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Soil matters

ORC Principal Consultant Roger Hitchings trains Future Growers in the importance of soil. See Roger retires (p17). Photo: Rachel Harries/Soil Association



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Organic Research Centre Bulletin

No. 112 – Spring/Summer 2013



News in brief

Landmark ruling on eco-smallholdings in Devon

The Ecological Land Co-op has been granted planning permission to develop three affordable residential smallholdings for new entrants to ecological agriculture. Their applications, made in December 2011, were recommended for approval by Mid Devon District Council's planning department, but refused by Councillors in June 2012.

The Inspector, at appeal, did not agree with the Councillors that there was no 'essential need' to live on the land. Expert witnesses at the appeal included ORC's Roger Hitchings, who provided evidence on the suitability of the site for the proposed businesses.

The Inspector concluded that the Council had failed to have regard for their 'aims of addressing the need to reduce the negative impacts of conventional farming and globalised food distribution'. Inspector Graham continued: "I accept that the labour-intensive nature of such practices, necessary to ensure that a sustainable livelihood could be developed without resort to agro-chemicals and the reliance on fossil fuels, would require the worker's presence and involvement to such an extent that the need could only be met by living on site".

The Ecological Land Co-op is selling two of the holdings (6.87 and 8.45 acres) near Holcombe Rogus in Devon, with permission to build a low impact dwelling, shared lane access, shared barn, PV solar array, potable water supply and on-site biological grey water treatment.

ORC trains European advisors

The second course of Sustainability Training for Organic Advisors (STOAS) was held at ORC in June 2013. The main aim of the course was to improve the understanding of the concept of sustainability and introduce advisors from Denmark, Germany, Austria, the Netherlands and the UK to using the Public Goods Tool developed by ORC.

Sustainability assessment tools like the Public Goods tool and the Swiss/German developed Response-Inducing Sustainability Evaluation (RISE) tool can help review the various aspects of sustainability, and can guide towards a discussion of what practical action farmers can take to improve the overall sustainability of their farm. The discussions on economic, social and environmental aspects of sustainability illustrated that people have different views on what is most important to become more sustainable, but that for most farms financial viability is an essential element of farm sustainability.

CORE Organic research seminar

CORE Organic II (COII) is a transnational ERANET project supported by the European Commission to coordinate organic research programmes between partner countries.

COII held a research seminar in Amsterdam on 15th May 2013, which brought together the co-ordinators from its funded projects to present and discuss their work with the team as well as the national funders. In all 14 projects were represented at different stages of delivery. Some, such as TILMAN-ORG

(Reduced tillage and green manures) and ICOPP (100% organic feed for pigs and poultry) are about half way through while others, such as COBRA (Coordinating organic plant breeding activities for diversity) are just starting. Project themes range from management of soft fruit pests (Softpest Multitrap), fast methods for authentication of organic plant based foods (AuthenticFood) and strategies to reduce environmental impact by improving health and welfare of organic pigs (ProPig). ORC is co-ordinating COBRA and Bruce Pearce represented the project at the seminar.

UK consumer reactions to organic logos

ORC staff and colleagues from the University of Kassel in Germany have completed a study to ascertain the reaction of UK consumers to organic certification labels commonly used in the UK. The findings show that UK consumers are willing to pay more for products with organic certification logos as long as they recognise the logos and trust the underlying certification. UK consumers have concerns over the authenticity of organic food and are not fully aware of the certification and inspection process, but do have some trust in the Soil Association and OF&G logos and so are willing to pay a premium for products labelled with these.

Gerrard CL, Janssen M, Smith LG, Hamm U, Padel S (2013) UK consumer reactions to organic certification logos. *British Food Journal*, 115(5).

Sustainability indicators from financial data?

ORC and IBERS researchers have looked at analysing existing financial survey data as a method to provide indirect indicators of farms' environmental performance. For example could the Farm Business Survey's (FBS) cost of fertiliser per hectare, be an indicator for fertiliser use? Or could the sum of fertiliser, pesticide and purchased concentrate costs be an indicator of intensification?

ORC's research concludes that the data could be used to compare conventional and organic farms and to show changes in environmental performance over time. but with some limitations. Financial data provides no means for measuring environmental indicators such as biodiversity. The analysis is also limited by using costs as a proxy for physical amounts. More accurate input indicators could derived if the FBS included physical quantities e.g. of fertilisers/concentrates used.

Certain indicators could also be looked at on an EU level, through the Farm Accountancy Data Network (FADN), which collates farm economic data across the EU. This was a part of the FACEPA project, with some results presented in Bulletin 105.

Gerrard CL, Moakes S, Padel S (2012) The use of Farm Business Survey data to compare the environmental performance of organic and conventional farms. *International Journal of Agricultural Management*, 2:5-16.

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About us

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The Organic Research Centre

is the UK's leading, independent research organisation committed to developing sustainable land management and food production systems based on IFOAM organic/agro-ecological principles; disseminating knowledge to current and future farmers/land managers and other related businesses; compiling evidence on systems performance and informing public debate through communication with policy makers and opinion leaders, and through them the wider public, in order to ensure the health and well-being of soil, plant, animal, people and the environment.

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Editorial: Paterson on GM - great speech but a catalogue of half-truths, myths and outright deception

Despite the furore in the "twittersphere" and the activist websites and blogs, Owen Paterson's speech will probably go unnoticed by most people in the UK. This is as it should be. The farming and environment minister gave what was supposed to be a 'game-changing' speech promoting an innovative technology that can change the world, but like GM it was high on hype and short on substance.

Speaking to a selected audience at Rothamsted Research, Owen Paterson finally gave the speech that has been touted around for weeks. He was promoting genetic engineering to an audience who are being paid by the taxpayer to promote genetic engineering.

To be fair, the speech – at least the text - is very good. A catalogue of half truths, myths and deception with accompanying deceptive references, but nonetheless good. It will pass by most right thinking people who mistrust politicians, industry, the media and scientists and in any case if they ever think about GMOs they are completely against and certainly don't want it anywhere near the food they eat.

Paterson did, however, make some claims and statements that need a response.

He said "the era of complacency about food production must come to an end". He is right. Leaving food production to the market and the control of no more than five multi-national corporations is no way to provide food for all equitably and healthily.

He said we must "use all the available tools" in order to feed the world. He is right. So why does the UK government not fund agro-ecological methods which are recognised by the FAO and others as the best way of feeding hungry people? Why is this tool left in the box and GM over-promoted?

He said that 29 countries are growing GM. He is right, but why does he not say that over 40% of GM crops are grown in the US and two countries – Argentina and Brazil – make up most of the rest? Why doesn't he ask why this is?

He said that GM is a success. He is right in a few places, but in most places it makes no difference and in some places it has been a social, economic and environmental disaster (see p.20)

Of course he is not going to say that. Just as he is not going to say that the EU Ombudsman has recently and repeatedly criticised the EU GM safety regulator as being too close to industry. Nor is he ever going to say that the GM safety assessments are fundamentally flawed and demonstrably so; nor that the health risks are becoming apparent but that government chooses to ignore them.

He said that we in the EU are importing and eating masses of GM animal feed. But product is from animals fed on this feed are never labelled as such.

How can we exercise choice when the facts are hidden from us?

Paterson said that GM benefits farmers, consumers and the environment. His speech laid out that assertion and gave very dubious references to support it. The UK public, the EU public and increasingly the US public know and are saying this assertion is bullshit.

Translating that into language that Paterson et al. can understand requires citizens to act.

Lawrence Woodward

About the Bulletin

We owe all our loyal readers a sincere apology for the absence of a Spring edition of the ORC Bulletin this year – you'll read elsewhere about some of the staff changes we've been experiencing. Meeting all our commitments has been challenging as a result. We are now back to full strength and able to bring you a bumper joint Spring/Summer edition full of the latest news on projects, practices, policies (and politicians). Cheers!



The trials (and odd tribulation) of the ORC Participatory Research Network

The ORC Participatory Research Network (PRN) is up and running. Farmers and growers are getting enthusiastically engaged, partly to address specific questions but always with a view to improving their systems. Louisa Winkler, Nick Fradgley and Katharine Leach report on the ups and downs of current activities with broccoli, beans and dairy.

On-farm participatory trials are difficult at the best of times and rely on the flexibility and commitment of farmers. Trials, like day-to-day farming, do run into problems with the weather or with pests and disease and unforeseen circumstances necessitate changes of plan as the following examples show.

Italian Broccoli but English weather

ORC researchers have been trialling populations of sprouting broccoli at Wakelyns Agroforestry in Suffolk as part of the SOLIBAM project¹.

One potential use of populations is as a source of breeding material from which growers could select, on their own farms, a subset of plants which best suit their local environmental conditions and market. This would give them a personalised ‘variety’, more diversified than a commercial one but consistent enough to be commercially useful. So we realised that a participatory programme with commercial grower involvement could be an important and complementary adjunct to our more usual research trials.

However, for this to work for both a research and a practical application, a good methodology must be developed whereby the farmer can conduct worthwhile evaluations and selections, and integrate the extra work into normal working schedules.

We decided therefore that the first trial should be a feasibility study to allow us to address the methodological questions such as what would be the appropriate approach to communications be (methods, frequency), and how do we write a protocol that works for the growers (level of detail, scoring systems)?

The primary focus of the trial was to assess the commercial viability of the plants which originate in Italy. These are green and leafy sprouting, quite common there but not so in the UK where purple sprouting broccoli is the norm.

We felt it was best for the first trial to begin by working with growers who we know well, have good communications with and whose growing sites are close enough to visit easily.

The trial started in 2012. Three growers agreed to participate and together we developed a protocol and scoring system.



Figure 1 Broccoli plant with spear rot (photo: S. Eglington)



Figure 2. Healthy broccoli plant (photo: S. Eglington)

They were sent twenty seeds for test plants, twenty seeds for control plants and urged to get in touch whenever they needed to. The growers’ engagement has been very encouraging. They actively used the protocol and kept in regular contact to ask questions or report progress.

“It doesn’t take long,” says Sam Eglington of Woodlands Farm, Norfolk. “It’s just remembering to do it.” From this perspective, the trial proceeded extremely well. Even the best-laid plans of mice and agricultural researchers, however, are not invulnerable to the forces of nature. Weather and (other) pests can easily destroy datasets, and this year’s very cold autumn meant that the broccoli plants grew less well than normal.

One grower’s plants have not grown large enough to produce harvestable sprouts, meaning the loss of one-third of the possible datasets. Another dataset was lost when slugs destroyed the seedlings at a second grower’s site. Such occurrences are impossible to predict, and the way to prevent them from being problematic in agricultural trials is numbers: with more individual grower-participants and more plants per grower. However, this was a small scale feasibility study and we were able to fulfil our goal of developing both a workable protocol structure and a familiarity with the right level of communication intensity.

Sam Eglington’s feedback on commercial viability has also been useful. From Sam, we have had positive indications: “I think it will be a niche item (restaurants and customers that don’t just want calabrese), and its viability will depend on how long a succession it can supply from different planting dates, and the distinctiveness of its flavour.”

Beans: more trials and tribulations

Field beans are a notoriously difficult crop to grow organically at the best of times. After last year’s particularly bad incidence of Chocolate Spot disease, on-farm participatory trials were set up for three farms in autumn 2012 to compare winter field bean varieties for their resistance to the disease. However, particularly wet weather conditions over autumn and winter meant that farmers across the country struggled to get winter crops drilled in good conditions or even at all.



Often, on-farm trials are last on the list to be drilled after the farmer's main crops, but two out of the three farmers were still able to drill the trial strips before Christmas. One trial was drilled thanks to the ingenuity of the farmer, who was only able to get onto the land to drill at night while the ground was frozen. It remains to be seen how well the trials will establish over the season but the farmers taking part will be able to compare what varieties work well under current conditions and on their own land.

Participatory work with dairy farmers

Arising from contact with farmers through the EU funded Sustainable Organic and Low Input Dairying (SOLID) project², work has begun on following the performance of a novel management system for dairy cows and calves, involving leaving the calves with the milking cows³.

An approach allowing unlimited suckling has been temporarily suspended due to the fact that a large proportion of the calves appeared to reach consumption of over 30 litres of milk a day. This was estimated from comparisons with the cows' yield in the previous lactation. A new strategy is required to optimise milk collection in the parlour whilst still allowing the calves to suckle enough to maximise their health, welfare and growth potential.

Groups of farmers interested in diverse swards and mob grazing have been established. Monitoring of cow performance and measurement of herbage production will be carried out in an existing mob grazing system.

Through the 'Field Labs' funded by Duchy Originals Future Farming project, we are involved with another group of dairy farmers working towards reducing use of antibiotics in their dairy herds. One member of the group has been taking a close look at indicators of cow health relates to dietary inputs. This is a topic we plan to pursue further.

Another key area is improving the understanding and management of soils in dairy systems. A farm workshop on this topic has been organised in conjunction with the Prosoil project based at the Institute of Biological, Environmental and Rural Sciences (IBERS) in Aberystwyth⁴.

The online survey on hedge browsing advertised in the last Bulletin has generated some interest and is still open at: https://www.surveymonkey.com/s/cattle_browsing_hedges

Don't watch from the gate - participate!

The more farmers get involved in this research approach, the more robust and valuable the information generated. And participation gives farmers and growers better insight to their own systems and an inside track to developing them.

Information on how to join the ORC Participatory Research Network can be found on our website or by contacting Bruce Pearce (overall, poultry/pigs) and Mark Measures (overall, beef/sheep), Katharine Leach (dairy), Nick Fradgley (arable) and Anja Vieweger (horticulture).

References

1. http://www.organicresearchcentre.com/?go=Research%20and%20development&page=Plant%20breeding&i=projects.php&p_id=29
2. http://www.organicresearchcentre.com/?go=Research%20and%20development&page=Livestock&i=projects.php&p_id=21
3. www.creamogalloway.co.uk
4. http://www.aber.ac.uk/en/ibers/research/major_research_projects/prosoil/comment@organicresearchcentre.com

Research and innovation needs for the future of farming

ORC has been identifying the innovation gaps and needs of organic and agro-ecological producers as part of the Duchy Originals Future Farming project. Bruce Pearce reports on the findings.

