

THE ORGANIC
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ELM FARM

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Cover: ORC researchers bag this year's wheat population trial while University of Reading researchers explore the potential impacts of climate change on grain sterility and how diversity might help (p 4)
(Photo: Anja Vieweger)



Organic Research Centre

Bulletin

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News in brief

ORC's 2012 Organic Producer Conference now open for registrations

With this Bulletin (and on our website) you will find the outline programme and conference registration details for our conference due to be held at Aston University, Birmingham, from 18th-19th January 2012. We have worked closely with organic producer groups and other organisations to offer a challenging programme featuring the latest research and farmer-led innovations to improve organic practice and profitability. Once again, Southwest England producers will be able to get financial support to attend through Duchy College and we are grateful to Triodos Bank for their continued sponsorship.

Please note that the **significant discount for early bookings** will be strictly limited to those received by the deadline!

Last-minute EU feed proposals raise concerns, but are they a step in the right direction?

With only a few days notice before the latest Standing Committee on Organic Farming (SCOF) meeting of member state government representatives, the EU Commission proposed an amendment to Article 19 of Regulation 889/2008 to require 40% of monogastric and 70% of herbivore feed to be grown "on-farm", with the remainder from neighbouring regions other than in exceptional cases. Significant concerns were expressed by the UK and other member states, as well as by the IFOAM EU group and other organic sector representatives, both about the lack of opportunity for consultation and the potential impact on the industry, especially pigs and poultry.

However, the principle that the majority of feed for livestock should be produced on the holding or locally is a key part of the organic ethos of working within closed cycles and reflected in the EU regulations. Specialist poultry producers already need to make agreements with local organic producers to take their manures – could a similar arrangement work for sourcing feed? To really close cycles, should the farms that provide the feed be the same ones that get the manures back? We'll be following this debate under 'Policy and debates' on our website.

Lower prevalence of antibiotic resistance on recently-converted organic poultry farms

A study published recently in Environmental Health Perspectives has found lower antibiotic resistance on newly organic farms than conventional farms in the US. In conventional poultry production, antimicrobials are used for therapeutic, prophylactic and non-therapeutic purposes. Researchers have shown that this can select for antibiotic-resistant commensal and pathogenic bacteria on poultry farms and poultry-derived products. The study investigated on-farm changes in resistance as conventional poultry farms converted to organic practices and ceased using antibiotics. The authors concluded that the transition to organic practices is associated with a lower prevalence of antibiotic resistant and multi-drug resistant *Enterococcus*. For further details, see the News section of our website www.organicresearchcentre.com.

New window for Welsh Organic Farming Conversion Scheme (OFCS) 2012 opens

Following its decision not to integrate the Organic Farming Scheme with Glastir after all (Bulletin 105), the Welsh Government has now confirmed that the OFCS 2012 window for applications will be open from 3 October to 4 November. Only land that started conversion between 2 January 2011 and 1 January 2012 is eligible. An explanatory booklet is available from the Welsh Government, but most conditions and payment rates are similar to last year (as summarised in the Organic Farm Management Handbook). Applications must be received by 4 November, with decisions made and offer letters sent out by 28 November. Farmers must then return acceptance forms by 7 December. Organic control body certificates, confirming conversion started between the dates specified above, must be submitted by 31 March with claims for area and establishment payments to be made on the SAF in May. See www.organiccentrewales.org.uk for further information.

ORC to host UK organic policy forum at Elm Farm

For the first time in several years, representatives of the four devolved administrations in England, Wales, Scotland and Northern Ireland will meet with organic food and farming representatives to review progress with developing the organic sector in each nation of the UK. The meeting, to be held on 18 October, is being hosted by ORC at Elm Farm. The meeting will cover CAP reform, organic regulations, trade support, promotion campaigns, research and the potential role of organic action plans.

Leaked CAP proposals confirm specific measures for organic farming will be included

The detailed Common Agricultural Policy (CAP) reform proposals, due to be published on October 12, have been widely leaked and confirm that organic farming will be specifically addressed at two levels. Firstly, organic farmers will qualify automatically for the greening element of the single farm payment – this element is envisaged to be worth at least 30% of the SFP, other producers will need to make specific commitments to crop rotation, permanent grassland and dedicating some land to have specific ecological focus. Secondly, organic farming will also now be a stand-alone measure as part of the rural development programme. Since the mid-1990s, organic farming has been supported as an agri-environmental scheme.

Despite the specific recognition for organic farming, consistent with the announcement by Commissioner Ciolos back in June (Bulletin 105), environmental groups have been concerned about the 'greenwashing' potential of the reforms. The IFOAM EU Group has also called for organic farming to be prioritised in terms of higher co-financing rates (the share of the payments met by the EU centrally), and to be specifically recognised in the context of knowledge transfer support measures.

