

Annual Report

November 2012 - October 2013





The Organic Research Centre - developing more sustainable food and farming based on organic/agroecological principles

The Organic Research Centre is the UK's leading, independent research centre focusing on the development of sustainable food production and land management systems based on organic/agroecological principles. Established in 1980 by David Astor, the Progressive Farming Trust Ltd., ORC's parent educational charity, has continued to pursue the visionary sustainability goals.

Why organic?

Organic farming and agroecological approaches work with natural ecosystems and biological processes to produce high quality food, maintain and encourage genetic diversity of farms and their surroundings and encourage fair rewards for farmers and others participating in the food system.

Organic farmers build soil fertility using biological nitrogen and carbon fixation, capturing solar energy and fostering soil life. They use crop rotations and diversity to encourage natural weed, pest and disease control. Animals are kept free-range with access to pasture for foraging, which allows them to express their natural behaviours and complement, rather than compete with, human food needs. Manures and crop residues are recycled to help close nutrient cycles, minimising waste and conserving non-renewable resources.

Together these practices make organic farms much less reliant on external inputs such as synthetic nitrogen fertilisers, fossil energy and pesticides. The result is a food production system that is more resilient, less resource consuming and better equipped to cope with uncertainty at multiple levels. While individually all these practices can be used by any farmers, a key feature of organic/agroecological land management is their combination in a system-driven approach that generates greater benefits for society and the environment.

What are the benefits and how does ORC help?

- **Building resilience and conserving wildlife through diversity:**

Organic practices enhance species diversity (both cultivated and wild) on farms, benefiting soil organisms and invertebrates, pollinators, plants, birds and other animals. *ORC's research on plant breeding, legumes and agroforestry is helping enhance both genetic and species diversity on farms.*

- **Protecting and improving our soils:** The return of carbon-rich crop residues and the use of green manures and fertility-building phases in crop rotations help to conserve and enhance soil organic matter levels, soil structure and soil biological activity.

ORC's research on cropping systems, cover crops and reduced tillage is helping build and protect soils.

- **Conserving non-renewable resources and developing renewable alternatives:** By reducing external input use, the consumption of non-renewable resources such as fossil energy and minerals are reduced, while renewable resources such as soil and water are protected from pollution/degradation.

ORC's research is helping to close cycles through better nutrient/energy budgeting and developing on-farm renewables such as biofuels from hedgerows.

- **Climate-smart agriculture:** Greenhouse gas emissions are reduced due to less use of fossil energy-based inputs such as nitrogen fertilisers and pesticides and because of the soil carbon restorative effects of the fertility building phase of organic crop rotations.

ORC's research is providing evidence on the impact of UK agriculture and organic management.

- **Promoting animal health and welfare:** This is carried out through an emphasis on free range production, diverse forages, high quality housing, lower stocking rates, preventive disease management and the avoidance of prophylactic use of medication, including antibiotics.

ORC's research is looking at how the integration of trees and legumes can improve nutrition and welfare of dairy cows, pigs and poultry.

- **Food security, productivity and public health:** The connectedness of soil, plant, animal, humans and the planet through 'health' is a key principle of the organic agriculture movement.

ORC is exploring what health really means in these different contexts, and examining how organic systems productivity and food security can be reconciled.

- **Sustainable livelihoods:** All farmers need to earn a living and consumers need affordable food. Premium organic markets, supported by a regulated certification system can help the first group survive and while farming more sensitively, but may disadvantage others. *ORC's research covers the financial performance of organic farms, consumer values and market demand and better regulation and policy support options to reward farmers more directly for delivery of public benefits.*

- **Bridging the gap between research and practice:** Farmers have always been at the forefront of agricultural innovation and are familiar with finding new solutions to cope with changing climatic as well as market and political conditions.

ORC is actively fostering producer engagement in research, developing tools to support improved management and sustainability assessment, organising conferences and other events for information exchange, and publishing information resources.

- **Policy development and advocacy:** In recognition of the public benefits that organic/agroecological approaches deliver, there is an extensive framework of regulation and policy support for organic farming at the European level and within the UK.

ORC engages with policy-makers to ensure that the evidence on the impacts of organic farming is recognised and that appropriate policies and regulations are developed.



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Roger Harrison

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Chair's report

2013 saw significant progress made in restoring the fortunes of the Organic Research Centre, with increases in project funding for ORC's own charitable purposes, in donation income and in the value of new contracts secured contributing to a significant improvement in our financial performance. Debt restructuring and the initiation of some limited land sales also helped to restore our liquidity position. The cash released by the land sales will help investment in new and refurbished buildings, with significant work planned for 2014.



During the year, some significant new ORC-led projects were started, including the EU-wide Co-ordination of Organic Plant Breeding Activities (COBRA) project and the Welsh Government Organic Advisory Services project, which includes policy advice and certain Organic Centre Wales activities. Both projects run from 2013 to 2016.

The five-year, Defra-funded Wheat breeding LINK project was completed, concluding a significant 12-year period of projects generating, developing and studying the performance of novel wheat populations, paving the way for a ground-breaking legal agreement to enable the experimental marketing of wheat population seed to producers.

Funding was also secured for two major new EU-funded research projects starting in 2014: Agforward, led by Cranfield University, focuses on the development of agroforestry systems, while the Wheat and barley Legacy for Breeding Improvement (Whealbi) project adds to our growing portfolio of plant breeding work aimed specifically at organic producers.

A highlight of the year was the Prince of Wales's Food and Farming Summer School, which ORC was invited to host following a break in the series of events previously hosted by the Royal Agricultural

University, Cirencester. Attended by more than 30 participants and a dozen highly expert contributors, the challenge of delivering sustainable food systems was examined in both a theoretical and a practical framework on both organic and non-organic farms, including Helen Browning's Eastbrook Farm, Duchy Home Farm and West Woodhay Estate. The event culminated with a reception by the Prince of Wales and a visit to Highgrove Gardens. Building on the success of this event, ORC has been asked to host the Summer School again in 2014.

ORC staff have also been heavily engaged with providing evidence to Natural England, Defra and the Welsh Government on the potential and implementation of organic farming and agroforestry support schemes to be implemented as part of the Rural Development Programmes from 2014-2020. ORC's research on the environmental impacts of organic farming, the financial performance of organic farms and the evaluation of European policies for organic farming have proved invaluable in this context.

The completion of an evaluation of the EU organic regulation for the European Commission means that ORC is also well placed to engage with the debate on a new EU organic regulation expected to take place in 2014.

Mike Turnbull



Research for sustainable food systems

ORC's research aims to support the development of organic/agroecological approaches to farming/land management for the sustainable production of food, energy and ecosystem services, so as to:

- Improve the productivity and sustainability of such approaches and address key technical problems where current practice falls short of organic/agroecological principles while recognising the importance of working within the participatory/farming systems research tradition;
- Evaluate, with a view to improvement, the economic, social, environmental, quality and other impacts of such systems, including delivery of ecosystem services; pollution, resource use and biodiversity impacts; greenhouse gas emissions and potential for climate change mitigation; food security, food sovereignty and sustainability of food production systems; food quality, safety and human/animal health and wellbeing.

Our research programmes deliver public benefits through the promotion of health and environmental protection (in particular sustainable development and biodiversity; recycling and sustainable waste management; and the use of renewable energy sources), and the advancement of animal welfare through research into improved livestock production systems. Further details of any of the projects mentioned in this report can be found on our website: www.organicresearchcentre.com.

Crops and agroforestry research

The work of the Crops team is focused on three main areas: plant breeding, production systems and agroforestry. A major focus of the crops research programme is the use and maintenance of plant diversity to increase crop performance and stability and to enhance the provision of ecosystem services. Using a whole-system approach in highly participatory research projects, ORC aims to develop innovative solutions for farming systems in a range of arable and horticultural crops, including wheat, oats, barley, spelt, oilseed rape, broccoli, beans, and various forage legumes.

The public benefits from this programme include the advancement of agricultural, ecological and plant breeding knowledge through research as well as contributing to food security (through more stable yielding and more resilient crops), sustainable development, biodiversity conservation and the reduction of greenhouse gas emissions through better design of the fertility building phase of rotations. This all contributes to reducing the need for industrially fixed nitrogen fertiliser inputs and fossil energy use and reducing the scale of related emissions. All findings of the research programme are being made available in the public domain.

ORC continues to collaborate with several UK and overseas universities in joint supervision of crop-related PhD and MSc projects alongside our existing research programmes.

- ✓ At ORC, we have successfully **pioneered** the concept of **'population' breeding**, in wheat and other arable crops; where each individual plant in a crop is bred to be genetically distinct from every other one, making the whole crop more resilient to changes in weather conditions and pest and disease pressures. This is the antithesis of variety breeding with its emphasis on genetic uniformity.
- ✓ We have secured a **temporary marketing experiment** under the relevant EU seed marketing regulations to enable trade in seed from the populations from 2014, a process that will be developed further in coming years.
- ✓ We have now extended this approach from wheat to other crops.

Plant breeding

Our plant breeding work is focused on the principle of increasing genetic diversity in order to produce crops that are more resilient to variations in climate and weather conditions, weed, pest and disease pressures, and other challenges.

Wheat breeding LINK: Adaptive winter wheat populations – development, genetic characterisation and application

The five-year, Defra-LINK-funded Wheat breeding LINK project was completed, concluding a significant 12-year period of projects generating, developing and studying the performance of novel wheat populations using a range of scientific approaches including participatory on-farm assessments, research station plot trials, glasshouse trials and molecular techniques. The project also worked with UK government officials to develop the policy framework for the marketing of diverse populations, which has been taken forward in the SOLIBAM project (see opposite page).

The main findings of the work were:

- The populations showed greater yield stability than that found in pure lines under both conventional and organic conditions; protein content and hardness were significantly increased in populations versus pure lines.



- The yield of populations is consistent with that of commercial varieties under untreated conditions, however under conventional conditions the yield is reduced relative to conventional varieties.
- The baking quality of population flours was shown to be able to meet industry standards for artisanal bread production, however it was not suitable for more industrialised bread making processes.
- Micronutrient levels in population flour did not differ from pure line varieties, suggesting flour from populations was as nutritious as that from pure line varieties.
- Wheat population seed was shown to be not suitable for use in malting or distilling but was suitable as an animal feed.
- On a genetic level populations maintain their diversity of alleles over generations and require directed selection to cause adaptations to occur. By maintaining their genetic diversity they therefore maintain their capacity to cope with changing environmental conditions.

SOLIBAM: Strategies for Organic and Low-input Integrated Breeding and Management

The aim of SOLIBAM is to develop specific and novel breeding approaches integrated with management practices to improve the performance, quality, sustainability and stability of crops adapted to organic and low-input systems in Europe and small-scale farms in Africa.

Our cereal trials this year incorporated some additional assessments, including straw biomass measurements using a mini baler. They continue our long-standing work on evolutionary breeding and composite cross populations as well as being central to the SOLIBAM project as a whole, where they contribute to multi-location parallel trials in Hungary, France, Austria and Italy.