We undertook an online survey to access producer views over a wide geographical area. This was backed up by: a) meeting producers at a number of events (The National Organic Cereals 2012, the Soil Association/ORC Organic Poultry Conference 2012, ORC 2013 Organic Producer Conference and the EU Sustainable and Low Input Dairying project stakeholder consultation) and b) accessing data from other groups such as the Organic Growers Alliance research needs survey.

The online survey ran from 10/08/2012 until 29/11/2012 and elicited 169 responses. Most respondents were certified organic with a small number either in conversion, farmed conventionally or they placed themselves in the undefined "other" category (Figure 1). With the exception of the pig sector, we received responses in significant numbers from all agricultural enterprise type (see Figure 2).

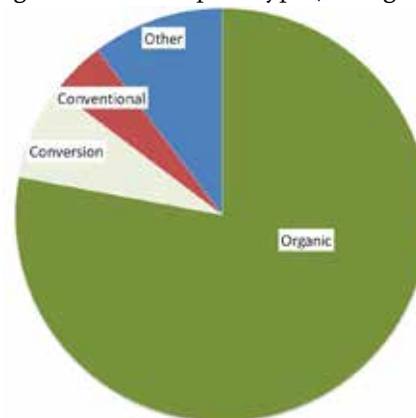


Figure 1: Proportion of producers who said they were organic, in conversion, conventional or other (not defined) from our producer survey.

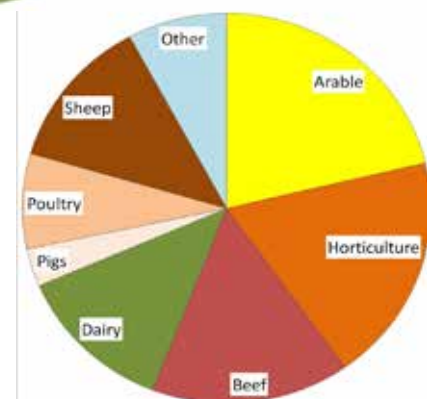


Figure 2: The proportion of enterprise types of the producers who responded to our survey.

The responses are summarized in the list overleaf. They give a clear and relatively wide focus of research needs for organic and agro-ecological producers.

As might be expected there are a number of cross cutting or common priorities including breeds suitable for organic and agro-ecological production, weed management, feed, grassland productivity and management.

These priorities will feed into the sector roadmaps being produced within the DOFF programme as well as future research funding calls.

**Arable**

- Breeding cereals for organic systems
- Trialing of arable varieties for agro-ecological systems
- Fertility building in stockless systems
- Soil management techniques
- Managing soil biota
- Manure management
- "Mintil"/non-inversion tillage in agro-ecological systems
- Nutrient supply
- Organic inputs
- Increasing arable yields in agro-ecological systems
- Mixed or bi-cropping cereals in agro-ecological systems
- Cover crops
- Undersowing of arable crops in agro-ecological systems
- Disease management in organic arable systems
- Organic seed dressing for bird control
- Weed management & techniques
- Perennial weed management
- Profit during fertility building
- Establish organic market based on superior nutritional quality
- Improved marketing of organic products

Dairy

- Breeds for organic and agro-ecological systems
- Breeding for production
- Climate effects
- Feed/breed interactions
- Drought tolerant crops
- Grassland management for productivity
- Alternative approaches to feeding
- Hbage production
- Home-grown protein
- Home-grown feed
- Increasing longevity
- Outwintering
- Parasite control
- Reduced energy use
- Reducing antibiotic use
- Managing soil biota
- Soil fertility; Soil organic matter/C
- Weed management & techniques

Pigs & Poultry

- Alternative protein sources for pigs and poultry
- Improved range and forage for monogastrics
- Suitable poultry breeds for organic/agro-ecological systems
- Organically acceptable ways to control of parasites in poultry

Beef & Sheep

- Breeds for organic and agro-ecological systems
- Grassland management for productivity
- Alternative TB controls
- Management of worm burdens
- Outwintering
- Home-grown protein
- Perennial weed management
- Trace element deficiencies
- Management of parasites
- Improved marketing of organic products

Horticulture

- Identification of suitable varieties
- Seed availability
- Improved nutritional quality
- Managing soil biota
- Soil organic matter/C
- Soil management techniques
- Composting
- Control of brassica whitefly
- Control of slugs
- Control of flea beetle
- Information on beneficial antagonists

Duchy Originals Future Farming Research Fund

A key part of The Duchy Originals Future Farming (DOFF) project is the participation by farmers and growers in 'field labs' designed to develop skills and share knowledge. A complementary development is a small research fund which, as Euan Brierley explains, is open to any professional researcher who wants to work alongside farmers and growers and both the researcher and the producer are eligible for grant aid.

DOFF is managed by the Soil Association, with support from the ORC, and whilst the research fund is eminently suitable for projects developed through ORC's Participatory Research Network, it is open to the wider research and producer community.

Modest money but high impact

Despite offering relatively modest grants, the fund should be attractive to researchers because it provides an outstanding opportunity to deliver research with real impact. Over forty good ideas to improve agro-ecological systems have come from farmers and growers.

They have told us they want help with challenges ranging from weed control to animal welfare. Some topics focus on practical implementation, for example on pasture cropping or zone tillage, others are looking for natural solutions to manage pests, such as push/pull control of flea beetle. Some suggestions propose development of technology, including laser weeding or precision manure spreading.

Criteria for success

A crucial stage in the process is to team up interested researchers with farmers and growers to ensure that the problems and needs are thoroughly understood. This will also pay dividends later, ensuring results reach their target

audience. It follows that we will also put farmers and growers at the heart of reviewing proposals, alongside a strategic review of the science.

Proposals are assessed against a number of criteria:

- How far could answering the research question improve productivity, quality or environmental performance in organic or other agro-ecological systems?
- How many farmers or growers could benefit?
- What would be the wider benefits to environment and society?
- Are there practical plans to get relevant findings to those who could use them?
- Are the proposed methods appropriate to address the research question?
- Does the team have the knowledge and capacity to succeed?
- Does the project offer value for money?

Research winners

The Soil Association has announced the winners of the first of their farmer-led innovative research grants funded by DOFF. The four projects selected for a research grant were:

- *Using green manures instead of spraying glyphosate around fruit trees in cider orchards.* The research is led by



New projects at ORC

Coordinating Organic Plant Breeding Activities for Diversity (COBRA)

ORC is to lead a new three-year project funded under the European CORE Organic ERA-NET programme. It involves coordinating 41 partner organizations from 18 European countries in a project, worth €3 million.



The aim is to support and develop organic plant breeding and seed production with a focus on increasing the use and potential of plant material with high genetic diversity in cereals (wheat and barley) and grain legumes (pea and faba bean) through coordinating, linking and expanding existing breeding and research.

Although production approaches based on high genetic diversity have shown promising results in organic systems and are currently subject to intensive research (such as ORC's work on populations), their benefits cannot at present be exploited, due to agronomic, regulatory and other hurdles.

Nor is it clear which plant breeding approaches are the most efficient to breed varieties for organic agriculture. Therefore, COBRA aims:

1. To improve methods to ensure seed quality and health
2. To determine the potential to increase resilience, adaptability, and overall performance in organic systems by using crop diversity at various levels
3. To improve breeding efficiency and to develop novel breeding methods to enhance/maintain crop diversity
4. To identify and remove structural barriers to organic plant breeding and seed production
5. To improve networking and dissemination in organic plant breeding.

Methodologies for sustainability assessment and monitoring in eco/organic agriculture

A new two-year project funded by the Ekhaga Foundation



will pool the extensive experience of ORC and the Swiss Research Institute of Organic Agriculture (FiBL) in developing methods for sustainability assessment of organic farming, to support farmers and policy makers in decision-making.

The project will build on the FAO Sustainability Assessment of Food and Agriculture systems (SAFA) guidelines and other relevant approaches to produce sets of societal level indicators. This will involve;

- Evaluating existing sustainability assessment approaches of farms and identifying suitable indicators or sets of indicators to assess the sustainability performance of ecological/organic farms by evaluating their environmental integrity, economic resilience, social wellbeing and good governance
- Using the scientific literature to explore the inter-dependencies between the identified performance outcomes and indicators
- Synthesise the results into draft guidelines for applications of the indicator sets to assess and monitor the sustainability performance of organic/ecological farms with respect to farmer decision-making, policy monitoring and labelling/communication with consumers.

The project will also work closely with the International Federation of Organic Agricultural Movements (IFOAM) initiatives on sustainable of organic farming and in particular the Best Practice Reference Guide of the Sustainable Organic Agriculture Action Network (SOAAN).

Continued from p.6

the Bulmer Foundation's ONE project in conjunction with Henry Weston of Weston's Cider, Jim Clay of Showle Court and Chris Cotton of Hutchinsons.

- *Managing flea beetle and other pests on Brassica crops.* The research is led by Dr Pat Croft of Stockbridge Technology Centre, with consultants Phillip Effingham of GreenTech Consultancy, Dr George of Northumbria University and Prof Wackers of Leeds University. The trial sites will be on farms such as Polybell, Tesco's Organic Grower of the Year.
- *Control of common couch by using cover crops in organic rotations.* The idea was put forward by Cyril Blackmore, a root crop grower in Devon, who will be taking part in the research. The project is led ADAS Boxworth.
- *Biochar in animal feed.* The research is led by the Biochar Research Centre, University of Edinburgh, in conjunction with Pete Richie of Whitmuir Organics.

This is an exciting model for user-led research. We intend to demonstrate its effectiveness through DOFF and lobby the major research funders to adopt the model.

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Organic Centre Wales reborn

The Organic Centre Wales (OCW) partnership of Organic Research Centre, ADAS and Aberystwyth University have been successful in their bid to deliver 'Organic advisory services' to the Welsh Government from 2013-2015.

A major focus of the work will be the development of the new Welsh organic farming scheme. OCW is starting by collecting information from stakeholders to assess their experiences of the current organic scheme and identifying issues that will need to be addressed in any future scheme, and looking forward to continuing discussions at the Royal Welsh Show. Based on this, proposals for the new scheme will be developed and put out to consultation in the autumn.

During the next few months Welsh organic producers and others will become more aware of OCW's revived activities at the Royal Welsh Show and the Winter Fair, visiting the OCW website and enjoying the updates in future editions of the new Cymru Organig magazine and e-bulletin. OCW will also be running its annual producer survey again in the autumn.

Beans and wheat intercropping: a new look at an overlooked benefit

Nearly a decade ago and after several years of R&D, ORC researchers were convinced that intercropping of beans and wheat would be a valuable approach for organic farmers. Despite clear evidence of benefit few took it up. It is now being rediscovered by researchers in other countries. **Martin Wolfe**, one of the earliest proponents of the approach, has never doubted its value. Here he, **Nick Fradgley**, **Louisa Winkler** and **Thomas Döring** report on a trial last year, at Wakelyns Agroforestry, intercropping spring wheat and beans.



Beans are an important crop, mainly used for high protein livestock feed, and wheat is a valuable cash crop. However, beans are often unreliable under organic conditions as yields can be depressed by Bruchid beetle attack, Chocolate Spot disease and weed competition. Intercropping wheat with field beans can be a practical approach to reduce these risks while making use of additional benefits.¹

Provided that the maturation time of the two crops is similar, they can be harvested together and either separated using a seed dresser or used as a mixed livestock feed. Alternatively, the intercrop can be used for whole crop silage.^{2&3} Depending on variety choice, there is the further possibility of using both crop components directly for human consumption.

There are several ways in which wheat and beans are complementary.

- Beans, being legumes, are able to fix and use atmospheric nitrogen whilst wheat only uses nitrogen already in the soil.
- Wheat plants sown at lower density (relative to their density in a monoculture) in a mixed crop may have access to more nutrients per plant than they would in a denser monoculture.
- Light competition in the intercrop is lower than in the sole crops as the two species make use of light resources in different parts of the canopy and at different times in the growing season.
- Disease incidence is also generally lower in diverse cropping systems as host plants are further apart from

each other, delaying the spread of pathogens.⁴ There are also several suggested mechanisms by which intercropping reduces pests; for example, beans may provide a habitat and food source for beneficial insects, thus controlling cereal aphid populations.

Intercropping - weeds and yield

A trial was carried out at Wakelyns Agroforestry in growing season 2012 to investigate the optimum drilling rates for a spring sown bi-crop of wheat and faba beans.

The wheat cultivar used was Paragon and the beans were Fuego. The replicated trial included plots of wheat- or bean-only sole crops as well as various combinations of wheat and bean intercrops sown at 75, 50 and 10% of their Recommended Density (RD) for sole cropping.

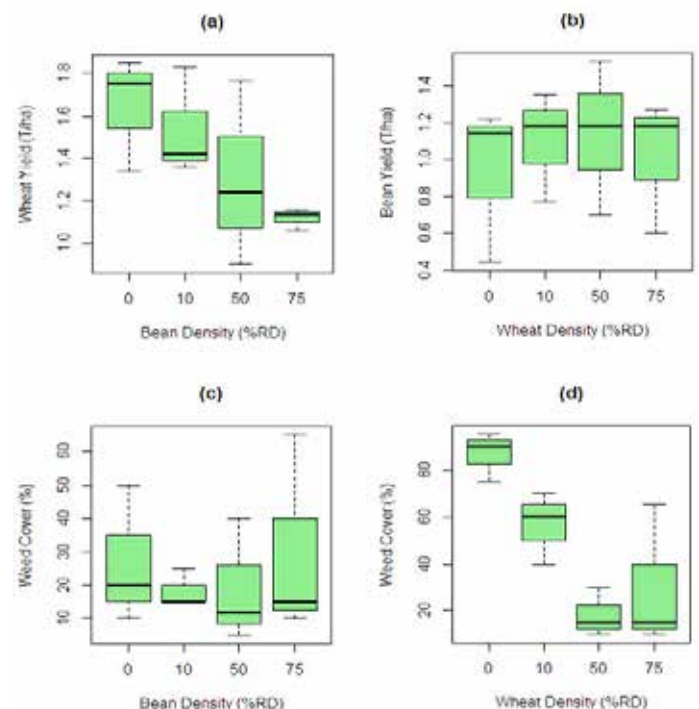


Figure 1: Yield in t/ha (panel a, b) and weed cover in % ground cover (panel c, d) depending on the density of the bean (a, c) or the wheat partner (b, d). In panel (a) wheat yield responds to the density of the accompanying bean; to keep results comparable only those plots are included in panel (a) where wheat is sown at 75% of the recommended density (RD). Conversely, panel (b) shows the response of the bean yield to the density of the wheat when the bean density is fixed at 75% RD. Similarly, weed cover (%) is shown for plots of wheat at 75% RD and varying bean density (c); and for plots of beans at 75% RD with the accompanying wheat at the variable % RD shown on the x-axis.



