THE ORGANIC RESEARCH CENTRE
ELM FARM

In this issue:

Protected cropping

New recommendations for organic protected cropping standards have been made by EU expert group. *See p.11.* *Photo: Organic tomatoes at Wight Salads (Phil Sumption)*

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Organic Research Centre

Bulletin

No. 113 – Autumn 2013

News in brief

Organic research and innovation platform

TP Organics, the organic research and innovation platform, has been officially recognised by the European Commission. TP Organics was established in 2007 by the IFOAM EU group and ISOFAR and hosted by the IFOAM EU Group. The granting of official 'technology platform' status by the European Commission is reserved for outstanding European innovation platforms and 'must represent a sizeable proportion of a current or potential future market and be seen to contribute to the global value chain benefiting Europe'. As well, Technology Platforms are explicitly mentioned as stakeholders to be consulted on EU research priorities in the context of the European Innovation Partnerships and play a considerable role in setting priorities for Horizon 2020.

Susanne Padel, Principal Socio-economics Researcher at ORC said: "This is very good news. After many years of working with TP Organics, the European Commission has officially recognised it. TP organics advocates agricultural research with a systems perspective and working with agro-ecology."

Further details at http://cordis.europa.eu/technology-platforms and http://www.tporganics.eu

Legume-based mixtures bring real benefits

The final report for the LegLINK project is now available online: (http://tinyurl.com/m2xud4h)

The project demonstrated that including species-rich, legume-based leys in rotations helps to maximise synergies between agricultural productivity and other ecosystem services. By using functionally diverse plant species mixtures, these services can be optimised and fine-tuned to regional and farm-specific needs. The trials showed that there is a large degree of functional complementarity among the legume species. No single species scored high on all evaluation criteria. In particular, the currently most frequently used species, white clover, was outscored by other legume species on a number of parameters such as early development and resistance to decomposition. Further complementarity emerged from the different responses of legume species to environmental variables, with soil pH and grazing or cutting regime being among the more important factors. In comparison with the monocultures, the all species mixture (ASM) showed increased ground cover, reduced weed biomass and increased above-ground biomass. Benefits of mixing species with regard to productivity also increased over time. On soils low in organic matter the biomass advantage of the ASM over the control ley was more marked than on the soils with higher organic matter content. Ecological modelling revealed that the three best multifunctional mixtures all contained black medic, lucerne and red clover.

The LegLINK project was led by ORC and ran for 39 months, from December 2008 until February 2012. The work was funded by Defra and industry partners.

Schumacher College and ORC link-up

ORC is pleased to be a partner in the pioneering postgraduate programme in Sustainable Horticulture and Food Production, run residentially at Schumacher College, in Devon. Schumacher College is recruiting now for January 2014 and has MSc, PG Dip and PG Cert options available, both full- and part-time. This course explores the frontiers of research and practice that will meet the social, ecological and economic challenges our food systems face in the 21st Century. It offers a unique and transformative blend of academic and practical learning opportunities from Schumacher College in conjunction with Plymouth University, ORC, the Campaign for Real Farming and the Centre for Alternative Technology (CAT).

Three scholarships are now available for the full-time Masters programme, contributing up to £5000 of the course fees. ORC is very proud that one of these is named in honour of Professor Martin Wolfe and his pioneering work on agroforestry at Wakelyns. The scholarships are:

- The Martin Wolfe Scholarship in Agroforestry
- The Vandana Shiva Scholarship in Food Policy
- The Lady Eve Balfour Living Soil Scholarship

The closing date for scholarship applications is 1 November 2013. The successful applicants will have experience or strong interest in the subject area of the scholarship they apply for and will need to choose a relevant topic for their dissertation project.

Schumacher College have just taken on more food-growing land around the College to try out novel growing techniques that allow a deeper connection to the land and the soil. They have six full-time apprenticeships available from April to October 2014 on a residential basis.

For more information contact Jane.Pickard@schumachercollege.org.uk or see www.schumachercollege.org.uk

UN says 'Act before it is too late'

The United Nations Conference on Trade and Development (UNCTAD) Trade and Environment Review 2013 is entitled 'Wake up before it is too late: Make agriculture truly sustainable now for food security in a changing climate'. Farming in rich and poor nations alike should shift from monoculture towards greater varieties of crops, reduced use of fertilisers and other inputs, greater support for small-scale farmers, and more locally focused production and consumption of food, the report recommends. It talks of a collective crisis and says that urgent and far-reaching action is needed before climate change begins to cause major disruptions to agriculture, especially in developing countries.

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About us

ISSN 1367-6970
Bulletin editor
Lawrence Woodward OBE

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.

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

Registered address
Organic Research Centre
Elm Farm
Hamstead Marshall
Newbury
RG20 0HR

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

www.organicresearchcentre.com

Editorial: Organic support – now the haggling begins

Now that the details of the new CAP arrangements are finally emerging from Brussels, it's the turn of Defra and the devolved administrations to show what they can do for organic farming between now and 2020.

The Commission has done its bit. It has made organic farming qualify automatically for Greening in Pillar 1 and made it a stand-alone measure in Pillar 2. It has given a clear steer to member states that other RDP measures should also be used to support organic farming in order to maintain and increase organic hectares in the EU.

The Commission has yet to issue guidance on how possible dual-funding of organic farms under Pillar 1 greening and Pillar 2 schemes will be handled. Given that many farms are likely to qualify for Greening on grounds other than being organic, our view is that most, if not all, weight should be given to Pillar 2 payments. Discussions are now taking place between the Commission and the IFOAM EU group which will influence this.

However, a lot more is left to interpretation and the discretion of member states, with bureaucracy, politics and prejudice all playing a part. Currently, things are looking reasonably positive for organic farming in Wales and Scotland (with its new organic action plan) and dire in Northern Ireland where the government, backed by an anti-organic farmers' union, is proposing to abandon organic support. But what about England?

It is already clear that organic support will be part of NELMS in England while other parts of the UK may retain separate organic schemes. As we go to print, Defra is launching a public consultation on the detail of its CAP implementation proposals for England, including the new environmental land management scheme (NELMS) which will include organic options. It will be critically important for organic farmers, stakeholders and consumers to respond and try to influence ministers to take positive decisions about organic farming.

Defra's organic farming unit has been working very constructively with ORC and other stakeholders to craft something to boost and not bash the organic sector. They have worked hard to reduce the disruption between the end of one scheme in 2014 and the delayed start of the new schemes in January 2016 due to new administrative and IT arrangements. However it is inevitable that the 2015 funding gap will catch out farmers who want to start conversion, convert more land or whose agreements end in that year. It is unclear how many farmers will be caught and how it will impact. Agreements which end in the latter part of the year will be less badly affected than those ending earlier and Defra is open to considering ways of helping businesses or sectors that are particularly hard hit. Officials are urging farmers who want to convert or those who want to expand their organic land to do so in 2014 using OELS under the RDP transitional arrangements.

