tools to assist land

managers in implementing and monitoring climate-resilient land use based on agroforestry principles. The projects will also contribute to policy development and stakeholder-led action plans to integrate agroecological principles into existing policy frameworks.

By bringing together farmers, researchers and policymakers these projects aim to create conditions where agroforestry becomes one of the most attractive land management systems in Europe.



Re-Livestock

The Re-Livestock project aims to develop innovative approaches to dairy, beef and pig farming in different geographic regions. These will reduce greenhouse gas emissions and increase the capacity of the sector to deal with potential climate change impacts. Re-Livestock brings together scientific expertise across different disciplines and

has a total of 37 partners from 14 different European countries and from Australia. The project consortium includes farmers associations, livestock feeding companies, a seed company, animal breeding companies, a precision livestock company, advisory organisations, universities and applied research institutes, and an intergovernmental organisation.

LIVESEEDING and Oper8

The LIVESEEDING project will contribute to the upscaling of organic production in Europe by focussing on increasing the supply and demand for organic seeds and organic breeding. It aims to marry crops bred for organic and low-input systems with local food production and raise awareness of the importance of biodiversity within this.

While the use of synthetic pesticides in agriculture has helped to increase food production, this has not occurred without great costs to the environment, natural resources and human health. However, farmers can be reluctant to adopt non-chemical methods because of complexity, costs and management time.

The **Oper8** project will communicate, demonstrate and promote alternative weed control solutions, that are proven to be effective on farm against key weeds, to stakeholders via co-innovation networks across the EU.



These projects will all support the transition towards resilient agricultural systems that mitigate climate change and biodiversity loss at local, regional, national and EU levels.

Agroforestry and Organic ELMS Tests and Trials

We have received funding from Defra for a number of projects including an Agroforestry ELMS Test and Trial project that involved a systematic review alongside consultation with farmers and other stakeholders to determine what is holding farmers back from adopting agroforestry and what can be done to encourage them to plant trees on their land.

This process of co-design has helped shape an agroforestry option under ELMS.

In addition, we are working with the Soil Association on the Organic Test & Trial to explore how the Sustainable Farming Incentive (SFI) can be accessed by the organic farming sector and how the current and proposed SFI standards may impact that sector.



Carbon code for Agroforestry

We are in a consortium that has received funding from the Natural Environment Investment Readiness Fund to explore the feasibility of developing a carbon code for Agroforestry. That project is scoping and exploring the potential for the carbon captured and stored by trees in agroforestry systems to be quantified and potentially used to support the net zero strategies of farmers, land managers and their partners and funders.



Trees Outside Woodlands

On a more regional level we have worked with Shropshire Council and three other county authorities on a programme which is testing how to best encourage the uptake of tree planting on farmland to improve biodiversity, soil health, productivity and animal welfare. We have reviewed the success of mini-grant schemes operated in these areas and highlighted the lessons that can be learned for rolling out a financial and advice support package.



Evolutionary breeding of organic seeds

Another Defra project has been reviewing our work on evolutionary breeding of organic seeds – with a particular focus on ORC Wakelyns Population “YQ”. Heterogeneous wheat populations developed in this way can be better adapted to local conditions and resilient to climate change and extremes.



LiveWheat

Over the past three years, the LiveWheat project has enabled on-farm assessment of a range of current wheat varieties in organic systems to improve our understanding of their performance under management conditions not tested in the AHDB Recommended List trials. This work may help the sector to identify traits important in organic systems and impact future breeding programmes.

Diversification of cropping systems including the types of crops and varieties grown is an essential strategy to build resilience into the UK's food and farming system as we transition to net zero, reduce dependence on artificial inputs, and work to maintain production in the face of climate instability.

Working with farmers to assess the real-world application of our research is key to what we do. We often collaborate with Innovative Farmers, a network of organic and conventional farmers, on 'field labs' – on-farm trials that test new approaches.

Silvopasture and CCAL

One field lab, involving seven farms in Devon, will be the largest participatory research project to date looking at silvopasture – a practice of integrating trees and livestock into a farming system. The farmers, who produce beef, sheep, venison and dairy, are expecting the trees to bring a range of benefits to their farming systems by enhancing the natural processes that underpin sustainable food production.