ORC presented results from UK trials in the third annual meeting held in Portugal. The meeting highlighted the relevance of key project concepts, which will be instrumental in formulating the final conclusions. ORC was

also part of the team that completed work comparing the resource efficiency of contrasting systems in the UK, using the 'emergy' approach.

In May 2013 we were involved in a meeting in Brussels with DG Agri and DG Sanco on seed regulations. This was particularly relevant to the new organic legislation being formulated at EC level and has led to strengthening links with Defra and the agreement for a six-year 'temporary experiment' to look at the marketing of composite cross populations.

COBRA: Coordinating organic plant breeding activities for diversity

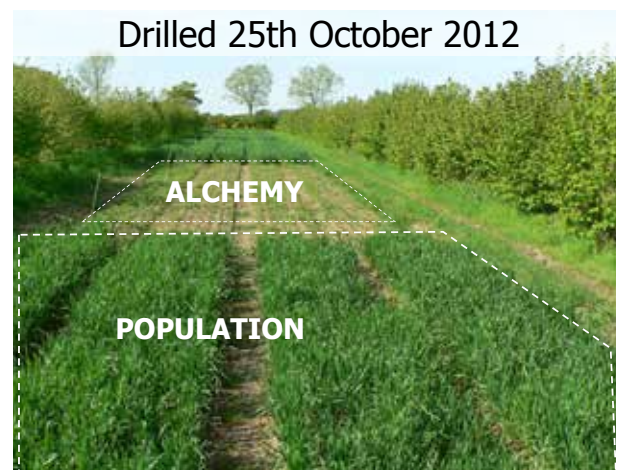
The ORC-led COBRA project, which started in 2013 with funding from the CORE-Organic ERANET, including Defra, brings together 42 partners from 18 European countries and focuses on coordinating, linking and expanding on-going organic breeding activities in cereals and grain legumes across Europe, drawing together experts from previously fragmented areas.

The first trials for the project in which composite cross populations are cycled around Europe have been initiated.

ECOPB: European Consortium for Organic Plant Breeding

ORC is a leading participant in the European Consortium for Organic Plant Breeding (ECOPB), which has a number of key goals:

1. provide a platform for discussion and exchange of knowledge and experiences;
2. the initiation and support of organic plant breeding programmes;
3. the development of scientific concepts for organic plant breeding; and the provision of independent, competent expertise to develop standard settings with respect to organic plant breeding.



The trials above demonstrate that, unlike the population, the pure-line variety Alchemy failed when drilled only nine days later than the plots in which both crops established well, demonstrating the advantages of the greater genetic diversity in populations.

During 2013, ORC took on the role of Secretary to the consortium. There is significant overlap between this work and our work in SOLIBAM on seed regulation. We co-organised a very successful workshop in Brussels in September. Our participation in ECOPB is crucially important in developing networks with other European partners working on organic seed production and there is significant overlap between ECOPB members and partners working on our crops projects. This has facilitated our involvement in a number of EU-funded project bids.

A translation of a document entitled 'Techniques in Organic Plant Breeding' was completed by ORC. This was initially written by the Swiss Research Institute of Organic Agriculture (FiBL) and will be available for English speakers through the ECOPB website in due course.



Cropping systems

This programme of work is focused on the development of productive organic cropping systems, including the use of legumes and cover crops to build soil fertility to sustain crop yields and deliver other ecosystem services, as well as the development of reduced tillage systems adapted to organic farming and the non-use of herbicides. This programme also aims to contribute to the development and promotion of crop varieties specifically suited to organic production, i.e. those which incorporate traits such as lower nitrogen requirements and higher competitive ability with weeds. Our work in recent years has demonstrated the potential of complex legume mixtures to contribute to fertility building and to supporting pollinators, and we are beginning to see the development of tillage options that can contribute to reduced energy consumption and enhanced soil protection.

- ✓ We are developing complex seed mixtures with a wide variety of legumes and other cover crops, that encourage pollinators and build soil fertility, fixing nitrogen, providing forage and improving animal health.
- ✓ We are developing reduced tillage options that, in combination with the use of living mulches and cover crops, contribute to reduced energy consumption and enhanced soil protection.
- ✓ Our work is helping farmers to be more efficient by developing rotations and practices that reduce nutrient losses, e.g. from nitrogen leaching, and improve the recycling of nutrients, including through improved composting and manure management systems.

Legume LINK

This project formally finished in 2012, but the final report was published during 2013 (see <http://orgprints.org/24662/1/PR513.pdf>). Key conclusions from the report were that:

- There are several advantages to more complex mixtures over simple two-way mixtures or monocultures, including stability and resilience, weed suppression characteristics, slower decomposition, better nitrogen utilisation, and extended forage availability for key insect pollinators (which is also the subject of an on-going PhD at Reading University due to be completed in 2014).
- The above-ground yield of the ley is linked positively to subsequent crop yield.
- Red and white clover, black medic, birdsfoot trefoil, lucerne, sainfoin and crimson clover have useful characteristics.
- In terms of forage yield including a 3rd or 4th legume in a mixture is generally advantageous.

- The best multifunctional mixtures contain black medic, lucerne and red clover. Including crimson clover significantly contributes to pollinators in the first year.

- There are benefits from the inclusion of grass species. The grass takes up the N fixed by the legumes and reduces the free N in the soil; the legume rhizobia respond to the low soil N levels and fix more N, resulting in higher overall N fixation and hence greater biomass. In addition the grass raises the C:N ratio, prolonging the release of N to subsequent crops. The balance of grass and legumes is important.
- The annual N accumulation of ley mixtures decreases after two years, although there may be other advantages from longer leys, such as weed control.

OSCAR: Optimising Subsidiary Crop Application in Rotations

In the OSCAR project we are studying key factors that influence the success of cover cropping, including cultivation methods, machinery and suitable plant genotypes.

Field trials were undertaken where a legume cover crop (black medic) was sown into a winter wheat crop and the first round of the two-year, multi-country cover crops and tillage experiment was completed. The bespoke Wenz Eco-dyn reduced-tillage machine designed for use at our Wakelyns Agroforestry site arrived from Germany and is being tested prior to use in 2014 trials.



John Newman of Abbey Home Farm assessing legumes in on-farm field trial with ORC researchers Mary Crossland and Sally Westaway



Significant progress has been made on the dissemination work that ORC is leading. Building on a previous project (Legume LINK), research was undertaken to write profiles for 12 leguminous cover crop species. These form the basis of a new 'wiki' webpage on cover crops and living mulches hosted by OSCAR (<http://web3.wzw.tum.de/oscar/wiki/>). An information leaflet was produced for dissemination at Cereals 2013 and the National Organic Cereals event.

QUOATS: Harnessing new technologies for sustainable oat production and utilisation

This Defra LINK project led by Aberystwyth University seeks to develop oats with qualities that meet the needs of growers and industrial end-users. ORC's role is to investigate this within an organic context.

The 2012/13 growing season was a particularly difficult one due to adverse weather conditions which affected the drilling and establishment of the crop. We successfully established the organic trials, which were of particular value as the majority of trials sown by project partners failed to establish.

Although the project does not finish until 2014, the 2012/13 season saw the last field trials. The assessments were carried out successfully over the season and conditions were good for harvesting the trials. A new method of measuring straw yield was developed which worked particularly well in the oat trials. This is important, as the straw component of the crop is particularly valued in organic systems for weed competition, livestock feed/bedding and cycling organic matter. The results and project were presented at a number of events including Cereals 2013.

TILMAN-ORG: Reduced tillage and green manures for sustainable organic cropping systems

In the TILMAN-ORG project ORC is collaborating with 15 partners across 10 European countries to investigate the effects of reduced tillage and green manures on organic farms. Weed and biomass assessments of the Eco-dyn and ploughed trial plots were carried out, and cereal and soil samples sent off for analyses of C and N. This project is also due to be completed in 2014.

Agroforestry

Agroforestry systems, by integrating the production of trees, crops and livestock, have the potential to increase agricultural productivity through more efficient utilization of resources and solar energy (light), as well as through positive impacts on soil fertility and pest and disease incidence. At the same time, agroforestry offers significant environmental benefits, from biodiversity to soil conservation, water quality and flood resilience through to climate change and carbon sequestration.

ORC has a long-standing engagement with research and development work on this topic, in particular at our Wakelyns Agroforestry site in Suffolk, but also now at Elm Farm, where we have established an integrated bioenergy/livestock agroforestry system. ORC is also engaged with the European Agroforestry Federation and works with the Woodland Trust and the Farm Woodland Forum to further develop this approach.

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- ✓ **We are developing a diverse range of agroforestry systems. Integrating trees into farming systems increases productivity and biodiversity, improves the recycling of nutrients via leaf litter, conserves water and has positive impacts on soil fertility and pest and disease incidence.**
 - ✓ **We are leading on work to make better use of hedgerows and other landscape elements as a productive renewable energy resource while conserving biodiversity. This has the potential to enable rural communities to access local wood fuel as a substitute for oil through individual or district heating schemes.**
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Co-Free: Innovative strategies for copper-free low input and organic farming systems

Within Co-Free, apple yields and pest and disease levels were assessed in the apple/timber agroforestry system at Wakelyns, and compared with a modern local organic orchard in autumn 2012, with the results analysed during 2013. Despite 2012 being a very bad year for apple production in the UK, apple yields

in the agroforestry system were comparable with standard figures when scaled up from 2.5% land area under apple production to 100%, and even at just 2.5% cover, they outperformed the organic orchard used for comparison. Scab levels were over twice as high in the organic orchard than in the agroforestry system, indicating that this approach may offer some potential in reducing copper use in organic apple production.



Dr Jo Smith assessing pollinator populations at Whitehall Farm



SOLID: Sustainable Organic and Low-input Dairy Production (see also main report below)

Within SOLID, assessments of productivity carried out in the short-rotation coppiced willow silvoarable system at Wakelyns suggested that while there may be competition for resources between crops in the alleys and the willow in some years, overall productivity (from the crops and willow) is higher than in monoculture systems, with a 10% yield advantage for the agroforestry system in 2012 and a 44% yield advantage in 2013.

Rapid review of agroforestry for Natural England

The rapid review of agroforestry options for the next English Rural Development Programme was completed for Natural England, with a view to identifying the potential benefits of agroforestry and possible policy options to support the establishment of agroforestry. Following consultation with agroforestry experts and policy-makers, three approaches to integrating agroforestry within the new English Environmental Land Management Scheme (NELMS) were developed: (1) Design and costing of selected agroforestry systems as new options; (2) Modification of existing options; and (3) Grouping of existing options to develop 'Agroforestry bundles'. Although further work on an establishment of an agroforestry option was undertaken by Natural England based on our work, Defra subsequently decided not to implement the option, a decision that is still subject to political debate.