However, Defra's proposals to exclude holdings in England with less than 5ha from any support, and not to adopt a new establishment of agro-forestry option that had been developed as part of NELMS, could still be subjected to political pressure and change.

Meanwhile, discussions on support rates for the organic conversion and maintenance and other options, and whether they should be differentiated according to land use or farm type, are continuing in the background.

An issue that affects all parts of the UK is targeting and selection criteria. The Commission has ruled that, where demand to join is too high for the resources available, money should not be allocated on a first-come, first-served basis. There is a need for debate about what key criteria should be applied in such situations – e.g. under-developed UK supply, involvement with other agri-environment schemes, existing or new organic businesses etc.

The next few weeks will see much of this being resolved. Updates will be put up on the ORC website and through our e-Bulletin. We urge you to participate in the process.

Lawrence Woodward

Can you help us finish the job?

We're making real progress in our discussions with policy-makers to ensure organic producers in the UK get a fair deal under the new CAP. But it costs time and money – more than £25,000 this year already – and we have no direct funding for this work. Can you make a contribution to help us with these costs? You can donate at via our website or contact Nic Lampkin.

Survey of EU organic market data collectors

The availability of good quality information is crucial in making market and policy decisions. Yet despite the growth of the organic market in Europe only very basic statistics about the sector exist in most countries. ***Catherine Gerrard, Anja Vieweger*** *and* ***Susanne Padel*** *present the results of a survey developed as part of the Organic Data Network project aimed at finding out who is collecting what information and how it's being used.*

Member states collect data on the number of certified organic holdings, organic and in-conversion land areas and livestock numbers, which are published nationally and by EUROSTAT (the statistical office of the European Union), but other data are less commonly collected.

Important market statistics such as yield, consumption, retail sales, international trade and prices at farm or consumer level, which would be valuable to producers and others involved in the organic market, are lacking in most European countries.

To understand the availability of data on the organic market in Europe, an online survey was developed. 112 organisations in Europe and the Mediterranean (MOAN) completed the survey (see Figure 1).

Figure 1: Map of Europe showing the number of responses in each country

Not Surveyed	No response	1-2 responses	3-4 responses	5 or more Responses

The largest category of respondents was government bodies (29%), followed by control/certification bodies (20%). 23% 'others' included private and state research institutes, not for profit organisations, NGOs and advisory services.

Production data, especially land area and production volume, are most commonly collected, whilst production value data are much less so. Price and retail sales data are the most generally collected market data. Export data are more common in non-EU countries than within the EU, perhaps reflecting a higher importance of export to their economies.

The product categories most often represented in EU+EFTA (Norway, Switzerland, Iceland and Liechtenstein) market data collection are meat, milk and dairy products, fruit and vegetables. Data on non-food organic products are rarely collected.

The main uses of the data (Figure 2) are for statistics (32%) and market information (19%). However there is some variability with a higher proportion of 'EU15' countries (i.e. the older EU states including the UK) using the data for market information (26%) compared with 'newer EU states' (14%); and a lower proportion of them (4%) utilising data for subsidies/government support programmes relative to 14% in the 'newer EU states'.

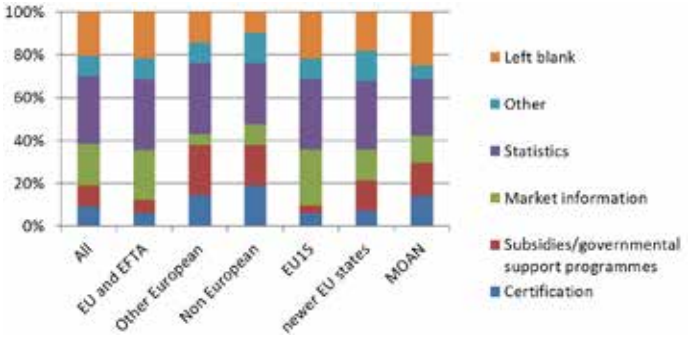

Figure 2: Ways in which the collected data are used.

There is generally a low rate of data publication in all countries (less than 50% of respondents gave a positive answer - see Figure 3). Production data are most likely to be freely available, but not all are published. Data are usually published annually; price, retail or export data are occasionally published more frequently, but sometimes at a cost.

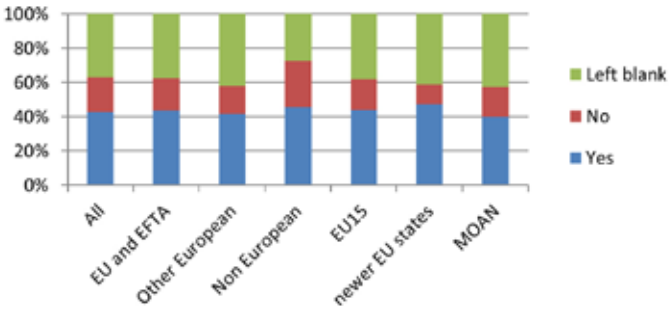

Figure 3: Responses on whether the collected data is published

It is clear that concerns about a lack of organic market data are justified. The data collection effort is very varied across Europe and not all collected data are published. There is a need to understand the reasons for this and the barriers to good quality data collection and dissemination.

Without good quality, accurate and timely information it is difficult for stakeholders to make investment decisions and for policy makers to frame effective policies.

The EU funded OrganicDataNetwork project (http://www.organicdatanetwork.net/) has been established to address this problem.

The EU Seed Regulation proposals - a chainsaw to crack a nut

Under the guise of 'simplifying' Europe's seed regulations, the EU is proposing a new seed law. Introduced in May, and widely criticised, the draft regulation is on its way through the EU machine. ***Ben Raskin****, Head of Horticulture at the Soil Association, explains why he thinks it's the wrong tool for the job.*

In July, Defra organised a day for representatives from the horticultural sector (organic and conventional) to discuss the EU Commission's proposals for a new seed law. By the end there was a nearly unanimous view that it is not the best way of solving what are, at worst, small problems to a small minority of people, and might lead to less seed being available.

Some of the stated aims are laudable, for instance to promote agricultural biodiversity, sustainable production and innovation, but the EU seems to want to achieve these by imposing a huge administrative and cost burden onto producers.

And there is much work still to be done to ensure that the regulation does not in fact result in a significant reduction in agricultural biodiversity.

On the plus side there are specific exemptions for populations (such as those that have been bred by ORC) and land races,with a five year marketing trial proposed. ORC's Martin Wolfe and Bruce Pearce played a significant role in making this happen. There are also exemptions to fees and some red tape for micro-businesses of less than 10 people or €2 million. These are very welcome and an improvement on the current system.

However, what fits arable doesn't suit vegetable and isn't ornamental

I won't go through the whole 146 page proposal in detail but here are a few of examples of how a law designed for broad acre arable seed production appears to have little relevance and significant risk for vegetable and ornamental producers.

Firstly there is the proposed increase in scope of the regulation. Until now variety control has existed only for arable and vegetable seeds. The new directive encompasses what it calls Plant Reproductive Material (PRM), which includes not only seed but also cuttings, rootstocks, module plants, and even potted plants intended for planting into a private garden.

