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Cover photo

ORC staff outside Trent Lodge our new headquarters in January 2020...before social distancing rules applied!

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ORGANIC RESEARCH CENTRE

Bulletin

No. 131 – Spring 2020

News in brief

Minor cereals

ORC's Ambrogio Costanzo and Dominic Amos are co-authors of this open access paper 'Performance and Nutritional Properties of Einkorn, Emmer and Rivet Wheat in Response to Different Rotational Position and Soil Tillage' (published in *Sustainability*) in cooperation with the University of Bologna, arising out of the DIVERSIFOOD project. This is one of the first studies of its type. Rotational position and tillage systems significantly affected agronomic performance of the minor cereals investigated, suggesting that low fertility and shallow-non-inversion tillage might be suitable options to manage tall species. Emmer showed the highest incidence of foliar diseases, whereas einkorn and rivet wheat appeared quasi-immune to the main fungal diseases (stripe rust, septoria). In addition, rotational position and soil management also affect total polyphenol and flavonoid content differently, depending on the species (or accession) examined. Our results suggest a good potential to introduce these species in sustainable cropping systems andfurther trials are needed to evaluate additional quality traits.

Organic seed and organic heterogeneous material

As part of the 'LIVESEED: Boosting organic seed and plant breeding across Europe' project ORC has co-authored 'A proposal for a toolbox to identify and characterise Organic Heterogeneous Material (OHM)'. The New Organic Regulation 2018/848/EU broadly defined OHM as 'material with a high level of genetic diversity, intended for the market and for which DUS criteria (Distinctness, Uniformity and Stability) are not applicable.' More detailed provisions are currently under discussion. Examples of crops that could potentially fall into the category of OHM are provided with a focus on less well-documented species.

The report provides a summary of the SWOT analysis of possible tools for identification and description of heterogeneous populations based on experiences of the EU temporary marketing experiment of wheat, barley, oats and maize. Secondly the potentially confusing overlap between seed legislation and the new Organic Regulation is examined. Thirdly the authors summarise the general requirements and the possible tools for characterisation of OHM that can be used in the notification process, alongside a proposed framework to forecast scenarios of application of these tools to three categories: Farmers' Selections, Dynamic Populations and Composite Cross Populations (CCPs).

Embedding cultivated diversity in society

This open access article 'Embedding Cultivated Diversity in Society for Agro-Ecological Transition' was published in the *Sustainability* Special Issue Genetic Resources for Sustainable Agriculture. This review is based on the results of DIVERSIFOOD, a European H2020 multi-actor research project, and explores the concept of cultivated diversity using various dimensions relevant to fostering sustainable organic food systems and agroecological transition.

Organic Farm Knowledge

The online platform Organic Farm Knowledge aims to help increase productivity and quality in organic farming across Europe by providing access to a wide range of tools and promoting the exchange of knowledge among farmers, farm advisers and scientists. Organic Farm Knowledge was set up in the European funded project OK-Net Arable (2016-2019), which promoted improved productivity and quality in organic arable cropping. The platform has now been expanded to include the knowledge acquired in the OK-Net EcoFeed project (2018-2020), which supports organic pig and poultry farmers to achieve the goal of using 100% organic and regional feed. Further projects are joining, and tools addressing a range of additional themes are being added. The core of the platform is the 'toolbox'. Available tools include, for instance, factsheets, guides, online calculation tools and videos. Every tool is described by metadata that helps users to find the most relevant tool addressing their needs. Metadata include the problem the tool addresses, the solution(s) it offers, a description of the tool, the theme(s) covered, the language(s) it can be found in, the year it was released, the country of origin and information about the issuing organisation. https://organic-farmknowledge.org/

Global organic area continues to grow

2018 was another record year for global organic agriculture. According to the latest FiBL survey on organic agriculture worldwide, organic farmland increased by 2.0 million hectares, and organic retail sales also continued to grow, reaching another all-time high, as shown by the data from 186 countries (data as of the end 2018). The 21st edition of the study *The World of Organic Agriculture* published by FiBL and IFOAM – Organics International shows a continuation of the positive trend seen in recent years. The United States is the leading market with 40.6 billion euros, followed by Germany (10.9 billion euros) and France (9.1 billion euros). In 2018, many major markets continued to show double-digit growth rates, and the French organic market grew by more than 15 percent. Danish and Swiss consumers spent the most on organic food (312 euros per capita in 2018). Denmark had the highest organic market share with 11.5 percent of its total food market.

GM Freeze faces closure

Funding cuts mean that the UK's umbrella campaign challenging the use of GM in food and farming is facing permanent closure this summer. GM Freeze needs £25,000 to keep going but supporters are being asked to chip in £7,000 to ensure that, if the closure goes ahead, it happens in a way that helps others keep fighting for a responsible, fair and sustainable food system.

https://www.gmfreeze.org/join_us/donations/

For more details on items on this page, including links to the publications, visit the News link at www.organicresearchcentre.com or, to receive more frequent updates, register for our E-bulletin service and follow us on Facebook, Twitter and Flickr.

About us

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The Organic Research Centre is a leading, independent, research charity working for better farming, food and health, promoting environmental sustainability, quality food and health and wellbeing for all. We work in the UK and internationally to: research and develop practical, sustainable land management and food production systems based on organic and agro-ecological principles; foster knowledge exchange with and between current and future producers, food businesses and related professionals; and influence policy and public debates on the future of food and farming based on sound evidence.

Registered in UK as
Progressive Farming Trust Ltd.
Company No. 1513190
Charity No. 281276
VAT No. GB314668159

Registered address
Organic Research Centre
Trent Lodge,
Stroud Road,
Cirencester,
Gloucestershire GL7 6JN

T: +44 (0)1488 658298
F: +44 (0)1488 658503
hello@organicresearchcentre.com

Twitter: @OrgResCent
Facebook: @OrganicResearchCentre

Editorial: A look on the bright side

Welcome to the Spring edition of Bulletin! As this is my first bulletin I wanted to start by saying how excited I am to have joined the Organic Research Centre as the incoming Chief Executive. Although the current isolation which we are all adhering to has created something of a different workplace to the one that I envisaged when I accepted the role I am really delighted to have joined such a positive, enthusiastic team. Everyone is now working from home and making full use of all that technology offers us – we are video conferencing with each other for our meetings, enjoying virtual lunches and have even developed a 'Look on the Bright Side' chatroom for any amusing anecdotes to share!

Since the last Bulletin, the business has now moved to its new home at Trent Lodge in Cirencester. After a Herculean effort by everyone, we were settling down and getting used to new ways of working before the isolation restrictions were put in place. I count our business as fortunate to have invested in technology when we moved to Trent Lodge, so it has made this new virtual world a little less daunting from a ways-of-working perspective.

The current crisis has really brought home to me – and the wider team – just how important and relevant our work at the Organic Research Centre continues to be in order to address the disparate and fragile nature of our food chains. Our focus remains on developing fair and sustainable farming and food systems that are resilient and able to adapt to the environment – whether that is economic, environmental and social. It is times like these when we admire the 'Dunkirk spirit' of our farming communities in order to feed the nation with healthy, nutritious food that is kind to the environment and we would like to say an enormous thank you to everything that has been achieved in such difficult circumstances.

In the immediate future our work is continuing and we are using the home-working opportunity to deliver our ongoing work where we can but also really catch up on our report writing and administration, so that we can hit the ground running once restrictions are lifted. Yet we are living in uncertain times and we don't yet know how long the restrictions will last for. Given the time of year, we are currently able to manage this (although our spring field labs are not operating) but we are doing our best to prepare for extended isolation (in the hope that there is no need to enact our plans!), with the teams actively liaising with farmers to ensure that the valuable data that we need might still be collected and would like to say an enormous thank you in advance to everyone who is helping to ensure that the wheels keep turning.