The results of this one year trial can be compared to a similar study by Hugh Bulson with Reading University and ORC¹.

The effects of intercropping on the yield of the intercrop components can be evaluated by observing how the yield of one crop at constant seed rate alters in response to changes in seed rate of the other (Figure 1a, 1b).

One finding in which the two studies concurred was that where wheat is drilled at 75% RD, its yield decreases as the bean density increases (Figure 1a). This may be due to the shading effect of the beans, which are tall and leafy, or to below-ground competition between the two species.

Bean yields, on the other hand, were relatively unaffected by increased wheat density (Figure 1b). Bean sole crop plots in the Wakelyns trial were very inconsistent, giving the highest and lowest bean yields in the whole trial.

In the field, we observed that the low-yielding bean plots had patchy crop growth due to high burden of both grass and broad-leafed weeds. However, bean yields were more stable in the intercropped plots, where the weed burden was also observed to be lower, particularly of grass weeds, and the amount of weed ground cover was negatively correlated with wheat sowing density (Figure 1d).

Bulson et al.¹ also observed reduced weed biomass in intercrop versus monocrop plots, a finding later confirmed by Hauggaard-Nielsen et al.⁵ for a series of grain legume-barley intercrops. One hypothesis is that the bean crop is sensitive to weed pressure, and that wheat is able to out-compete weeds, grass weeds in particular, and it exerts a weaker competitive effect on beans than the weeds it replaces.

A Land Equivalent Ratio (LER) is a useful way to test the effects of intercropping on yields. It is a measure of the area of land that would be required to reproduce the yield of a bi-crop component when grown as a monocrop.

An LER of more than one indicates a beneficial yield effect, and the higher the LER, the greater the benefit. LER can be used to compare drilling densities for optimum productivity.

In the study by Bulson et al., the highest LER was 1.29, which was generated by an intercrop of beans drilled at 75% RD and wheat also drilled at 75% RD. In the Wakelyns pilot trial, an even higher LER value of 1.65 was observed in plots with beans at 75% RD and wheat at 50% RD (Figure 2).

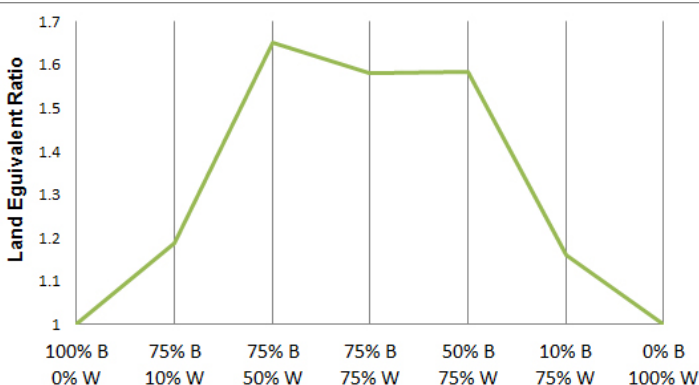


Figure 2. Land Equivalent Ratios of bi-crops relative to yields derived from monoculture plots. Seed rate of bi-crop components, wheat (W) and beans (B), is expressed as a percentage of Recommended Density (RD).

However, because the LER values are relatively similar for intercrops with RD between 50 and 75%, there is potential to adjust drilling rates to give priority to the crop that will yield a higher economic value.

Intercropping with populations and disease levels

In the Wakelyns trial, we were also interested in intercropping potential of a diversified Composite Cross Population (CCP) of wheat relative to the monoculture. We therefore included plots where the CCP and beans were both drilled at 75% RD. The CCP yielded significantly higher ($p < 0.05$), on average 68.5%, than the pure line wheat at the same RD.

Although a more robust comparison would need to include multiple varieties of wheat to compare with the CCP, this result gives a positive indication that CCPs have strong potential as an adaptable intercrop component with high nutrient-use efficiency.

Another aspect of intercropping is changes in disease patterns. Bulson et al. found increased disease incidence of mildew (*Erysiphe graminis*) on wheat when intercropped with beans, which is contrary to other studies suggesting reduced disease incidence in more diverse cropping systems.²

Bulson et al. suggested that this may be due to an increased mildew susceptibility of the wheat crop under higher nitrogen availability in the intercrop. Although similarly, wheat grown in a monoculture with added nitrogen fertiliser would also be subject to increased mildew susceptibility.

Mildew was not present in our spring trial and other diseases only at low levels with no significant trends regarding their incidence.

It is clear that more research needs to be done to see if these results are consistent against year-to-year variations in weather, pest and disease spectrum, and weed pressure. However, our trials do provide an encouraging glimpse into the potential of intercropping beans and wheat generally and in particular, making spring beans a more attractive option for organic farmers.

References

- Bulson HAJ, Snaydon RW, Stopes CE (1997). Effects of plant density on intercropped wheat and field beans in an organic farming system. *Journal of Agricultural Science* 128:59-71.
- Ghanbari-Bonjar A, Lee HC (2002). Intercropped field beans (*Vicia faba*) and wheat (*Triticum aestivum*) for whole crop forage: effect of nitrogen on forage yield and quality. *The Journal of Agricultural Science* 138:311-315.
- Ghanbari-Bonjar A, Lee HC (2003). Intercropped wheat (*Triticum aestivum* L.) and bean (*Vicia faba* L.) as a whole-crop forage: effect of harvest time on forage yield and quality. *Grass and Forage Science* 1:28-36.
- Finckh MR, Wolfe MS (2006). Diversification strategies. In: *The Epidemiology of Plant Diseases* (ed. Cooke, B.M., Jones, D.G., Kaye B.), Springer, Berlin.
- Hauggaard-Nielsen H, Jørnsgaard B, Kinane J, Jensen ES (2008). Grain legume-cereal intercropping: The practical application of diversity, competition and facilitation in arable and organic cropping systems. *Renewable Agriculture and Food Systems* 23:3-12.



Milk from forage on organic dairy farms

Milk from forage (MFF) has been used as an indicator of dairy enterprise performance since the 1970s. There is considerable evidence associating MFF with good economic performance. ORC researcher Katharine Leach and intern Gaëlle Feur have been looking at the MFF performance of some organic dairy farms.

Maximising milk from forage is an ideal that fits well with organic farming concepts, since feed self sufficiency is often regarded as a desirable goal and controlling purchased feed costs is particularly important as purchased organic feed is expensive. The ability to produce MFF reduces the dairy farm's vulnerability to fluctuations in the price and availability of purchased concentrates.

DairyCo's Milkbench+¹ consistently shows that forage utilisation contributes to profit in a wide range of dairy systems. Data from Canada show that farms with high MFF have better economic returns in the form of net income, work income per full time labour equivalent, and margin per cow.² The key fact is that the top 20% of farms ranked on MFF had 10% lower feeding costs than the bottom 20%. However, not all UK organic farmers take a low concentrate input approach. As Table 1 shows the amounts of concentrate fed in organic systems can be quite high. Nevertheless, good MFF levels are still being achieved.

The main influences on MFF are forage quality, type and level of concentrate feeding, stocking rate and calving pattern. Good economic returns from MFF require high forage intakes, which will only be achieved if the forage is available, palatable, well presented and (if necessary) supplemented with appropriate amounts and types of concentrate. The cheapest forage is of course grazed grass.

Calculating milk from forage

There are a number of ways of calculating MFF. The more complex ones involve measuring the energy of feed intake and recording accurately the amounts of forage and grazing accessed by the cows. However an estimate based on milk production and concentrate use is generally used.

In this case, the energy requirement of producing a litre of milk is calculated taking its fat and protein content into account and extrapolated to produce the annual energy requirement for the herd. Energy supplied by concentrate feeds for the year is calculated from the amounts fed and the feeds' metabolisable energy contents. This can account for a known number of litres of milk produced from concentrate and supplementary feed; the remainder is assumed to be MFF.

What should organic farmers aim for?

Available figures suggest that there is considerable variation in the annual rolling average of MFF on UK organic dairy farms. For example over the period 2003 to 2008, the lowest figure was 2753 l/cow in 2006 and the highest 3426 l/cow in 2004.³ It is likely that this change over time is due to seasonal variation in forage quantity and quality, the relative cost of purchased feed and price of milk, and the changing population of farms included in the sample. Current indicative benchmark figures can be seen in recent Kingshay data (Table 1), which summarises data for 30 organic farms using the annual rolling figures for June 2012.

How can high milk from forage be achieved?

Case studies carried out last autumn by Gaëlle Feur, an intern at ORC, studying at the University of Dronnten, illustrate that it is possible to achieve good returns from MFF with a variety of approaches. Table 2 outlines the relevant aspects of four farms with above average MFF.

Table 1: Annual rolling result for 30 organic herds, June 2012. Source: Kingshay

	Overall mean	Average of best 20% on MFF	Average of worst 20% on MFF
COWS IN HERD	179	197	183
MILK PRODUCTION			
Yield (l/cow)	6271	6147	6580
Yield from all forage (l/cow)	3281	4025	2287
% of total yield from forage	54	66	36
FEED			
Concentrate use (kg per cow)	1451	1049	1962
Concentrate use (kg per litre)	0.22	0.17	0.30
Concentrate price (£ per tonne)	313	291	319
Other purchased feed cost (£ per cow)	16.57	8.33	41.17
All purchased feed cost (p per litre)	7.30	4.98	10.04
MARGINS			
MOPF* (£ per cow)	1499	1583	1404
MOPF (p per litre)	24.21	25.96	21.47
Measures per hectare (n = 16)			
Stocking rate (cows/ha)	1.67		
Milk from forage (l/ha)	5421	insufficient data available	
MOPF (£ per ha)	2662		

* Margin over purchased feed

Common features of these farms include diets of mixed forages to boost forage intakes and optimise rumen function, well monitored rotational grazing, which ensures optimum quantity and quality of available herbage, and cross-breeding.

The last is common across organic herds so it is not clear how influential it is on MFF. However, all four farmers emphasised their policy is to breed for robust cows rather than milk production. The case study farms also demonstrated attention to detail in the storage and presentation of forages. They all used silage analysis to assist ration formulation.

Factors that vary between the farms include speed of grazing rotation and method of monitoring; and different calving times. The widely held view that the highest MFF will be achieved from a spring calving herd⁴ is not reflected in these farms.

In general, block calving is likely to result in higher MFF due to the ease of feeding cows more efficiently when they are at a similar stage of lactation. However, other factors that may be



Table 2: Performance and management characteristics of four organic farms with above average milk from forage

Farm		1	2	3	4
Cows in herd		235	170	184	144
Yield	(l/cow)	6522	6941	7604	6747
Yield from forage	(l/cow)	4708	4404	3878	4210
% of total yield from forage	%	72	63	51	62
Concentrate use	(kg/cow)	860	1260	1808	1157
	(kg/l)	0.13	0.18	0.24	0.17
Concentrate feed cost	(p per l)	4.32	5.23	7.63	5.22
Other purchased feed cost	(p per l)	0	0	0.04	1.02
All purchased feed cost	(p per l)	4.32	5.23	7.67	6.24
Margin over purchased feed	(£/cow)	1670	1728	1822	1660
Margin over purchased feed	(p per l)	26.36	25.07	24.23	24.8
Stocking rate	(cows/ha)	1.52	Not available	1.9	1.5
Yield from forage	(l/ha)	7143	Not available	7368	6309
Calving season		Spring & autumn	Spring & autumn	Autumn	Spring
Concentrates fed		Dairy cake, rolled barley, rape meal (protein-protected)	Dairy cake (summer), home-grown barley, home-grown beans	Dairy cake, barley, soya, rapeseed meal, sunflower, beans	Home-grown crimped barley/peas, soya
Winter feeding system		Parlour cake + TMR*	TMR*	Parlour cake + TMR*	TMR*
Forage					
Silage leys		Red clover Mixed leys inc. red clover Permanent pasture	Lucerne Mixed leys inc. sanfoin, red/white clover	3yr leys red clover/hybrid ryegrass 7-8 yr leys Ryegrass, white clover, timothy Permanent pasture	Red clover/Italian ryegrass Ryegrass, red/white clover, chicory
Grazing		Mixed leys inc. chicory Permanent pasture	Mixed leys inc. chicory Permanent pasture	Ryegrass, white clover, timothy Permanent pasture	Ryegrass, red/white clover, chicory
Wholecrop		Spring barley		Spring barley	Spring barley/peas
Grazing system		Rotational 21 days. Deferred grazing in winter	Rotational 30 days	Rotational 7 - 14 days	Rotational 21 days + strip grazing
Grazing monitoring methods		Platometer	Platometer	Ruler and "3-leaf system"	Grass heights "by eye"
Breeds		Cross-breeds: B/W, Ayrshire, Scandinavian Red, Jersey, Montbeliarde	British Friesian	Cross-breeds: Montbeliarde x Friesian, Some Ayrshire, Norwegian Red	Cross-breeds: Holstein, Montbeliarde, Swedish Red

* Total Mixed Ration

specific to the individual farm are also important.

Table 3 shows some of the case study farmers' personal views on the secrets of success and the challenges of producing high MMF.

The wide range of MFF values illustrated in Table 1 shows that there are organic farms with considerable potential to improve performance. Within the Sustainable Organic and Low Input Dairying (SOLID) project, ORC has the opportunity to explore this further and we would like to hear from more farmers who are achieving high MFF, or who would be interested in doing so.

Table 3: Comments from farmers producing above average milk from forage

Farmer	1	2	3	4
"Secrets" of success	Efficient grazing management supported by good infrastructure.	Recent improvements in grazing management – platometer. Own staff and machinery helps forage quality.	Grazing management. Always feeding silage ad lib to milking cows.	Grazing management and grass quality. Straw yards provide manure to maintain forage production.
Challenges or limitations	Wholecrop silage could be improved. Vulnerable to drought in dry summers.	Limited grazing area due to farm layout.	Silage quality. Autumn calving herd, difficult to avoid soya supplementation.	Silage making by contractor limits flexibility and is expensive.