Then there is the issue of 'Value for Cultivation and Use' (VCU). Under current regulation any new arable variety has to pass this VCU test and prove to the EU (via member states) that it is a 'clear improvement' on any existing variety before it is approved for sale.

The Commission is proposing to include VCU testing for any crop that is deemed 'significant'. Furthermore they want the power to move any plant species into this category at any time with no consultation.

Often the value of a plant might not be seen during initial testing and field trials, but only once it has been grown either for a long time or in a particular set of circumstances. Rejecting these plants is thus restricting the diversity of our future gene pool.

Perhaps one of the most confusing areas concerns the definition of a variety. This might seem obvious: for F1 hybrids it's pretty straightforward, but with open-pollinated (OP) varieties it all gets a bit more difficult. OPs are not stable, they are liable to genetic drift; indeed this is one of their most attractive qualities for many growers as you can save seed and adapt them to your own micro-climate. So for a classic tomato variety like Gardeners Delight that has been grown for many years there may be many different strains all being sold under the same name.

And if veg seed is a minefield what about ornamental plants? Under the new regulation these are likely to be covered too. Which of the nurseries that, for example, currently breed 20 different versions of Lavender 'Hidcote' will be responsible for registering and maintaining that variety with all the associated cost and red tape? Until now there has been no requirement to register ornamentals. With many growers producing different versions of the same plant, it is estimated that there will be more than 50,000 plants to register. This could not only put immense strain on the ever shrinking Defra team, but could bankrupt companies too.

Too late to change, but some things need to

There are other areas of concern; for instance the definition of a genebank or network. Garden Organic's Heritage Seed Library seems to fit, but many plant collections are owned and managed by commercial nurseries whose financial survival is intrinsically linked to the collection. The directive aims to differentiate between not for profit genetic resources and private companies, but the real world does not always fit such a black and white picture.

In the meeting, Defra were clear that there is little chance of making significant alterations to the proposals, so our main hope is to try to build in sufficient flexibility, safeguards and exemptions to protect what is left of our seed diversity.

The EU Commission says it wants to protect consumers and improve food safety without threatening biodiversity, innovation or sustainable agriculture. Some believe that these proposals will do that for arable varieties. I remain to be convinced that there are not cheaper ways to achieve a similar result.

To achieve the same for vegetable, ornamental and forestry sectors may be possible but the tool they have designed is far too powerful for the job and from where I'm standing looks like it's going to make quite a mess.

Would you be interested in growing ORC's wheat populations commercially?

We've started the process of bulking up seed and hope to be able to make the first seed available in 2015. Small quantities may be available for trial in 2014.You can register your interest with Robbie Girling at ORC.

Addressing diffuse pollution from agriculture

Can we produce enough food and have a healthy (water) environment? Can we balance our current and projected future levels of production with environmental needs? We have to feed a growing, and increasingly urbanised, society largely divorced from its food and water sources and where individuals are unaware of their ecological footprint. But if we degrade the other interconnected ecosystem services, what will we gain? ***Bob Harris*** *of Sheffield University outlines some of the current discussion around the challenges of addressing diffuse pollution and creating better water quality, safe and protected drinking water supplies, improved freshwater ecosystems and a better environment for all.*

Through the increased use of fertilisers, crop protection products, selective breeding and other production-focused methods, we now achieve higher yields in agriculture. But this is often at the cost of insidious environmental damage which takes longer to restore than to cause.

There has been a step-change in food production, but also a huge increase in the flux of nutrients into the water environment. An excess of nutrients and sediment eroded from soil now presents a barrier to returning our once dead and dying rivers to a healthy state.

So-called agricultural diffuse pollution is contributing to a steady decline in rivers. Although our past industrial legacy and urbanisation still has an impact, agricultural land use is now the dominant influence on the water environment and is apparent through the chemical quality and declining ecology of rivers, lakes and ponds. But the standard 'polluter pays' approach to water pollution is not appropriate for managing diffuse pollution and in today's consumer society it could be argued that the polluter is… us.

What's changed?

Farming practices changed around and following World War II. The threefold increase in stocking of upland farmland (with its associated impact on land use and nutrient loads) is a direct response to two incentives - the Hill Farming Act (1946) and the Hill Livestock Compensatory Allowance (HLCA) (1976).

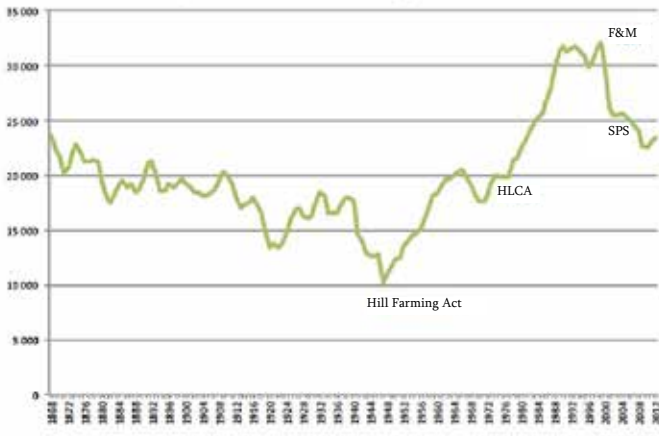

Figure 1: Sheep and lamb numbers in England and Wales (1868 to present day)

A good example, in a lowland setting, of an indirect response is the two step increase in nitrate concentrations in the River Thames resulting from the ploughing of old pasture and the increased cultivation of gardens during and immediately after the post-war period.

The mineralised nitrogen released resulted in a pulse of nitrate in run-off towards the end of the decade. The second step 20 years later is the same flux but delayed because of the time needed to leach into and travel through the groundwater to the river.

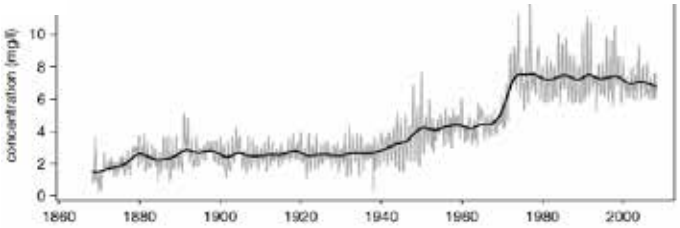

Figure 2: Nitrate concentration in the river Thames at Hampton (1868 to present day)

Do we really understand how to deal with diffuse water pollution?

There's no single reason why our rivers and groundwaters contain too many nutrients, pesticides or microbiological pollutants and are now blinded with silt. It's complicated.

The Prince of Wales's Food and Farming Summer School

In July this year, ORC was delighted to host the Prince of Wales's annual Food and Farming Summer School, for the first time. Held over three days at Elm Farm and Duchy Home Farm, the event culminated in a reception hosted by Prince Charles at Highgrove. The Summer School brought together leading individuals from farming, food businesses, research, government and non-governmental organisations to address the challenges of producing sufficient food sustainably, to meet not just the requirements of current but also of future generations.