TWECOM: Towards Eco-Energetic Communities'

The TWECOM project aims to demonstrate that local short-chain systems of valorising biomass from landscape elements, such as hedgerows and small woodlots, for local energy or heat production is economically feasible, even in densely populated areas and taking into account ecological and social constraints. Through realising these short-chain systems and bringing together experiences from different partners and regions in North-western Europe, we want to demonstrate that this – up until now – unused biomass

from landscape elements can contribute to local sustainable energy production, ecologically, socially and culturally. A pilot project that may involve installing a community biomass boiler at Elm Farm and harvesting the hedgerows on site for woodchip, got off to a good start with a community meeting at ORC in April. The Hamstead Marshall Sustainable Energy Co-operative was set up to investigate the feasibility of a community biomass district heating scheme based at Elm Farm. Hedgerow biodiversity surveys were carried out on Elm Farm in June with help from a group of volunteers and plans for hedgerow harvesting plot trials are in place for 2014.

AGFORWARD: AGroFORestry that Will Advance Rural Development

Funding was secured in 2013 for a major new agroforestry project to start in 2014. Working with 26 partners from across 23 European countries, Agforward is an EU FP7 project led by Cranfield University that aims to promote agroforestry practices in Europe to advance sustainable rural development. ORC is responsible for developing participatory research and development networks centred on silvopoultry systems (such as Woodland Egg producers) and silvoarable systems within the UK. We will also be collecting data from our own agroforestry research sites to feed into modelling impacts on yields and ecosystem services at a field, farm and landscape scale. We will work with colleagues from Spain to investigate how agroforestry sits within the current and future policy frameworks, and develop policy recommendations. We will also be closely involved with the development of tools for farmers and advisers and other knowledge transfer activities.



Sustainability assessment

This programme focuses on the wider impacts of organic and other farming systems and the assessment of their sustainability, environmental impact and contribution to delivery of ecosystem services.

Quantifying the business benefits of the Low-Carbon Farming project

The research, commissioned by the Soil Association, explored four areas of low-carbon farming ; nutrient management, soil and grassland management, livestock management and renewable energy, through a literature review, telephone interviews with farmers, and Farm Business Survey data analysis. The most cost-effective measures were found to be those requiring a low initial investment from the farmer, such as using clover and other legumes in place of manufactured nitrogen fertiliser, the adoption of cover crops and the use of nutrient budgeting software. However, economic impact was found to vary depending on farm type, crop rotation, location, soil type and production intensity.

Development of sustainability assessment methods

This Ekhaga Foundation-funded project brings together two leading research teams (FiBL in Switzerland and ORC) with the aim to pool their respective expertise and experience in sustainability assessment to work to develop a level set of indicators of sustainability outcomes. Work comparing existing farm sustainability assessment approaches of farms against a common set of international guidelines (FAO SAFA) concluded that the variability of the tools illustrates the variance in approaches to sustainability assessment, and that the convergence between the tools and the FAO SAFA guidelines varies considerably.

The Public Goods tool in action at Yatesbury House Farm



- ✓ We are investigating the **impact** on the UK's greenhouse gas emissions **of a widespread adoption of organic farming.**
- ✓ We are **developing low-carbon farming tools and guidelines**, for example improving nutrient management, soil and grassland management, livestock management and the use of renewable energy.
- ✓ We are working with government to ensure they have **robust data and information on farm greenhouse gas emissions** through active participation in the UK Greenhouse Gas Platform.
- ✓ We have developed tools that allow farmers to **budget and benchmark their energy and nutrient use.**
- ✓ We have developed a rapid, on-farm **sustainability assessment and advisory tool** that provides information on the delivery of a variety of public benefits quickly but reliably.
- ✓ We have developed the concept of **net system output** as a measure of total system productivity, taking account of the use of crops as an intermediate input to feed livestock, and focusing on the ability to meet human needs for food, fibre and fuel from limited land and other resources.
- ✓ We are encouraging communication and collaboration between different scientific disciplines with respects to **health concepts** at different levels, and we are working to translate such concepts into practical guidance for farmers.

Greenhouse Gas Platform: Data synthesis, modeling and management

ORC led a second knowledge-exchange workshop in Birmingham that presented results from the methane and nitrous oxide measurement projects and invited the audience to test a range of methods for communicating uncertainty in inventory calculations of the share of emissions between sectors and changes in emissions over time. The meeting was attended by over 60 representatives from industry, Government, research organisations and NGOs. A large number of posters were presented covering topics ranging from the effect of diet type on methane emissions to the efficacy of nitrification inhibitors. Presentations and posters from the workshop are available on the Platform website: www.ghgplatform.org.uk.

The project team has also continued to develop the agricultural activity datasets that will underpin the emission calculations in an improved inventory. As part of this process the

team has assessed benchmarking datasets from a number of industry sources e.g. the levy boards DairyCo and EBLEX, and the private consultancies Promar International and the E-CO₂ project. The results from this analysis will help to improve the representation of farm systems within the revised inventory.

A new reference map of the extent of cultivated organic soils in the United Kingdom has also been produced. This will be used to calculate nitrous oxide emissions resulting from the drainage or tillage of these soils. A literature review has also been completed on the potential mitigation of emissions from stored manures, along with a synthesis of manure management practice surveys in the UK from the early 1990s to the present day. The links between manure production and livestock productivity have also been improved through the derivation of new statistical models predicting manure nitrogen excretion from the metabolisable energy requirements of cattle and the dietary protein content.

Climate change impacts of wide-spread conversion to organic farming in the UK

Building on the data platform work, Laurence Smith has continued work on this PhD project, completing a literature review comparing the energy use of organic and non-organic farms.

Review and development of health concepts in ecological agriculture

Aspects of health in agricultural contexts are often approached in separate discussions within soil science, plant science, animal science and human medicine; with little interaction or communication among these disciplines. The aim of this Ekhaga Foundation-funded project was a clarification and critical assessment of health concepts in farming systems; as the 'connectedness of soil, plant, animal, man and planet through health' is a key statement of ecological agriculture and a foundation stone for the principles of the organic agriculture movement.

A key outcome of the project was the emergence of the cross-disciplinary use of 'resilience' as a universal, meaningful and measurable criterion of health in a wide range of domains; soils, plants, animals, humans and ecosystems.

A content analysis of scientific health literature indicated that among terms used most frequently to describe health, 'function', 'maintenance' and 'resistance' occurred in all five domains. Seeing that many concepts however are not equally shared among the domains, it becomes clear that the specific 'languages spoken' and terms/concepts used in the different domains can lead to difficulties when the organic principle of health is applied universally. This illustrates the importance of clear communication and demonstration of the meaning of health in the different domains.

It was concluded that an intensified, interdisciplinary dialogue is necessary for a more integrated and more comprehensive understanding of health in agriculture. Many stakeholders, from farmers to policy-makers, could benefit from a better understanding of health concepts in organic agriculture, and rules and regulations could be formulated in a more applied and clear form to enable the direct translation of principles into actions.



Livestock research

This programme covers both ruminant and non-ruminant livestock, focusing on pasture and range management and nutrition and integration with agroforestry with the aim of improving animal productivity, health and welfare.

- ✓ We are working to develop **better use of pasture and other locally grown feed sources** so that reliance on imported protein feeds such as soya can be reduced. The work also contributes to improving biodiversity and improving sustainability of livestock systems and reducing the risk of GM contamination.
- ✓ We are investigating the **impacts of pasture diversity and ecology on nutrition, disease and parasite incidence, and on overall animal health as a consequence of improved immune responses and pathogen/parasite suppression.**



SOLID: Sustainable Organic and Low-input Dairy Production

The aim of this EU-funded project led by Aberystwyth University is to improve the technical performance and economic competitiveness of organic and low-input dairy systems in Europe, whilst maximising their potential to deliver environmental goods and enhance biodiversity.

The work on evaluating the sustainability of organic and low-input dairy farms in Europe was intended to 'set the scene' and encourage farmers to consider sustainability in its broadest sense whilst identifying suitable topics for participatory research. The results illustrate the diversity of low-input and organic dairy farms in terms of size and intensity throughout Europe.

Research topics suggested by the farmers relate to home-grown protein sources, forage production, feeding, soil and nutrient management, breeds choice, animal health, product differentiation and marketing, and environmental issues.

Building on this, the participatory, on-farm research work in the UK is progressing. Formal research protocols have been agreed for three of the six projects. Data collection was undertaken for two of them, on rearing calves on cows and on the suitability of mob-grazing with diverse swards for milk production. Diverse swards have been established on several other farms for comparison. Collaboration with Scotland's Rural College (SRUC) on a soil management project has started and a field-lab (see DOFFP

below) on reducing antibiotic use was attended. Regular meetings were held with the SME partner OMSCo to discuss these and explore how the relationship between cow nutrition and cow health could be monitored in an on-farm experiment.

ORC is also responsible for overseeing the participatory research work in other countries. A common procedure for carrying out on-farm research for use in all countries participating in the SOLID project has been drafted and discussed with other partners, and a workshop on participatory methods was organised with the Finnish partner (MTT), attended by Katherine Leach.

A survey contrasting the views of farmers, other businesses and consumers in the supply chain on the acceptability of innovations started. Data collection for farmers and other businesses was carried out by Holly Gerrard-Cole using e-mail contacts and personal approaches made at two events.

ICOPP: Improved Contribution of local feed to 100% Organic feed supply for Pigs and Poultry

The objective of this project is to produce economically profitable feeding strategies based on 100% organic feed across Europe, which will supply poultry and pigs with the required level of nutrients in different phases of production and support high animal health and welfare.

The second poultry trial was initiated at FAI farm, Oxford, during a particularly cold spell so the chicks had to be 'doubled up' in the houses, reducing the replication. The feed trials are now finished and the data are ready for analyses. We received the draft UK results of the protein self-sufficiency for pigs and poultry data exercise (for which ORC had collated data from Defra, feed companies, certification bodies and other experts) and carried out the final data check and confirmation with experts from FAI.





Socio-economic research

The focus of the socio-economic work in 2013 continued to be on developing information about markets and consumers, on the evaluation of the EU organic regulation and on organic farm financial performance. Public benefit is generated by enabling a range of users including producers, supply-chain businesses, and consumers, to improve their financial and environmental sustainability, and by improving the effectiveness of regulation and policy-making by governments at national and European level.

- ✓ We analyse and publish a unique range of **financial and business information**, including the **Organic Farm Management Handbook**, which provides financial and management data on different farm types and enterprises.
- ✓ We are working to improve the **transparency of the organic market** for producers, food businesses, consumers and policy-makers, by analysing and publishing data on consumer behaviour and markets.

Organic Data Network: Data network for better European organic market information

This EU-funded project, led by Ancona University, aims to increase the transparency of the European organic food market through better availability of market intelligence about the sector to meet the needs of policy-makers and actors involved in organic markets.

A survey and report carried out by ORC with the aim of compiling an inventory of bodies carrying out organic market data collection, confirmed that the effort and availability of such data in Europe remains very varied, making it difficult for businesses to take sound investment decisions.