The CAP reform page on the ORC website (under 'Policy and debates') will be updated with further details as soon as they are officially published.



About us

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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 & 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: Venus and Mars are both planets

As lies and statistics are both used to prevent clarity, I find it amusing that it is unclear who the originator of the quote "there are lies, damned lies and statistics" was. Disraeli has claims, so has Mark Twain, and the two together probably have the best claim. But it is a fair bet that had either of them been alive today, they would have added the words "and then there is the media and marketeers."

Recent headlines say that the amount of organic land in the UK is declining – accurate, but not really the true story, which can be found in the article on page 10. The headlines have also been saying that the organic market is in free fall, but, as the same article shows, this is far from true. It is actually showing remarkable resilience in the face of this painful recession.

Headlines by themselves can be damaging, but when they are coupled with something labelled "analysis and comment" from somebody held up to be an expert or an informed commentator, things become destructive and too often self-fulfilling. Misleading or partially informed headlines spun by inexperienced and inaccurate analysis and comment becomes the gospel truth through the alchemy of repetition.

Sophistry – "a method of argumentation that seems clever but is actually flawed or dishonest" – is what Disraeli and Twain were highlighting; and sophistry is what organic food and farming has been subject to in the last 12 months or so.

We can't pretend there are no problems facing the organic sector but to understand the situation it is necessary to see and not just look; after all Venus and Mars are both planets and both a summer breeze and flatulence is wind.

So what is going on? Hardly any new land is being converted to organic at present, but – apart from a specific situation in Scotland – organic cropping and livestock production is holding its own. Clearly there have been falls in organic sales, but the example of the farmer on page 7 is by no means unique. There are many farmers and businesses doing better organically than they would be conventionally and have no intention of leaving the sector.

According to IGD's ShopperTrack research "Shopper values: beyond price", buying on principles, ethics and values is still strong despite the recession, with around 40% of people making buying decisions for these reasons. Organic purchases are still at the forefront of these sales – with the much trumpeted decline now stabilising and in the case of Waitrose showing a 6% increase in organic sales and a remarkable 16% in own label organic products during 2010.

In the wake of BSE, salmonella in eggs, the threat of listeria, dioxin and the ever present pesticides in the food chain, organic captured imaginations. It was and is something different; it is pro-change, pro-animal welfare, pro-environment, pro-biodiversity, pro-fair trade, pro-health, pro-food quality and holistic.

Today many of these things are separately boxed for presentation and marketing and have their specific sales pitch. Organic ticks all those boxes, but we are told it is harder to market than something with just one big tick on one thing and zero on everything else. The problem has always been that food companies and retailers cannot own up to all those zeros because of what the zeros really say about the agriculture and food system they are peddling.

Organic food and farming is showing itself to be resilient in dreadful economic conditions; if it's accessible people will buy it and into it, because they trust it in a way that they do not really trust conventional food and farming or government policies; and because they aspire to a better world.

Market ups and downs are just that, but aspirational visions persist and fundamental values are steadfast. The ultimate threat to organic is not market vacillation but forgetting our values and vision. Remember our product is not only food, it is a better world.

Lawrence Woodward

Grain sterility and flowering stress: the role of diversity.

*Weather conditions early in the growing season once again focused minds on the impact of climate change on agriculture. It is essential that mitigation strategies are developed at all points of agricultural production. Our former research colleague **Hannah Jones**, now at the University of Reading, and **Martin Lukac** are working on a particularly interesting approach in a BBSRC funded collaboration between Reading and The John Innes Centre, which in the final year will utilise ORC's composite cross populations.*

Cereal ears commonly have a sub-optimal number of grains, mainly due to a combination of environmental factors such as excess heat, inadequate light incidence, as well as deficiencies in water and nutrient supply. The issue of empty grain sites, often known as grain sterility, is likely to become a significant yield limiting factor in UK wheat if climatic conditions similar to those of this spring become more frequent.

At the present, the main strategy for reducing the effects of environmental stress on yield is to select for varieties which flower *earlier*, thus increasing their chance of avoiding early summer environmental stress such as heat. The converse is of course also true; sites which are at risk from late frosts are more suitable for *late* flowering varieties which start stem extension after the risk of cold damage has passed. Time of flowering is published in HGCA recommended lists.

Results this year from the NIAB-TAG wheat variety demonstration plots at Sutton Scotney have shown a significant interaction between the time of flowering and sterility. Contrary to expectations, earlier flowering varieties had reduced grain set compared to late flowering varieties. Early season drought (and perhaps also heat) had a disproportionately negative effect on those varieties which flowered early.