The topics covered included; food security and sustainable intensification; economic, social and public health challenges; sustainable nutrient and water use on farms (including zero tillage and agroforestry alternatives) and the role of livestock in sustainable systems. Visits were made to Helen Browning's Eastbrook Farm, West Woodhay Estate, the agroforestry trials at Elm Farm and Duchy Home Farm.

Over the next few issues we plan to bring you some of the papers presented at the Summer School, starting in this issue with contributions from Prof. Bob Harris and Prof. Christine Watson.

ORC will be running the Summer School again in 2014 – please let us know if you would like to be informed when details are available.

The impact of diffuse pollution is a collection of pressures on the ecological system acting in synergy. We are only now beginning to understand and use systemic approaches to unravelling such cause and effect relationships.

Apart from discrete research projects, we seldom collect the right data in the right places, let alone make much sense of it. A quote attributed to Einstein goes something like: "If I had an hour to solve a problem, and it was terribly difficult, and my life depended on it... I'd spend the first 55 minutes thinking about the problem." We don't think enough; we like to see action on the ground.

At a simplistic level the issues centre around waste (or resource) management: in the west too much for the land area at certain times; in the east the intensification of cropping of land so that a proportion of the nutrients and pesticides applied will leach to water. But solving agricultural diffuse pollution is far from simple. It is an enormous challenge, especially in the face of pressure to grow the rural economy, when the very things that grow it have caused the damage.

However, focusing on trying to understand the complexities does bring rewards, as outputs of The Demonstration Test Catchments (DTC) project[1] are showing. Here, detailed investigation of mobilisation and transport processes and pathways gave results at field/farm scale which show that more than 90% of sediment and 75% of phosphorus in the stream can be transferred as a result of heavy rainfall in storms whereas the majority of nitrate is transferred in lower flows.

Scales of impact and of action

Diffuse water pollution is a spectrum of pollutant sources ranging from those that are truly diffuse, such as atmospheric deposition across extensive areas, to discrete discharges from, for example, small chemical leaks, septic tank drainage or poorly maintained farmyard infrastructure.

Much depends on the scale at which we consider the issue. At a landscape or catchment scale a myriad of individual sources, which in isolation may not present a problem, become merged to deliver a considerable collective impact. At the site or field scale each of these sources is identifiable, and manageable, but at a cost.

We all work at differing scales and levels – from the policy making scales at European and national levels; through the thinking and planning scale of river basins and catchments; to the 'doing' scale of sub-catchments, water bodies, farms and sites.

Actors and the issues vary at the different scales and levels of governance. However, we often don't recognise this layered system and for example try to communicate across several at once and then wonder why the message doesn't get through. Conversely, messages that are learnt at the bottom seldom filter up to the top.

Adaptive and iterative approaches are needed but as yet we don't have robust systems to achieve them. There remains a gulf between the thinkers and planners at river basin scale and above, and the doers at the field scale (e.g. the Pont Bren farmers in the Welsh borders[2] who had to invent their own schemes to deal with their particular circumstances).

The complexity and inter-connectivity of the issues requires the co-operation of the various actors, rather than their isolation in silos; the better joining up of agencies, trying for win-wins in delivering differing parts of legislation and making research programmes more relevant to society's needs. But governance and management remains poorly joined up in terms of water and land issues, with the governance of water quality and water quantity issues largely separated – from themselves, food production and flood risk management. This is a bigger problem at higher scales - better policy integration is required at EU and national levels - but at local scales integration becomes a necessity ("…all these directives end up being integrated in a field on a farm." Andrew Clark NFU, oral evidence to House of Lords EU sub committee on Agriculture[3]) and is an essential element of integrated catchment management.

Catchment approaches in action

The complex linkage between land and water management, ecosystem services and the socio-economics of an area is becoming more acknowledged in government. The catchment based approach (CaBA)[4] now being developed brings co-operative and collaboration down below the level of river basin planning. This will draw on existing catchment scale and community partnerships and initiatives and allow new ones to develop, fostering a more targeted and holistic approach. It should therefore lead in time to more resilient communities and landscapes supported by existing initiatives such as the catchment sensitive farming (CSF) programme[5].

One of the challenges for getting a balance is that there are few champions for the environment with muscle and money. However, water companies have started to take a more active interest in managing the catchments of the water they supply and/or discharge into. Closer working with the farmer, often using trusted intermediaries, is starting to bring results (e.g. Wessex Water paying farmers to work in particular ways[6] and South West Water's 'Upstream Thinking' programme[7] with the Westcountry Rivers Trust).

The Future – the Einstein quality of common sense

Perhaps it is time to stop thinking of all people who own rural land as 'farmers' and more as land managers who are paid to manage the land for the primary ecosystem services for which that land is best suited. Thus in places farmers become carbon sequestrators, water purifiers, biodiversity guardians or landscape enhancers. This might lead us to more directly and better valuing the critical but what until now have been regarded as the more ephemeral benefits of land, landscape and water systems.

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Holding on to sustainability: long-term management of nutrients in organic farming

The ongoing sustainability of organic farming faces a number of challenges which will sharpen in the future – not least the supply and availability of nutrients. ***Christine Watson****, of SRUC (formerly SAC), and* ***Elizabeth Stockdale*** *of Newcastle University consider some of the options and challenges for improving the long-term management of nutrients in organic production with a consideration of both local and global scale issues.*

Organic farming has become a part of the global agricultural industry and organic products are traded not just between farms and regions, but also between countries and continents. Inevitably, large amounts of nutrients are exported from farms as part of this process and they can only continue to produce acceptable quantities of quality food if these nutrients are replaced.

Soil has a finite capacity to supply crop nutrients unless they are replenished. The solution is perhaps easiest for nitrogen, where biological fixation by legumes can be harnessed to provide the engine for crop production. For other major and micronutrients more consideration needs to be given to acceptable sources for organic production as *in situ* mineral weathering from soil parent materials will only rarely meet crop demand.

We need to understand and improve the recycling and management of all nutrients on farm to optimise crop and livestock production and quality while minimising losses.

There is a vast body of research on nutrient management in organic farming carried out within Europe over the last 30 years but the majority of it focuses on nitrogen (N) and phosphorus (P) with fewer studies on potassium (K) and very rare consideration of secondary macro (Ca, Mg, S) and the wide range of micronutrients.

Regulations and principles

The EU Regulation on organic food 834/2007[1] sets a legal framework for practices which are considered acceptable within organic production. The regulation also seeks to embody at least some aspects of the international organic movement's principles of organic production.

A key concept within organic production is the idea of a balanced system, working as far as possible within closed cycles, and to a limited extent the regulation addresses this issue by controlling the sources of external nutrients that can be imported to the farm.

The regulation is mainly focused on the farm as this is considered to be the main unit of control. However some wider scale issues are also addressed, e.g. the ability to import organic fodder from within the region.

Closing the yield gap

Recently there has been considerable controversy in the scientific literature with regard to quantifying and closing the yield gap between organic and conventional production[2,3,4].