The market data compilation of 2011 presented at Biofach in February 2013 showed that trends in most other European markets differ from the UK. Markets generally continue to develop well, with particularly strong growth noted in Denmark, Finland, France and also the Netherlands. Reasons for the differences are not fully understood.

ORC hosted the first international stakeholder workshop in March 2013, combined with the third annual project meeting. The workshop showed that methods to collect market data vary widely and there is an urgent need for harmonisation of terms and methods. Based on the results of the workshop and further discussions a statement was submitted to the European Commission as part of the assessment of the organic regulation (see below).

ORC is overseeing case-study work on improving market reports in six case-study countries. A structured exchange of experience between the people producing organic market reports in the case-study countries/regions of UK, France, Germany, Italy, the Czech Republic and the Mediterranean commenced at the fourth project meeting. Work on the UK case study that ORC is doing jointly with the Soil Association has started.

Evaluation of the EU Organic Regulation for the European Commission

The aim of this 10-month project, led by the Thünen Institute in Germany, was to evaluate Regulation (EC) No 834/2007 (Organic products) and the associated implementing rules with respect to achieving its objectives and side effects, considering rules on organic production, control, labelling and trade with Third Countries.

Case-study work in the UK consisted of documentary analysis and 19

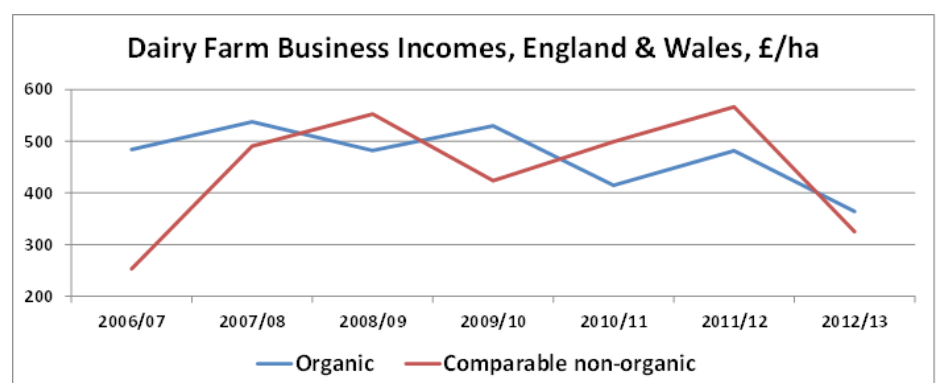
interviews with the competent authority, control bodies and representatives from several production sectors. Many interviewees found that the rules and principles of the regulation are too vague and unclear to guarantee a common understanding of organic agriculture and that they leave too much room for interpretation, which can lead to unfair market conditions.

The final draft report of the EU Regulation Evaluation was submitted in October 2013, but not published until January 2014. [Sanders, J (2013, Eds) *Evaluation of the EU legislation on organic farming*. Braunschweig: Thünen Institute of Farm Economics. http://ec.europa.eu/agriculture/evaluation/market-and-income-reports/organic-farming-2013_en.htm

The evaluation shows that the EU legislation on organic farming generally provides a sound basis for a sustainable development of organic production in the European Union. However, the analysis also points to a number of areas where the regulatory framework could be improved.

Economics of organic farming in England and Wales

Although Defra have stopped funding Aberystwyth University and ORC to produce an annual Organic Farming Incomes in England and Wales report, we conducted an analysis of the 2011/12 data and produced a report in the traditional format using other resources. We also compiled time-series data for the 6-year period 2006/7-2011/12 as part of a project with the Soil Association to improve the visibility of the organic farm incomes data. The results were published in 2014, and feature in the 2014 Organic Farm Management Handbook.





Information services: Supporting knowledge exchange through advice, training and education

The main objectives for our work in this area are to:

- Communicate organic principles/best practice and disseminate technical and market information to producers, consultants, food businesses and others, so as to improve both business performance and delivery of public goods (climate change, animal welfare, biodiversity etc.);
- Educate and inform students and young people, consumers and civil society more generally about the issues affecting the sustainability of primary food/energy/fibre production;
- Engage with the media on relevant food, farming and sustainability issues.

Our primary focus is on engagement with producers, professionals such as advisers and land agents that engage with producers, and young people preparing for careers in agriculture or the related professional support services.

- ✓ We work with farmers to enable them to be **confident innovators**. Through our participatory approach emphasising producer involvement and leadership through the whole research and development process, farmers can share ideas and innovations, test them robustly and engage directly in our research programmes.
- ✓ We publish a range of reports, technical guides, popular articles and peer reviewed publications as well as our own **quarterly bulletin**.
- ✓ We maintain a diverse collection of on-line and social media resources, including the **ORC website**, e-bulletin, Facebook and Twitter services.
- ✓ We are developing an on-line **information hub for agroecology and organic farming**.
- ✓ We provide **support to organic advisers** in the UK and Ireland in the form of accreditation, information, advisory tools and training.
- ✓ We run **conferences, summer schools, training and other events** aimed both at producers and other audiences, which enable learning, dissemination of research results and encouragement of best practice.
- ✓ We collaborate with several colleges and universities **providing input to teaching on organic farming and agroecology** at postgraduate level.
- ✓ We have a popular internship programme to enable students to gain **work experience** with us.

Participatory research and knowledge

Many of our research projects already involve a participatory research approach, where producers are not only involved in hosting research trials but are actively involved in the development, implementation and interpretation of the results.

DOFFP: The Duchy Originals Future Farming Programme

This Soil Association-led project, funded by the Prince of Wales's Charitable Foundation with royalties from the Waitrose Duchy Originals brand, entered its second year with ORC delivering an increased range of activities including scientific support for a range

of field labs, delivery of field labs in the dairy sector, analysis of research priorities, and research policy work.

ORC has worked closely with the Soil Association to develop the field lab concept to more closely fit producers' needs, leading to modifications to the way events are held and an increase in the range of field lab topics being offered.

Conferences and other events

7th annual ORC Organic Producers' Conference

With the theme 'Making producer-led innovation a reality', this was the best-attended organic producers' conference yet, with well over 200 participants. Comments from producers attending included: "A great inspiring event at the start of the year to feed my need to be a better farmer"; "Very useful summary of research and resources from producer's perspective"; "Excellent and particularly relevant to me." On the closing plenary: "Good to get an idea of the bigger picture"; "Nadia Scialabba was magnificent"; "Expert and robust". For the first time there was a Twitter hashtag (#ORC13) and this worked well, with delegates posting and discussing the issues throughout the conference.

The Prince of Wales's Food and Farming Summer School

This event, hosted by ORC for the first time in July 2013, was attended by more than 30 participants and a dozen highly expert contributors. The challenge of delivering sustainable food systems was examined in both a theoretical and a practical framework



on organic and non-organic farms, including Helen Browning's Eastbrook Farm, Duchy Home Farm and West Woodhay Estate. The event culminated with a reception hosted by the Prince of Wales and a visit to Highgrove Gardens. Building on the success of this event, ORC has been asked to host the Summer School again in 2014.

Scandinavian producers' study tour

Phil Sumption hosted a group of 25 Scandinavian organic growers, advisers, researchers and one politician on a 5-day study tour of horticultural holdings in Southern England. The feedback was very positive, with the visits to different kinds of operations in terms of their scale and philosophy, including Tolhurst Organic Produce, Wight Salads and Hankham Organics, highly appreciated.

Training and education

ORC staff continued to contribute to courses run by other institutions. Susanne Padel contributed to Scotland's Rural College's (SRUC, formerly Scottish Agricultural College) distance-learning MSc and PG-Dip course on organic farming, covering marketing and policy topics with on-line presentations and one interactive session for questions. She also presented a series of lectures on 'Principles of agro-enterprise' as part of the Graduate Specialisation Programme in 'Mediterranean Organic Agriculture' at the Institute for Mediterranean Agriculture in Bari (IAMB).

Agreement was reached with Schumacher College in Devon for ORC staff to contribute teaching input to their MSc in Sustainable Horticulture, validated by the University of Plymouth. This work will take place in 2014.

Supporting organic advisers and trainers in the UK and Ireland

IOTA: The Institute of Organic Training and Advice

IOTA is now fully integrated within ORC although it maintains its name and external presence. IOTA has delivered a number of training courses for its members and is working with the ORC research team to ensure effective and timely transfer of knowledge from the research programme to trainers and advisers.

STOAS: Sustainability Training for Organic Advisers

This project provides training on farm sustainability assessment to organic advisers and advisory service managers using three different tools including the ORC Public Good Tool. The project delivered a number of workshops in Germany, Switzerland and the UK.

Communication with the wider public

As a research organisation primarily, we do not see our role as a campaigning or membership organisation engaging directly with the wider public, but we nevertheless have an important role to play in disseminating dependable, evidence-based information for and on behalf of the organic movement. We rely primarily on the ORC Bulletins, our website and, increasingly, social network media to make information available on a regular basis. Our quarterly printed Bulletin and monthly e-bulletin continue to be well received. We are working through the Bulletins, website and press releases to make information more widely available. Work on an electronic organic information-hub, funded by Defra, will start in 2014.

ORC continued to increase its presence on social media, including Facebook and Twitter, during the year. This is proving a useful way of directing people toward our work on our website, communicating with the general public and strengthening our networks. Flickr, used for the first time in 2013, is becoming increasingly useful for image sharing, with 26 sets of photos having been added in the year and linked to Facebook, Twitter and the website and e-bulletin.

HRH The Prince of Wales meets attendees of his Food and Farming Summer School at a reception held at Highgrove



Developing our own resources to support our work

As a result of the land sales initiated in 2013, the opportunity was identified to invest in a new livestock building at Elm Farm to replace some very dilapidated stock. The design work for this was completed and the project put out to tender, with the contractor selected and work due to progress in 2014 subject to planning permission.

It is envisaged that the new building will include a solar PV installation, which will complete the process of making ORC largely energy self-sufficient, with some of the electricity generated used to power our offices and the heat pumps for our ground-sourced heating system.

We are continuing to develop plans for a community woodchip boiler which would provide heat for the farmhouse at Elm Farm, utilising woodchip sourced from the hedges and agroforestry plots on the farm. Further work is needed to improve our IT systems and in particular broadband access. We had identified opportunities to solve current access problems for ourselves and the local community, but these turned out not to be financially viable. A new satellite provider was brought in during 2013, leading to a significant improvement in service, but still falling short of what should be possible. The extension of fibre optic services to the village remains a dream, but they may reach Kintbury, two miles away, in 2014. This may still not be sufficient to enable us to move to a landline service.



Supporting the development of the organic sector through policy advocacy and communication

We see it as an important part of our work to communicate the results of our research to policy-makers at local, national and international level in order to:

- Facilitate the sound development of the organic sector;
- Ensure that the potential of organic/agroecological approaches is recognised in climate change, food security, biodiversity, animal health/welfare, food quality/health and agri-environmental/ rural development policy debates and that appropriate policies are developed.