Sadly a number of the events and conferences that we had planned to host or attend over the coming months have been cancelled. Although this is upsetting, it has encouraged new thinking and exploring new possibilities of how we may continue to share the findings of our research and really enact the knowledge exchange that is so important and pivotal to all our work. Our Agricology team have been busily looking at 'virtual alternatives' – webinars and podcasts – using farmers and researchers in conversation about specific sustainable farming practices. It will be interesting to track our progress with this work as there may be many lessons that we can learn to take us into the future.

Although I remain optimistic about what the future holds for the ORC, I would be naïve if I wasn't slightly daunted by it. The impact of the Covid-19 pandemic on the economy and our political landscape will be far reaching and something that we need to be prepared for. In the short term we need to be prepared for the impact on our cashflow if projects are delayed, but in the longer term we must be mindful as the Government counts the economic cost of the situation and also couples this with our future outside the EU. Whilst we are and will continue to do everything we can to ensure we have a long term, viable and resilient future ahead of us we are vulnerable to any reduction in donor or funding support and would like to use this opportunity to ask you to help us in any way that you can.

Last but not least, it is my sad duty to report that Bruce Pearce has decided that it is time to move on from his role as Director of Research & Innovation at the ORC. Bruce has worked for the organisation for more than 20 years and is a highly valued member of our team. His decision to leave is due to personal reasons and will be an enormous loss to the business, but he has agreed to an extended notice period so will remain with us until the end of September, when (restrictions permitting) we will be able to give him a great send off.

Lucy MacLennan

New era for ORC: at Trent Lodge with Lucy MacLennan at the helm

Organic Research Centre started its 40th year at new headquarters, Trent Lodge in Cirencester. ORC is also delighted to announce the appointment of Nuffield Scholar Lucy MacLennan as its new CEO.

Since the departure of long-standing and well-respected CEO Nic Lampkin last year, Stuart Rogers stepped in as interim CEO and continued to develop the strategic direction of the organisation until Ms MacLennan's new appointment.

Ms MacLennan brings over 25 years' experience in the fresh produce sector to the role, including senior leadership and management positions for global retailers and food producers such as Sainsbury's, Marks & Spencer and Kettle Produce.

While working as a senior consultant in food quality, food safety, and food supply chain integrity and innovation, she is also a non-executive director and chair of the fresh produce board at Red Tractor Assurance.

"I'm thrilled and excited to be appointed CEO at the ORC," says Ms MacLennan. "The work of the organisation to redesign and deliver better farming systems based on organic and agro-ecological principles offers real value to our society.

"I don't think there's ever been a time where emphasis on the development of sustainable agricultural practices and organic production methods has been more important. With public awareness of climate change and the environment at an all-time high, there's enormous potential to further develop the work of the ORC and extend its potential reach and impact."

Since attaining a postgraduate diploma in agri-food and sustainable supply chains from the University of Nottingham last year, Ms MacLennan has been awarded a Nuffield Scholarship to investigate 'audit and assurance' in the fresh produce sector, including conflicting agendas between food safety requirements and sustainability initiatives.

"I'm a scientist at heart, so the chance to marry my personal interests and business experience in order to lead such a fantastic and well-respected team at the ORC is a real privilege and I'm committed to continue to build on its pioneering work."

Mike Turnbull, outgoing chairman at the ORC, says Ms MacLennan's new position marks a significant change in the ORC's approach to appointing a CEO.

"The ORC's unique contribution to organic and agroecological practice is its ability to combine scientific excellence with practical experience to deliver real benefits on the ground. In searching for the right candidate, we prioritised broad experience in both farming and the wider food industry, given our strong and respected research capability.

"We also sought an individual with a strong track record in the environmental and sustainability field, with shared values and excellent communication skills. We are very much looking forward to Ms MacLennan starting her new role and the undoubted value she'll bring to the ORC," concludes Mr Turnbull.

Trent Lodge

The Organic Research Centre (ORC) begins its 40th year at new premises. Committed to organic sector scientific excellence and knowledge exchange, the organisation is now operational from Trent Lodge in Cirencester.

The relocation follows a rethink of the charity's business model since the departure of long-standing CEO Nic Lampkin last year. The decision was made to sell the ORC's previous headquarters, Elm Farm near Newbury, with the proceeds providing long-term stability, a source of investment income for core funding, and scope to invest in the organisation for the future.

The new premises are situated next to the Royal Agricultural University (RAU), which will help boost the ORC's industry relations and collaborative activities as well as providing a base for research.

"We see this relocation as a great opportunity to enhance the ORC's strategic links and positioning," says Mike Turnbull. "The majority of staff are moving with us and the team will be led by our new CEO, Lucy MacLennan. The ORC's status as an independent charity won't change."

Mr Turnbull says the new three-year business plan builds on the ORC's unique strength in combining scientific excellence with practical experience to deliver real benefits on the ground.

"A key part of the strategy is a change in our approach to securing contract funding, while maintaining our unique way of delivering research using participatory methods.

"Rather than reactively responding to bidding opportunities, we intend to prioritise areas of research and knowledge exchange that play to our strengths and develop pilot projects in these areas in advance of making bids for external funding.

"A benefit will be greater control of the research agenda and less reliance on opportunities that funders happen to favour, although there's a place for the latter as well, provided the work we bid for fits with our strengths. We'll be investing some of the proceeds from the Elm Farm sale as 'seed funding' over the next two years to support the change."

Organic faces a challenging time over the coming months. Biodiversity is under unprecedented pressure and the future for UK farming and food supply is uncertain in light of Brexit and the Agriculture Bill.

"We're confident we can continue to be a driving force in the British organic movement from our new home," concludes Mr Turnbull.

Staff news at ORC

Welcomes

Catherine Ritchings

Catherine joins us from Inspire Displays, a family run exhibition stand company in Swindon, as a part-time office administrator within the Finance and HR team. Catherine is currently responsible for the day-to-day administration of HR and ensuring the office is fully stocked with all the usual daily supplies; having previously worked as a finance administrator she is also perfectly placed to support the finance function as and when required. Catherine provides a first point of contact for many initial enquiries at Organic Research Centre, answering calls into the switchboard and fielding emails in the Hello inbox. In her spare time Catherine is creative, she paints (usually watercolour animals) and designs clothing, homewares and interiors.

Sara Lloyd

Sara Lloyd joins ORC as Interim Financial Controller and will lead the Finance and Administration team. Since training as an auditor and qualifying as a Chartered Accountant 25 years ago, Sara has worked for charities, including the National Trust, and commercial organisations specialising in contract manufacturers. Sara is experienced in leading finance and administration teams with 17 years in Financial Controller and Head of Finance roles, and 5 years running her own company and working as a consultant specialising in financial management, financial control, financial reporting, change management, process improvement, internal audit and system implementation. Sara lives close to the office in Cirencester, in a small village in the Cotswolds, and enjoys walking, gardening and looking after her ever growing flock of chickens.