Increasing yields in organic farming will require an increase in both the total amounts of macro- and micronutrients and their availability from acceptable sources. If higher yields are to be achieved sustainably, this requires a concerted approach from agronomists, soil scientists and plant breeders.

Farm gate nutrient budgets for organic farms show both positive and negative results for macro- and micronutrients[5,6,7]. Many budgeting studies show balanced nutrient budgets (values close to zero) for P and K but studies are sometimes published from data collated for only one year. This may mask critical issues in organic production where practices may be planned on a rotational basis, e.g. nutrients imported in permitted fertilisers.

Some crops export much larger quantities of nutrient per kg dry matter than others and this kind of detail can be lost in budgets calculated for short periods. It is essential that nutrient budgets are estimated over at least one full crop rotation and that this information is used alongside soil analysis to allow useful interpretation whether for farm planning or policy-making.

Horticulture — a special case

Nutrient management in organic horticulture is perhaps a special case in relation to both the principles and practice of organic production.

Within organic field-based annual cropping systems, the principles of organic farming suggest that crop rotation is pivotal to the provision of nutrients to growing crops, but that this can be supplemented by acceptable inputs of fertilisers and manures. However, in protected cropping, where standards are currently under-developed (see page 11), the use of crop rotation is a more difficult issue as setting aside land for fertility building is generally economically challenging. As a result, production in protected cropping systems may be more heavily based on imported nutrients than in field-based systems, although regulatory total limits on applied N still apply.

There is currently no requirement for field-based and protected cropping systems to be linked, e.g. in the way that intensive livestock systems (pigs, poultry) are required to have a field-based element when produced organically.

Suitable off-farm nutrient sources

Optimisation of the use of on-farm nutrient sources such as soils, crop residues and farmyard manure, where available, is critical in any approach to increase yields in organic production.

However, in addition to these resources and the selection of suitable plant species and varieties, locally available off-farm materials are an important option. While once viewed only as waste for disposal, materials such as food processing,

kitchen and garden wastes and municipal leaf litter can represent a valuable source of various nutrients (as well as potentially toxic elements).

However, use of such soil amendments in organic farming requires these materials to be approved for use and to be analysed prior to application so that they can be used appropriately within a rotational nutrient management plan, as well as in line with environmental legislation to protect agricultural land and the food chain (European Community and national regulations, e.g.[8]).

Manures, composts and other organic materials as well as imported feed may contain both macro- and micronutrients which need careful scrutiny in the long term. For example, high levels of copper have been found in manures due to contamination with waste from footbaths using copper salts[9], as has zinc from metal equipment or building materials in animal housing[10]. The Environment Agency has also imposed restrictions on using composted leaf litter from street sweepings in agriculture due to heavy-metal contamination.

Waste materials, and thus nutrients, from processing and/or consumption of organic products are not generally returned to organic farming systems, potentially resulting in nutrient depletion of soils.

Relocalisation of the food system

There are ongoing debates about whether the food system in Northern Europe can continue to rely on global transport of food; hence there has been an increased interest in relocalisation of the food system[11].

Changing diets have been a major driving force in the spatial decoupling of consumption and production. This is not only the demand for 'exotic' products which cannot be produced locally and year-round consumption of seasonal goods but also the changing patterns of meat consumption.

The EU imports the equivalent of 37 million tonnes of soya bean, accounting for about 15 million hectares of land outside the EU, and is the largest cause of the EU net 'virtual' land (and nutrient) import[12]. This is increasingly pertinent for organic farming, which now has substantial global trade and increasing numbers of countries requesting recognition of their organic standards by the EU.

As a result of spatial decoupling of food production and consumption, macro- and micronutrients are being exported not just from organic farms but from entire regions and replacement nutrient inputs acceptable to the organic standards will have to be found (ideally in the country of production) if soil fertility is to be maintained.

There has also been increasing decoupling of crop and livestock production in Europe over the last 40 years and it is interesting to consider whether this has occurred in organic production to the same extent that it has in conventional production. From a point of principle there is an expectation that mixed farming will be more prevalent within organic production, with a degree of reliance on home produced feed and fodder.

The scale at which nutrient management is best considered to answer questions about long-term sustainability of organic farming in relation to nutrients is thus an interesting one.

Nesme et al.[5] question whether the farm is the correct scale to address nutrient balances in organic farming or whether groups of farms or regions are more appropriate.

This larger scale would allow exploration of the issues about decoupling of livestock and crop production and also the appropriate uses of local soil amenders or 'waste' products. Ultimately, returning human waste to organic farms is one way to help to 'close the nutrient loop' although this is not currently allowed within the EU regulations.

Issues over the use of globally traded commodities like rock phosphate within organic production continue to be up for debate. It is however very difficult to obtain figures which allow robust independent analysis of the reliance of organic production on the use of particular inputs.

Improving the management of nutrients in organic farming in the long term will continue to challenge the research community. It undoubtedly will require a range of approaches both on farm and at a wider scale. However, in looking for economically viable solutions to on-farm and off-farm nutrient management challenges, it is essential to hold on firmly to the principles of organic production.

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From the 'antibiotic revolution' to 'the revenge of the bacteria'

The development of antibiotics revolutionised human and animal health care but now the World Health Organisation says that antimicrobial resistance is one the most concerning health challenges of our age. Katharine Leach and Gonzalo Palomo report on a meeting of the Save Our Antibiotics Alliance where the role played by farm livestock management was explored.

Richard Young, policy advisor at the Soil Association, is emphatic about the prominent role of farming in antimicrobial resistance generation and its spread through the food chain and the environment. He highlighted the spread of resistance in common food-borne bacteria such as with Campylobacter and the use of fluoroquinolones; a new fast-spreading strain of Salmonella; *Escherichia coli* (including Extended-Spectrum Beta- Lactamases – ESBLs); enterococci; and meticillin-resistant *Staphylococcus aureus* (MRSA).

The role of conventional husbandry in the generation and spread of antimicrobial resistance is well documented. On the other hand, according to a Defra study antibiotic resistance is lower on organic (where antibiotics are only used for emergencies for welfare purposes) than conventional farms.

According to Peter Stevenson, Chief Policy Advisor at Compassion in World Farming, although antibiotics as growth promoters and as prophylactic additives in feed have been phased out in the EU since 2006, there are still some grey areas in the policies and guidelines. Vets are still allowed to prescribe antibiotics to healthy animals in order to avoid an ongoing problem. In fact, in some sectors, like dairy, antibiotics are widely used preventively. According to a survey in 2010/11, 96% of dairy farmers in England and Wales used antibiotics during the drying off period.

Professor Liz Wellington, environmental microbiologist at the University of Warwick, tracks bacteria in the environment and studies their role in developing resistance. Animal manures, human sewage and some industrial wastes applied as fertilisers, can also be a source of antibiotics and, therefore resistance. Her research has shown that antibiotics and resistant bacteria can survive in pig slurry for more than 280 days. In comparative studies of organic and conventional farming, nearly half of conventional and 28 per cent of organic farms were found to have pathogens present, but conventional farms had additional pathogens that the organic farms did not.