Flowering variability

Flowering in a single spike of modern wheat varieties can last for up to 8/9 days. The florets in the middle of the spike start to flower first, followed by those leading to the top and the bottom of the spike. Moreover, flowers within single spikelets do not flower at the same time. This three-dimensional variation can result in, for example, the last floret in centre spikelets releasing pollen at the same time as the first floret at the bottom of the ear has a receptive stigma. This spatial and temporal variation of stigma and pollen releasing anther flowering in a wheat ear can be visualised in a contour map (see Figure).

The impact of stress on pollination

Self-pollination dominates in wheat; but does this relate to same floret pollination, or pollination by different florets in the same spike, or pollination between tillers in the same plant? And, more importantly does it matter?

Stress induced by environmental change is known to reduce flowering synchrony (e.g. Herrero & Johnson, 1980), potentially reducing the level of same-floret pollination.

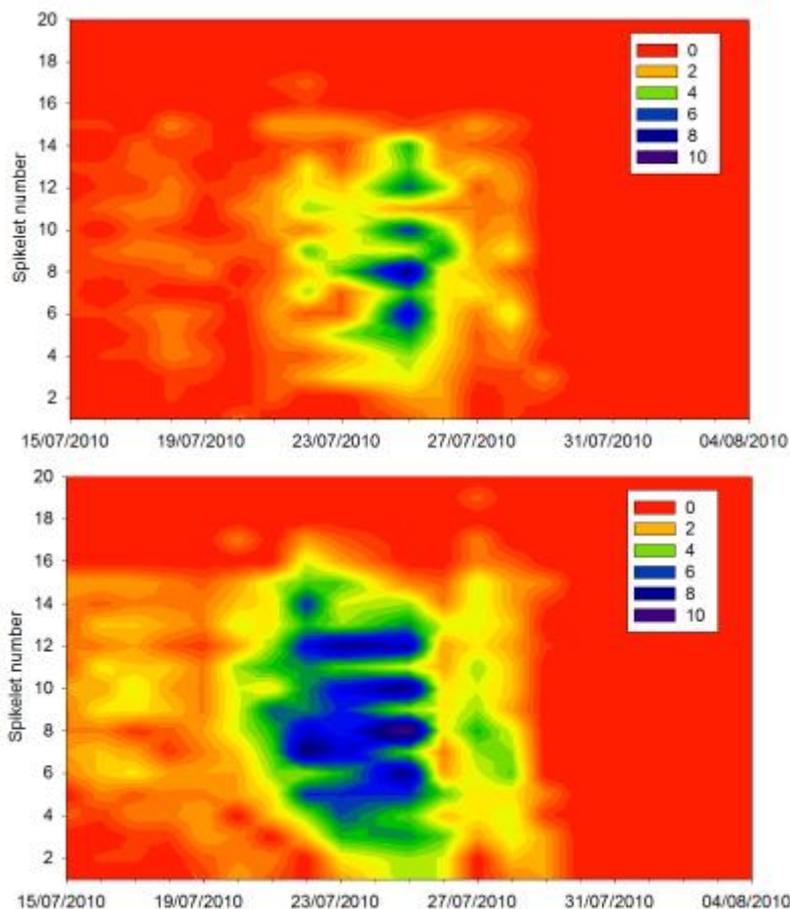


Figure: Contour plot indicating the spatial and temporal variation instigma (top) and anther (bottom) flower activity in wheat cross: Paragon x Opatá 85 (2D).

The colours denote the number of active flowers within each spikelet on a plant consisting of five ears. The y axis indicates the floret position in the ear with 1 representing the base of the ear. The x axis defines the date of the assessment.

Our recent work has shown that even under non-stressed conditions a minimum of 10% of florets are pollinated by pollen coming from elsewhere i.e. not within the same floret. So clearly, in a stress situation, pollen from one floret can pollinate a flower on a neighbouring floret, a different tiller, or even on a neighbouring plant.

Wheat pollen is short lived (less than an hour on a normal sunny day) and highly vulnerable to stress conditions, both during its development and its release. The female part of the flower is however more robust, and can remain receptive for an estimated 6 days (Molnár-Láng et al 1980).

Thus, a hypothetical heat wave may render all pollen released on one day sterile, but successful pollination of waiting stigmas can still take place on the successive day by pollen which has avoided stressful conditions. Evolution of wheat flowering, therefore, appears to offer an in-built escape strategy; wheat florets may be self-pollinating



under optimal conditions, but have a significant opportunity to utilise pollen from other florets when under stress.

Resilience in action

The scope of this resilience can be illustrated by research on the variety Moulin, which suffered pollen loss due to the sensitivity of its formation under cool and cloudy conditions. However, cross pollination of Moulin reached 32% in field conditions, compared to 7% in the less sensitive cultivar Aubaine (Demotes-Mainard *et al*, 1996).