References

1. DairyCo (2013) Milkbench+ Report. <http://www.dairyco.org.uk/resources-library/technical-information/milkbenchplus/milkbenchplus-report-2013/>
2. Carbonneau E., Oba, M, Pellerin, D. (2011) The impact of forage use and quality on economic return on Canadian dairy farms. *WCDS Advances in Dairy Technology*, 23:349-359.
3. Waterfield, W. (2009) Financial performance, benchmarking and management of livestock and mixed organic farming. Results of Organic Research, Technical Leaflet 2. IOTA. http://www.organicadvice.org.uk/technical_leaflets.html
4. Measures, M. (2009) Report on Organic Dairy Feed Conference, Berkeley, 2009. http://www.organicadvice.org.uk/misc_docs/IOTA_Dairy_cow_conference_report_final.doc



Free trees for farms

*The Woodland Trust is offering farmers interested in increasing tree cover a unique support package. It begins with a farm visit, where an expert adviser conducts a free whole-farm tree assessment. They will work with you to design a planting scheme that meets your farm needs, plus a management plan. Trees and guards may also be provided free of charge, although large or complex schemes are likely to require some contribution towards the costs. The Trust's **Victoria Hodson** explains what it's all about.*

From soil and water management to natural shelter and firewood, well-managed trees are a low-cost, multi-purpose farm resource. When planted and managed correctly, trees help improve resilience and productivity, mitigating the impacts of our challenging weather system.

Depending on the types of trees you choose and where you plant, farms can enjoy a host of benefits.

- Shelter belts can protect soils from wind and water erosion, attract pollinators and help improve crop water efficiency (particularly in times of drought).
- On livestock farms, trees can be planted as natural fencing to support stock management while providing year-round shelter.
- They are a reliable source of firewood reducing reliance on expensive fossil fuels, and an effective way to capture pollutants from animal housing.
- When planted in alley schemes, the interaction between trees and crops/ pasture can boost productivity,
- Riparian buffer strips reduce flood risk and improve water quality. Within just 3 years of planting, water infiltration rates have been shown to increase by 60 times.

To get the most benefits, the key is planting the right trees in the right places. Whether it's a simple hedgerow or a fully structured agroforestry scheme, having clear objectives from the start and a good management plan is essential.

Advice and funding support available

Now, new funding to support farm tree planting is being made available through an innovative new partnership between the Woodland Trust and the Pur Project, a global organisation working on behalf of Accor Hotels.

The aim is to plant 200,000 trees on UK farms by the end of 2015 as part of the hotel chain's Plant for the Planet programme, using planting designs that help farmers cut costs, raise yields and improve the environment.

The Trust is searching for at least 15 farmers willing to plant this coming winter. Planting schemes can include shelter belts, riparian strips, pasture trees, small areas of woodland and integrated agroforestry alley schemes.

In return the farmer is asked to plant and maintain the trees and allow access to monitor the effects on for an agreed period of time. The results will then be used to develop more UK-based evidence.

In the long-term, it is hoped that these farms will develop relationships direct with local Accor hotels, keen to engage their customers and staff in sustainable food production and potentially opening up new sales markets.

All types of organic and non-organic farms are welcome to apply for trees. The aim is to develop practical models that deliver real farm benefits, and can be replicated across a range of farms (producing crops and livestock in different conditions).

If you'd like to know more about this exciting opportunity, please contact the Woodland Trust on 0845 293 5689 or email woodlandcreation@woodlandtrust.org.uk. It would be useful if you mention Pur Project when talking to the team.

Organic market shows signs of recovery, but land area falls

After several years of decline since 2008 due to the recession, the organic market in the UK is finally showing signs of recovery. In May, new figures from Kantar Worldpanel revealed that organic sales through supermarkets had increased 1.6% over the previous three months. The increase is the first time the sector has seen year on year growth since 2009, and brings sales back to their May 2011 levels. Soil Association market intelligence work also shows organic sales have increased through independent retailers, catering and online. Jim Twine, the Soil Association's business development director, has credited the horsemeat scandal as the turning point for many consumers; "Recent moves from supermarkets, with the exception of Waitrose, to allow GM animal feed into the supply chain are also likely to impact on sales because the only way to avoid eating chicken or eggs from animals on a GM diet is to buy organic."

Waitrose has also reported a resurgence in organic food sales in the wake of the horsemeat scandal and the GM debate. Speaking at the opening of Waitrose's Greenwich branch in June, Managing Director Mark Price said that after flatlining for years, organic food sales were up 6.6% in the latest quarter. He attributed its renewed popularity to the concern about traceability and authenticity. "I think it's in reaction to GM, horsemeat and the neonicotinoids debate, that has made people buy into organic", said Price.

Producers too are reporting increased premiums for beef and potentially for milk, as supply shortages become a real prospect, with more producers leaving the sector than are converting, and with the demand growth returning.

The latest organic statistics published by Defra in June show that the total area of organic and in-conversion land in the UK in 2012 fell to 606,000 ha, compared with a peak of 744,000 ha in 2008. While the biggest decline over this time has been experienced in Scotland, both England and Wales have also seen reductions in the last two years, Horticultural production in particular saw a 22% fall from 2011 to 2012.



2013 Organic Producers' Conference: Making producer-led innovation a reality

This year we challenged the idea that innovation is only about high tech inputs and that valid research is only carried out in academic institutions and large corporations. Innovation is also about working with ecological knowledge to design self-reliant production systems, and about supporting producers to explore their own creative ideas. Many participants said this was the best conference to date and 'first timers' were 'blown away' by the range and quality of the sessions; by the 'networking' and friendliness and the overall good fun experience.

Opening plenary

Delivering the goods for consumers and society

Philip Cook and Becky Jam (Coombe Farm), John Pawsey (Shimpling Park Farms), Kate Collyns (Grower)

All the opening speakers stood staunchly by organic production values, saying that putting the farm first makes good sense for the sustainability of the business. The self-sufficiency at the heart of organic systems builds resilience and 'delivers the goods for society'. Communicating to buyers along the supply chain the social and environmental advantages of organic systems, integrity and quality is key to building up a loyal market. Farm visits continue to be a highly effective tool for this. Improved farming practice, quality and productivity are at the top of the R&D agenda with organic producers committed to innovation.



Arable workshops

New approaches to crop cultivation and cover crops

Paul Mäder (FiBL), Marion Casagrande (INRA) and Joséphine Peigné (ISARA), Julia Cooper (Newcastle University)

The EU-funded TILMAN project is developing robust, sustainable arable crop production systems using reduced tillage techniques, green manures and new weed management. It aims to increase farm biodiversity and lower carbon footprints. First results show a conversion effect of reduced tillage: during the first two to three years a decrease in yield, changes to soil structure and processes like N-mineralisation occur. After this initial phase, field trials show that yield, soil organic matter and biomass of soil organisms are increased by 10-20% (50% for earthworms). Farmers see soil conservation as the main goal of reduced tillage and weed control the most important challenge. Newly emerging project results are published at www.tilman-organic.net.

GMOs: recent developments and alternatives

Pete Riley (GM Freeze), Lawrence Woodward (GM Education), Thomas Döring (ORC)

Due to government and EU funding many public institutions are now engaging in and promoting GM research. There is a lack of transparency and justification for this. Often GM technology, such as in drought-resistant wheat, is based on a flawed understanding of ecosystems and the environment and is unlikely to help farmers. Alternatives to GM exist and have been investigated and proven in funded research e.g. agroecological and IPM measures for aphid control in wheat. All speakers agreed that UK and EU funding and research bodies are ignoring systems-based, agroecological solutions and even existing, conventionally-bred germplasm in their push for GM.

Weed control in arable crops

Andrew Trump (Organic Arable), Jonathan Storkey and David Brooks (Rothamsted), John Pawsey (Shimpling Park Farms Ltd)

Weed seed bank management (e.g. through encouraging seed predation and degradation, and using cover crops) is a successful weed control strategy but is more complex than other approaches. The whole life cycle of weeds needs to be considered to identify the weed's most vulnerable stages. These differ, e.g. black grass should be attacked in the seed bank while wild oats should be targeted at seed production and seed shed. A weed surfer, successful against charlock, is less so against wild oats because there is a limited window to act as seeds become viable ten days after flowering. Carabid beetles are important weed seed predators but have been in decline. To encourage carabids tussocky grass margins and hedgerows should be kept.

Prohibited product contamination of organic cereals

Lawrence Woodward (Whole Organic Plus), James Winpenny (Defra), Richard Jacobs (OF&G)

The session focused on the Defra consultation on testing procedures for substances prohibited in organic farming. James Winpenny introduced its scope and welcomed comments. Richard Jacobs highlighted the need to protect genuine organic producers and the consumers and to investigate cases if contamination is found. A Defra proposal, that if there is 'no suspicion' the control body cannot carry out testing on any product that has been previously certified, i.e. no random testing would be allowed, was criticised as endangering consumer trust. Lawrence Woodward said that organic regulations in the EU were not developed as a guarantee of pesticide residue free food. Residue testing should focus on final product, not on the farm.



Horticulture workshops

Organic seeds and breeding for organic growers

Louisa Winkler (ORC), Peter Brinch (Open Pollinated Seeds), René Groenen (Biodynamic grower)

Breeding and propagating open pollinated vegetable seeds for organic production is now at a cross-roads. The skills necessary to develop locally adapted selections are being lost. There is a need to reinvigorate this approach to provide plants with the diversity required to adapt to increasingly unstable environmental conditions. Peter Brinch outlined current gaps that need addressing. Louisa Winkler described some early results from UK trials of sprouting broccoli. René Groenen talked about how cooperatives can promote wider adoption of seed saving. A lively discussion centred on the practical challenges of balancing economic and production needs.

Innovations in grower tools and cultivations

Roger Hitchings (ORC), Iain Tolhurst (Tolhurst Organic)

This session discussed approaches of growers and farmers to integrate their own innovative ideas into their daily work. Roger Hitchings spoke about Eliot Coleman's work and his impressions and experience of two visits to Eliot's farm. A wide range of handmade tools were shown and various constructs of movable polytunnels, including mobile chicken coops. Iain Tolhurst gave an instructive presentation of innovation on his farm, underlining that labour is the most expensive part of his, and most growers, work and that he tries to make tasks as efficient as possible. He showed and explained a selection of his handmade tools and described how he transforms his wood-chip compost heap into a hot-bed, using the heat coming from the compost in a low tunnel to grow salad leaves during the winter months.

Systems resilience for weather extremes

Sam Eglington (Garden Farm Produce), Martin Wolfe (ORC), Iain Tolhurst (Tolhurst Organic Produce)

This session outlined how organic and agroecological systems can be used to buffer against varied and unpredictable weather. Sam Eglington outlined how nutrients cycle within an agro-ecosystem but photosynthesised energy moves up through trophic levels extremely inefficiently. There are a range of ways to make the most of this energy such as green manures, diverse intercropping and managing effective rotations to increase system productivity. Martin Wolfe showed how diverse tree alley and cropping systems can be managed to stabilise environmental conditions, increase nutrient cycling, reduce disease pressure, increase pollinator services and yield a wider range of outputs. Iain Tolhurst described his experience as an organic veg producer and outlined the challenges our agricultural system is going to have to face in a changing climate.



CSAs/community-based opportunities for growers

Roger Hitchings (ORC), Ben Raskin (Soil Association)

Community Supported Agriculture (CSA) is one of the most exciting developments of the last few years, helping enliven the organic movement and introduce new growers. The focus of this session was how CSAs can maintain their viability and how they benefit existing growing enterprises. Roger Hitchings described the CSA survival guide he is working on. Ben Raskin outlined the business case as to why producers should consider a CSA, the main advantages being cashflow, security and allegiance. Roger used Mike Westrip as an example of a grower with an established box scheme who has successfully added a voucher subscription CSA to his business. The conclusions were that in order to survive CSAs need a realistic pricing policy, expertise, to avoid over-reliance on volunteer labour, clear land entitlement, a suitable site and a clear communication structure. CSAs may offer an opportunity for existing growers to diversify.

Grassland workshops

Greenhouse gas emissions from grassland systems

Dave Roberts (SRUC), Ross Paton (Torr Farm), John Kay (National Trust)

This session explored the complex issues surrounding ruminant livestock's contribution to climate change. Results from recent studies were presented and an overview given of some of the practical, on-farm mitigation measures that can be introduced. The session highlighted that although it may be difficult to do anything about 'belching cows', more efficient management can help to reduce impact and improve profitability. The discussion highlighted that not all carbon is the same. Coal and other fossil fuels have been built up over millennia and emissions from these sources should not be compared on the same basis as emissions from ruminants. Organic farmers rely on the natural carbon cycle. The importance of expressing greenhouse gases per unit of land not output was highlighted.

Soil management for grassland systems

Heather McCalman (IBERS), Jon Wilson (Holt Farms, Yeo Valley), Elizabeth Stockdale (University of Newcastle)

All organic farmers know about the importance of soil health in supporting a stable and productive organic system, but understanding what is going on in the world beneath our feet is a massive challenge. This session explored the chemical and biological nature of the soil environment of grassland systems, and as illustrated by dairy farmer Jon Wilson, looked at ways to increase our understanding and tailor management to improve the functioning of the soil, and thus forage productivity, and ultimately animal health and productivity. Key issues discussed included the value of more expensive soil tests such as the Albrecht for finding out the state of soils; and the use of mechanical methods and manure management to improve the soil.

Enhancing biodiversity on dairy farms

Mike Townsend (Woodland Trust), Gethin Davies (RSPB)

This session looked at how biodiversity benefits on dairy farms can be realised without compromising productivity.



Potential advantages to the farmer of introducing measures to improve biodiversity were outlined. All speakers emphasised a whole farm approach. Introducing trees onto farms, using diverse leys, improving sward diversity/structure and introducing edge habitats were all discussed as ways to achieve biodiversity benefits. Advantages of using these methods to animal health and productivity include tree presence reducing heat stress in livestock, shelterbelts reducing soil erosion and improving pastures, and the nutritional benefits to livestock of a range of forage types.