The UK can learn a lot from Denmark, which has one of the lowest antimicrobial resistance rates on farms in the EU. According to Jan Dahl, chief vet advisor to the Danish Agriculture and Food Council, Denmark began to address the issue more than 20 years ago. In 1993 veterinary advice was officially separated from the sale of antibiotics in order to avoid the incentive to prescribe too much. Also a ban on generic antibiotics, such as tetracyclines, was introduced. Later, monitoring systems were introduced. In 2001 VetStat, a database registering drugs being used on all farms in Denmark, was set up, allowing all stakeholders, including consumers, to know about the health status of their food suppliers, and for farmers to compare themselves against the average. Recently the 'Yellow Card' initiative, which issues a warning to herds with double the use of antibiotics, was introduced.

Stricter rules for organic farming?

Consumers' trust in organic products, together with a demand for stricter rules at EU level, are among the main responses from the EU's public consultation on the future of organic farming. The online consultation, which took place in the first half of 2013, returned nearly 45,000 responses from people who have some interest in organic farming. Of those, the majority (56%) came from France, followed by Italy (15%), Belgium (4%) and Germany (3%). Other countries were represented with less than 2% each. 96% of respondents were citizens, of whom more than 60% characterised themselves as regular consumers of organic food. The remaining responses represented a number of different stakeholders of the organic sector.

The report's key findings include:

- Consumers trust organic products (71%).
- The EU-organic logo is well recognised (79%).
- Consumers buy organic products mainly out of concern for the environment (83%), and because they are (believed to be) free from GMOs and pesticide residues (81%).
- The vast majority (78%) also indicated that they were prepared to pay more for organic goods. There was a very strong demand for harmonised rules at EU level, with 74% of all respondents requesting European organic standards to be strengthened and 86% wishing organic rules to be uniform across the EU.
- Local feed for animals. 49% stated that organic livestock should be fed 100% feed from the farm or region, 27% opting for setting a minimum percentage from farm or region. 16% said if good quality, it could come from anywhere.
- The majority (66%) wanted legislation to boost European production of protein crops.
- End to derogations? Most (61%) were against keeping exemptions from the production rules for specific conditions.
- More than 60% strongly insisted on strengthening animal welfare standards.
- No pesticides. 73% and 67% of respondents requested that pesticides and additives respectively should not be allowed in organic farming. 61% wanted testing of organic products for pesticide residues.
- Measurement of environmental performance. 61% requested processors and traders to implement environmental management systems to monitor environmental performance.
- Yes to group certification. 70% were in favour of permitting group certification in the EU.
- More info required! 94% requested more information on organic products.

The results of the public consultation will feed into the ongoing review of the political and legal framework for organic agriculture in Europe, with an overall strategy to be put forward in early 2014.

ORC has now completed its part of an independent evaluation of the EU organic regulations, which will also feed into this process, and the draft report is with the Commission – more details in the Winter Bulletin.

Full report: http://ec.europa.eu/agriculture/organic/news_en

Final expert report on organic protected cropping

The controversial subject of regulations for organic greenhouse production (protected cropping) has been examined by the EU Expert Group for Technical Advice in Organic Production. The working sub-group included representatives from the UK (Roger Hitchings of ORC), Italy, Spain, Denmark, Switzerland and Germany. The European Commission has just published their final report.

Here is a brief summary of their conclusions:

- *Fertility* should be supplied primarily from slow release organic fertilisers, such as manures and composts. The use of liquid fertilisers should be justified by calculating nutrient balances. Using irrigation to flush out surplus nutrients is not acceptable.
- *Crop rotation* is desirable but difficult. Rotation concept should include diversity in space rather than time.
- *Soil health* should be maintained by preventive methods including rotation and use of biologically active composts. Biofumigation, solarisation and shallow steam treatment of the soil should be allowed. Deep steam treatment (beyond 10cm) should only be allowed under exceptional circumstances (e.g. nematode infestation).
- *Use of natural enemies* (beneficial insects) is in line with the principles of organic farming.
- *Plant protection:* The same substances authorised for use outdoors should be allowed in protected cropping.
- *Cleaning and disinfection:* There should be a review of the substances allowed for disinfection and/or decalcification in all situations. This could be complemented with a list of substances authorised only for specific purposes.
- *Mulching:* Non-biodegradable mulches should be allowed, with re-use and recycling encouraged. Biodegradable mulches are OK though not if use GM-derived starch.
- *Irrigation and water use:* Guidance for efficient water use and/or water recycling should be developed.
- *Energy use:* Responsible energy use is needed.
- *Light:* Use of artificial light is acceptable, although not in excess of the photosynthetically active radiation (PAR) of a summer day (21st June) and should not exceed 12 hours of daylight including the artificial light.
- *Temperature:* Due to variation in climate, unified criteria for heating greenhouses can't be easily applied to different regions in the EU. Efforts should be made to minimise energy consumption and maximise the use of energy from renewable resources.
- *Carbon dioxide:* CO_2 enrichment is acceptable but should preferably be from processing or burning of biomass sources. Research is needed on alternatives to CO_2 enrichment based on burning of fossil fuels, which shouldn't be allowed.
- *Growing media:* Limited use of peat, restricted to 80% by volume of growing media, and should be progressively reduced. Peat not allowed as a soil improver, due to environmental concerns. Soil from certified areas of organic farms should be allowed to be mixed into substrates for use on the farm itself.
- *Growing in substrates* is acceptable for seedlings and transplants and plants sold to the consumer together with the pot/container in which they are grown. Harvesting organic vegetables or fruits from plants grown in substrate cultures is not acceptable; they should be grown in the soil. However, the report makes an exception for the growing of vegetables in growing media in demarcated beds for farms which grew such cultures before 2013 in Finland, Sweden, Norway and Denmark, on the condition that the growing media and plastic are recycled. The production of plants, fungi and algae that do not naturally grow in soil should be allowed.
- *Recycling of growing media:* Excess growing media from potting/unsold potted plants, or growing media used in demarcated beds, should be recycled.
- *Conversion periods* should be the same for greenhouse cropping as for outdoor cropping. For greenhouses, where plants are grown in substrate with no contact with the soil, no conversion time is required if appropriate measures are taken to avoid contamination risks. The group suggests that conversion periods in general should be reconsidered, considering a one-year conversion for greenhouse and outdoor crops.

It is unlikely that this report will be the last word on the controversial issues. It will be reviewed by the EU's Standing Committee on Organic Farming over the next few months, and consideration will be given to adopting some or all of the recommendations into the current review of the EU organic regulation. This review process provides an opportunity for organic producers to engage in a debate about how the regulations should be changed.