It is possible that cool, dark conditions damaged the pollen development in Moulin making the florets male sterile. As stigmas can remain receptive for 6 days, or perhaps even longer (depending upon the environmental conditions), pollen from another less sensitive variety could then have provided viable pollen leading to successful seed set.

In this case continuously cool and low-light conditions during a critical period of pollen formation was the factor but short term stress can also have a negative impact on seed-set in wheat. Looking at the weather during this last spring and early summer, one can easily find unseasonably hot single days (over 25°C) when the plants were both drought and heat stressed. This kind of short-term stress “event” can damage pollen in the critical stage of its development, but pollen which has been formed prior to or after the “stress event” *escapes* the stress and therefore the negative impact.

Extend flowering, increase resilience?

The longer a crop flowers, the greater the chance of some pollen avoiding stress conditions, guaranteeing successful pollination. This leads us to suggest that extended duration of flowering in wheat may constitute a useful strategy to increase resilience against stress. However, can we increase the duration of flowering in a particular variety (within a spike and between tillers) while maintaining existing levels of pollination and yield and so utilise this inherent characteristic? Or to ask in a different way, is long-duration flowering an appropriate strategy for reducing the effect of environmental stress, thereby exploiting the within crop cross-pollination?

For vernalised (cold treated) winter wheat, the dominant environmental driver of flowering is day length, called photoperiod sensitivity. However there are a range of genes which also affect time and duration of flowering, but do not mediate any specific environmental adaptation, these are collectively termed ‘earliness per se’ (Snape *et al*, 2001). Our research is quantifying the duration of flowering, relative to the genetics of this ‘earliness per se’ in a range of varieties using lines bred by Simon Griffiths and his team at the John Innes Centre.

In the final stages of this research, a wheat population will be bred for flowering diversity i.e. different genes controlling flowering time will be bred into the variety Paragon. This will be compared to ORC’s composite cross population (see previous issues). The aim of the work is to measure the stability of performance of the “Paragon population” under environmental stress at and just before flowering, compared to the diverse ORC population in order to establish the role of *earliness per se* genes.

More extreme yield deficits are predicted in the UK (Semenov, 2009) as a result of increasing adverse climatic events. For a single genotype, a ‘stress event’ results in significant crop loss if it takes place when the wheat florets are in full flower. Observations from this year have demonstrated that we need to engage with a range of strategies to increase crop resilience, with flowering heterogeneity a potentially important tool to ensure yield stability in the changing climate.

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Resilient and drought-busting organic crops

30 years ago, the Rodale Institute set up its “Farming Systems Trial” comparing organic and conventional management.

Initially the trial looked at different conversion approaches but once established it began to yield lots of interesting and important information. A report summarising the trial and its findings can be downloaded at: <http://www.rodaleinstitute.org/files/FSTbookletFINAL.pdf>

One interesting finding in relation to resilience to environmental stress is just how well organic maize yields did compared to conventional. According to the report:

“Organic corn yields were 31% higher than conventional in years of drought. These drought yields are remarkable when compared to genetically engineered “drought tolerant” varieties which saw increases of only 6.7% to 13.3% over conventional (non-drought resistant) varieties.”

The report also says: “Water volumes percolating through soil were 15-20% higher in the organic systems than the conventional system. Rather than running off the surface and taking soil with it, rainwater recharges our groundwater reserves in the organic systems, leaving soil in the fields where it belongs.”

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Europe's organic seed dilemma

*Using organic seed is a natural consequence of the organic philosophy but for many crops there is a long way to go before all seed used by organic farmers and growers is organic. There is still a limited choice of varieties available in many plant species and so producers can apply for permission to use non-organic seed. However, these derogations limit the market opportunities for organic seed producers and prevent investments in this area, which in turn keeps the number of appropriate organic varieties low. **Thomas Döring** and **Sally Howlett** helped organise a European workshop at ORC to review the situation.*



Participants in the ECOBP seed regulation workshop

Seed is one of the most important foundations of agriculture. As the carrier of the genetic material it determines, to a large extent, the qualities and quantities of agricultural produce. Seed is also a focal point for the organic principles of health, ecology, fairness and care. For example, do we have seed available from plant varieties that are appropriate for the specific ecological conditions of organic agriculture? How can organic seed producers ensure good seed health to provide growers with excellent starting material? Who should bear the risks of seed production, and in particular, the higher costs associated with organic compared to conventional seed?

Using organic seed is a natural consequence of the organic philosophy – there is no reason why in the life cycle of the plant the seed should be exempt from the application of organic principles. However, the organic sector is relatively small and costs in both organic plant breeding and organic seed production are high, consequently the lack of, or limited choice of, organic seed. On a European level, its use seems to have increased over the last few years, but not nearly enough. Continued derogations pose a significant obstacle for the fledgling organic seed sector.