Pasture-fed for life

John Turner (PFLA), Anna Bassett (PFLA), Dan Bull (Sheepdrove Organic Farm)

There has been an increasing focus on the benefits of life-long pasture-fed livestock production. The environmental, health and welfare advantages were discussed, along with the commercial and marketing aspects of selling pasture-fed meat. John Turner presented information on the Pasture Fed Livestock Association (PFLA) and outlined their production standards. Anna Bassett described the science and research evidence that supports this method of livestock rearing, and Dan Bull put this into context by describing how it works in practice at Sheepdrove Organic Farm. Considerable discussion was generated particularly regarding the use of a 'Pastoral Mark' quality logo, and the differences between pasture-fed and organic livestock systems.



Livestock workshops

Current animal health and welfare issues

Peter Plate (vet), Neil Edwards (farmer), Jessica Stokes (Soil Association)

The challenge of ensuring optimum animal health has implications for farm productivity and certification as well as the all-important one of the animal's wellbeing. Jessica Stokes outlined the latest developments in welfare assessment from the Assurewel project. Neil Edwards, Crichel Farm manager and vet Peter Plate outlined how they are tackling the challenges of running two milking herds of 200 cows each on an organic farm in Dorset.

As well as the input of dedicated herdspersons, key improvements in animal health and welfare were achieved by breeding and the simple transformation of old cubicle houses into sand cubicles. Disease risks are closely monitored. The herds are BVD and (probably) Johne's free; lameness and mastitis levels have fallen significantly and fertility is now excellent; parasitic problems in young stock during last summer were dealt with by targeted medical action according to egg count results followed by a review of grazing strategies; fly control has been successfully achieved using parasitic wasps.

High organic concentrate feed costs: challenges and solutions

Susanne Padel (ORC), Graham Vallis (Producer), Becky Nelder (ORC)

Susanne Padel's overview of concentrate feed costs in different livestock enterprises set the scene. Graham Vallis provided the example of his dairy enterprise where he minimises concentrate use, feeding only 0.1kg concentrate/litre. This needs cows 'that know how to graze'. Becky Nelder's presentation stimulated discussion of the approaching challenge of providing 100% organic diets for pigs and poultry. The conclusion was that producers should be planning for the end of the derogation in 2014, taking up existing knowledge on protein sources produced in the EU. Further research is needed to improve the potential of temperate legumes in the UK. It is hoped that HGCA and PGRO levies could be pooled for research funding into protein sources.

De-certification the only option? Facing current financial challenges

Nic Lampkin (ORC), William Waterfield (Consultant), Geoffrey Sayers (Carswell Farms/Well Hung Meat)

Nic Lampkin showed that for most farm types organic farms are performing as well as comparable conventional ones. William Waterfield highlighted that organic farmers have options: increasing yields requires a need to look for innovative solutions and potentially be more rather than less organic. Decertification is not an easy option. However, Geoffrey Sayers used a back of the envelope calculation to show that if the same milk price could be maintained by selling to a specialist cheese maker, using nitrogen would improve profitability on his dairy farms. The discussion did not provide an easy answer and concluded that for most farms good management is likely to be the key.

EU Organic Regulation changes: implications for poultry producers

Chris Atkinson (Soil Association), Nic Lampkin (ORC), Richard Kempsey (Stonegate)

Changes to EU regulations for poultry are on the horizon, although not yet finalised. This session explored how these might impact (positively and negatively) the organic poultry producer. Key issues discussed included the move to 100% organic feed, which was seen as a possibility but presented technical challenges, particularly with sourcing locally; the shift from limits by maximum birds per house to flock size limits; defining outdoor stocking rates using maximum N loads, maximum bird densities or maximum bird flock sizes; and the use of organic chicks.





Other topic workshops

OELS/OHLS new options in 2013

Steve Bellingham (*Natural England*), Alison Smyth (*Abacus*), Caroline Corsie (*Lower Smite Farm*)

Concerns about the lack of effectiveness of the Environmental Stewardship (ES) scheme in England led to the Making Environmental Stewardship More Effective project, which aims to improve the delivery of environmental outcomes of the scheme. A mismatch between option uptake and biodiversity needs resulted in modification of existing options and the introduction of new options. Steve Bellingham from Natural England introduced the changes to the scheme, and Joy Greenall (on behalf of Alison Smyth) explored how the OELS options can be used creatively on organic farms to improve the system. Caroline Corsie, farm manager of Lower Smite Farm for Worcestershire Wildlife Trust, illustrated the challenges and benefits of having ELS, OELS and HLS on the farm. Within the suite of OELS options introduced this year are two of particular relevance to organic farmers: adding wildflowers to buffer strips; and establishing legume and herb rich swards. Other options need modifying to improve their value. For example, over-wintered stubbles should include green cover to reduce soil erosion; and the rye-grass seed set option should be widened to include grasses in general. There was much support for the need to develop specific organic options in the future ES to increase the effectiveness of the scheme in delivering public benefits.

CAP reform: Latest developments and Defra implementation plans

Christopher Stopes (*IFOAM EU Group*), Rob Macklin (*National Trust*), Kevin Ruston (*Defra*)

The proposed CAP reform appears to maintain the status quo, but adds even more confusion and provides less support for organic. Christopher Stopes said the government needs to think bio-economy not biotechnology. The reform needs to address the double funding question – what is covered under greening or pillar two? Right now rural socio-economic growth, like the employment of additional labour on organic farms, is not even considered. Nic Lampkin put forward a proposal for common organic sector development principles.

Anaerobic digestion and digestate use

Dr Kurt Möller (*University of Hohenheim*), Dr Clare Lukehurst (*Task 37*), Richard Tomlinson (*Calon Wen*)

Research results are showing the benefits of adding digested material to crops and the technology of larger digestors is improving and proving viable in Germany and the UK. However, the use of small scale anaerobic digestors is still limited, due to both technology and policy. Kurt Moller discussed research results which indicate that digestate of grass/clover leys, crop residue and cover crops can increase the crop dry matter and N yields and the N content of wheat grains in organic stockless systems; reduce soilborne N₂O emissions and reduce the risk of nitrate leaching. Dr Clare Lukehurst discussed the viability of small scale anaerobic digestors (<100kW) for UK farms and the present limitations. Task 37 will be releasing a report on small scale AD viability in the UK. Richard Tomlinson presented some AD case studies for UK farms and highlighted the importance of the Renewable Heat Incentive (RHI), a government led subsidy, in making AD economically viable on farms.

Making farming more sustainable: tools for the job

William Waterfield (*Consultant*), Laurence Smith (*ORC*), Christine Watson (*SRUC*)

The session outlined the various tools that can be used to quantify, compare and track levels of sustainability on farms, and how the different assessment tools can be used by farmers and consultants. William Waterfield talked about the farm assessment tool he uses to survey organic dairy farms. Laurence Smith outlined the range of tools available for farmers to quantify their carbon footprint. Christine Watson discussed how nutrient budgeting can help farmers manage their rotation to maximise nutrient use efficiency. The discussion focused on where research is needed to improve the accuracy of these tools.

Closing Plenary

The role of sustainable intensification and agroecology in achieving food security sustainably

Nadia Scialabba (*FAO*), David Gould (*IFOAM*), Lawrence Woodward (*ORC*) - chair.



Nadia Scialabba pointed out there is widespread agreement on the need to transform the food and agriculture sector but views are very divergent on how this can be achieved. Sustainable intensification (SI) is currently most prominent though it is not clearly defined. The FAO recognises that SI can be an effective example of how increased productivity can be combined with decreased environmental impact but Nadia highlighted that a solely 'productivist' approach like SI will not improve and may worsen access to food, malnutrition and stability of the food systems, so it is questionable how far it can increase food security. In contrast organic agriculture covers the whole food system and operates to precise standards. Agroecology systems share organic production practices and might also be appropriate to resource poor regions. The 'ecological intensification' of these practices should be pursued but Nadia concluded that 'feeding the world sustainably' will only be possible if there is a significant change in the global diet. David Gould argued that the IFOAM Principles of Organic Agriculture when grounded in action and best practice provide the fundamental basis on which to build. In summarising the discussion Lawrence Woodward reiterated that agriculture and food systems are part of the wider economic and political context. The work of organic farmers and growers should be seen as a significant force for change to a sustainable and equitable society.

Conference proceedings

The session summaries and most speaker presentations are available on-line at www.organicresearchcentre.com



Farewell but not goodbye to the retiring Roger Hitchings

Roger has worked at ORC for the last fourteen years, first as an OCIS (Organic Conversion Information Service) adviser, then as head of the Organic Advisory Service (OAS) and latterly as Principal Consultant, Information Services. His contribution to the organic farming and particularly the organic horticultural sector has been immense and goes beyond his work at ORC. Phil Sumption pays tribute.

It was an emotional moment on May 15th when Roger Hitchings drove away from Elm Farm and into retirement.

For those of us with a horticultural bent Roger has been 'always there' as a friendly face, a mentor and someone who has steadfastly promoted and defended the interests of organic growers.

His contribution to organic horticulture was recognised recently by the Organic Growers Alliance (OGA) at their AGM.

Presenting Roger with his award "for recognition of all your efforts helping others to grow", pioneering organic grower Tim Deane said: "This award is for someone who's been working away for the good of organic horticulture for years and who, up to now, has received little enough recognition for it. He's a man with a wide grasp of technical matters, particularly of the all-important science of soil, and a great ability to communicate these matters through advisory and educational work. Almost always calm and almost always positive I personally have always found it a pleasure to work with him."



Roger receives the award from the OGA



Growers, guitars and hairdressers

Roger's career progressed somewhat erratically from his degree in soil science at Reading University, via British Rail and teaching science to hairdressers at Carmarthen College.

Roger and Susie had moved to Wales in search of 'the good life' and in 1987 the opportunity to set up an educational organic growing project at the college presented itself. Roger, somewhat out of character, pushed himself before the Principal and demanded that the job should be his.

His duties included the conversion of a 4-hectare unit for the production of organic vegetables and the development of training courses. Roger was also active in the growing and marketing of organic produce becoming Chair of the Organic Growers Association in 1990. Under his leadership the Carmarthen unit was a member of Organic Growers West Wales and he was closely involved in the setting up of the Organic Marketing Company.

This project was ahead of its time and facing difficulties when in 1998 Mark Measures, the then head of OAS, asked Roger to help out with conversion advisory visits in Wales.

Roger became a full-time member of staff at ORC- Elm Farm in 2002 and through the Defra-funded OCIS must have provided advice or information to the majority of organic growers currently active in this country.

The work took him all over England and Wales and some of his colleagues wondered when he ever managed to sleep! Certainly at conferences he would be seen and heard into the early hours entertaining the hardcore with his singing and guitar-playing.

The beat (and the advice) goes on

As well as providing advice to individual growers Roger has also worked on advisory projects for Farming Connect in Wales, Organic Centre Wales and the Welsh Assembly Government. He was a member of the UK Government's Advisory committee on Organic Standards (ACOS); chair of its Technical Committee for the seven years of its existence; a member of the EU Expert Group for Technical Advice in Organic Production (EGTOP); and secretary to the OGA.

Other work has included carrying out of an organic integrity audit for Sainsbury's; working for HDRA-HRI project on the conversion of field scale vegetable production on nine reference farms; a DEFRA-funded organic vegetable market study; and advising the National Botanic Garden of Wales (NBGW) on strategies for the development of the Estate farmland.

Roger will be carrying on as secretary of the OGA for at least another year, thanks to the persuasive powers of Debra Schofield and will also still be involved with ORC as needed on training events. So we at ORC and the UK's organic growers will still be seeing plenty of him. We wish him and Susie well on his retirement.

Other staff comings and goings at ORC

We've not only said goodbye to Roger and to Thomas Döring (see page 21), but also to Louisa Winkler and Helen Pearce at Wakelyns Agroforestry and to Liz Adams. We've welcomed in their place Dr Robbie Girling as Crops and agroforestry research team leader, Tom Hughes as research technician at Wakelyns, Sally Westaway as a researcher primarily on the TWECOM project (see page 24) and Phil Sumption (formerly at Garden Organic) as our Research Communications Officer, and we're just in the process of appointing a new crops researcher at Wakelyns. In future issues, we'll be profiling the new staff (and some not so new) so you can see who is behind the exciting new developments at ORC.



Enhancing biodiversity in grassland and dairy farming

While there is considerable awareness of the declines of farmland birds in arable systems, the pastoral regions of the north and west of the UK have also seen farming related decline in the numbers and range of several species. Here **Gethin Davies** of the RSPB discusses the problem and what can be done about it.

The loss of field boundaries and increasing use of agro-chemicals in the arable sector has tended to grab most attention, but the changes seen in farming over the last century have been equally profound in both mixed cropping and grassland systems.

What has changed on livestock farms to impact on wildlife?

Hedges and other field boundaries remain far more plentiful on livestock farms than on arable land. However, a fundamental change has occurred in the management of grassland and the reduction of cropping.

Modern grassland management has tended to promote structurally uniform, dense swards. Tight grazing and cutting regimes rarely allow plants to go to seed or key insect groups to complete their lifecycles. Reducing these early links in the food chain has impacted on several bird species. Studies of yellowhammers, skylarks and corn buntings have shown these birds actively avoid intensively managed grassland. In contrast, when you walk through a field of 'old grassland', one of the most striking things is the abundance of insects rising, jumping and scurrying in front of your footsteps.

Mixed farms hold a greater diversity of habitats than specialised farming systems. This leads to a greater diversity of plants, insects and opportunities for mobile species such as birds to explore. On mixed farms, the arable component generally provides more seed food for seed-eating birds, and the grass component (and dung from associated grazing livestock) provides more insect and soil invertebrate food.

It is clear that intensive farming practices – whether applied to cropland or grassland – impacts on the basic food chains that underpin wildlife. Fortunately, ways have been developed to mitigate some of these changes without having unduly affecting overall farm productivity and profitability.

Conservation measures that can make the biggest wildlife friendly impact on organic dairy farms

Dairy farms often have excellent hedges which provides a great deal for many species, but some species do not use hedgerows at all e.g. lapwing and skylark. Other farmland species, which do use hedge rows, also require in-field resources for at least part of their lifecycle; e.g. yellowhammer and linnets for their summer and winter food.

A thriving farming ecosystem consists of a range of plants (whether on cultivated land or grassland), a variety of insects (from pollinators to predators), and a diversity of birds and mammals at the top of the food chain.