Our policy engagement is primarily at three levels – within the organic community, with other NGOs and the agricultural industry, and with governmental agencies and committees, both in the UK and at European level.

- ✓ We have conducted **evaluations of policies and regulations and compiled evidence on the impacts of organic farming** for the European Commission, national governments and environmental agencies.
- ✓ We work with the EU, Defra, Natural England and the Welsh Government to develop and implement **policy support for organic farming** as part of the Common Agricultural Policy.
- ✓ We work with governmental and non-governmental organizations in the UK and Europe to further develop **organic regulations and standards** so that consumers can trust the promises they make and farmers are encouraged to improve their practices.
- ✓ We provide input to UK and European authorities on the **research needs** of agroecology and organic farming.
- ✓ We worked to **change EU seed laws**, paving the way for a ground-breaking legal agreement to enable the experimental marketing of our wheat populations to producers.

Supporting the development of the organic movement

Facilitating the development of organic producer groups continues to be an activity, though at a reduced level compared with previous years. We continue to provide support to the **Organic Growers Alliance**, through our new Research Communication Officer, Phil Sumption, who edits the OGA magazine and maintains their electronic media. Lawrence Woodward has maintained his role as a Director/Board member of **Organic Arable** and **Organic Seed Producers**, although he resigned from OSP during the year.

We have continued to develop better relationships between the major organic charities (**Soil Association**, **Garden Organic** and **ORC**), with a number of new joint projects started and joint events delivered, including

a joint day at Garden Organic in July when staff from all three organisations came together to learn more about each other's activities. We have also worked to support alliances of organic organisations, in particular the **English Organic Forum** in its engagement with government departments and meetings with Ministers. The contract with the Welsh Government to provide policy advice (see below) has meant that we have had to withdraw from an active role in the similar **Organic Group of Wales**.

At the European level, we are involved with policy work through the **International Federation of Organic Agriculture Movements (IFOAM) EU Group**, addressing research priorities (through TP Organics – see below), CAP reform and organic regulation issues. We are represented both in the IFOAM EU group (with

Lawrence Woodward as a deputy UK representative), and in the forum of UK IFOAM members (represented by Nicolas Lampkin) that started meeting regularly in 2009.

We have continued as members of the international **Food Quality and Health** organisation and the **European Consortium for Organic Plant Breeding** (ECOPB, see above under Research).

Engagement with the **European technology platform for organic food and farming** (TP Organics: www.tporganics.eu) has been of particular significance. With support from the Duchy Originals Future Farming project, Susanne Padel has continued to actively support the initiative, including making presentations at EU level events and engagement in the debate over future EU research funding for agriculture within the new Horizon 2020 framework.

Working with other agricultural and environmental organisations

ORC continues to engage with a number of other organisations on relevant issues, with particular emphasis on GMOs and climate change continuing in 2013. On genetic modification, we have continued to support **GM Freeze** (represented by Bruce Pearce) as well as influence the debate through the development of alternative breeding and agroecological approaches in our research (see above).

On climate change, we continue to work with the IFOAM/FAO-sponsored **Round Table on Organic Farming and Climate Change** (RTOACC) and to participate in the delivery of the English agricultural industry **greenhouse gas action plan** (GHGAP), represented in both by Laurence Smith. Nicolas



In September 2013 ORC hosted a visit of the European Innovation Partnership Arable Group

Lampkin was appointed a Director of the **Task 37** group focusing on anaerobic digestion and is now also a member of the **NFU Organic Issues Group**.

Working with government in the UK and internationally

ORC continued to be actively engaged with a number of government advisory committees.

The EU Commission's **expert group to provide technical advice on organic production (EGTOP)** includes four ORC staff: Nicolas Lampkin as a permanent member and Susanne Padel, Bruce Pearce and Roger Hitchings as 'pool' members to be invited to serve on sub-groups when required. The group has been working actively in 2013, with Roger Hitchings participating in a sub-group on protected cropping, the conclusions of which are available in a published report.

With the new Common Agricultural Policy for 2014-2020 agreed at EU level in June 2013, and now in the implementation phase in the UK, Nicolas Lampkin has continued as an active member of the Natural England **agri-environment stakeholders group**, and the Defra **Organic Options and Informal Agri-environment groups**, which have been reflecting on future directions for agri-environment policy including organic farming support in England.

In July 2013, ORC played a lead role in the organisation of a **UK Organic Policy Forum** hosted by Defra, which brought together government officials and stakeholders from England, Wales and Scotland to review developments and policy options in the three countries.

In Wales, the value of ORC's policy and other expertise was recognised in the form of a contract for **Organic Centre Wales (OCW)** to provide policy advice and other services to the Welsh Government. The contract, led by ORC with OCW partners IBERS (Aberystwyth University) and ADAS, started in February 2013 and continues to 2016.

The policy advice to the Welsh Government is focused on the development of a new organic farming support scheme **Glastir Organic** to be implemented in 2015, with the initial work involving an extensive stakeholder consultation process to identify pros and cons of previous support and identify changes needed in future support. A dossier of evidence on the state of the organic sector in Wales and potential policy options was presented to the Welsh Government and provided the basis for a public consultation on future organic policy support in autumn 2013. The project also supports information to Welsh farmers and others – the first issue of the Cymru Organig magazine was produced, and the Organic Food and Farming Centre was organised at the Royal Welsh Show.

Factfile

Funders

Continuing statutory funders

Defra (LINK and CORE Eranet projects)
European Commission DG Research and DG Agriculture and Rural Development (Research and evaluation projects)
Welsh Government (Organic Centre Wales)

Individual donors/supporters

I Alexander; C Allen; L Allen; H Cook; P Conford; W Copas; A Dumsky; L Cornwallis; R Crowder; Mr P Davies; A Dennis; R Ewbank; R Gantlett; E Goff; C Haynes; P Kearney; W Kendall; Dr & Mrs Kunz; N Lampkin; T Latter; C Lavell; Rev. Mason; Lord Newborough, J Pawsey; K Phillipson; P Plate; I Pointer; W & L Pope; Duchess of Richmond, R A Rowlands; Mr Sandwith; S Sarikhani; J Scales; C Sinclair; R Tandy.

Trusts and companies

Ashden Trust, Cuthbert Horn Trust; Doves Farm Foods; Ekhaga Foundation; Hamstead Marshall Village; Little Sunflower; Meadowbrook Trust; Oakdale Trust; Paget Trust; Pye Charitable Settlement; Ratcliff Foundation; Rushall Farms; Sackler Trust; Sheepdrove Trust; Shimpling Park; Tim & Marion Stephenson Trust; Jan Sundt & Co.; Constance Travis Charitable Trust; Tedworth Trust; Triodos Bank; Sylvia Waddilove Foundation; Waitrose; Wakelyns Agroforestry; Prince of Wales's Charitable Foundation; Woodland Trust.

Human resources

New staff:

Elizabeth Adams: Research Communication Officer
Dr Henry Creissen: Crops Researcher
Dr Robbie Girling: Principal Researcher; Crops and Agroforestry Team Leader
Thomas Hughes: Research Technician
Mark Measures: Principal Consultant; Director Institute of Organic Training and Advice
Philip Sumption: Research Communication Officer
Sally Westaway: Agroforestry & Crops Researcher

Staff leaving:

Elizabeth Adams: Research Communication Officer
Oliver Crowley: Crops Research Assistant
Dr Thomas Döring: Principal Researcher; Crops and Agroforestry Team Leader
Roger Hitchings: Principal Consultant; Information Services Team Leader
Dr Katharine Leach: Senior Livestock Researcher
Rebecca Nelder: Livestock Researcher
Helen Pearce: Crops Researcher
Louisa Winkler: Crops Research Assistant

Interns, work-experience students and volunteers:

Research: Cathy Boufartigue (FR); Mary Crossland (UK); Anna Cura (FR); Lucia Foresi (IT); Gaele Fuer (FR); Caitlin Fuller (UK); Holly Garrard-Cole (UK); Christina Hieronymus (DE); James Nash (UK); Gonzalo Palomo (ES). **Library and proof-reading:** Bob Hotchkiss; Chris Sinclair; Corinne Sreeves.

Postgraduate students:

(co-supervised by ORC). **PhD:** Robert Brown, University of Reading; Alexa Varah, University of Reading; Christine Reitmayer, University of Southampton.



Financial report

Review of financial position: Year ended 31 October 2013

At £968,245, income generated from donations and grants, investments and charitable activities was 2.2% lower than the preceding year (£990,480). Income from research and information projects fell by 7% to £764,195 (2012: £819,522), representing 79% of total incoming resources (2012: 83%). However, the 2012 project income figure included £209,736 payable directly to LINK project partners, so the 2013 project income in fact represents a significant increase in income (£154,409 or 25% of net 2012 project income) to support ORC's own charitable activities. Voluntary donations increased by 26% to £157,753 (2012: £125,453), while investment and estate income were largely unchanged at £46,297 (2012: £45,505). The improvement in voluntary donations continues a process started the previous year and was helped by a £25k challenge fund set up by our main sponsor, the Mr & Mrs JA Pye Charitable Settlement.

Expenditure at £1,037,655 was down 14% compared with 2012 (£1,205,704). Overall expenditure on charitable activities fell by 10% to £1,023,920 (2012: £1,136,512). Of this, expenditure on research projects fell by 17% to £775,689 (2012: £936,210), largely a consequence of the ending of payments to LINK project partners (see above) offset by some new projects. Total staff costs increased by 2.9% to £669,416 (2012: £650,696), with 58% of total staff costs covered by project funding (2012: 52%).

Fundraising costs at £6,610 (2012: £12,179) and project bidding costs at £37,409 (2012: £50,354) were both significantly reduced, to give a combined total of £44,019 (2012: £62,533). The expenditure on fundraising represents 4.2% of the voluntary donations (see above), and that on project bidding 3.9% of the £962,985 (2012: £821,424) new project funds, raised in 2013.

Although the reduction in expenditure was not fully sufficient to return us to surplus, there was still a significant improvement in the trading and depreciation deficit (net outgoing resources), which fell to £69,410 (2012 deficit: £215,224), continuing a run

of earlier deficits. Investment assets again increased in value, by £19,084 (2012: £18,395). As a result, the net overall loss for the year (net movement in funds) was £50,326 (2012 loss: £196,829). This deficit was slightly higher than the £47,413 deficit including depreciation and investment gains budgeted at the start of the year.

Investments in tangible fixed assets (note 7) at £13,153 (2012: £17,185) were more than offset by depreciation of £43,758 (2012: £49,344), resulting in their net book value, calculated on an historic cost basis, falling to £2,184,096 (2012: £2,214,700).