In order to promote the use of organic seed and to identify regulatory and other barriers that prevent higher uptake, the European Consortium of Organic Plant Breeding (ECOPB) organizes regular meetings with stakeholders in organic seed regulation. These workshops take place every two to three years, and the 6th European workshop was recently hosted by ORC, a founding member of ECOPB.

Chaired by ECOPB president, Prof. Edith Lammerts van Bueren, the workshop was attended by representatives from Austria, Belgium, Denmark, France, Germany, Italy, the Netherlands, Switzerland, and the United Kingdom. Members of the EU's Standing Committee on Organic Farming (SCOF) were present, as were country representa-

tives responsible for approving or declining seed derogation applications, farmers, seed companies, breeders and researchers.

During the meeting information was exchanged on the current situation in various EU member states concerning the use of organic seed and seed derogations. Not surprisingly, there are large differences between countries in the way organic seed derogations are handled and reported to the EU. In the discussions, key points that emerged were:

- The need to harmonise the reporting on seed derogations across the EU;
- The important role of national expert groups who support decisions on seed derogations;
- The potential conflict between the harmonisation of European rules for organic seed regulation and the conservation of on-farm diversity of cultivated plants, especially in Italy and Spain where informal seed exchange systems, particularly of traditional varieties, are of high importance;
- The difference between 'small' organic growers who tend to use a higher proportion of organic seed and larger growers who tend to request more derogations.

A more detailed report on the conclusions of the workshop will follow in the next issue of the Bulletin.

Organic seed in the UK

The excellent publication, *The Organic Standard* (www.organicstandard.com) is running a series of articles on organic seed. In their recent issue they highlighted figures from the *UK Annual Non-Organic Seed Authorisation Report for 2010* to the EU by Defra:

“The total number of non-organic seed authorisations decreased slightly from 16,011 in 2009 to 15,815 in 2010 in the United Kingdom. There is real progress in the use of organic arable crop seed. With the exception of winter rye seed, there have been reductions in the volume of non-organic cereal seed authorized across all species in both winter and spring crops. Notable categories include winter wheat and winter oats, which had a 36% and 48% reduction respectively. Both pea and bean seed also experienced substantial reductions in authorisations. The total number of authorizations in the horticultural sector in the UK decreased from 4,223 in 2009 to 3,731 in 2010.”

Since 2008 the number of authorizations for broccoli and cucumbers has remained broadly at the same level; brussels sprouts, carrots, cauliflowers, leeks, onions (sets) and parsnips have declined in varying degrees; whilst those for onions (seed) and tomatoes have increased.



The launch of ORC's participatory research & demonstration network

*Over the 30 plus years of our existence we have aimed to put the end user at the heart of our research and advisory work. We have undertaken research with producers and processors, on producers' own holdings and within processors' businesses. Now, to improve our engagement with the industry and strengthen these links, we have established a Participatory Research & Demonstration Network. It was formally launched in July at Abbey Home Farm, Cirencester, with a meeting of 30 organic producers, advisors and scientists. **Bruce Pearce** (ORC Senior Programme Manager and Network co-ordinator) and **Mark Measures** (IOTA Director) led the proceedings.*

For ORC, participatory research is not just about carrying out research on farms. A participatory approach means that producers and other end users of research should be central to the process of identifying research needs and potential solutions, as well as involved in designing, implementing and assessing the outcome of the work. This can mean producers' own innovations and ideas being evaluated and producers being trained in research monitoring techniques to assist with data collection, while the researchers play a more supportive role, for example with trial designs, analysing data and ensure scientific rigour.

At the launch meeting, Bruce Pearce presented the reasons for the network's establishment and its aims and outlined his experiences of undertaking participatory research from the scientist's point of view. John Newman (Farm Manager of Abbey Home Farm), who has engaged with a range of research over many years, gave the farmers perspective. There was a reassuring agreement between the two of the pros and cons of participatory research.

Mark Measures facilitated a workshop on what research is needed to improve organic systems and running a more successful organic farm. These ideas were illustrated on a tour of the farm where producers spoke about their experiences of research, what they have gained by it and what their future needs might be.

What is the Participatory Research & Demonstration Network?

While the establishment and development of this network is very important to our research programmes, there are clear benefits to participating producers.

ORC needs the engagement of producers to help find solutions to running more successful organic farms and businesses. They will have direct input into ORC research projects (both funded projects as well as any other research set up as part of the network). Their experience and knowledge will ensure that research is relevant and focused on their needs. However, we also want to work with members to establish or develop research on their own farms/businesses and to enable connections between those who may already be undertaking similar research.

As the network develops we hope that some producer members will be part of bids that ORC submit to funders; and where possible to be full partners and paid for their time and resources. Membership of the network will enable access to new research relevant to member's businesses. We also aim to work across the network to train and mentor producer members so that they can undertake their own research.