The principles and practices of organic farming provide a great foundation for delivering this, but there is scope for carefully targeted management on a small percent of the farm to provide considerable additional benefit.

Priority options for lowland livestock systems to boost the availability of insects

On permanent grassland

To maximise the benefits of these options, locate on areas of grassland with existing higher plant diversity, or potential to achieve this i.e. less productive areas.

- Low input pasture – grazed at an average sward height of 9-12cm for the entire grazing season. Avoid topping, except in patches to control injurious weeds.
- Un-cut patches in mown fields – no need to fence off and can be grazed after the final cut. Simply leaving the back-swath uncut can provide considerable benefit.

On temporary grassland

- Legume and herb-rich swards. Manage by cutting or grazing but allow parts of the field to have extended periods of flowering eg leaving small strip at 1st or 2nd cut
- Small areas fenced-off from grazing livestock to create rough grassland eg hedgerows, water-bodies or field corners.
- Arable options to specifically boost insects: flower rich margins, pollen and nectar mix, uncropped cultivated margins.

Priority options for lowland livestock systems to boost the availability of seed food

On arable land

- Cereals (or bi-crops) for wholecrop silage followed by winter stubble.
- Unharvested cereal headlands
- Wild bird cover – area growing a variety of seed rich plants e.g. cereals, kale, quinoa BUT not crops that only provide cover, e.g. maize
- Winter stubbles. Green stubbles are substantially better than stubbles where pre-harvest desiccants or post-harvest herbicides are used.
- Brassica/root crops – any winter grazed/harvested root or brassica crop – the presence of a tolerable scattering of broad-leaved weeds, e.g. fat hen, redshank, is essential to benefit priority species. Where this cannot be provided, an alternative is to leave strips in the worked field unsown.

On temporary grassland

- Seeding ryegrass. Area of ryegrass dominated grassland, reseeded within last 5 years, closed up in May/June to go to seed and left until March.

Such measures can often be funded under 'open to all' agri-environment schemes such as OELS in England. Two areas particularly worth focussing on are:



1. Boosting the availability of insects

Research has shown that many priority farmland birds select taller, patchier grassland where they can find seeds or large insect prey such as grasshoppers and caterpillars.

Any management that allows plants the chance to flower and seed, even if only for a short period – such as extending rotational grazing and minimising topping - will be beneficial.

2. Providing winter seed food

Seed food is required throughout the year for many farmland bird species, but the most demanding period is through the winter when supplies are generally in short supply.

Many traditional sources have declined especially weedy cereal stubbles. Where maintaining stubbles is not a practical option, there are a number of alternatives, including specifically grown 'wild bird seed mixes' or allowing productive ryegrass grassland to go to seed. The table below identifies some of the options available within agri-environment schemes.

How much makes a difference?

All the options presented here have been trialled individually and shown to deliver conservation benefits for priority species. Trials have shown that in the conventional arable sector around 5% of the farm area needs to be in a range of high quality options to provide significant benefits. There is no equivalent data for organic farms but the relatively high diverse nature of organic grass and mixed farms is likely to mean that a little bit extra will go a long way.



Bee orchid in grassland

Cholderton Estate

The example of Henry Edmunds who farms the Cholderton Estate epitomises just how much can be done for biodiversity within a productive dairy enterprise.

Cholderton lies on the chalk downland of Wiltshire, next to Salisbury Plain. The organic estate is around 1100 acres, with dairying the main enterprise, though Henry also keeps Hampshire Down sheep and Cleveland Bay heavy horses. Three hundred Friesian x Shorthorn cows are milked, with all calves reared for replacements or fattening.

The estate is highly self-sufficient, with crops mainly used within the dairy enterprise. Legume based leys are rotated with the arable crops, and the integration of specific conservation management such as fallow plots, wild birds seed mixtures and flower-rich margins has seen wildlife flourish across the whole of the farm. This includes the diminutive harvest mice, marble white butterflies and rare arable plants such as pheasant's-eye.

The centrepieces of Henry's conservation work has been extensive restoration of chalk grassland and his work for the stone curlew. Shallow chalk soils have been reverted to grassland under agri-environment schemes. Some of this chalk grassland is now alive with flowers and buzzing insects, helping to link up and extend remaining remnants of this important habitat of the downs.

The rare stone curlew is also flourishing thanks to the work of many farmers like Henry in the region. The introduction of better quality nesting habitat has seen this rare birds' population double from a low of around 150 pairs in the late eighties, to well over 300 pairs today.

Henry Edmunds won the 2012 Nature of Farming award – a competition run by the RSPB, supported by Butterfly Conservation and Plantlife, and sponsored by The Telegraph – with the votes of over 22,000 members of the public. Henry is proud of his farm and hopes winning this competition will make more people aware of the benefits of organic and wildlife friendly farming.

Organic farming favours insect- over non-insect pollinated forbs in meadows and wheat fields

The aim of this French study was to determine the relative effects of landscape-scale management intensity, local management intensity and edge effect on diversity patterns of insect-pollinated vs. non-insect pollinated forbs in meadows and wheat fields. Nine landscapes were selected, differing in the percentage of intensively used agricultural area (IAA), each with a pair of organic and conventional winter wheat fields and a pair of organic and conventional meadows. Within fields, forbs were surveyed at the edge and in the interior.

Both diversity and cover of forbs were positively affected by organic management in meadows and wheat fields. This effect, however, differed significantly between pollination types for species richness in both agroecosystem types (i.e. wheat fields and meadows) and for cover in meadows. The study showed for the first time in a comprehensive analysis

that insect-pollinated plants benefit more from organic management than non-insect pollinated plants regardless of agroecosystem type and landscape complexity. These benefits were more pronounced in meadows than wheat fields. Finally, the community composition of insect-pollinated and non-insect-pollinated forbs differed considerably between management types.

In summary, their findings in both agroecosystem types indicate that organic management generally supports a higher species richness and cover of insect-pollinated plants, which is likely to be favourable for the density and diversity of bees and other pollinators.

Batáry P, Sutcliffe L, Dormann CF, Tschardt T (2013) Organic Farming Favours Insect-Pollinated over Non-Insect Pollinated Forbs in Meadows and Wheat Fields. *PLoS ONE* 8(1): e54818. doi:10.1371/journal.pone.0054818



GM soya in Argentina and its impact on organic farming

*Las Dos Hermanas is a 4,000 hectare estancia in the western Pampas of Argentina. It was converted to organic production in the 1980s with advice from **Mark Measures**, then head of ORC's Organic Advisory Service. Mark has remained involved in its development and visits regularly. Following his latest visit he reports on the massive impact GM soya production is having in Argentina and the serious consequences for organic farmers there.*

Los Dos Hermanas was formerly owned by Rachel and Pamela Schiele who, after the start of its organic conversion, incorporated it into a new organic farming and wildlife charity, the Foundation of Rachel and Pamela Schiele (www.lasdoshermanas.com.ar).

The estancia is farmed along traditional Argentine lines with a crop rotation including soya, wheat, maize, sunflowers and lucerne and is grazed by 4,000 Hereford cattle. It is an important wildlife site, a Vida Silvestre reserve, with a unique 300 ha of indigenous pampas grassland and a 250 ha lagoon.

Organic farming in Argentina has a well established certification system which allows international trade, particularly in grains, fruit and wine. However, there is no reliable export market for organic meat and the majority of it is sold conventionally. The domestic organic market is undeveloped with only a few specialist shops in Buenos Aires.

Apart from the market the main constraint to the development of organic farming is the high costs of running a mixed farm and government policy which provides no support, imposes land and export taxes and encourages an industrial agriculture approach.

Farming to a flawed blueprint

The widespread adoption of genetically modified (GM) Roundup Ready Soya and more recently GM Maize during the last 10 – 15 years has fueled an unprecedented agricultural revolution in Argentina. Now 98% of soya in the country is GM and in parts of the Pampas 90% of the crop is soya i.e. no crop rotation.

The reasons why this has happened are quite straightforward, certainly in our part of the Pampa. GM soya allows direct drilling, which minimizes soil moisture loss and consequently increases yields over the non-GM soya. Organically farmed soya requires ploughing and cultivations for weed control; resulting in moisture loss and some risk of soil erosion.

Be under no illusions, GM soya is easy and it is profitable, in fact it so easy that it does not need a farm manager on site and consequently there are businesses running 100,000 hectares, spread over many sites and farmed to a blueprint. The resulting social upheaval is immense. Herbicide use is not just a matter of a pre-drilling application of Roundup (Glyphosate) herbicide, as is practiced in the UK. It is also applied to the growing crop, normally once by tractor at the establishment stage and again by air during the later growth stage.

Due to the lack of rotation and repeated use of Roundup the inevitable has happened; there are now five weed species that are known to be resistant to Roundup and there are as yet unconfirmed reports of a further five resistant species.

The consequence of course is that farmers are increasing the application rates of glyphosate to get the weed kill, these are reported to be up to 20 times standard application rates

and other, often more toxic herbicides are having to be used in addition to Glyphosate, including the infamous Agent Orange chemical, 24D.

The chemical treadmill to destruction

Farmers are keeping one step ahead of the game at the moment, but the visible weed incidence in fields observed during the seven-hour bus trip across Buenos Aires province suggests only just. The use of some brushwood killers presumably explains why there are dead trees and shrubs along field boundaries.

There is now multiple herbicide resistance in some weeds and it's not yet clear whether the seed companies will be able to respond by continually developing new herbicide resistant characteristics in their seed.

What is clear is that the need for higher application rates and use of additional herbicides there is now higher use of herbicides than ever before. Claims that GM soya reduces herbicide use may be true for the first year or so, but in the long term it is nonsense.

Adverse environmental impacts are beginning to emerge. There are widespread reports of ground water contamination and effects on wildlife throughout the food chain. Research from Buenos Aires University by Andres Carrasco, Professor of Embryology, has reported major neurological effects of glyphosate on amphibians at below standard application rates, and further problems associated with the additives which are thought to penetrate the amphibian cells more easily than the main ingredient. There is virtually no one in Argentinean agriculture who voices concerns about possible health effects on humans, but in a country that has only just prohibited aerial crop spraying adjacent to towns perhaps this is not surprising.

Contamination, destruction and corporate control

Genetic contamination of organic and non-GM crops is now happening on two fronts. Firstly, as we know to our cost at Las Dos Hermanas, there is contamination of adjacent crops. Soya is self-pollinating but crop contamination does happen and we have to test routinely and at times reject crops from the organic market. The risk is of course much greater with GM maize. All farmed crops, organic and non-organic are also liable to contamination in store and transport. There are also real risks for us of genetic contamination of our native species in the wildlife reserve. We have to bear the costs of all this, not the GM farmers or the seed suppliers.

The second contamination front and one of the most pervasive consequences of the total domination of GM soya is that there is now no development or multiplication of non-GM varieties. At Las Dos Hermanas we have been saving our own single variety of seed and supplying to a few other



A good crop of organic soya at Las Dos Hermanas

organic farmers for 15 years now. The conventional farmers are totally dependent on the two or three seed companies (who of course also supply the herbicides) and the organic and any surviving non-GM farmers are being forced to use outclassed and underdeveloped varieties.

Of ultimate importance is the fact that GM technology has facilitated growing soya in the virgin pastures, scrub land and forest in the north of the country. 277,000 ha were cleared in 2010, often land totally unsuited to cropping but with the potential to grow a few crops before soil structure collapses and the depleted land is returned to grass – by which time the damage is done, not just to biodiversity, but through destruction of one of our most important carbon sinks.



Organic Hereford cattle in the Pampas

A pall of poison and folly

Flying over the North of Argentina you see the organic matter of soils and trees going up in pillars of smoke. The consequences for climate change are dire and inevitable unless there is a major and speedy reversal of this production policy.

It could be argued that the problems experienced with GM Soya are due entirely to misuse of the technology, that with proper rotations, with precise application and use of the herbicides and avoidance of spraying near people and watercourses all would be well. But the fact is that the human and environmental safety of this technology is unproven and it is always accompanied by environmentally damaging cropping, corporate control and inadequate regulation. Argentina is the classic example – no caution, no controls and with the government desperate for taxable exports, farmers are being driven by sheer economic pressure to use the technology to the detriment of all.

Farmers are losing their independence, consumers are losing control of their source of food and we are all losing a globally important biodiversity and carbon sink. This is industrialization of food production on a devastating scale. If this is the application of 'sound science', God help us.

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Auf Wiedersehen Dr Döring

At the end of March we reluctantly said “auf Wiedersehen” to Thomas Döring our Crops & Agroforestry Team Leader as he moved to a new job at the Humboldt University of Berlin’s Faculty of Agriculture and Horticulture. Bruce Pearce reflects.

Thomas had led the team since April 2009 and had made a major impact on ORC – both in our research and on the institution overall.

He is an entomologist by training with his PhD and post-doc research (at Queen Mary and Imperial Colleges) focusing on insect behaviour. However, he was well versed in organic farming before he joined us, having worked on the EU Blightmop project while studying for his PhD at the University of Kassel (ORC was also part of this project).



On joining us he rapidly got on top of the range of projects and science that he was responsible for and began to grapple with the complexity of composite cross populations, seed legislation and legume mixtures as well as the completely new task to him of managing people, across both the Elm Farm and Wakelyns sites.

Thomas brought to the role of team leader great enthusiasm and skill both within his research projects and looking after the members of his team. For example he demonstrates a love for statistics and numbers that is infectious. He became the “go to” person for us all when we were struggling with how to set up an experiment and after we had our data and needed to analysis it.

The scientist as philosopher

He is a bit of a renaissance man who plays a pretty mean cello and thinks deeply about what organic farming is and should be. Thomas’s philosophical side came to the fore when producing and securing funding to review and develop health concepts for ecological agriculture. This challenging project could not have been undertaken without his insights and determination.

Thomas works hard with producers and researchers and both old and new collaborators to identify areas of research that are important to improving farmers systems but are also interesting and challenging science.

He is a prolific writer of scientific papers and has encouraged others within ORC to publish. We are grateful for the way he has developed his team and his programmes.

We wish Thomas, Mareike and Frider all the best in Berlin and looking on the positive side for ORC - we now have a new collaborator in Germany.



CAP Reform agreed – what does it mean for organic farmers?