As a result of the deficit for the year, total net assets fell to £1,738,596 (2012: £1,788,922). With investments down to £62,775 (2012: £243,658), the main change apart from the fall in the value of tangible fixed assets was a reduction in creditors due within one year to £292,713 (2012: £370,540) and an increase in current assets to £113,417 (2012: £51,103). The fall in creditors falling due within one year was largely due to the fall in deferred income from pre-financing of EU-funded projects to £81,140 (2012: £176,400).

2013 saw significant progress in turning around the fortunes of the Charity, which we believe will be continued in 2014. A break-even trading budget has been agreed by the Trustees based on confirmed project incomes and increased donation income, a significant proportion of which has already been secured. We continue to make significant efforts on bidding for new projects and increasing voluntary donations so that the possibility of a better than break-even outcome exists.

In the longer term, the organisation needs to grow its project activity so that more funds are available to cover overhead costs. We are seeking to do this through developing a range of training activities designed to complement our research activity and replace previous government-funded advisory work.

The accounts were approved by the Annual General Meeting of the Progressive Farming Trust on 19 March 2014. Full audited accounts are available for inspection at the Trust's registered office (see page 3) and on the Charity Commission's website.

*Nicolas Lampkin,
Executive Director and Company
Secretary*

Auditor's report

In our opinion the accounts:

- give a true and fair view of the state of the charitable company's affairs as at 31 October 2013 and of its incoming resources and application of resources, including its income and expenditure, for the year then ended;
- have been properly prepared in accordance with United Kingdom Generally Accepted Accounting Practice; and
- have been prepared in accordance with the requirements of the Companies Act 2006.

In our opinion the information given in the Council Members' Report for the financial year for which the accounts are prepared is consistent with the accounts.

*Mr Mark Cummins FCCA
(Senior Statutory Auditor)*
for and on behalf of Russell New
Limited, Statutory Auditors

Future aims and objectives

The detailed activities to be undertaken in support of the 2012-2016 Corporate Plan are set out in the organisation's Annual Business Plans. In addition to all the research projects and ongoing activities, this plan foresees the expansion of our training activities, linked to the refurbishment of the farmhouse as a training centre, if appropriate funding can be secured.

The Organic Research Centre continues to lead in the fields of research, development and advice for organic agriculture, with the public benefits that that entails. For more than 30 years, it has played a central role in the development of policy and standards for organic farming and food within the UK, EU and internationally. The Centre's alliance of practice and policy, on-farm and desk research and consultancy and advice is unique. We will continue to develop this approach, with an increased emphasis on working in partnership with other organisations.



Statement of financial activities for the year ended 31 October 2013

Values (£)	Funds	Unrestricted	Designated	Restricted	Total (2013)	Total (2012)
Incoming resources						
Donations and grants		138,696	-	19,057	157,753	125,453
Farm and estates		39,653	-	-	39,653	35,190
Research and projects		957	-	579,825	580,782	713,212
Information services		53,301	-	130,112	183,413	106,310
Interest received		24	-	-	24	932
Investment income		6,620	-	-	6,620	9,383
Sundry		-	-	-	-	-
Total		239,251	-	728,994	968,245	990,480
Excluding funds redistributed to project partners included as expenditure below					968,245	780,744
Resources expended						
Fundraising and publicity		6,610	-	-	6,610	62,533
Farm and estates		2,105	-	-	2,105	1,226
Research and projects		194,178	1,435	580,076	775,689	936,210
Information services		128,996	-	117,130	246,126	199,076
Governance		7,125	-	-	7,125	6,659
Total		339,014	1,435	697,206	1,037,655	1,205,704
Net incoming/outgoing resources						
Before transfers		(80,706)	(1,435)	12,731	(69,410)	(215,224)
Gross transfers between funds		25,030	-	(25,030)	-	-
Gain/loss on investment assets		19,084	-	-	19,084	18,395
Net movement in funds		(36,592)	(1,435)	(12,299)	(50,326)	(196,829)

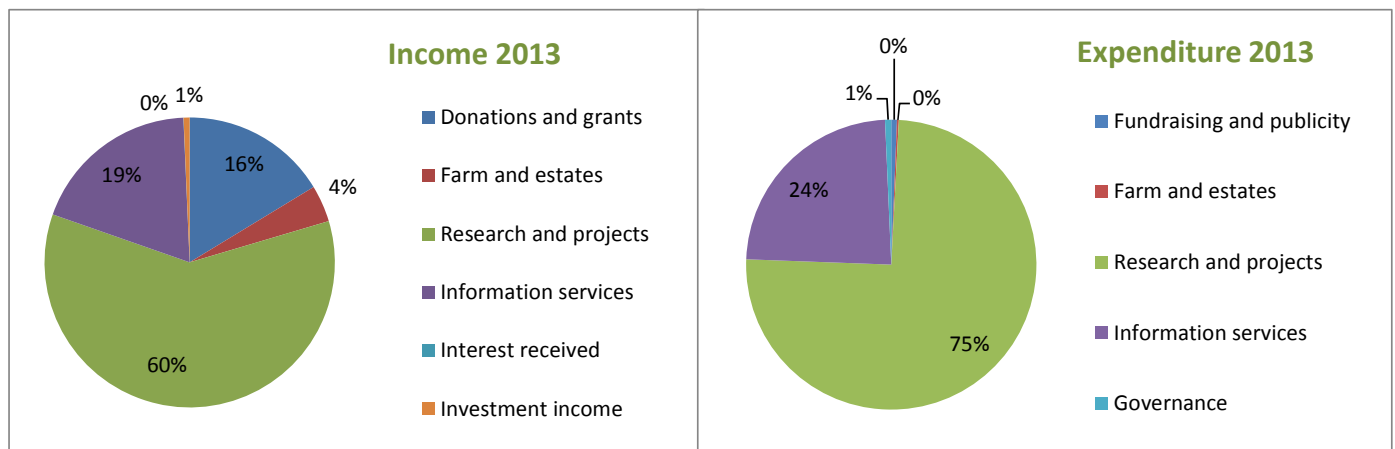
Notes: Income and expenditure are divided into project funds in three categories:

Fundraising costs reduced in 2013 due to changed categorisation excluding project bidding costs

Unrestricted: without stipulation on use.

Designated: where the charity itself restricts use to a particular purpose.

Restricted: restricted use by stipulation of the sponsor for a particular purpose.



New grants/contracts secured

Defra/Core Organic 2 ERANET. Co-ordination of Organic Plant Breeding Activities (COBRA). 2013-2016. 42 partners led by ORC. Value to ORC £149k.

Ekhaga Foundation (Sweden). Further Development of Methodologies for Sustainability Assessment and Monitoring in Organic Agriculture. 2012-2014. Led by ORC with FiBL (CH). Value to ORC £24k.

EU DG Research FP7. AGROFOREstry that Will Advance Rural Development (AGFORWARD). 2014-2017. Led by Cranfield University. Value to ORC £253k.

EU DG Research FP7. Wheat and barley Legacy for Breeding Improvement (WHEALBI). 2014-2018. Led by INRA, France. Value to ORC £153k.

Natural England. Can agroforestry deliver production and environmental benefits in the next rural development programme. 2013. £10k.

Soil Association. Quantifying the Business Benefits of the Low Carbon Farming. 2013. £6k.

Welsh Government. Organic Agriculture Advice. 2013-2015. £346k.

Balance sheet as at 31st October 2013

	2013	2012
Fixed assets	2,246,871	2,458,358
of which Land (historic cost)	750,000	750,000
Buildings (historic cost)	1,434,096	1,464,700
Investments (market value)	62,755	243,658
Current assets	113,417	51,103
of which Stocks	4,301	4,958
Debtors	101,431	44,776
Cash at bank/in hand	7,685	1,369
Creditors amounts due within 1 year	(292,713)	(370,540)
Net current liabilities	(179,296)	(319,437)
Total assets less current liabilities	2,067,576	2,138,922
Amounts falling due after one year	(328,979)	(350,000)
Net assets	1,738,597	1,788,922
of which Restricted	44,954	57,253
Designated	93,902	95,337



Project partners and outputs

Project partners

Research UK:

Aberystwyth University (IBERS and Organic Centre Wales); ADAS; Agri-Food and Biosciences Institute (AFBI); Bangor University; Centre for Ecology and Hydrology; Centre for Environmental Data Archival; Cranfield University; Duchy College; FAI Farms; Forest Research; Garden Organic; Institute Of European Environmental Policy; James Hutton Institute; John Innes Centre; Met Office; National Physical Laboratory; NIAB/TAG; Rothamsted Research; Rutherford Appleton Laboratory; Scotland's Rural College; University of Aberdeen; University of East Anglia; University of Gloucester (Countryside and Community Research Institute); University of Newcastle; University of Nottingham; University of Reading; University of Southampton; Warwick University.

Industry UK:

Abacus Organic Services Ltd; Bernard Matthews Foods Ltd; Bluebell Farms Ltd; Bread Matters Ltd; British Oat and Barley Millers Association (BOBMA); Calon Wen Organic Milk Co-Operative Ltd; Causey Park Farms Ltd; CPB Twyford Ltd; Crisping Malting Group Ltd; DairyCo; Doves Farm Foods Ltd; Duchy Home Farm; E-CO₂ Project; East Haydon Farm; EBLEX; Farmeco Ltd; HGCA; J E Wardle and Sons; John Deere; LEAF; Letheringsett Watermill; Micron; Monsanto; Nairns Oatcakes; New Houses Farm; Nickerson-Advanta Ltd; Oat Services Ltd; Organic Arable; Organic Farmers & Growers Ltd; Organic Milk Suppliers Co-operative (OMSCO); Organic Seed Producers Ltd; Promar; RAGT Seeds Ltd; Rushall Farms; SAC Commercial Ltd; Scottish Organic Producers Association; Senova Ltd; Shipton Mill Ltd; Soil Association Certification Ltd; Soil Association Ltd (Charity); Tillet and Hague Technology; Wakelyns Agroforestry.

The participatory research engagement of many individual producers is particularly appreciated.