In the first instance the network is being established with producers who have engaged with our current LINK or EU-funded research projects as well as members of the Organic Systems Development Group/Programme and through producer groups. As we develop, we envisage engaging with other organic producers and businesses.

We also intend that other organisations such as Soil Association, Garden Organic, Organic Centre Wales, SAC, Duchy College, IOTA and Abacus become partners on an ongoing as well as a project-by-project basis.

An activity programme for the network is currently being developed. This will be published on our website. We are seeking funding from various sources so that we can develop both research and training activities. Some network members have already engaged in research bids with us and as we progress these are likely to increase.

If you are interested in the network please contact Dr Bruce Pearce at ORC.

Talking retail, talking organic, talking advice

The Organic Advisory Service was established by ORC in the mid 1980s to provide advice to farmers, many of whom are now long and well-established organic businesses.

One we had an involvement with was Andrew Burgess, whose business Produce World, with over 500 acres, is the largest grower of organic vegetables in the UK. In a recent interview with the Talking Retail magazine, he gave a bullish assessment of the organic market:

"Without a doubt organics have been under pressure since 2008, and we have seen sales volumes decrease in potatoes and brassicas. However, we haven't seen any significant erosion of the organic carrots market, and we are now actually seeing year-on-year growth."

"At the same time, organic has a significant advantage over conventional methods of growing as it has not experienced the same level of increased costs. Because we don't use herbicides, pesticides or oil-based fertilisers, our input costs haven't had the same inflationary pressures."

Andrew was initially sceptical, but: "The more that I learned about organic growing, the more convinced I became of the benefits of using organic methods, and following the natural cycles." He is now applying organic techniques to the company's conventional farms.

He is sure that organic will continue to grow because more and more people will opt for organic when they have the choice.



GM: What they said would happen, but hasn't, and what couldn't happen, but has

*Government officials and Chief Scientists keep hailing GM as the technology of the future – the UK's Chief Scientist Sir John Beddington was at it again recently – but the industry regularly lets them down by not delivering on its claims and promises. Why don't they get embarrassed? **Bruce Pearce and Lawrence Woodward** suggest a few reasons why they should.*

The whole world is growing GM?

The promoters of GM crops claim that the whole world (bar the EU) is growing GM crops and that UK and most of the EU is missing out on a market opportunity. However, even a cursory look at the International Service for the Acquisition of Agri-biotech Applications (ISAAA, 2011) figures does not show this to be the case. The area of land cultivated with GM crops does continue to increase, with a 10% increase in plantings between 2009 and 2010, to a total of 148 million hectares worldwide. However, nearly 80% of these plantings are in 3 countries (US, Brazil and Argentina) with the US alone accounting for 45% of worldwide plantings. The ISAAA talks about 17 “mega-countries” growing over 50,000 ha GM crops. In reality 50,000 ha is a tiny amount of most countries' agricultural area – to put it in context, London is about 160,000 ha and the UK organic land area in 2010 was 718,000 ha (Defra, 2011) – ie over 14 times the area of a GM mega-country and even wearing a whole rose bush of spectacles we wouldn't call the UK an organic mega-country.

Feeding the world – with what?

Only four crops make up virtually all of the GM crops grown across the world. These are soya (50%), maize (31%), cotton (14%) and canola (5%). No new crop has even made it into significant enough levels to appear on this list. The three “food” crops that appear in three of the top four places are not for human consumption but are used to produce animal feed. Yes, animals eventually feed humans, but this GM supply chain is innately attached to intensive and unsustainable food production; probably better described as “feed” rather than “food” as it is focused more on nourishing corporate than human bodies.

To spray and spray again

The GM industry, scientists and regrettably government advisors have made heroic – or more accurately, unsupported – claims about what GM can deliver. They have promised nitrogen fixing wheat, salt and drought tolerance, enhanced nutritional values and increased yield. What has been delivered is increased herbicide use.

Herbicide tolerance is the dominant trait in commercialised GM crops. Crops engineered for herbicide tolerance accounted for 61% of GM crops grown in 2010; and those developed for insect resistance 17%. Crops that have more than one engineered trait (known as stacking – usually two but sometimes three traits, e.g. herbicide tolerance and insect resistance) have become more popular and accounted for 22% of land area in 2010. Therefore on a global level these two traits make the overwhelming proportion of those used in GM crops.

Of course herbicide tolerance traits lead to more herbicide use – that is why they were developed – but the dramatic increases that have occurred have been a nasty surprise to many GM farmers because they have been forced onto an ever faster moving treadmill to cope with the build up of herbicide resistant weeds. Glyphosate resistance has been confirmed in over 20 species and over 100 resistant strains have been identified (GM Freeze, 2011).

It gets worse ...