Philippa Hall

We also welcome Philippa Hall who joined us in January as our new Finance Administrator

Farewells

Gillian Woodward

The major changes at ORC, including the move to Cirencester have had casualties, not least the redundancy of my long-term colleague Gillian. She started as farm secretary in 1983 playing a central part in the radical young organisation. When we set up the Organic Advisory Service (OAS) in 1985 she became administrator. She kept the OAS office in order and with her unfailing good humour and professionalism kept the team of up to 30 advisers on the road. Apart from handling the long–term client contracts, she ensured the successful operation of the Defra-funded Organic Information Service from 1996 to 2009. Many will be familiar with Gillian as the contact point for events, particularly the Organic Producers' Conference, but she was also responsible for fundraising and latterly managing the Dean Organic Fund. Gillian was a passionate supporter of the work of the charity, she continued to be central to the operation of ORC and contributed to making a real difference to the way we worked and to the lives of the farmers, growers and others who have been involved in ORC. I very much miss working with Gillian and wish her well with her life and work in the future. ***Mark Measures***

Jo Smith

Our agroforestry expert and inspiration Dr Jo Smith left ORC for pastures new in Portugal earlier this year to work for a small newly established agroecological research centre (MVArc https://mvarc.eu/). In her ten years at ORC Jo made a huge contribution to raising the profile of agroforestry and in building up the evidence base of the benefits of diversifying agricultural systems with more trees from soil biodiversity to feeding trees to cows. We will miss her loads but look forward to collaborating on future projects. ***Sally Westaway***

Richard Holmes

We said goodbye to Richard in January after two and a half years as ORC Director of Finance and Resources. Richard is taking the time to transcribe his grandfather's WW1 letters home from the Front (he has 250 of them!) and to research those people that lived in his house since it was built in 1830.

Suzanne Oliver

Another role to disappear with the move was that of Office & Facilities Officer and we unfortunately said goodbye to Suzanne Oliver. For many the first person you met on arrival at reception, she also ensured that the offices and farmhouse ran efficiently and frequently got her hands dirty dealing with the numerous issues that arose on site. Our interns will be particularly sad to see Suzanne to leave as she was 'mother' to many of them, dealing with their problems in the farmhouse and understanding of the UK and England. We wish Suzanne all the best in her continuing career and our loss is someone else's gain.

Stuart Rogers

With the move to Trent Lodge and the appointment of Lucy MacLennan, our Interim CEO, Stuart Rogers, also left ORC. Stuart steered us through the ten months of changes which have delivered the move to Trent Lodge, a new way of working and strategic approach as well as a research centre on a much better financial footing. Stuart joined ORC with no knowledge of organic food and farming but with a wealth of experience of change in the charitable sector. He led and directed us through a particularly difficult time with understanding and care but with a firm hand on the tiller. His short tenure was much appreciated by both the staff and council of management. We hope he keeps in touch with us and has continuing success in transforming charities that need his help.

Also see Council of Management changes: p9

Organic farming regulations and support post-Brexit

*Defra have provided some clarification as to what will happen to organic standards after the 1st January 2021. Chief Executive of OF&G and ORC trustee **Roger Kerr** reports on this and updates us on the progress of Defra's Environmental Land Management (ELM) schemes.*

Defra statement

"The current EU organic standards will become retained EU law at the end of the transition period with minor amendments to make them operable. The Northern Ireland Protocol arrangements will only come into effect on 1st January 2021 at the end of the transition period. During the transition period, to move goods between Great Britain and Northern Ireland, you can continue to operate as you do now – there are no immediate changes to the process.

Discussions are underway to consider the best way to implement the Northern Ireland Protocol.

We're seeking powers in the Agriculture Bill, which is currently going through Parliament, which will allow us to make new organics legislation.

We intend to amend organic production rules in ways that help the organics sector to remain competitive, improve the already high environmental and animal welfare standards within organics, and protect consumer confidence.

We also intend to consult on a new domestic organics regime to support domestic needs in this sector."

This means that the current EU organic standards applied in the UK will be translated into UK legislation in preparation for UK exit from the EU on 31st December 2020 (although in the face of the Covid-19 pandemic this is in some doubt).

The EU-UK Withdrawal Agreement 1 requires Northern Ireland to remain aligned to a limited set of EU rules for an initial period of four years. Within the EU, the new organic regulation is meant to come into effect on 1st January 2021 although in light of C-19 there are moves to delay this for a year, so it's likely that organic operators in Northern Ireland will have to comply with this new regulation from that point but that remains unclear. We also do not know how this will affect products sold from the rest of the UK to Northern Ireland. As stated by Defra, "Discussions are underway to consider the best way to implement the Northern Ireland Protocol." so we will let you know once we have some clarity.

Defra do intend to consult on a new domestic organics regime. At this point they have indicated that there will be a Four Nation Group made up of the Devolved Administrations to ensure that the UK organic regulation is implemented consistently across the UK. Defra have also stated that they will convene a group of 'Experts' to ensure the continued development of the UK organic regulation but again we are unclear about the makeup of this group.

How the new regulation will impact on the regulatory framework needed to allow imports and exports we are also unclear on. It is hoped that the UK and EU agree 'mutual recognition' within a broader trading agreement in which case it is hoped that organic imports and exports can move in and out of the UK at least as far as the certification is concerned with minimal bureaucracy.

There is still a possibility however that no deal (the Australian option highlighted by Government) is reached by the end of the transition period, in which case access to the EU markets will only come via approval of individual UK Control Bodies by the EU, and for operators to be certified to the new EU regulation rather than the new UK regulation. All UK control bodies have submitted applications to the EU Commission for approval as third country certifiers to ensure we have this approval, if necessary, by then. In this scenario, only products for sale on the UK market and not intended to be sold in the EU would be certified to the UK standards.

Environmental Land Management (ELM)

Defra's Environmental Land Management (ELM) scheme – founded on the principle of 'public money for public goods' – is due to be fully rolled out by the end of 2024, replacing the schemes currently available under the EU's Common Agricultural Policy (CAP). Defra is using the principle of 'co-design' to develop ELM.

What does co-design mean?

- Civil servants working with farming, forestry, environmental, food and health interests and the myriad of skills these people bring to the table.
- Each has significant expertise and long-standing experience.
- For co-design to be successful the essential ingredients besides experience and insight are compromise and cooperation.

The strategic objectives of ELM:

1. To secure a range of positive environmental benefits, prioritising between environmental outcomes where necessary;
2. To help tackle some of the environmental challenges associated with agriculture, focusing on how to address these in the shorter term.

There can be no 'one-size-fits-all' prescription, although everybody around the (now virtual) table is eager for their favoured approach to be smiled upon by Defra.

This process continues with wide and well-informed participation of stakeholders, alongside the key Delivery Partners, including the Rural Payments Agency, Environment Agency, Natural England, Forestry Commission and the Joint Nature Conservation Committee.

The stage is set for filling in the details and getting the new policy properly designed.

Three-tier structure

All farmers, growers and land managers will be working within a three-tier structure. This has been developed following months of work by Defra, with regular reporting to the ELM Stakeholder Engagement group.

Tier 1: Encouraging environmentally sustainable farming

Tier 2: Locally targeted environmental outcomes

Tier 3: Landscape scale, land-use change projects

Consultation

Defra paused the consultation process on April 8th, initially due to run until 5th May, due to the Corona crisis and will not be accepting any new responses. Once it is practical to do so, they will reopen the Policy Discussion Document giving everyone the opportunity to respond and hold the planned regional events as soon as it is possible to do so.

The organic sector, represented by the English Organic Forum and with the active participation of organic organisations and businesses, must make sure that we make clear the strengths of organic production for the health of England's agricultural and natural landscape.

Organic is a well-developed and effectively operating agro-ecological system-based approach that delivers the simultaneous benefits of food production and public goods, demonstrated and evidenced through certification of a robust system-based standard, and one which has strong recognition by businesses and shoppers.