Overseas partners and affiliates:

Aalborg University (DK); Aarhus University (DK); Aegean Agricultural Research Institute (TU); Agence Française pour le Développement et la Promotion de l'Agriculture Biologique (ABIO) (FR); Agencia Estatal Consejo Superior de Investigaciones Científicas (CSIC) (ES); Agrarmarkt Informations GmbH (AM) (DE); Agresearch Limited (NZ); Agricultural Dairy Cooperative of Anogia Proodos (GR); Agricultural Research Council Research Centre for Soil-Plant System Studies (RPS) (IT); Agricultural Research Institute of the Hungarian Academy of Sciences (HAS) (HU); Agrifood Research (MTT) (FI); Agro Solomonescu S.R.L. (RO); Agro-Levures et Dérivés (FR); Agrológica (DK); Agronomic Institute of Paraná (IAPAR) (BR); Agrovegetal (ES); AkiNao SAS (FR); Arcoiris S.R.L. (IT); Aristotelio Panepistimio (GR); Associazione Italiana per l'Agricoltura Biologica (AIAB) (IT); Bayerische Landesanstalt für Landwirtschaft (DE); BB Projects (BE); Benaki Phytopathological Institute (GR); Bio Fruit Advies BV (NL); Bioaustria (AT); Biocop Productos Biológicos S.A. (ES); Bioforsk Organic Food and Farming (NO); Bioland Beratung GmbH (DE); Centre de Recherche Public-Gabriel Lippmann (LU); Centre For Agricultural Research, Hungarian Academy of Sciences (HU); Centro di Ricerca per le Produzioni Foraggere e Lattiero-Casearie (IT); Centro di Sperimentazione Agraria e Forestale Laimburg (IT); Centro Internazionale di Alti Studi Agronomici Mediterranei - Istituto Agronomico Mediterraneo di Bari (IT); Ceradis BV (NL); Česká zemědělská univerzita v Praze (CULS) (CZ); Coordination Nationale des Organisations Paysannes du Mali (CNOP) (ML); E-Nema Gesellschaft für Biotechnologie und Biologischen Pflanzenschutz mbH (DE); ECOZEPT GBR (DE); Eigen Vermogen Van Het Instituut voor Landbouw en Visserijonderzoek (Ev-Ilvo) (BE); Escola Superior Agrária de Coimbra (ESAC) (PT); Estonian Crop Research Institute (EE); Estonian University of Life Sciences (EE); Federación Andaluza de Asociaciones de Ganado Caprino de Raza Pura (ES); Federal Department of Economic Affairs/Agroscope Reckenholz-Tänikon Research Station (FDEA-ART) (CH); Ferrari Costruzioni

Meccaniche S.R.L. (IT); Fondazione Edmund Mach (IT); Friedrich Wenz GmbH (DE); Fytopend S.A. (BE); Gautier Semence (FR); German Research Center for Environmental Health (DE); Graminor (NO); Humboldt University Berlin (DE); IFOAM EU Group (BE); Imo-Control Sertifikasyon Ticaret Limited Sirketi, (TU); Inagro (BE); INRA Transfert (FR); Institut National de la Recherche Agronomique (INRA) (FR); Institut National de la Recherche Agronomique, Morocco (INRA) (MO); Institut Technique de l'Agriculture Biologique (ITAB) (FR); Institute for Agricultural and Fisheries Research (BE); Institute for Sustainable Development (SE); Institute of Food and Resource Economics (UCPH) (DK); Institute of Soil Science and Plant Cultivation (IUNG) (PL); Instituto de Agricultura Sostenible (IAS) (ES); Instituto de Tecnologia Química e Biológica (ITQB) (PT); Institutul National de Cercetare-Dezvoltare Pentru Biologie si Nutritie Animala (INCDBNA) (RO); Instytut Ochrony Roślin - Państwowy Instytut Badawczy (PT); International Centre for Agricultural Research in Dry Areas (ICARDA) (LB); Institut Supérieure d'Agriculture Rhône-Alpes (ISARA) (FR); Istituto per la Certificazione Etica ed Ambientale (IT); JNK Plant Breeding (DK); Joint Research Centre - European Commission (BE); Julius Kühn-Institut (JKI) (DE); Juvan Luomu Oy (FI); Kai Kreuzer BMI (DE); Knowledge Centre for Agriculture, Danish Agricultural Advisory Service (DAAS) (DK); Lantmännen SW Seed (SE); Leibniz-Zentrum für Agrarlandschaftsforschung (ZALF) (DE); LFZ Raumberg-Gumpenstein (AT); Lithuanian Institute of Agrarian Economics (LIAE) (LI); Louis Bolk Institute (NL); Marangon S.R.L. (IT); Mekelle University (ET); Mitteltulundusühing Ökoloogiliste Tehnoloogiate Keskus Ceet (EE); Nor-Natur ApS (DK); Nordic Genetic Resource Center (SE); Nordic Seed (DK); Norwegian Institute for Agricultural and Environmental Research, Plant Health and Plant Protection Division (BIOFORSK) (NO); Oikos (NO); Oréade Brèche (FR); P.H. Petersen Saatzucht Lundsgaard GmbH & Co. KG (DE); Philipps University Marburg (DE); Pro-Bio Association of Ecological Farmers (CZ); Province Of Limburg, Provincial Nature Centre (BE); Provinciaal Proefcentrum Voor de Groenteteelt Oost-Vlaanderen, Kruishoutem (BE); Regionaal Landschap Lage Kempen vzw (BE); Research Institute for Organic Agriculture (FiBL) (CH); Saatzucht Donau GesmbH & CoKG (AT); Scuola Superiore Sant'anna (IT); Sejet Plantbreeding (DK); SERVICE-ICAR S.R.L. (IT); Southern Dutch Farmers and Horticultural Organisation (ZLTO) (NL); State Priekuli Plant Breeding Institute (LV); State Stende Cereal Breeding Institute (LV); Stichting Dienst Landbouwkundig Onderzoek (NL); Swedish University of Agricultural Sciences (SE); Technical University of Denmark (DTU) (DK); Technische Universität München (TUM) (DE); Thise Mejeri Amba (DK); Trifolio-M GmbH (DE); Università di Pisa (IT); Università Politecnica delle Marche (UPM) (IT); Università degli Studi della Tuscia (IT); Universität für Bodenkultur (BOKU) (AT); Universiteit Gent (BE); University of Barcelona (ES); University of Copenhagen (DK); University of Kassel (DE); University of Maribor (SI); University of Perugia (UNIPG) (IT); University of Turin (IT); University of Udine (IT); VFL (DK); Thünen Institute (VTI) (DE); Wageningen University, Department of Plant Sciences (WU) (NL); Weihenstephan-Triesdorf University of Applied Science (DE); Wim Govaerts & Co (BE).

Outputs

Publications

Three issues (111-113) of the ORC Bulletin were published during the year, including many articles from ORC staff which are not itemised in the following list of publications.

Peer-reviewed papers indicated with an asterisk (*).

Anon (2012) Animal health of ruminants: A summary of research conducted under the German Federal Programme for Organic Agriculture and other forms of Sustainable Agriculture. Berlin, Eberswalde and Hamstead Marshall. <http://orgprints.org/21872>

Anon (2012) Food quality: A summary of research conducted under the German Federal

Programme for Organic Agriculture and other forms of Sustainable Agriculture. Organic Research Evaluations, Berlin, Eberswalde and Hamstead Marshall. <http://orgprints.org/21871>

Anon (2012) Knowledge transfer: A summary of research conducted under the German Federal Programme for Organic Agriculture and other forms of Sustainable Agriculture. Organic Research Evaluations, Berlin, Eberswalde and Hamstead Marshall. <http://orgprints.org/21870>

Anon (2012) Nutrition of monogastrics: A summary of research conducted under the German Federal Programme for Organic Agriculture and other forms of Sustainable Agriculture. Organic Research Evaluations, Berlin, Eberswalde and Hamstead Marshall. <http://orgprints.org/21874>

Anon (2012) Plant protection in organic apple production: A summary of research conducted under the German Federal Programme for Organic Agriculture and other forms of Sustainable Agriculture. Organic Research Evaluations, Berlin, Eberswalde and Hamstead Marshall. <http://orgprints.org/21875>

Anon (2012) Plant protection in organic arable and horticultural production: A summary of research conducted under the German Federal Programme for Organic Agriculture and other forms of Sustainable Agriculture. Organic Research Evaluations, Berlin, Eberswalde and Hamstead Marshall. <http://orgprints.org/21869>

Anon (2012) Regional marketing: A summary of research conducted under the German Federal Programme for Organic Agriculture and other forms of Sustainable Agriculture. Organic Research Evaluations, Berlin, Eberswalde and Hamstead Marshall. <http://orgprints.org/21873>

Anon (2012) Soil Fertility: A summary of research conducted under the German Federal Programme for Organic Agriculture and other forms of Sustainable Agriculture. Organic Research Evaluations, Berlin, Eberswalde and Hamstead Marshall. <http://orgprints.org/21868>

Cook SM, Döring TF, Ferguson AW, Martin JL, Skellern MP, Smart LE, Watts NP, Welham SJ, Woodcock C, Pickett JA (2013) Development of an integrated pest management strategy for control of pollen beetles in winter oilseed rape. HGCA report, 139 pp (in press).

Crowley O, Winkler LR, Howlett S, Döring TF, Wolfe MS (2013) Is mass selection a tool to improve quality in winter wheat composite cross populations? In: **Döring TF, Howlett S, Winkler LR, Wolfe MS** (Eds.): International Symposium on Evolutionary Breeding in Cereals. Aston University, Birmingham, 21 January 2013.

Döring TF, Baddeley JA, Brown R, Collins R, Crowley O, Cuttle S, Howlett SA, Jones HE, McCalmann H, Measures M, Pearce BD, Pearce H, Roderick S, Stobart J, Storkey J, Tilston EL, Topp K, Watson C, Winkler LR, Wolfe MS (2013) Using legume-based mixtures to enhance the nitrogen use efficiency and economic viability of cropping systems project final report. <http://orgprints.org/24662/1/PR513.pdf>

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***Döring TF, Cook S** (2012) Colour choice behaviour in the pollen beetle, *Meligethes aeneus* (Coleoptera: Nitidulidae). Physiological Entomology pp360-378. doi: 10.1111/j.1365-3032.2012.00850.x

***Gerrard CL, Janssen M, Smith LG, Hamm U, Padel S** (2013) UK consumer reactions to organic certification logos. British Food Journal 115(5). <http://orgprints.org/22557/>

***Girling RD, Lusebrink I, Farthing E, Newman TA, Poppy GM** (2013) Diesel exhaust rapidly degrades floral odours used by honeybees. Scientific Reports 3:2779.

***Girling RD, Higbee BS, Cardé RT** (2013) The plume also rises: Trajectories of pheromone plumes issuing from point sources in an orchard canopy at night. Journal of Chemical Ecology 39:1150-1160.