Further information

1. Download the full report: http://ec.europa.eu/agriculture/organic/files/eu-policy/expert-recommendations/expert_group/egtop_report_on_greenhouse_production.pdf
2. See also: Towards protected cropping standards - a principled approach in ORC Bulletin 110

Field labs focus on fertility, weeds, varieties, antibiotics and.. er...foam

The field labs component of the Duchy Originals Future Farming programme has forged – in one case foamed – ahead this summer. Each 'lab' is hosted by a producer who meets with a researcher, facilitator and other producers to identify and tackle production problems through small-scale trials. ***Nick Fradgley, Katharine Leach, Anja Vieweger*** *and* ***Phil Sumption*** *report from the field labs where ORC, the lead research partner in the programme, has been directly involved.*

Focus on fertility – Home Farm Nacton

This field lab focuses on how to access and manage fertility economically in field-scale vegetable and arable systems. On 28th May 2013 the field lab was hosted by Home Farm, Nacton, at the mouth of the river Orwell in Suffolk. Home Farm benefits from fertile soils and good light land to produce organic vegetables and cereals on 2,500 acres.

Talks in the morning included the background to the farm and introductions from the partners, Soil Association and LEAF. David Stanley of e3 also talked about climate change processes and their effects on agriculture.

As well as a tour of the farm, the group discussed common issues affecting their own farms and what their research priorities are. Some of the topics discussed included late season N top dressing on brassicas, leaching of compost manures, quantifying the effects of adding compost, fertigation and micronutrients.

From these ideas, two priorities were chosen that farmers will be able to experiment with themselves as part of the on-going field lab. Weed control was identified as a problem that all organic farmers are faced with. Specifically, couch, fat hen and creeping thistle are common problem weeds. Control methods using specialist equipment such as foam weeding, electrical, comb weeders and Garfield inter-row weeders were discussed that could be demonstrated and compared among the farms.

Trials to compare different late season top dressings including mushroom compost, muck and high N organic products were discussed. These trials on cauliflower or other brassicas applied in 25m strips would be replicated on two or three of the farms involved. Later in the season differences may be recorded by measuring yield, leaf sampling and vegetable shelf life.

Weed control – Shimpling Park Farm

This field lab is for farmers interested in improving their understanding of how effective different weeding techniques are within stockless arable rotations. On 11th June the field lab was hosted by John Pawsey on his stockless arable farm near Shimpling, Suffolk. John has a market-led rotation of 18-months red clover ley => winter wheat => winter barley => winter beans => winter wheat or winter barley (undersown).

On the farm tour John outlined the various weed problems that he has and the cultural and mechanical control methods that he's tried. As blackgrass was the most prevalent weed, at the time of visit, we decided to focus on this. Although John has experimented with various weeding equipment such as the weed surfer, inter-row hoe, and comb-cut weeder, the most apparent differences in blackgrass populations were an effect of spring cropping (less blackgrass) and the competitive effect of different crops.

John Pawsey and Martin Todman amongst the blackgrass

The group discussion opened up to hear the participants experiences and included the role of over-wintered green manures. The topic of allelopathy was raised, particularly the possible benefits of rye straw and further discussion on this topic continued via email after the meeting.

The plan for a continued on-farm trial is to drill strips of different spring and winter sown crops, including winter wheat, winter barley, winter oats, spelt wheat, winter triticale, spring oats and spring barley. By assessing blackgrass populations in the following crop we will be able to compare the relative weed suppressive ability of each crop and between winter and spring sowing.

Foam weeding

Around 15 growers and advisors met on 19th June at the Somerset Flower Farm in Wrington for a field lab on foam weeding. Foam weeding is a relatively new technology using biodegrabable starch foam at high temperature to kill the weeds and weed seeds without disturbing the soil. The current delivery method is most applicable to perennial crops and amenity areas, but with potential for wider applications.

As a first step, all participants identified their priorities and expectations of the field lab, and listed areas and questions for which they would like to receive more information during the day. Examples were: data on actual labour saving in comparison to flame weeding, affordability and costs, potential negative effects on insects and soil organisms or residues of the foam.

William Iliffe from Ecological Weeding Techniques gave a short introduction to foam weeding, answering some of these questions, and then demonstrated the technique. The participants then identified four different plots in the flower fields, where comparison trials were set up. The size of these plots was measured and the time needed for the application of foam weeding was recorded. On the same day, comparable control plots were hand weeded and the time was again recorded. Photos of each plot were taken weekly to follow the development of any potential regrowth of weeds.

The globe artichokes between the canes were treated with the foam weeder and still relatively clear of weeds 2 months after treatment compared to the control (unweeded) to the left.

This field lab was followed up by a second event in September to review the plots and evaluate the results. It showed that in many places the docks had re-grown to appear not significantly different to the non-treated plots, though on closer inspection there were few other weeds amongst them. Where there were fewer docks, e.g an area treated along a fence-line and amongst globe artichokes, the treatment appeared more long-lasting. Further plots were treated, and some re-treated, which will be monitored. The group wondered whether the best application of the technology could be in difficult perennial crops such as asparagus and soft fruit, plus awkward areas like the edges of polytunnels. This could be followed up in the field lab programme next year.

Vegetable varieties

This field lab has been designed to take some of the open pollinated (OP) varieties only available as non-organic seed and trial them in organic systems to see what might have potential for maintaining and improving as organic varieties or for seed-saving for on-farm use. A series of around 20 seed variety trials and field labs were started in February 2013, operating as 'virtual' field labs due to the geographic spread of participants.

The trials at Tolhurst Organic Produce are well under way. Here, various varieties of Brussels sprouts, leeks and tomatoes are being compared.

The Brussels sprout varieties Evesham Special, Sanda and Roodnerf as well as the holding's usual varieties F1 hybrids Nordic and Doric were sown into trays at the end of April. At the beginning, the hybrids showed faster and more vigorous growth, whereas the other three varieties were growing a bit more compact and hardy. The transplants were planted in early June; and in August, some differences in growth were still visible (see photo above right). So far no particular problems with disease or pests have been detected.

Also, at the end of April, the leek varieties Northern Lights, Winter Giant 3, Toledo, Long de Mezieres, Husky, Hannibal and Bandit were directly sown in rows in the tunnel; at around 100 seeds per metre. Some differences among the varieties could be noticed during an assessment in late May as well as in early July; they were planted out in the field in the end of July.

The tomato varieties were sown on two different dates, the holdings' usual varieties in mid-February, which were planted into the tunnel in April; and the trial varieties at the end of March. Here, the varieties Tangerine, Stipice, Galina, Yellow Submarine and F1 Diplom are compared. Obvious growth differences were noticed, both in May and in July; and again, no particular problems with disease or pests have been detected yet.

Brussels sprout varieties in the field at Tolhurst Organic Produce, showing considerable variability. Inset: transplants.

Antibiotics

A group arising from the autumn field lab on reducing antibiotic use in dairy herds held three meetings during the spring and summer of 2013, each hosted on a different group member's farm, giving plenty of opportunities for exchange of ideas. All members have summarised their antibiotic use for the previous year, so that the effects of attempts at reduction can be measured. Members are monitoring the effectiveness of treating high cell count cows with "Uddermint", with careful recording of treatments and reference to subsequent individual cow somatic cell counts. At one meeting an interesting additional topic was a demonstration of the 'Obsalim' method of assessing the suitability of the ration by observing particular 'cow symptoms', or animal indicators of deficiencies or imbalances in the diet or how it is fed. The group plans to meet again in September.