Defra is keen to learn the lessons of previous schemes, and based on an assessment of the nine key lessons that Defra lists in the consultation document, organic scores well. It seems to be an exemplar of the right sort of production method.

ELM National Pilot

Ready for rollout from 2021 this will explore how best to make ELM agreements with farmers and growers at scale; how to target incentives to deliver specific environmental outcomes; how to implement the application and payment process and how to deploy advisers to good effect.

Challenges

There is a danger, which can only be countered through detailed and well-informed discussions with the Defra ELM teams, that existing organic producers may fall through the gaps as the National Pilot is developed.

Clear organic standards govern and demonstrate the delivery of public goods, in the case of organic this is recognised in Clauses 36 and 37 of the Agriculture Bill that lists these public goods.

Integrating organic and the 500,000 ha and 3,000 existing organic producers and the thousands of others who rely upon organic produce in the UK into the National Pilot is critically important. As things stand it is not clear how this will be achieved.

The English Organic Forum is ready to work with Defra and others, including Natural England – one of the key delivery partners well-versed in the practicalities of organic – to design a scheme that enables organic production to flourish and to implement the beneficial organic standards.

ELM Test & Trials: ORC

ELM test & trials are a collection of projects funded by Defra that are designed to provide evidence and support for the development of the future Environmental Land Management (ELM) scheme. ELM is intended to form the cornerstone of Defra's new agricultural policy by rewarding Farms / Farmers for the public goods they deliver through public money. Defra are interested in six particular public goods which are outlined in the UK Government's 25 Year Environment Plan:

- Clean and plentiful water
- Clean air
- Protection from and mitigation of environmental hazards
- Mitigation of and adaptation to climate change
- Thriving plants and wildlife
- Beauty, heritage and engagement

The test & trial ORC is currently involved in aims to assess and identify the public goods being delivered by the agricultural sector across two converging landscape areas.

Commencing last October (2019) and due to complete in September 2021, the project is led by the Soil Association and partner organisations include ORC, Rothamsted North Wyke and Organic Farmers and Growers, alongside a network of local advisors.

The two converging landscape areas for study have been identified as The Clun, Shropshire, and the Exe Valley, Devon. By mapping public goods delivery within these areas, the project aims to test:

1. The usefulness of the Public Goods (PG) Tool for baselining public good delivery
2. The extent to which PG delivery is linked with;
   a) a set of practices, used extensively in both organic and non-organic farms, and
   b) organic monitoring and other certification schemes
3. The development of an action plan across the test area targeting the changes required to improve public goods.

ORC's main role will be in the delivery and adaption of the PG Tool (originally developed at ORC in 2011), to align with the needs of the project and the public goods identified within the UK Government's 25 Year Environment Plan. Additionally, ORC will provide essential skills towards the general facilitation and delivery of the trial.

ELM Test & Trials: Agricology

Agricology has been awarded an Environmental Land Management Scheme Test which is due to start in May with the University of Reading. The purpose of the Test is to research the effectiveness of videos and podcasts in farmer knowledge exchange, when compared to other learning mechanisms such as events. This Test reflects the appetite by Defra to understand what digital mechanisms will encourage farmers to adopt sustainable farming practices. With the timing of Covid-19, necessitating an unprecedented shift towards different communications and digital technologies, the Test is of greater relevance to the farming community than ever before.

Sustainability assessment of sheep and goat farms; a comparison between European countries

*This article is a synopsis of a recent open access paper published in the Journal Sustainability and covers the role the Public Goods (PG) Tool has played in the Innovation for Sustainable Sheep and Goat production in Europe (iSAGE) project. It builds on the article 'Sheep Sustainability research findings begin to emerge' published in ORC Bulletin No.126. ORC's **Lisa Arguile** and **Marion Johnson** summarise the paper.*

Introduction

Sustainability issues are of particular importance for the sheep (130.8 million head) and goat (16.8 million head) sector in Europe. These small ruminants ensure the livelihoods of many vulnerable populations in rural areas.

In order to choose the best Sustainability Assessment (SA) tool and indicators that would provide an overview of the European situation the iSAGE project (www.isage.eu) mapped out and reviewed 21 SA tools. It was concluded that the PG Tool developed by ORC was the best option if adapted for the iSAGE project. The 13 sustainability themes addressed in the iSAGE PG Tool are as follows:

1. Soil management
2. Agri-environmental management
3. Landscape and heritage
4. Water management
5. Fertiliser management
6. Energy and carbon
7. Food security
8. Agricultural systems diversity
9. Social capital
10. Farm business resilience
11. Animal health
12. Animal welfare
13. Governance

Dairy goats

Geographical scope of the survey

A sample of 206 farms in 6 European countries– Finland, France, Greece, Italy, Spain, United Kingdom and Turkey – was used for the analysis as shown in Figure 1. The selected European countries represent more than 74% of the European sheep and 87% of the European goat populations. The sample farms were chosen by partners participating in the iSAGE project to represent farms that were typical of each farm typology in each country.

Figure 1. Map of the studied farms (created using Tableau Desktop Professional Edition 2019.4.2 software)

As the farms were chosen by partners, essentially providing only a snapshot of the industry the level of bias does not permit robust statistical comparisons across countries and farm types, but rather yields rich information regarding the prevailing challenges that farms of each type face in each country with respect to their overall sustainability performance. The chosen farms were spread throughout the countries, in different regions and climatic zones as shown in Figure1.

Sustainability assessment

Data were collected through on-farm surveys. Enumerators visited the farms and conducted the assessment through a semi-structured questionnaire, with closed and open-ended questions based on the iSAGE PG-Tool indicators. Each question was nested within a sub theme associated with each of the 13 sustainability themes. In total, whilst undertaking the SA, farmers answered 154 questions, with each interview requiring on average 4 hours of the farmers time.

To determine the final score a non-weighted rounded average of the questions in each subtheme is calculated. Together, using non-weighted averages these sub-theme scores generate the overall spur score.

The average farm scores were then aggregated and averaged in order to calculate the average sustainability theme score per country. The full results are available in the paper[1].

Summary of results and discussion

Finland appears to be the most sustainable among the seven participating countries, ranking first in 5 out of 13 categories, and being above average in all categories. Water, Soil and Fertiliser Management scores indicate that the preservation of natural capital is a goal for Finnish farmers, while high performance in the Landscape and Heritage and the Social Capital themes suggests that society and the preservation of their lands are important to them.

United Kingdom and Italy perform higher than average in all categories. UK leads the Animal Health, Animal Welfare and Agri-environmental Management themes, all relating to higher environmental and welfare standards. Italy – on the other hand – leads the Energy and Carbon, Food Security and Agricultural Systems Diversity themes. Therefore, Finnish, UK and Italian farms can be regarded as reasonably, although not holistically, sustainable.

France and Spain each rank the highest only in the Farm business resilience and the Governance themes respectively but both economics and governance were identified by SAFA as being important contributors to overall sustainability. At the same time both rank, on average, above the mean for each theme assessed demonstrating an acceptable level of performance.

Photos: Marion Johnson

Local breed ram

Turkey underperforms within the sustainability assessment in a number of themes. Although Turkish farms score higher than average regarding Social Capital and Water Management, their performance is low in all other categories. Greece achieves the lowest performance in almost all categories and underperforms in the remaining ones. The reason for lower economic performance relates to the country's economic crisis, which burdens farms with higher expenses and lower margins. Greece also faces the challenges common to other countries – for instance, the lack of a younger generation entering agriculture and of a work force willing to invest time and money into more sustainable patterns of livestock production with a long-term perspective. In Greece this common challenge is coupled with the persistent problems of small farm size and a lack of an enabling regulatory framework.