We will explore the hypotheses that these systems will improve soil health, including soil carbon, earthworms, fungi and other indicators of soil biology. It is also hoped to improve livestock health and welfare through providing shelter and additional nutrition, diversifying farm income by providing extra crops of fruit, nuts and timber and boosting the nutritional value of forage.

One of the farmers involved, Andy Gray, who rears animals for a direct sales meat box company says of the project:

“With big changes in agricultural policy ahead, farmers are now looking into the regenerative practices we can do on our farms to prepare our businesses to benefit from public money for public goods. For me, agroforestry is one of these changes. I’m incredibly keen to get agroforestry taken up by more farmers because of the environmental benefits it brings. The list of the benefits you can get are undeniable; soil health, water quality, shelter for animals. It also provides an extremely good marketing opportunity as it helps us show our customers that we are doing our bit.

This field lab is about building knowledge and the understanding

for the wider farming community. By doing this we can prove to our neighbours that it works so they then have the confidence to adopt it. Farmers trust farmers and the more conversations you have, the more you learn, the more you develop new ideas.”

This project is part of the Innovative Farmers network and is a collaboration between ORC, the Farming & Wildlife Advisory Group and The Woodland Trust.

A further project is also underway to research how to incorporate animal health into landscape design and management (**CCAL** – Cattle Care at Landscape Level).

Optimum Shelterbelts

We are also working with the Farming & Wildlife Advisory Group and The Woodland Trust on a related project investigating optimum shelterbelts.

Shelterbelts are rows of trees or shrubs that reduce the force of the wind. They can reduce soil erosion, increase crop yields and protect livestock from heat and cold. They beautify the landscape and provide habitats and corridors for wildlife.

Optimum shelterbelts (OSBs) are designed to optimise the effects through their design and planting.

The project will involve the planting of 6.5km of OSBs (around 10,000 trees) across 6 farms in the Cotswolds.

This is the first time research has ever been carried out to measure the effect of OSBs on real-life production farms.

By understanding how the shelterbelts function across the Cotswolds landscape, we can develop knowledge about UK conditions in several of our core disciplines including livestock welfare, arable production, biodiversity and economics.



Living Mulches

The Living Mulches project began as a collaboration with Innovative Farmers, Organic Arable and the Agriculture and Horticulture Development Board. Its aim is to discover whether cash crops can be successfully grown in a permanent clover understory to control weeds and fix nitrogen without significantly affecting yields. If the approach proves successful it would offer a way to build fertility without livestock,

tillage or synthetic inputs, while sequestering more carbon, cutting costs, and improving productivity.

Both conventional and organic farmers are involved in the trial and are pooling findings and knowledge. Staffordshire arable grower and contractor, Clive Bailye, is involved in the field lab. Clive practices conservation farming and hopes using living mulch will allow him to eliminate synthetic fertilisers.

“I’ve never really felt able to go fully organic. Without livestock in my system we’ve never been able to facilitate that circular farm approach for building soil fertility, as I don’t want to go back to cultivation to control weeds. So, to find out how we can do organic no till, without livestock, is like the holy grail of farming.”



Organic Hop Varieties

We are also working with Innovative Farmers on a field lab trialling organic hop varieties. Brewers and hop merchants say demand for organic beer and locally-sourced ingredients has accelerated since the pandemic, but there is a lack of UK-grown organic hops with currently only three growers. In its heyday in 1865, there are 77,000 acres of UK hops being grown, but now there are less than 2,000. This decline started with the consolidation of breweries and varieties

post-WW2 to feed a more commercial beer industry. This consolidation resulted in a lack of genetic diversity which is one of the main drivers of disease and pest vulnerability in hops. We hope that if new disease resistant hop varieties are found that can grow effectively in a UK climate then more growers will be encouraged to grow them both in organic and conventional systems with the latter being able to confidently reduce their reliance on agro-chemicals.



Organic Marketing and Organic at the Heart

The UK organic market as a whole saw a growth of more than 9.5% in 2020, where the sector outperformed non-organic market growth by an average of 3% across different food types. As such, there is unrealised potential for the marketing of a wider range of organic products in the UK and to grow the share of organic in food retailing.

However, the organic sector is under-prepared for the transition from smaller “niche” market strategies towards being a significant presence in future mainstream food and drink retail.