New research from Canada has found a Bt toxin, produced by GM insect-resistant crops, in the blood of women and clear evidence that it was passed to fetuses (Aziz and Leblanc, 2011). Pesticides used on GM herbicide tolerant (HT) crops were also detected. The study by a team at Sherbrooke University Hospital in Quebec has been published in the peer reviewed journal *Reproductive Toxicology*. None of the women studied worked with pesticides or lived with anyone who did. The results show that the toxic Bt protein Cry1Ab was present in blood serum from all sample groups (93% of pregnant women, 80% in umbilical blood and 67% of non-pregnant women). The researchers suggest that the most probable source of the toxin is GM food.

According to GM Freeze, the detection of the Bt toxin Cry1Ab is very significant. Previous studies and advice from food safety agencies (like the European Food Safety Authority and UK Food Standards Agency) have always maintained that this toxic protein is broken down during digestion of GM food, and only GM DNA has previously been found in the blood/tissues of farm animals. This study suggests that the whole protein, not just pieces of DNA, has survived in the human gastric tract and passed into human blood, a complete contradiction of current safety advice on GM foods. Concerns have been expressed about the potential allergenicity of Bt proteins, as well as other potential toxic effects on internal organs.

... and worse

Gilles-Eric Séralini and colleagues reviewed 19 studies of mammals fed with commercialised genetically modified soybeans and maize and modified to tolerate or produce a pesticide (Séralini *et al.*, 2011). They obtained, reviewed and reworked the raw data of 90-day-long rat tests, having to take legal action to get access in some cases and numerous official requests to regulatory agencies in others.

Their findings are disturbing, indicating liver and kidney problems as endpoints of GMO diet effects. In their opinion 90-day-long tests are insufficient to evaluate chronic toxicity, but even these are not obligatory. It is hard to disagree with their view that the regulatory testing of GMOs is unacceptable in terms of consumer health protection. In fact, the public inaccessibility of information is a scandal.



However, some regulatory authorities can sometimes rise to the challenge. Back in February 2010 the Indian Government placed a moratorium on the growing of GM Brinjal (aubergine). This precaution was well-founded as a subsequent review (Gallagher, 2010) of the toxicity data submitted by Monsanto's Indian subsidiary Maharashtra Seed Company found that *"The current food safety studies for Bt Brinjal were not conducted in accordance with published standards, did not accurately summarize results, and ignored toxic endpoints for rats fed Bt Brinjal."*

Several indicators of toxic reactions to the GM Brinjal with potential to cause adverse effects were reported:

- elevated white blood cell counts from chronic exposure, indicating possible inflammation allergy or tissue damage;
- higher aspartate aminotransferase in blood from acute exposure, indicating possible liver damage;
- elevated bilirubin in blood, indicating possible liver damage;
- altered plasma acetylcholinesterase, indicating possible liver damage;
- smaller ovaries, indicating possible reproductive toxicity;
- enlarged spleens, indicating possible chronic infections or blood cancer.

In September the European Union Court of Justice ruled that honey contaminated with GM pollen must go through full GM food authorisation before it can be marketed in the EU (Court of Justice, 2011). A Bavarian beekeeper brought the case after his honey was contaminated by an open-air field trial of GM Mon810 maize. The judgement overturns the European Commission's position that honey contaminated with GM pollen should not carry GM labels because pollen was unintentionally present. The overturning of this position means that co-existence rules will have to be much tighter than the EC wanted.

In March a US jury awarded the US company Riceland Foods Inc. US\$136.8 million after court action over the 2006 contamination of US long grain rice stocks with Bayer's unapproved experimental GM rice LL601. This GM rice had only been grown on experimental plots in the USA between 1998 and 2001, yet its presence was detected in imported rice in at least 24 countries showing just how invidious and pernicious this technology is. This award follows several others in US courts where the German-based company has repeatedly been found negligent for allowing a GM long grain rice strain, which had not received any safety approvals anywhere, to contaminate US supplies, yet no legal action was taken against Bayer by US regulators.

So what next?

The evidence is growing that GM is delivering less than promised and more than we bargained for. Regulators, scientists and policy-makers need to take these alarm bells seriously and act now to ensure we are protected. Turning a blind eye is not an option, whether from an institutional or individual perspective. Let it not be said that vested interests conspired to prevent action, when action is surely what is needed.