The findings from this study should be considered in the light of some limitations introduced by the SA Tool, the small sample size and in particular farmers' subjective responses to some themes. However, this study has demonstrated some trends regarding the overall sustainability of the European sheep and goat sector that should attract significant attention. In addition, these results highlight priorities to enhance the overall sustainability of sheep and goat production and are thus of equal importance in the formulation of future policy. For both these domains, further and larger scale studies at the European level are needed to provide more detailed and statistically important results as well as more generally applicable measures and interventions.

Reference

1. Paraskevopoulou C, Theodoridis A, Johnson M, Ragkos A, Arguile L, Smith L, Vlachos D, Arsenos G. Sustainability Assessment of Goat and Sheep Farms: A Comparison between European Countries. Sustainability. 2020; 12(8):3099.

iSAGE has received funding from the European Union's Horizon 2020 research and innovation programme (grant agreement 679302). More at www.isage.eu.

Council of Management

Mike Turnbull

Mike stepped down in April after eight years as Trustee/Chair of ORC. Mike writes "Having now been a Trustee of a succession of charities for a continuous 22 years, 18 of these as a Chair, I shall be relieved to give it all a rest. I had eagerly anticipated being able to spend time with my family, in particular my grandchildren, although for the immediate future that looks to be on hold.

"We have come through some very challenging times together, and following the recent changes, I am confident that the organisation is well placed now to make its much deserved breakthrough into the wider national consciousness as a leading player in the UK and indeed international organic scene."

Tim Bennett

We are pleased to announce Tim Bennett as the new Chair of ORC's Council of Management.

Tim writes "It was a great honour for me to be asked to take over the Chair of the Organic Research Centre. I want to thank Mike Turnbull for his incredible efforts over the last few years on behalf of ORC and particularly over the last year in delivering the farm sale that has created the opportunity to invest funds to create a more sustainable organisation.

"I am a first-generation farmer with an organic grassland farm near Carmarthen in South Wales very close to the National Botanic garden of Wales (which is also organic!). We converted to organic production about 14 years ago. I have been fortunate to undertake quite a few roles in my career including president of the NFU, Chair of the Food Standards Agency for the UK and Chair of the Farmers Club in London.

"When I stood down as Chair of the FSA, I was asked to Chair the Livestock Agri-tech company (CIEL) to set up and invest in a much-needed new applied livestock research capability. So far in partnership with 12 Universities and Research Institutes around the UK, and with the support of Innovate UK we have invested over £70 million in new capabilities which is already yielding significant research. Therefore, over the last few years I have been working within research and I know the difficulties in bidding for and winning new funds and the imperative to have good partnerships to succeed.

"This is a challenging time for ORC as we develop the business strategy that will help us to make the ORC even more relevant as the UK moves to a more sustainable farming future. The Covid-19 pandemic has disrupted not only our work at the ORC but our whole food supply chain as well. But the good news is that this should lead to a more evidence-based debate about the future of food production in the UK as part of the lessons learnt exercise that inevitably will take place. I think that the ORC must help drive that debate as part of helping to create solutions based on sound science."

Hot water seed treatment to reduce leaf spot in chard

*This Riverford sponsored Innovative Farmers field lab is investigating hot water seed treatment of chard (Beta vulgaris) seed to reduce the incidence of foliar leaf spot on the crop in the field during commercial production. ORC's **Dominic Amos** is the researcher responsible and reports on the first two years of trials.*

Spotting the opportunity

Riverford suffered a serious leaf spot epidemic in their chard crop in 2016 that prompted them to investigate alternative options for control. Riverford farm manager, John Richards, explained: "You don't want the crop covered in leaf spot, there is a certain tolerance but once it goes above that guys have to start picking them out. Our pickers can harvest around 15-20 kg of chard an hour, but if that goes down to 10 there is a real financial impact."

Hot water seed treatment is an effective method for eliminating disease causing organisms for vegetable seeds. The treatment may be even more effective than fungicides as it's able to control pathogens that have penetrated the seed coat. As chemical seed treatments and active ingredients are lost this type of treatment may become of increasing relevance to non-organic growers. Growers at Riverford have teamed up with ORC through Innovative Farmers to test the approach in a real farm setting with environmental factors considered.

Aims of the field lab

The overall aim of the field lab is to investigate whether hot water treatment (HWT) of chard (*Beta vulgaris*) seed can be used to reduce the incidence of foliar leaf spot on the crop in the field during commercial production through a field trial.

1. Test the treatment efficacy in the lab by measuring pathogen levels pre- and post-treatment
2. Investigate whether treatment efficacy in the lab translates into disease reduction in the field.

Objectives include measuring and comparing the marketable and unmarketable yield from treated and untreated seeds to establish efficacy of the hot water seed treatment in improving crop productivity and reducing levels of foliar disease.

The trials

The trials were run at Riverford Organic Growers main site near Totnes, across two growing seasons, 2018 and 2019, following their standard commercial practice. Seed was supplied and pre-tested for the presence of pathogens.

A portion of the seed was then treated and retested to confirm treatment efficacy. A small portion of the seed remained untreated to act as a control for the field trial, enabling in-field comparison of treated and untreated seed of both varieties. Weekly sowings of the seed took place during the season from April to August. Each successive drilling date had the same plot set up with adjacent beds of treated and untreated seed being used for comparison. In the experience of the Riverford growers leaf spot symptoms start to show up five weeks after drilling, so all trial plots

Photo: Soil Association

Riverford Farm Manager John Richards and ORC's Dominic Amos checking chard crops for disease

are assessed from that stage onwards. Harvest is normally eight weeks after drilling.

Harvest sampling

Harvest sample assessments were carried out by Riverford staff, to provide data on marketable (i.e. leaf spot free) produce. The results provided an estimated saleable percentage per plot and a percentage of leaf not saleable due to leaf spot. Data on the latter was the most relevant information for the farm in relation to this trial. In 2018, in addition to the weekly yield samplings, two foliar assessments were conducted by ORC in July and September on all chard drilled from five to seven weeks before to complement yield pick information and provide additional data on leaf spot incidence and severity.

Effects on disease levels

Results from the 2018 trial, suggested that HWT can be used as an effective control measure for leaf spot caused by *Alternaria* sp. and *Cladosporium* sp. with the seed treatment dramatically reducing incidence of pathogens in the seed. Results from the field trial harvest also showed significant reductions in percentage of leaf spot infected material and improvements in percentage marketable material and total yield. Complementary foliar assessments in 2018 also showed a significant reduction in both disease incidence and severity from the hot water seed treatment.

Table 1. Table showing % seeds with presence of pathogens prior to and after hot water seed treatment for two chard varieties in 2018.

Variety	Treatment	% Seeds Affected (Incidence)				
		Alternaria	*Cladosporium*	*Stemphyllium*	*Phoma*	*Penicillium*
Swiss Chard	Untreated	41.5	25	11.5	0.5	0.5
	Treated	0	0	1.5	1.5	1.5
Chard mixed	Untreated	33	66	27	0	0.5
	Treated	0	4	0	0	0

The picture is less clear in the second year of the trial. Testing showed the 2019 seed to be relatively pathogen free which meant that any effects from the seed treatment in the field were always likely to be modest, or at least the chance of detecting effects was lower.