To address this we are running a project that is looking at the current marketing of organic produce to identify what needs to change.

In a first for ORC, the Organic at the Heart (OATH) project was fully funded by ORC supporters to look at how we can support the development of emerging food and farming networks across England.

OATH explores how the organic principles of health, ecology, fairness and care can feed into decision-making of producers and retailers working together, via regional networks, to effectively supply their communities with locally produced food from organic and agro-ecological systems.



Agriculture

The unifying foundation of all these projects is working closely with farmers to identify ways to provide produce to the consumer in an environmentally friendly way that is fair and viable. The dissemination of the knowledge and experience gained from these projects to a wider farming audience is a key focus of our Impact Delivery work which encompasses the management and administration of AgricoLOGY. AgricoLOGY is an information hub for farmers to discover how to practically implement sustainable farming methods on their farms through peer-to-peer learning and is available both online and through a series of events and farm visits where farmers can meet and network with experts and practitioners.

A screenshot of the AgricoLOGY website homepage. The page features a green header with the logo and navigation links. The main content area includes a large image of hands holding soil, a welcome message, and a section for key resources with three featured articles: 'Climate-Friendly Practices on Your Farm - A Practical Manual', 'Managing the drought', and 'Biodiversity in crops and grassland'.

AGRICOLGY

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Welcome to AgricoLOGY

Sharing practical information about sustainable farming based on agroecological principles.

ABOUT US

Practical sustainable farming regardless of labels

Key resources VIEW ALL

Climate-Friendly Practices on Your Farm - A Practical Manual

Managing the drought

Biodiversity in crops and grassland

Project name	Description/objective	Funding	Timespan
Agroforestry ELMS Test and Trial	Co-designing agroforestry support under the Environmental Land Management Scheme	Defra	2020-23
Agroforestry Carbon code	Scoping the potential of a carbon code for agroforestry to support net zero and farmer engagement in carbon markets	Defra/NEIRF	2022-23
AGROMIX	Supporting the transition to resilient and efficient land use in Europe with a main focus on mixed farming and agroforestry with their related value chains	EU Horizon	2020-25
CCAL	Cattle Care at Landscape Level: Incorporating animal health into landscape design and management	Private donor	2022-23
LIVESEEDING	Supporting organic seed and plant breeding to accelerate sustainable and diverse food systems in Europe	EU Horizon	2022-26
Living Mulch Field Lab	Testing organic rotations on permanent clover understorey with a group of farmers	Private donor	2019-23
Oper8	EU-wide thematic network to support and promote solutions for non-chemical weed control	EU Horizon	2022-25
Optimum Shelter Belts	Developing protocols for farmer-led monitoring of the productivity and environmental benefits of shelter belts in the Cotswolds	Foundation	2021-23
Organic at the Heart	Building communities around environmentally friendly farming through the development and demonstration of local hubs that embody the Organic Principles of Health, Ecology, Fairness and Care	Various	2021-23
Organic Hop Varieties Field Lab	Exploring hop varieties untested in organic farming, to enable an increased supply of disease-resistant, local, UK organic varieties	Innovative Farmers	2021-23
Organic marketing	Consumer-focussed research into what are the main barriers and opportunities to grow the UK organic market	Private donor	2022-24
Organic T&T	Exploring how the Sustainable Farming Incentive can be accessed by the organic farming sector and how the current and proposed SFI standards may impact that sector	Defra	2022-23
Plant populations	Broadening the farm-based variety trials network to consider and support the wider use of heterogeneous material	Defra	2022-23
ReForest	Developing tools and instruments to break down the barriers to agroforestry uptake across Europe and unleash its potential to mitigate climate change and tackle the biodiversity crisis.	EU Horizon	2022-26
ReLivestock	Evaluating and mobilizing the adoption of innovative practices (animal, herd, farm, sector and region) to reduce GHG emissions and increase capacity to withstand climate change impacts	EU Horizon	2022-27
Silvopasture Field Lab	Investigating whether silvopasture is a viable way to address the climate and nature crises while maintaining productive farmland	Innovative Farmers	2021-2033
Trees Outside Woodlands: Agroforestry and orchard pilot study	Assessing the results and outcomes of a mini-grant scheme supporting tree planting activities as part of Defra's Trees Outside Woodlands programme	Shropshire Council	2023



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