In the last week of June, days before the Irish handed over the Presidency of the EU to Lithuania, agreement was finally reached on the outline of the new CAP from 2014-2020. But as the dust settles, there are still a lot of loose ends to tie up, and the European Parliament will not actually vote to ratify the agreement until the autumn. The original 2014 date for implementing the agreements has long since been abandoned, with 2014 now declared a transitional year, the main changes taking place in 2015 and many schemes, particularly in England, not actually starting until 2016. Nic Lampkin tries to make some sense of it all.

What has been agreed?

It's taken nearly two years to reach agreement since the European Commission's original legislative proposals were published in October 2011, due to delays in setting the EU budget and the need to secure the agreement of the European Parliament as well as the Council of Ministers to the proposals. With positions on issues such as Greening entrenched and divergent, it was only the process of 'trilogues' between the three parties under the Irish Presidency that finally enabled an agreement to be reached.

In the end it's a compromise that satisfies no-one. Farmers face reduced payments and increased administrative complexity, with more freedom to Member States (MS) to make final decisions potentially leading to bigger divergences in support between states and within the UK, while environmentalists, and the European organic movement, are disappointed at the extent to which environmental requirements have been watered down. We may not get the full picture until the revised legislation is published later this year. At present the key elements appear to be:

- The **Single Payment Scheme** will be replaced by the Basic Payment Scheme (BPS), but the value is likely to be significantly lower than currently due to budget cuts, modulation and other deductions (on top of the expected 5% reduction in SPS value in 2013 and again in 2014). All payments will still be subject to cross-compliance.
- **Modulation:** MS can shift up to 15% of Pillar 1 direct payment (DP) funds to Pillar 2 (rural development and agri-environment). Defra in particular is planning to make full use of this, as it fits with the goal of reducing farm subsidies, and means that less of its own money needs to be found to support the rural development programme (RDP).
- **Young farmers** (under 40) must be paid a 25% top-up for up to five years from the time of establishing a new unit, with qualifying areas limited to regional average farm size (min 25, max 90 ha). RDP support will also be available to support young farmers getting started.
- Additional support may be available at MS discretion to support hill farmers and small farmers, as well as for the first 30 ha on other farms.
- The **active farmer** requirement has been implemented by means of a negative list including airports, water companies, railways and sports grounds, but if there is a genuine farming activity they may still qualify for BPS.
- **Capping:** Payments will be reduced progressively for farms receiving more than €150,000, but the percentages and levels at which further reductions will take place have not yet been finalised.
- **Coupling:** Up to 8% of DP funds (13% in some countries) can be used for coupled schemes such as the current Scottish Beef Calf Scheme, though it seems unlikely that coupled

schemes will be implemented in England and Wales. 2% of DP funds can be used for protein crop support as now.

- **Greening** (representing 30% of total BPS funds) will apply to the whole holding and be implemented through various routes, including revised versions of the Commission's original proposals for crop diversity, protection of permanent grassland and ecological focus areas:
 - **Certified organic producers** will qualify automatically for greening, due to their clearly demonstrated environmental benefits.
 - **Crop diversity** rules will require farmers to cultivate at least two crops if they have 10-30 ha, or three crops if more than 30 ha, of arable land, with the main crop not covering more than 75% and the two main crops not more than 95% of the land.
 - **Permanent grassland**, defined as any grassland more than five years old (may be increased to seven years), has to be maintained within 5% of its baseline area. MS can decide whether to define this at national, regional or farm level, as well as what actions will be required should the 5% threshold be breached. This could give farmers more flexibility when cultivating long-term grassland. All UK administrations are aware that many grassland farmers operate long-term rotations with grass down for more than five years and will be looking at how to take account of this. MS will also be expected to prioritise protection of Natura 2000 and SSSIs, with valuable sites identified for a complete prohibition on cultivation.
 - **Ecological focus areas** (EFAs) will now only apply to arable land over 15 ha. MS will define these areas from a list of qualifying elements including landscape features (hedges and trees), buffer strips, fallow land, protein fixing crops, agro-forestry and short-rotation coppice. The area has been set at 5% of arable land from 2015, but could increase to 7% in 2017 subject to a Commission report. If over 75% of the farmed area is grassland, and less than 30 ha are arable land, then the EFA requirement will not apply.
 - MS have the option to identify **Greening equivalent** practices in Certified Environmental Schemes, which could include elements of existing agri-environment scheme (AES) delivery (this is very likely with Entry Level Stewardship (ELS) in England and Glastir in Wales). However, AES participants will be affected by the prohibition of dual funding of activities under Pillar 1 and Pillar 2, with some AES elements likely to be redefined as Greening, and other elements retained as part of a new intermediate or extended higher level schemes, with a corresponding reduction in support levels. Dual funding issues relating to existing AES agreements still need to be resolved.



Initially, compliance with Greening will be 'voluntary' to the extent that farmers will not be paid the 30% of total BPS entitlement if they do not comply. However, it is planned that it should become compulsory from 2018, with an additional Basic Payment penalty if Greening is not adopted. In 2018, farmers will lose 120% of the value of the greening payment for not complying and 125% from 2019. This will coincide with the introduction of a new, more detailed mapping requirement as part of scheme administration.

Rural development (Pillar 2)

With most of the arguments focused on the issue of Greening, most of the RDP proposals from October 2011 are still intact. The '3 Axes' will go, replaced by six broad 'priorities', but the underlying components will be much the same as previously (support for capital investments, advice and training, market development, agri-environmental and other land management schemes, young farmers, LEADER etc.), with some notable new components:

- A stronger focus on advice, knowledge exchange and innovation, in particular the potential for farmers working with advisers, researchers and others to form 'bottom-up' operational groups to solve practical and environmental problems under the 'European Innovation Partnership' heading. ORC is working closely with other organisations on this and will report in more detail in the next Bulletin.
- An increased emphasis on climate change within agri-environment schemes, more potential for the implementation of agro-forestry options and a separate measure for organic farming to give it more visibility. 30% of RDP funds must be spent on these agri-environment, climate change and other land management measures.
- A risk management toolkit to help farmers take greater responsibility for the weather, animal health and crop protection risks to which they are exposed.
- Newly defined Areas with Natural Constraints to replace Less Favoured Areas.

In particular the **agroforestry** options could be of interest to organic and other agroecologically minded farmers. So far in the UK, only Northern Ireland has implemented a scheme under the previous RDP. ORC has been working closely with Natural England on the development of an establishment of agroforestry option to be included in the new Environment Land Management Scheme currently under development. The Welsh Government is also considering an option.

What does the agreement do for organic farming?

Despite all the wrangling over Greening, the initial Commission proposal that organic farmers should be exempt from the Greening requirement and qualify automatically for the full Basic payment, due to their clear delivery of environmental benefits, has been retained. However, the issue of dual funding between Pillar 1 Greening and Pillar 2 organic support is likely to be an issue needing clarification. One option which ORC is currently discussing with Defra is a detailed list of the environmentally relevant requirements of the EU organic regulation/production standards, with some defined as 'Greening equivalent' and others, in particular the non-use of synthetic nitrogen fertilisers and herbicides and almost all pesticides/fungicides, as going significantly beyond Greening equivalence and therefore relevant to Pillar 2.

Within the rural development regulation, organic farming is now covered by its own measure – Article 30 – separate from other agri-environment/climate schemes. This does not prevent the two being linked, but the Commission's intention is this should give a higher prominence to organic farming and encourage Member States to give it more support. A recently circulated draft of the Commission's 'organic measure fiche', which sets out the issues that Member States are expected to consider when implementing it, include some notable new provisions:

- The scheme should be open to groups of farmers forming joint agreements, for example in catchment or ecologically sensitive areas, not just individual farm agreements.
- The schemes should not be burdened with too many additional eligibility conditions, for example additional environmental rules, so as not to deter producers from participation.
- Schemes should be designed so as to make use of other RDP provisions, including advice, knowledge transfer etc.
- They could be developed within the context of an action plan framework.

Timetable for implementation

Although the legislative framework at European level is unlikely to be complete much before the end of this year, intensive working on the design of new schemes is already in progress at MS level, with the intention of submitting country or regional rural development plans to the Commission for approval early in 2014, so that new schemes can be implemented later in the year. The new Basic Payment Scheme should start in 2015. Many agri-environment schemes, including organic, will in future have to operate on a calendar year basis, so it's possible some new schemes might be operational from 1st January 2015 (with applications opening in autumn 2014). In England, Defra is planning that most will not start until 1st January 2016.

Defra has set up an Organic Options Group to review the requirements and payment levels for organic conversion and maintenance support, as well as the possibility of new or revised Environmental Land Management options that could be used in combination similar to the current OELS model. Given the potential for supply shortages in some sectors, and the market sensitivities of potential delays with restarting organic support, discussions are underway as to whether an earlier start for the new English organic scheme might be feasible. In the meantime, Defra has just published details of its transition arrangements for 2014, which include the possibility of both new and renewed OELS agreements.

The Welsh government has contracted the OCW partnership of IBERS, ADAS and ORC to provide advice on the development of a new Welsh organic scheme. Consultations with stakeholders have already started and will be continued at the Royal Welsh show. Full proposals are to be developed and submitted to public consultation in the autumn. In the meantime, organic farmers have been offered some certainty in the form of extensions to agreements to the end of 2014.

Now that things are finally beginning to take shape, we will endeavour to keep you informed via the Bulletin and our website.



Towards eco-energetic communities

With the development of biofuels putting pressure on agricultural land, is there a new role for hedgerows to provide a renewable energy resource within short chain systems that connect the farmed landscape with local communities? And how can harvesting of hedgerows for biomass be optimized while maintaining their multiple ecological and social functions? Jo Smith and Sally Westaway outline a new ORC project and report on a pioneering initiative in Devon.

Hedgerows and small woody elements have many functions and benefits within the agricultural landscape, including sheltering crops and livestock, supporting biodiversity, controlling erosion, buffering natural habitats from agricultural impacts and enhancing aesthetic appeal.

They have significant cultural and historical value and are characteristic of many rural landscapes across Western Europe. Traditionally, they also functioned as sources of a variety of wood products, including wood fuel for energy production, although this economic function declined from the mid-20th century when fossil fuel replaced wood as the primary source of energy production in Western Europe.

As this economic incentive to manage hedgerows was lost, hedgerow management fell into decline. For example in the UK the Countryside Survey in 2007¹ showed a 9% increase in hedgerows which have degraded into lines of trees or relic features due to lack of active management over the last decade.

Hedgerows for energy and heat

Towards Eco-energetic Communities (TWECOM) is a new EU funded project which started in January and will run for 30 months. The project is co-ordinated by RLLK, a regional landscape organisation in Belgium, and involves partners in Belgium, Netherlands, Germany and the UK.

ORC has received match-funding for the project from the Ashden Trust, one of the Sainsbury's Family Charitable Trusts, who have been great supporters of our agro-forestry work.

The aim of the project is to demonstrate whether local short chain systems of valorising biomass from landscape elements for local energy or heat production is economically feasible, even in densely populated areas. It will take into account ecological and social constraints.

Through realizing these short chain systems and bringing together experiences from different partners and regions in North Western Europe, we want to demonstrate that this – up till now - unused biomass from landscape elements can contribute to local sustainable energy production, with respect to ecological, social and cultural aspects.

What we want to achieve:

- Optimization of the use of biomass from landscape elements with respect for the ecological and social functions they have.
- Local communities become more independent for energy.
- Contribution to a more multifunctional landscape.
- Contribution to reduction of carbon emissions and increasing carbon storage.
- Support biodiversity.

Project activities

To achieve these aims the project partners will be working together to:

- Set up pilot projects to develop short chain systems of harvesting biomass from existing landscape elements for local energy use. The UK pilot project will use the Organic Research Centre, Elm Farm as a central hub and will work with local farmers and landowners, and local communities and community resources (e.g. schools/community centres) to develop a co-operative. This will be carried out with in collaboration with Thames Valley Energy, who are based in Newbury, and have expertise in establishing energy co-operatives.
- Work with our Belgian partners to develop a planning tool to optimise biomass production without compromising environmental and cultural values.
- Optimise the use of machinery and logistics for harvesting biomass from hedgerows.
- Investigate the effect of the valorisation of biomass from landscape elements on biodiversity, carbon storage and regional identity.
- Undertake socio-economic analysis/evaluation of the different short chain systems and cooperative systems in different European regions.

Energy from hedgerows - The Devon hedge project

In Devon, the Devon Hedge Group, Tamar Valley and the Blackdown Hills AONBs (Area of Outstanding Natural Beauty) have been working with partners in northwest France, through the EU funded Cordiale Project², to look at ways of using their hedge-bank systems for producing wood fuel.

The project finishes in June 2013 and we went to meet them to talk about ways in which TWECOM could build on their work.³



Section of c.17 year old predominantly grey willow hedge harvested for wood fuel and layed 'Devon style'



Rob Wolton, chair of the Devon Hedge Group, hosted us on his farm in north Devon where he is actively managing his hedges for wood fuel production. The tour included looking at some examples of hedges managed for wood fuel and a discussion of the hedgerow management cycle.

Hedgerow management cycle

This consists of ten evaluation points showing different phases in the life cycle of a hedgerow (from newly planted, layed or coppiced through to a line of trees) and management options likely to be appropriate at each stage.⁴

Rob showed us one 85m relatively unexceptional section of hedge on his farm where over the last two years he has recorded over 2000 species of flora and fauna (approximately 830 of these were flies). This is a great demonstration of the biodiversity supported by hedgerows.

During the day we discussed the impact of managing a hedge by coppicing on biodiversity, in particular exploring impacts on key species (for example deadwood invertebrates) and the need to develop methods to assess the functional diversity - along with the biodiversity - of a hedgerow at a farm scale.

Community and co-operation

A key part of the discussion was how, following practices in northwest France, we can kick-start the uptake of fully-mechanised and optimally efficient methods of harvesting hedges for wood fuel in this country.