What the first year findings support, is that drilling seed free from pathogens can potentially help reduce and limit both incidence and severity of leaf spot disease.

Combining the data from both years has provided some interesting results though it appears that variety choice seems to play a greater role in the disease prevalence than the seed treatment. Swiss chard was generally lower in disease with a greater marketable and total yield. Mixed chard has showed greater levels of disease across the two years but particularly in 2018. There was a trend for the treatment to reduce the proportion of chard unmarketable due to leaf spot but this was mostly for the mixed chard and mostly in 2018.

For the proportion of marketable chard, the year was significant with a higher marketable proportion in 2019. There were trends for a variety effect with the Swiss chard having a higher marketable proportion of total yield. This complements data on the proportion with leaf spot since the Swiss chard generally has a lower proportion and the mixed a higher proportion as would be expected given the inverse relationship between the variables of unmarketable and marketable.

Effects on crop yields

In terms of total yield, variety was significant, with the Swiss chard yielding higher than the mixed chard. The effect of variety and treatment also appear to depend on the year. The HWT only increased total yield for the 2018 Swiss chard crop. There was no effect from the treatment on total yield of the mixed chard on 2018. The most surprising result is that there was a reduction in total yield from the HWT for the mixed chard and a trend for a reduction in yield for the Swiss chard in 2019.

Discussion

The evidence is growing for the benefits of HWT, particularly for the mixed chard. The increases in total yield from the treated crop suggest that there may be a priming effect on the seed that could lead to quicker emergence and greater early vigour, improving overall growth and reducing vulnerability of the young crop. The mechanism for in-field benefits may be two-fold in that disease is reduced while crop vigour is increased.

It should be noted that there will always be levels of pathogens in the environment that cause crop disease, regardless of any effective seed treatment employed.

Disease control, especially in organic production must always be treated as part of a wider systems approach using cultural management to help limit the incidence and severity of any disease outbreak. Planting clean, pathogen free seed is an essential first step in controlling disease, with varietal resistance, a crop rotation limiting the number of host crops, ploughing to bury crop residues and careful irrigation management, all contributing to limit risk.

It seems clear from the last two years that mixed chard is at a greater risk of leaf spot and may therefore gain most benefit from the hot water seed treatment. With this in mind a system that makes greater use of the Swiss chard variety is likely to provide a greater proportion of marketable yield and reduced levels of leaf spot. Levels of disease on the seed this year were very low so benefits from the treatment were likely to be reduced. The high levels of leaf spot observed in 2016, the motivation behind the trial, have not been repeated so an understanding of treatment efficacy in a 'bad year' is still lacking. Evidence of the potential priming effect has not been clear so treatment shouldn't necessarily be used automatically, with a testing of the seed performed first to ascertain pathogen levels and therefore likely benefits from treatment. If pathogen levels are low it may not be economical to treat the seed. Levels of pathogens on the seed were much lower in 2019 than 2018 and unsurprisingly the benefits of reduced proportion of crop with leaf spot and increased proportion of marketable crop were less clear. It has also been suggested that hot water treatment can also remove beneficial microorganisms and chemicals from the seed and this should also be considered when using seed already very low in pathogens.

In the end, on-farm experimentation and research support should hopefully have helped the Riverford team to gain a greater insight into the chard cropping system, hot water seed treatment and on-farm research to provide confidence to undertake similar experiments in the future. Testing transplant type and understanding further leaf spot risk factors, though not directly part of this experiment, have also hopefully helped to improve overall grower knowledge of the cropping system.

See the full report at https://tinyurl.com/IF-seedtreat

Innovative Farmers is part of the Duchy Future Farming Programme, funded by The Prince of Wales's Charitable Fund through the sales of Waitrose Duchy Organic products. The network is backed by a team from LEAF (Linking Environment and Farming), Innovation for Agriculture, the Organic Research Centre and the Soil Association.

Recommendations

- Always test vegetable seed for pathogens before planting.
- If seed contains pathogens or if seed has not been tested then consider hot water seed treatment.
- Using clean seed is the first stage in an integrated disease management approach but if tested seed does not have pathogens (or levels are very low) then it might not be economical to have it hot water treated.
- Treatment may remove beneficial organisms and chemicals as well as pathogens and this should be considered in the case of very low pathogen levels.
- Hot water seed treatment penetrates the seed and is therefore effective in controlling pathogens that are inside the seed.
- This trial provides some evidence that seed treatment can reduce levels of leaf spot on chard in the field and increase marketable yield.
- There is evidence from the trial that the seed treatment may have a priming effect.
- There is some limited evidence that hot water seed treatment reduced seed viability in 2019.
- Pathogen levels on the seed in 2019 were very low, limiting the experiment.
- A third trial year would be useful for providing stronger evidence for in-field efficacy particularly in light of low pathogen levels in 2019.

New projects at ORC

Farm-based organic variety trials network – LiveWheat

LiveWheat is a two-year Defra-funded project led by ORC, with Organic Arable and AHDB, that builds on the outcomes of the EU Horizon 2020 Liveseed project. The objectives are:

1. Establish a network of farmers and researchers, with stakeholders' support, to undertake on-farm experimentation and data collection to enable informed decision making for sustainable organic and low-input wheat production.
2. Collect key data and information about crop growth on-farm including weed interactions, and product quality relevant to farmers and stakeholders along the supply chain, e.g. millers, bakers and animal feed market.
3. Provide a detailed and robust statistical analysis of the data collected, integrating experimental data with external data sources, including research data and agro-environmental variables, to enable data-based decisional models to assist with farm business decisions.
4. Ensure visibility of the project, its methodology and its results for organic and non-organic farmers, stakeholders, scientific community, policy makers and the wider public.

The project will involve 10 to 15 organic farms and generate datasets describing winter wheat varieties in terms of field performance during the growing season, with special emphasis on weed abundance and community composition, diseases symptoms and key yield components, productive performance and quality performance.

In cooperation with the AHDB, these datasets will be analysed and compared with relevant external data sources, including climatic and environmental data, to scope out how to enhance the decision support basis available to organic and conventional farmers. This will also inform breeding of future varieties adapted to both organic and conventional systems where low fertility and high weed burdens are important factors. Beyond providing information for a better winter wheat varietal choice, the project will improve and standardise experimental designs and protocols for on-farm participatory trials. This will enhance know-how of on-farm, field-scale trials management and, ultimately, allow on-farm data to complement plot-scale research and environmental information towards an integrated evidence base for better informed decisions at the farm and supply chain level, as well as for plant breeding.

UK Organic Trade Statistics

The aim of this 6-months Department of International Trade funded, Defra-led project is to improve organic trade statistics in the UK. Improving organic trade data collection is particularly important and timely given the global growth in the organic market, which is likely to continue as consumer demand for organic food has been increasing over the last years. Also, better international trade data within the organic sector would help businesses and policy makers make informed decisions, which is especially critical in light of the UK's exit from the EU.

This study will at first assess the costs and benefits associated with different data collection approaches, e.g. surveys of organic importers and exporters, using existing customs data to extract organics data, incorporating a unique identifier into international trade statistics, e.g. as Denmark have done with SITC codes. Based on this analysis, the most suitable approach identified will be implemented in a pilot study for selected agri-food goods.

The project is led by ORC with partners including; Organic Policy, Business and Research Consultancy, Agriculture and Horticulture Development Board (AHDB), Soil Association Certification Ltd, Organic Farmers & Growers (OF&G), Organic Food Federation (OFF) and Organic Trade Board (OTB).