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- Hieronimus C, Howlett S, Winkler L, Döring TF, Fradgley N, Finckh MR, Wolfe MS (2013) Phenotypic comparison of winter wheat mixtures and composite cross populations. In: **Döring TF, Howlett S, Winkler LR, Wolfe MS** (Eds.): *International Symposium on Evolutionary Breeding in Cereals*. Aston University, Birmingham, 21 January 2013.
- Hitchings R** (2013) Key factors determining the long term success of CSA projects in Wales. *Better Organic Business Links (BOBL) project report*. Organic Centre Wales, Aberystwyth. http://www.organiccentrewales.org.uk/uploads/csa_survival_report.pdf
- ***Howlett SA** (2012) Terrestrial slug problems: classical biological control and beyond. *CAB Reviews* 7(51). doi: 10.1079/PAVSNNR20127051
- Knapp S, Snape J, **Döring TF, Wolfe MS, Griffiths S** (2013) Genetic analysis of evolving winter wheat populations reveals reversion to wild type. In: **Döring TF, Howlett S, Winkler LR, Wolfe MS** (Eds.): *International Symposium on Evolutionary Breeding in Cereals*. Aston University, Birmingham, 21 January 2013.
- Leach K, Barker Z, Maggs C, Sedgwick A, Why H, Bell N, Main D** (2012) Activities of organic farmers succeeding in reducing lameness in dairy cows. In: **Rahmann G, Godinho D** (Eds.) *Agriculture and Forestry Research* 362:143-146.
- Leach K, Gerrard CL, Kudahl AB, Nykänen A, Vaarst M, Weissensteiner R, Padel S** (2012) Assessing the sustainability of EU dairy farms with different management systems and husbandry practices. In: **Rahmann G, Godinho D** (Eds.) *Agriculture and Forestry Research* 362:277-281.
- Leach K, Richmond R, Waterfield W** (2013) Monitoring productivity of a UK dairy system aiming to increase soil carbon, based on diverse swards and incorporating mob grazing. *Proc. British Grassland Society 11th Research Conference, SRUC, Dumfries*. Sept 2013.
- Leach K, Smith J, Padel S** (2013) Sustainable grass farming. *Grass and Forage Farmer* 114 (Autumn 2013):4.
- Muller A, Olesen JE, Davis J, **Smith L, Dyttrtova K, Gatteringer A, Lampkin N, Niggli U** (2012) Reducing global warming and adapting to climate change: The potential of organic agriculture. Working paper, Forschungsinstitut für biologischen Landbau (FiBL), Frick, CH.
- Nelder R, Smith J, Clements R, Pearce B** (2012) 100% local and organic: closing the protein gap for poultry in the ICOPP Project. In: **Rahmann G, Godinho D** (Eds.) *Agriculture and Forestry Research* 362:385-387.
- OCW (2013) *Community Supported Agriculture: A survival guide for projects*. *Better Organic Business Links (BOBL) project report*. Organic Centre Wales, Aberystwyth. http://www.organiccentrewales.org.uk/uploads/csa_survival_a5_english.pdf
- Padel S** (2013) Organic farming as a European innovation system. *Proceedings of the NJF workshop: Organic farming systems as a driver for change*. *NJF Report* 9(3):15. <http://org-prints.org/23321/>
- Rinne M, Dragomir C, Kuoppala K, Marley C, **Smith J, Yanez Ruiz D** (2012) Novel and underutilized feed resources – potential for use in organic and low input dairy production. In: **Rahmann G, Godinho D** (Eds.) *Agriculture and Forestry Research* 362:404-407.
- Schaack D, Lernoud J, **Padel S, Willer H** (2013) The organic market in Europe in 2011: Nine percent increase compared with 2010. In: **Willer H, Lernoud J, Kilcher L** (Eds.) *The World of Organic Agriculture: Statistics and Emerging Trends* 2013. IFOAM, Bonn; FiBL, Frick. pp. 224-229.
- ***Schader C, Lampkin N, Christie M, Nemecek T, Gaillard G, Stolze M** (2013). Evaluation of cost-effectiveness of organic farming support as an agri-environmental measure at Swiss agricultural sector level. *Land Use Policy* 31:196-208.
- Smith J, Leach K, Rinne M, Kuoppala K** (2012) Integrating willow-based bioenergy and organic dairy production – the role of tree fodder for feed supplementation. In: **Rahmann G, Godinho D** (Eds.) *Agriculture and Forestry Research* 362:394-397.
- Smith J, Westaway S, Briggs S, Pearce B, Lampkin N** (2013) Can agroforestry deliver production and environmental benefits in the next Rural Development Programme? Report for Natural England, Peterborough. 117 pp
- Smith LG, Williams, AG, Pearce, BD** (2013). Energy use in organic systems. Paper presented at Tyndall Centre Climate Transitions Conference, Cardiff University, 3-5 April 2013.
- ***Varah A, Jones H, Smith J, Potts S** (2013) Enhanced biodiversity and pollination in UK agroforestry systems. Spotlight article, *J Sci Food Agric* 93(9):2073-2075.
- Winkler LR, Pearce H, Fradgley N, Döring TF, Howlett S, Whitley A, Wolfe M** (2013) Baking quality of two winter wheat CCPs in the UK. In: **Döring TF, Howlett S, Winkler LR, Wolfe MS** (Eds.): *International Symposium on Evolutionary Breeding in Cereals*. Aston University, Birmingham, 21 January 2013.
- Wolfe MS, Jones HE, Howlett S, Pearce H, Winkler LR, Crowley O, Stobart R, Döring TF** (2013). Adaptive winter wheat populations in the UK: selected results. In: **Döring TF, Howlett S, Winkler LR, Wolfe MS** (Eds.): *International Symposium on Evolutionary Breeding in Cereals*. Aston University, Birmingham, 21 January 2013.

Events organised

- TILMAN-Org project annual meeting, Birmingham (Jan-13).
- The International Symposium on Evolutionary Breeding in Cereals, Birmingham (Jan-13)
- 7th ORC Producer Conference, Birmingham (Jan-13)
- COBRA project Kick-off meeting, Bonn, Germany (Mar-13)
- Organic Data Network project stakeholder workshop and project meeting, ORC Newbury (Mar-13)
- IFOAM UK groups and English Organic Forum meeting, Bristol (Apr-13)
- STOAS project training course, ORC Newbury (Jun-13)
- TWECOM project working group meeting, ORC Newbury (Jun-13)
- Greenhouse Gas Platform 2013 Knowledge Exchange Workshop, Birmingham (Jun-13)
- Ekhaga Health Concepts project, second expert workshop in Frankfurt, Germany (Jun-13)
- ORC Open Day, Wakelyns Agroforestry (Jun-13)
- Prince of Wales's Food and Farming Summer School, ORC Newbury (Jul-13)
- Swedish Board of Agriculture study tour of organic growers in Southern England (Aug-13)
- European Innovation Partnership Network: Organic Focus Group, ORC Newbury (Sep-13)
- IOTA conference, Loddington, Leicester. (Sep-13)

Events contributed to

- DOFF Farmer Field Lab. Compost. Hankham, Sussex (Nov-12)
- DOFF Farmer Field Lab. Strategies for decreasing antibiotic use. Bishopstone, Wilts (Nov-12)
- APPG Agroecology, Westminster, Soils meeting (Dec-12)
- Oxford Real Farming Conference (Jan-13)
- Biofach, Germany (Feb-13)
- 12th Science Conference of Organic Agriculture, Bonn (Mar-13)
- TP Organics meeting, Dublin (Apr-13)
- IFOAM EU CAP reform event, Dublin (Apr-13)
- Soil Association Managing Soils event, Wales (Apr-13)
- NERC Workshop: Addressing knowledge needs of sustainable agriculture (May-13)
- CORE Organic research seminar, Netherlands (May-13)
- DG Agri & SANCO Seed regulation meetings, Brussels (May-13)
- FQH conference, Warsaw, Poland (Jun-13)
- Farm Woodland Forum Annual Meeting, Fife (Jun-13)
- Cereals 2013, Boothby Graffoe (Jun-13)
- EU Knowledge Transfer Conference, Eire (Jun-13)
- EU Expert Group on Technical Advice of Organic Production plenary meeting, Brussels (Jun-13)
- TP organic stakeholder forum, Brussels (Jun-13)
- Policy Panel EU Parliament: Agroecology for Sustainable Food Systems in Europe, Brussels (Jun-13)

- Cordiale Conference - Understanding and managing landscape change, Logonna-Daoulas, France (Jun-13)
- National Organic Cereals Event, Shropshire (Jul-13)
- DEFRA EU Seed Regulations Stakeholder Workshop, Cambridge. (Jul-13)
- IFOAM Round Table on Organic Agriculture and Climate Change Meeting, Bonn (Jul-13)
- UK Organic Policy Forum, Defra, London (Jul-13)
- Royal Welsh Show (Jul-13)
- SUSTAIN meeting Antibiotic resistance and over-use of antibiotics in farming, London (Jul-13)
- Farming with Trees event, Soil Association and Woodland Trust, Rhug Estate, Wales (Jul-13)
- Soil Association poultry action plan launch, Gloucestershire (Aug-13)
- DOFF Sustainability Assessment Workshop, Yorkshire (Aug-13)
- Delegation from Chinese Ministry of Agriculture to ORC Elm Farm (Sep-13)
- Hands on Hedges conference, Netherlands (Sep-13)
- ECO-PB General Assembly, Göttingen (Sep-13)
- EUCARPIA Conference, Göttingen (Sep-13)
- Agroforestry training event, Denmark (Sep-13)
- ECO-PB Seed Workshop, Brussels (Oct-13)

Directorships, Memberships of Boards and Government Committees

- Döring, TF** Fellow, Royal Entomological Society
- Girling, RD** Member, International Society of Chemical Ecology
- Girling, RD** Member, European Innovation Platform Agri Focus Group for Integrated Pest Management in Brassica
- Girling, RD** Visiting researcher at Southampton University
- Hitchings, R** Pool member, European Commission Expert Group for Technical Advice on Organic Production
- Hitchings, R** Secretary, Organic Growers' Alliance
- Howlett, S** Secretary, European Consortium for Organic Plant Breeding
- Lampkin, N** Permanent member, European Commission Expert Group for Technical Advice on Organic Production.
- Lampkin, N** Member, Defra/Natural England Agri-environment Stakeholders Group
- Lampkin, N** Member, Agricultural Industry Greenhouse Gas Action Plan Steering Group
- Lampkin, N** Member, NFU Organic Issues Group
- Lampkin, N** Director, Task 37/PROBIOGAS UK
- Lampkin, N** Co-ordinator, English Organic Forum
- Measures, M** Director, Neil Wates Trust (Commonwork)
- Measures, M** Trustee, Foundation of Rachel and Pamela Schiele
- Padel, S** Member, Steering Group, Better Organic Business Links, Organic Centre Wales
- Padel, S** Member, Steering Committee of the EU Technology Platform 'TP Organics'
- Padel, S** Pool member, European Commission Expert Group for Technical Advice on Organic Production
- Pearce, B** Director and Member of Management Committee, GM Freeze
- Pearce, B** Pool Member, European Commission Expert Group for Technical Advice on Organic Production
- Pearce, B** Member, IFOAM EU Poultry Expert Group
- Smith, J** Member, Farm Woodland Forum Executive Committee
- Smith, J** Member, European Agroforestry Federation Executive Committee
- Smith, J** Member, North Wessex Downs AONB Council of Partners
- Smith, L** Member, All Party Parliamentary Group on Renewable and Sustainable Energy
- Smith, L** Member, Round Table for Organic Agriculture and Climate Change
- Smith, L** Member, Greenhouse Gas Action Plan for England Steering Group
- Woodward, L** Director, Future Sustainability Ltd
- Woodward, L** Director, Organic Arable
- Woodward, L** Director, Organic Seed Producers
- Wolfe, M** Hon. Member, British Society for Plant Pathology
- Wolfe, M** Director, East Anglia Food Link