Hedges in the bocage landscape of northwest France are primarily managed on a coppice rotation as a source of wood fuel, often with standard trees retained for timber. Wood fuel initiatives are based on cooperative groups of

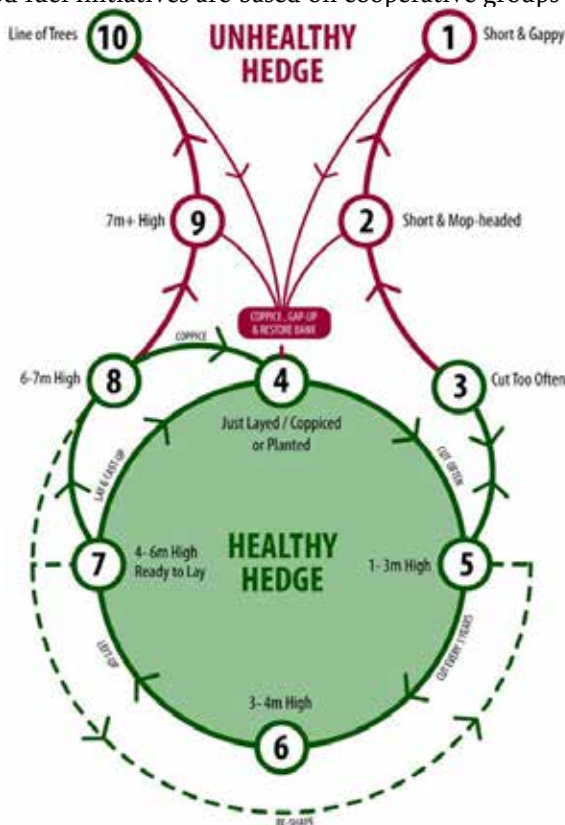


Diagram (Robert Wolton), shows the Devon hedge management cycle adapted from the Hedge management scale developed by Nigel Adams.

farmers and heat users with central platforms for the drying and storing of chip.

The group share costs of hiring the machinery for harvesting and chipping, and fund administration through subscription. Most French systems are led by mayors and work on a guaranteed market with subscribing individuals and institutions agreeing to buy chip at a discounted rate.



Native tree shelterbelt. Photo: WTPL, Andy Tryner.

Although there is less of a history of cooperation between farmers in the UK, applying the continental model here was discussed.

Andrew Sheldrake from the Dartmoor Circle, a co-operative of climate change groups, explained a toolkit they had put together to create woodfuel groups, which follows a similar approach to Community Supported Agriculture systems.⁵

Building on and moving forward

Other ways in which we could build on the work of the Devon group and priorities for further research that were identified during the day were:

- Assessing the biomass potential of single species hawthorn hedges and looking at ways to enhance hawthorn hedges for fuel value (replacing/ supplementing hawthorn with other woody species).
- Looking at how we can manage hedgerows as both a fuel source and a carbon store.
- Research into feller buncher attachments especially cutting equipment and impacts on the hedgerow of damage from pincer attachments.
- Looking at what we can learn from areas of the country where coppicing is the traditional form of hedge management (e.g. East Anglia and West Cornwall).
- The feasibility of using flailed material from hedgerows for fuel and the impact of flailed material on hedgerow biodiversity and carbon storage.

We will try to address some of these in the TWECOM project.

Acknowledgements: Thanks to Rob and Paula Wolton for hosting our visit in their home and showing us around their farm. TWECOM is funded by the European Interreg 4b programme which supports transnational cooperation (see www.nweurope.eu).

References

1. Countryside Survey 2007, <http://www.countryside.gov.uk/>
2. <http://www.cordialeproject.eu/>
3. <http://www.hedgelinek.org.uk/wood-fuel.htm>
4. http://www.ptes.org/files/1353_hedgemanagementcycle.pdf
5. <http://www.dartmoorcircle.org.uk/documents/DartmoorCirclewoodfuelgrouptoolkitv3.pdf>





Wakelyns Agroforestry open day: Agroecology - science and practice

The Wakelyns Agroforestry Open Day took place this year on 26th June with 28 visitors attending, some from as far afield as Ireland. These included farmers, seed producers, smallholders and advisors. The weather was kind and the sun shone for much of the day, with the downpours waiting until everyone was on their way home. Sally Howlett, Tom Hughes and Nick Fradgley report.

The morning included three presentations by experts offering challenging views on the use of energy in society and agriculture, showing how the application of agro-ecology to crop production can improve energy balances while maintaining or improving biodiversity and the valuable services it provides to agricultural systems. After a delicious homemade organic lunch, which has become something of a 'Wakelyns Tradition', the afternoon continued with a farm tour led by Martin Wolfe. The tour showcased the range of cropping ideas in progress, including cereals, vegetables and inter-cropping trials in the alley system, plus the latest from Brussels on regulations affecting wheat populations.

The multifunctional farm – finding room for all in farming

The key message from Barbara Smith, of the Game and Wildlife Conservation Trust was that on-farm biodiversity is not a luxury, it is a necessity. She illustrated this by describing the wide-reaching impacts of conventional agricultural practices, particularly large-scale monoculture, on biodiversity loss both at the species and landscape level.

Approaches that can be used to enhance wildlife habitat include the use of multifunctional seed-mixes designed to attract beneficial insects and targeted management of field margins. The common thread underlying such strategies is to increase wildflower abundance and, in turn, nectar.

Focusing on cropped areas, Barbara highlighted recent studies which looked at the importance of common arable weeds with respect to invertebrate abundance and contrasted this with how much 'tolerance' there is (or not) for those same weeds on cropping land. Projects looking at how much land is 'enough' to raise biodiversity to a level sufficient to bring measurable benefits found that, although a threshold couldn't be defined, there was a positive relationship between the percentage of uncropped land and diversity, and that the spatial arrangement of that land was not critical.

Barbara concluded by introducing a new study, QUESSA (www.quessa.info), which aims to quantify how much semi-natural habitat contributes to key ecosystem services, and will include a financial impact assessment. The QUESSA team is still looking for arable farms growing oilseed rape and/or wheat to participate in the study from 2014 so do contact Barbara if you are interested.

Functional biodiversity – arable weeds

Pete Ianetta of the James Hutton Institute gave an excellent talk, packed full of information on the research he has been conducting on sustainable agriculture, wild plant ecology, and functional biodiversity. The scene was set by describing the general misconceptions and attitudes towards arable weeds, and the resulting extinctions and population reductions that have occurred in the UK.

Pete explained how arable weeds and crops have co-evolved over quite a long period of time, and how this has resulted in crop mimicry and also herbicide tolerance in a number of species such as Giant Hogweed. He also suggested that many common arable weeds may once have been grown as crops in past times. However, Pete noticed a distinct lack of ecological and genetic information of the majority of wild plants, and in particular, believes that there is un-tapped potential in the use of wild legumes in agriculture, to provide better ground coverage, improve soil structure and fertility, support more diverse communities of invertebrates and other wildlife, and much more.

Pete intends to conduct further work on the functional biodiversity of wild arable plants and especially wild legumes, and is very interested in the breeding of wild legumes for traits that will allow for harmonious coexistence alongside arable crops.

Agriculture, sustainability and Permaculture

Steve Jones began his talk by outlining his background with 'Cwm Harry (Local Grown)' which began by promoting waste minimisation in mid-Wales and then setting up community gardening projects based on cyclical systems of organic permaculture. Urban regeneration was highlighted as the key to localising food systems.

Steve then went on to talk about our energy future and the rapid reduction in returns from using energy based on fossil fuels. As fossil fuel resources are depleted and become harder to extract, the costs involved increase so that we are approaching a turning point when it will be cheaper to produce energy from renewable sources. An Energy Profit Ratio (EPR) can be calculated for different farming systems which shows the energy put into the system, be it from fossil fuels or manual labour, against the energy produced as food. When considering how energy dense fossil fuels are, subsistence farming is clearly shown to be a far more efficient system than intensive agriculture which is simply turning oil into food.

Interestingly this downward turning point in oil production can also be linked to socio-economic changes. Several graphs show that in a number of Middle Eastern countries that are experiencing civil unrest, oil consumption is at the point of becoming greater than production.

Two key industries that will be severely affected by this change are transport and agriculture. The solution proposed is a relocation of food systems from centralised to local production and farming systems that make use of natural processes of carbon sequestration or 'carbon farming'.



Book Review: 2052 – A Global Forecast for the Next Forty Years

Jorgen Randers. Chelsea Green, Vermont (2012). ISBN 9781603584210 £19.95

Thomas Döring reviews Jorgen Randers book and finds a passionate and disturbing analysis of the future of the world or more specifically the next forty years.

Randers' motivation for choosing this time frame is that it mirrors the four decades since the publication of *The Limits to Growth* in 1972, which he co-authored.

The Limits to Growth, a landmark study, analysed what would happen to the world if humankind chose various paths of development – and many of the scenarios highlighted the potential of catastrophic collapse.

This new book does not follow a *what-if?* approach. It asks what will actually happen or at least, what is most likely to happen, to the world up to the middle of the century.

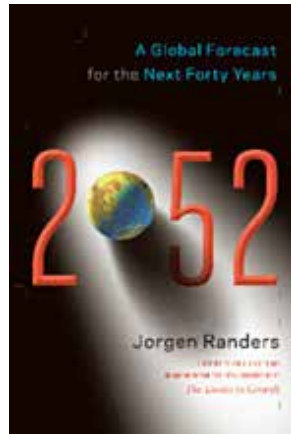
Many people shy away from making such forecasts because of the uncertainties involved. However, there is a deeper reason for not attempting an explicit forecast of the earth's future, namely the psychological issue of how to deal with the predictions once they have been made.

If we believe in them, why should we then continue to fight for a more sustainable world? Would we not be forced to adopt a fatalistic interpretation of gloomy scientific forecasts of the planet's future? It is one of the great strengths of 2052 that Randers tackles these questions right from the start.

Using a dynamic computer model, Randers' predictions about the development of the world cover a large number of parameters, including Gross Domestic Product, human population, CO² emissions, the proportion of renewable energy sources, and food production levels. The very thorough analysis is supplemented by thirty-odd 'glimpses', predictions made by a wide range of experts with specific regional or thematic focuses.

According to Randers' analysis:

- Global human population will not reach the often-quoted level of 9 billion, but will peak around 2040 at roughly 8.1 billion, mainly as a result of decreasing birth-rates in an increasingly urbanized world where many emerging economies catch up with the industrialised nations.
- The proportion of renewables in the energy mix (wind, and especially solar energy) will rise exponentially over the next four decades.
- Although humankind will eventually act to counteract climate change, it will act too late to prevent substantial climate-induced damages, with the potential for the planet facing run-away, i.e. self-reinforcing climate change in the second half of the 21st century.



In some areas, 2052 is possibly too optimistic. Conceivably the analysis underestimates the effects of biodiversity loss on land productivity and other ecosystem services; and it may considerably overestimate the global increase of food production. However, the study is a significant landmark, a basis for further discussion, and more importantly for action.

In making recommendations for actions the logic of 2052 unravels, at least in part. Randers calls for renewed and stronger efforts to avert climate disaster and to alleviate poverty, but some of his recommendations are blatantly counterproductive. For instance, one of his conclusions is to better give up on loving nature ("Don't teach your children to love the wilderness", p.332) because it is going to disappear anyway.

Controversially, he seems to have fallen in love with autocratic regimes. The idea that wise leaders will choose better than the short-sighted general populace or their elected leaders is dangerous. Some might dismiss the important predictions and conclusions presented in 2052 because Randers seems not only call for strong government but almost to endorse dictatorial regimes.

This would be a mistake because on balance it is an extremely significant contribution to the sustainability debate and should be read by everyone interested in the future of the planet. Hopefully, this will create the awareness necessary to help with Randers' final plea, namely to make his forecast wrong.

USA removes obstacles to organic growth

US Secretary of Agriculture Tom Vilsack has officially recognised the unique production system covering US organic agriculture and announced guidance to remove agency obstacles to its continued growth. "Organic is not the 'same as.' It is its own separate commodity and needs to be treated as such. I'm committed to that," Secretary Vilsack told the Organic Trade Association's (OTA's) policy conference. He added that the USDA will be providing new guidance and direction on organic production to all USDA agencies directing them to recognise the distinct nature of USDA certified organic production and organic goods, and to take into account the documentation and inspection required for organic certification when considering organic operations' eligibility for USDA programmes and policies.

"Organic production models may provide alternative solutions to current agricultural challenges, and it is the agency's responsibility to develop diversity in research and alternatives for all producers," the guidance points out. The guidance also establishes that agency administrators review their goals and report on actions taken towards achieving the USDA strategic goals related to organic agriculture. Organic production and commerce are bright spots in the American marketplace of innovation and entrepreneurship, and particularly can contribute to USDA's goals for rural economic development. In recognition of its potential, the 2010 USDA Strategic Plan called for an increase of 25 percent in U.S. certified organic businesses by 2015.



Events and announcements

Events

30 July 2013: Farming With Trees. Rhug Estate, Corwen. Woodland Trust and The Soil Association.

30 September 2013: IOTA advisors conference. Game Conservancy and Wildlife Trust, Loddington.

9/10 October 2013: Soil Association Annual Conference. London.

18 December 2013: Rethinking Agricultural Systems in the UK. British Ecological Society Conference, Oxford.

Save the date!

ORC's 8th Organic Producer Conference
22-23 January, 2014 - Aston University, Birmingham

See the events page on our website for further information on these and other events.

IFOAM Organic World Congress

The IFOAM Organic World Congress 2014 will take place in Istanbul, Turkey from October 13th to 15th 2014 and has the theme of 'Building Organic Bridges'. The IFOAM Organic World Congress (OWC) only occurs every three years. It is the largest and most important meeting of the global organic movement. The 2014 conference will have three themed tracks, The Main Track, The Scientific Track, and The Practitioners' Track as well as a series of Workshops. Each track will explore the organic sector from numerous interesting perspectives and the workshops will highlight the contributions of various initiatives from around the organic world.

The call for papers is now open. Submission deadline is 30 September, 2013.

Dairy farmers' opinions wanted

As part of the EU-funded Sustainable Organic Low Input Dairying (SOLID) research project we have just launched our on-line questionnaire to capture the thoughts of British organic and low input dairy farmers on three novel strategies. If you are one, we would really appreciate your opinions (go to <http://tinyurl.com/soliduk> - the password to use when requested is solidairy).

All UK participants completing the survey before 26th July will be entered into a prize draw for one year's free subscription to the ORC's Participatory Research Network (normal membership price is £50+VAT), which includes a copy of the Organic Farmer Management Handbook and the ORC Bulletin.

If you would like any more information please get in touch with Holly Cole: holly.g@organicresearchcentre.com

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**We're making a real difference
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