No-till with living mulches

This Innovative Farmers field lab will be investigating the potential for establishing no-till organic/low input arable farming systems using a permanent living mulch understory. The aim is to better understand its potential to reduce tillage in organic systems and chemical inputs in conventional ones. The system will rely on maximising the competitiveness of the crop while minimising the competitiveness of the mulch, but there is a trade-off since the main service provision from the mulch is weed suppression and nitrogen (N) accumulation; the mulch does require a degree of vigour and biomass.

ORC's Dominic Amos is the researcher involved and the field lab is sponsored by Organic Arable with support from Cotswold Seeds and AHDB. Five of the trials will take place on organic farms and two on conventional no-till farms.

The living mulch consists of a mix of wild white and small to medium leaved clovers in a 70:30 ratio, selected for their niche complementarity with the main crop, undersown into a cereal in spring 2020. The mulch will then be knocked back through grazing or topping with a cash crop direct- or strip-drilled in autumn. This will be compared to standard farm practice. A barrier discussed at the first meeting was the lack of machinery suitable for mowing the mulch in crop. Clover and other forage legumes only release N when their biomass is returned to soil and may provide too much competition during cash crop establishment, therefore inter-row cutting might be a necessary part of the system.

EIP Ancient Cereals

This EIP (European Innovation Partnership) project seeks to trial several agronomic practices (seed rates and undersowing) for ancient cereal species to identify the most appropriate methods of production on three Welsh farms which are managed to organic standards. The project takes a collaborative approach including development of the field trials and methodology in collaboration with the farmers and operational group, field work and collection of data, analysis of data and oversight of the final project report. The project focuses on the agronomy of spring einkorn and heritage wheat – April bearded – including seed rates and undersowing, in comparison with a modern control variety, Mulika. The spring 2020 trial will now be postponed until 2021.

The Dutch potato covenant model

Across the channel in the Netherlands a remarkable thing is happening. The whole supply chain has worked together through the 'Potato Covenant' to shift the organic potato sector to 100% use of robust, blight-resistant varieties. ***Phil Sumption*** *reports.*

Potato late blight (*Phytophthora infestans*) is the most important potato disease in the world. There has been a lot of effort put into conventional breeding of blight resistant varieties But, the introduction of novel cultivars often meets with … er…resistance as retailers' and/or consumers' awareness must be raised in order to open the market. Resistance is important for farmers but not an issue that immediately resonates with consumers.

In the Netherlands the transition has been achieved in a remarkably short time. In 2017, there were only three blight-resistant potato varieties on the market. Now 22 'robust' potato varieties are available as organic seed.

In 2016 organic potato producers suffered massive losses due to late blight, with no recourse to copper fungicides which are completely banned in the Netherlands. Bionext, the Dutch umbrella organisation for the organic sector recognised that the availability of resistant varieties needed to improve to prevent future disasters. Indeed, many organic farmers said that they would no longer grow potatoes unless they could use resistant varieties. So, 28 partners; organic potato breeders, growers, organic farmer associations and retailers came together to sign the covenant 'Accelerated transition to robust potato varieties.' The covenant partners agreed to give these robust varieties priority: in breeding, in production of seed potatoes, in growing and in sales.

How has this been achieved?

The covenant partners work closely with the Louis Bolk Institute and the Bio Impuls potato breeding project. The Bio Impuls programme (2009-2029), coordinated by Louis Bolk is aimed at breeding new blight-resistant potato varieties for the organic sector, working together with Wageningen University and Research, commercial breeders and farmer-breeders. The programme is funded by the Dutch Ministry of Economic Affairs. Every year three demonstration fields with all the robust varieties are set up and blight damage is monitored by Wageningen University. The demos are visited by farmers and covenant partners. Cooking tests of the varieties are carried out and factsheets on blight management and practical instructions are offered to the farmers. An annual meeting of all the covenant partners is held and results are communicated through the media and workshops. Most of the varieties have only one resistance gene, which means that there is a serious risk for those varieties to lose their resistance in the future. Therefore, they are focused on raising farmers awareness of 'resistance management', to ensure farmers actively check the crop and remove infected plants as quickly as possible to make sure new phytophthora strains do not spread. The Bio Impuls project has new funding for the next 10 years (2020-2029) with one of the main goals to develop varieties with multiple resistance genes.

It has been a successful model and in 2018 a similar covenant was signed in Flanders and Wallonia in Belgium. A key element for successful models is the involvement of ALL food chain partners and collaboration must be initiated from within the food chain. A neutral and skillful facilitator is needed who recognises and balances the different interests of all the parties involved.

So, why not the UK?

The organic market in the UK is very much driven by the multiple retailers who to a large extent dictate the varieties grown. If a a new cultivar is not attractive on the shelf it won't be accepted.There is very little diversity of organic potato varieties on the UK supermarket shelf. Variety choice is also a very real problem for the growers, especially to source organic seed. Seed growers will not multiply seed for the organic market unless they know they can sell it. A large area of the blight susceptible Maris Peer is grown organically, due to the demands of the supermarkets. This makes it very difficult to grow without the use of copper fungicides. Last year the manufacturer of the copper-based fungicide Cuprokylt decided not to apply to Defra for a licence to market it in the UK, leaving organic growers without any alternative products for crop protection.

What's more Maris Peer is not available as organic seed, so it needs a derogation from the organic Control Bodies. Cynics might suggest that this is a ploy by the packers to avoid expensive organic seed. The answer is not, in my opinion, to introduce resistance to Maris Peer through genetic modification, but to embrace the many blight-resistant varieties that are available – but it will need support from the market.

UK breeders of blight-resistant varieties the Sarvari Research Trust have struggled to break through in the commercial market, despite registering some excellent Sarpo varieties. Agrico have been selling a range of blight-resistant varieties under the Next Generation label appealing to both conventional and organic growers. Over the past three years the Soil Association has seen uptake of blight-resistant varieties increasing year on year. But, more needs to be done!

Wouldn't it be great to see the organic Control Bodies come together with the growers' organisations, breeders, researchers, multiples, packers and wholesalers to create a UK covenant and pathway to the greater uptake of resistant varieties? Let's remove the resistance to resistance!

This article was first published as a blog on Agricology: an independent collaboration of over 30 of the UK's leading farming organisations providing a platform for farmers and researchers to share knowledge and experience on agroecological farming practices; online and in the field. Visit www.agricology.co.uk to view blogs, videos, podcasts, farmer profiles, research projects and resources. Subscribe to the newsletter or follow on social media @agricology to share your questions and experiences with the Agricology community.

Agroforestry Innovation Networks

Agroforestry in the UK has great potential, as we look for ways to sustainably intensify agricultural production and increase resilience to climatic uncertainty. There is increasing interest in the positive effects of trees on agricultural land amongst UK farmers and a few pioneers have developed successful, innovative and profitable agroforestry projects on their land. However, the number of people talking about agroforestry still doesn't match the number of people implementing new systems. Since 2017, ORC has been part of the EU-funded AgroForestry Innovation NETworks (AFINET) project, working with partners across nine countries to get farmers and other practitioners together, learning from each other to help bridge the knowledge gaps and overcome perceived obstacles to agroforestry for the benefit of their farming businesses and the environment. In this article, ORC agroforestry researcher ***Sally Westaway*** *reviews the project highlights.*

The AFINET gold is hidden in the trees on Tim Downes' farm at Longnor, Shropshire!

The AFINET project drew to a close in December last year with a final meeting in Brussels, a session in the European Parliament entitled "Agroforestry knowledge-based innovation: bringing scientists and practitioners together" and, appropriately, the planting of some fruit trees on a farm 10km from Brussels; these trees will eventually form part of a new food forest for Brussels residents.