For more information on the field labs see: http://tinyurl.com/nwbg8cz

Is organic farming 'innovative' enough for Europe?

*Innovation and agriculture have always gone 'hand in hand' because working with dynamic geographic, climatic, market and political conditions requires constant change[1]. Today, innovation is seen as the primary instrument for overcoming the future challenges for agriculture of food security, climate change and the conservation of natural resources. The European Innovation Partnership for Agricultural Productivity and Sustainability (EIP) was set up in response to these challenges[2]. **Susanne Padel** explores how organic agriculture fits into that framework.*

Innovation is a broad concept. OECD defines it as the implementation of a new or significantly improved product (good or service), a new marketing method or a new organisational method in business practice, workplace organisation or external relations[1]. Innovation refers not only to an invention, but also to the embedding of that idea in a relevant sector.

The whole process has three stages of:

1) invention, when ideas and concepts are developed or prototypes built;

2) innovation, focusing on how to put ideas into practice and

3) diffusion, with more widespread application of the innovation at different social and economic levels[3].

In looking at how this applies to organic farming two possible perspectives can be adopted:

(a) Organic farming itself can be seen as an innovation. I examined whether conversion to organic farming can be interpreted as a typical example of innovation by applying the adoption/diffusion model[4] .Based on a review of various studies I confirmed that to some extent farmers, who had converted organic farming, showed similar characteristics to innovators and early adopters in the model[5].

(b) Innovation in the organic food and farming sector depends on the functioning of the system as a whole[6] and this systems perspective is becoming more widespread in designing innovation support, including for agriculture, within the EU[2].

But how relevant is this perspective to the organic sector? Work in the EU funded SOLID project[7] (in particular, the work package on 'Innovation through stakeholder involvement and participatory research') and the technology platform TP organics[8] indicates that it is.

The innovation system framework

The first problem to overcome is that in the context of agriculture innovation is nearly always understood as being only technical, with most experts not sufficiently aware of social/societal innovations[9] that could be particularly important for achieving societal and political goals.

This is not so surprising given the long period during which progress in agriculture was seen solely as increasing efficiency through using new technology. Morgan & Murdoch[10] describe this for the cropping sector in England in the post-war period as follows: 'Efficiency came very quickly to mean the application of the new agricultural technologies which were beginning to emerge onto the market. Input companies were investing heavily in research and technology development'. In developing the chemical inputs in arable production, the farmers' 'know-how' was replaced by 'know-what', i.e. what input to use and when.

In contrast, the systems perspective describes innovation in a more process-oriented, interactive and evolutionary way, whereby networks of organizations, together with the institutions and policies that affect innovative behaviour and performance, bring new products and processes into economic and social use[11]. It looks at innovation as an emergent property not only of science or the market, but of interaction among stakeholders that allows opportunities to develop[12]. Innovation is seen as the application of knowledge (of all types) to achieve desired social and/or economic outcomes. This may be acquired through learning, research or experience, but it cannot be considered as an innovation until it is applied[11].

The relevance to the organic sector

The importance of the system perspective and of different innovation is being increasingly recognised in agriculture (e.g.[1,9]). In the EIP this is expressed as the need for forming partnerships, using bottom-up approaches and linking farmers, advisors, researchers, businesses, and other actors in so called Operational Groups.

In the Implementation Action Plan of TP Organics, we argued for a broad understanding which included social/organisational as well as technology innovations[13].

We called organic farms 'creative living laboratories', because the restrictions in the standards forced farmers to think outside the box in finding new solutions to common problems.

We also introduced a category of 'know-how' innovations which emphasises the importance of the application or leverage of existing knowledge, for example through developing and prototyping management practices.

We argued that know-how is crucial to the farmer's ability to respond effectively to new challenges, such as saving and protection of natural resources, and for improving the multi-functionality and sustainability of agriculture.

Knowledge is of course important in any innovation systems, but for organic and low-input some innovations consist only of knowledge.

Examples of such 'know-how' innovation include finding ways to secure essential supply of vitamins and minerals in organic dairy production through natural sources (ECOVIT project), the use of compost in plant protection or to encourage predators by supporting their habitats (e.g. flowering field margins)[13].

With such a strong focus on knowledge comes a shift to learning, i.e. active knowledge construction rather than more passive 'technology transfer'[14]. Morgan and Murdoch[10] argue that in industrialised conventional supply chains the farmers' knowledge tends to be rendered into codified and standardised forms (blueprints) while in the organic chain there is increased scope for local, tacit forms of agricultural knowledge.

The organic sector has long been characterised as one that replaces inputs with knowledge[15] and where learning partnerships, group extension, farmer-field schools, communities of practice, study circles and farmer networks have emerged. These are not always successful and the process can be very frustrating for the participants, but there are a growing number of good examples.

In the SOLID project, we included a whole work package on farmer-led innovation where we collaborate closely with farmers and SME partners (mainly organic and low-input dairy buying groups and processors).

Initially, we consulted for research priorities using on farm interviews about sustainability as well as workshops[17]. At present we are developing on-farm projects in several countries, with the aim of testing ideas for relevance and feasibility and also for acceptability with various stakeholders.

Where next?

One problem for 'know-how' innovation is that it is often difficult for projects to generate something that is useful beyond the circle of actual participants. One reason might be the importance of tacit knowledge. This knowledge is un-codified and contextual and the user might often not even be aware that she/he possesses it[10]. If the user does not what they know, how can it be shared?

Also there is a need to consider different types of knowledge held by different participants e.g. the lay-expert[14], and the ownership of knowledge and associated conflicts between protecting intellectual property and open access.

The ongoing challenge for organic farming is to remain innovative in how we work with this mixture of different and very diverse sources and types of knowledge and to continue developing joint learning approaches for researchers, farmers and advisors.

This challenge can be met and the novel approaches developed in organic agriculture will be truly innovative through being more widely applied and used.

The Organic Research Centre is following up with Defra and the Welsh Government on how these perspectives can be reflected in the implementation of EIP operational groups in England and Wales as part of the preparation of the 2014-2020 Rural Development Plans.

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Events and announcements

Events

13/14 November 2013: National Soil Symposium. Soil Association conference, Bristol.

6 December 2013: True cost accounting in food and farming. Sustainable Food Trust conference, London.

16/17 December 2013: Training for Trainers. IOTA workshop, ORC Elm Farm

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

6-7 January 2014: Oxford Real Farming Conference

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

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

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For many of our activities, including the Bulletins, our website, pilot projects exploring new ideas, PhD projects and policy advocacy on behalf of the organic sector.

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We have big ideas for moving forward, including developing the farmhouse at Elm Farm as a centre for residential short courses.

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