Over the course of the three year project we worked with 13 partners from nine European countries, along with a huge range of farmers and other stakeholders from across Europe to raise the profile of agroforestry and to create opportunities for knowledge exchange and transfer between scientists and practitioners.

In the UK, together with project partners Abacus Agriculture, in collaboration with the UK's Agroforestry Group, the Farm Woodland Forum (FWF), and with the support of the Woodland Trust, we delivered 11 practical stakeholder events on agroforestry farms across the country reaching nearly 200 people. These events focused on gathering together existing knowledge, identifying gaps, innovative practices and solutions.

Barriers to agroforestry

Workshops focused initially on the barriers to establishment of agroforestry systems and gaps in knowledge. The main areas identified were:

- A lack of demonstration farms, case studies and pioneers, for experience-based learning, and a need to build local networks and partnerships to facilitate this learning.
- A requirement for detailed cost/benefit analysis of different systems, information on the economic implications of introducing trees to farms and grants and funding sources available.
- Access to advice on specific technical and management issues, for example the nutritional properties of tree fodder, efficient and economic tree protection, machinery to harvest tree products efficiently.
- Policy concerns, including lack of clarity around what is permitted under cross compliance regulations, what support is available and how this may change. Issues around land tenure and tree planting, how to make the case for trees to landlords.

Removing the barriers

We then moved on to try and address these with workshops on planning and designing agroforestry systems, implementation and finally on management and maintenance of agroforestry systems. From the final UK workshops there was an overwhelming consensus that on-farm meetings and training events are a good format for learning and dissemination of practical information. Working with the Woodland Trust, Agricology and the FWF we will look to continue supporting farmers to meet up and exchange ideas and innovations via a series of on-farm events in 2020 and beyond.

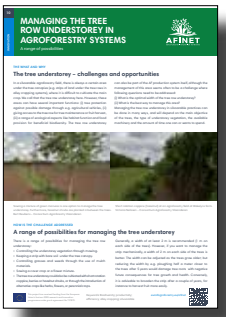
And in the rest of Europe?

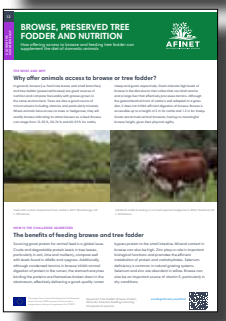
Across Europe, partners have also worked with groups of farmers to explore innovative solutions to barriers to adoption of agroforestry practices. Here's a flavour of what's been happening:

- In Italy the group have been working to identify ways in which sheep farmers can work together to build successful silvopastoral systems: https://tinyurl.com/AFINET-Italy

- In Portugal the revival of an ancient 'hanged vineyards' production system where vineyards are grown on the borders of arable fields supported by tree species such as Poplar and Elm has been investigated: https://tinyurl.com/AFINET-Portugal
- In Finland the group looked at the economics of mushroom cultivation in forests: https://tinyurl.com/AFINET-Finland

Outputs





A major output from the project was the creation of a Europe-wide reservoir of scientific and practical knowledge on agroforestry – the AFINET Knowledge Cloud (http://www.eurafagroforestry.eu/afinet/knowledge-cloud). This is a web-based searchable database for resources on agroforestry from peer reviewed scientific papers to agroforestry workshop presentations. All of the information and materials created in the project are published here as well as a large amount of other relevant material, searchable by key words and subject. It is a living resource and will be continually added to and improved by the agroforestry community across Europe.

Other project outputs include technical articles, video tutorials and a series of 45 factsheets available here: https://tinyurl.com/AFINET-facts. The UK factsheets include a couple written by our livestock researcher, Lindsay Whistance, on the importance of trees in livestock systems for animal health and the opportunities presented by feeding trees to livestock. We also looked at examples and options to make the tree understorey in alley cropping systems productive, the use of hedges for firewood production and, using Dartington Estate as a case study, the benefits of collaboration for successful agroforestry systems.

All project outputs are available from the project website http://www.eurafagroforestry.eu/afinet or UK outputs via Agricology https://tinyurl.com/Agricology-afinet.

But it doesn't end here. There is still a long way to go in the transition to agroforestry. The UK agroforestry association, the Farm Woodland Forum, has been key in the delivery of AFINET in the UK and together with the European Agroforestry Federation (EURAF) will take the work of AFINET forward and help keep the agroforestry momentum built up by the project in the UK.
To engage with the UK network and stay in touch join the Farm Woodland Forum and sign up to the mailing list here: www.agroforestry.ac.uk

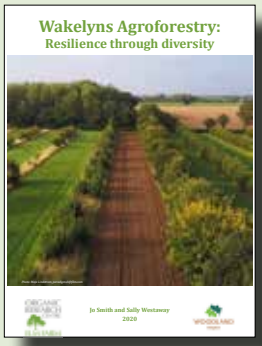
The Agroforestry Innovation Networks project

Project partners:

- USC Universidad de Santiago de Compostela, Spain (Coordinator)
- ORC Organic Research Centre, UK
- EV ILVO Institute for Agricultural and Fisheries Research, Belgium
- ISA Instituto Superior de Agronomía, Portugal
- IUNG-PIB Institute of Soil Science and Plant Cultivation, Poland
- INAGRO Inagro, Belgium
- SoE-KKK University of Sopron Cooperational Research Centre Nonprofit Ltd, Hungary
- ABACUS Agriculture Ltd, UK
- CNR-IRET - Istituto di Ricerca sugli Ecosistemi Terrestri, Italy
- EURAF European Agroforestry Federation
- AFAF Association Française d'Agroforesterie, France
- FEUGA Fundación Empresa-Universidad Gallega, Spain
- EFI European Forest Institute, Finland

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727872

Wakelyns and Elm Farm: ten years of agroforestry research



It's been a busy few months for the agroforestry team at the Organic Research Centre, in addition to wrapping up the AFINET project. With the support of the Woodland Trust, we've been working hard to summarise the large and varied agroforestry research activities that have taken place over the years at Elm Farm and at Wakelyns Agroforestry.

These have been written up into two comprehensive reports, one for each site, as well as a series of publications including a review of agroforestry at Wakelyns https://tinyurl.com/Wakelyns-RTD and four Woodland Trust Research Briefings:

Tree:crop interactions in UK alley cropping agroforestry systems: impacts on crop yield and total productivity. https://tinyurl.com/WTRB-Treecrop

Elm Farm: Planning and developing agroforestry at a farm scale. https://tinyurl.com/WTRB-ElmFarm

Tree leaves as supplementary feed for ruminant livestock https://tinyurl.com/WTRB-Tree-Fodder

Field or hedge? How to integrate trees for on-farm wood fuel (In press)

Events and announcements - details at www.organicresearchcentre.com

Events

12 May 2020: Innovative Farmers: Can we graze sheep on Lucerne? Webinar

7 July 2020: OF&G National Organic Combinable Crops 2020. NOCC is going digital. Highlights will include:

- No-till/min-till
- New land management schemes
- Input/output measurement tools
- New food businesses in light of climate/pandemic crises.

https://ofgorganic.org/

Agricology is running a series of Virtual Field Days
Each virtual field day will be focused on a particular sustainable or' agroecological' practice – bringing together farmers, farming organisations, researchers and advisors in conversation. These will be hosted and shared as free public webinars which are open to anyone.
https://www.agricology.co.uk/news-events/virtual-field-days

Technical guides/publications

Download only at present! https://tinyurl.com/ORC-pubs