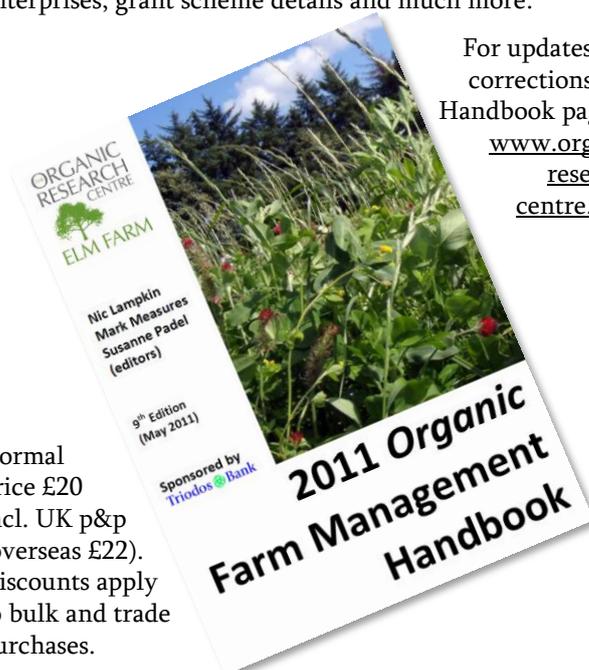
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With thanks to GM Freeze and see <http://www.gmfreeze.org/> for further information.

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Markets, price premia and profits – a look behind the headlines

Newspaper headlines proclaim the decline and fall of organic farming, yet in places organic sales are increasing and, financially, many organic farmers are doing as well – or better – than they would conventionally. **Nic Lampkin, Susanne Padel and Lawrence Woodward** look behind the headlines.

The gloomy recession-dominated headlines of 2009 – ‘Shoppers lose their taste for organic food’ (The Guardian); ‘Organic sales set to slip’ (Mintel); ‘Hard-up shoppers abandon organic and fair trade goods’ (The Times) – don’t appear to have gone away. In recent months we’ve seen ‘Is it all over for organic food?’ (The Guardian, Sep 2011); ‘Conventional farmers are shunning organic’ (Farmers Guardian, Aug 2011) and ‘Premiums vanish for organic meat/organic land area falls’ (South East Farmer, Sep 2011). Has anything changed? Is it as bad as the headlines suggest? Or is it a case of “lies, damned lies and statistics”?

The headlines give the impression that the organic market is in free fall. It has certainly dropped but is a long way from crashing into the ground (Figure 1).

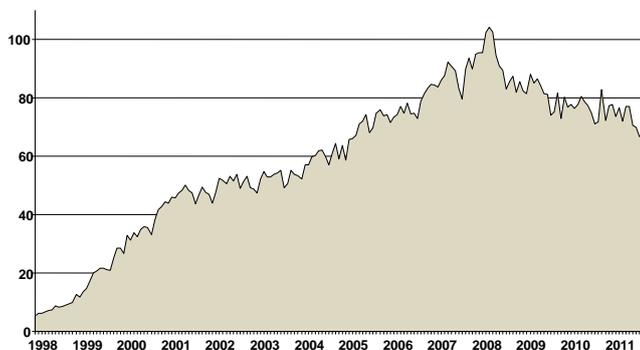


Figure 1: Four-weekly retail sales values (£m) of organic grocery products including baby foods to August 2011.
Source: Kantar Worldpanel, 2011

In fact, although overall sales are still declining (4% in the 52 weeks to August according to Kantar Worldpanel, which focuses primarily on supermarket sales), there are indications of recovery with increases in the sales of baby food (+16.5%), yoghurt (+6.5%), fresh beef (+4.7%), butter (+1.8%) and fresh poultry (+1.4%). While eggs, cheese, fruit and vegetable sales have fallen again, the decline has been less than the average, and Riverford recently reported a 2.4% increase in sales. The largest, above average, falls have been seen in chilled ready meals (-7.2%) and milk (-12.3%) where competition for retailer shelf-space has been particularly marked.

While Figure 1 indicates that total sales are down 30% compared with their peak at the end of 2007, this peak may have been only a Christmas-driven phenomenon, with sales in 2010 similar to sales in 2006/7. The downturn has certainly slowed – we may even be set to turn the corner – but sales are not the complete disaster that the headlines would have us believe.

IGD’s recent ShopperTrack research ‘Shopper values: beyond price’ shows that ethical value buying is more than holding its own. Kantar Worldpanel’s data show that, while some consumers are looking for value products, others are clearly interested in premium products, with sales of both value and premium range products growing.

What’s happening to our European neighbours?

Curiously, the UK trends are out of step with other European countries, which have seen continued growth, or at least level sales, despite the recession. The total value of the European market increased to €18.4 billion at the end of 2009 (the latest year for which data are available), up nearly 20% compared with the end of 2007. Over the same period, the European organic land area increased by a similar percentage to 9.3 million ha (Willer, 2011).

While the UK market is one of the largest in Europe, with €2.1 billion total sales value sitting in third place behind Germany (€5.8 billion) and France (€3.0 billion), the share of retail sales and per capita expenditure is relatively low. Even Germany is not top of the consumption ranking. Put another way, there should be plenty of potential to expand the organic market in the UK – to reach the same level as Germany would require a three-fold expansion in the UK.

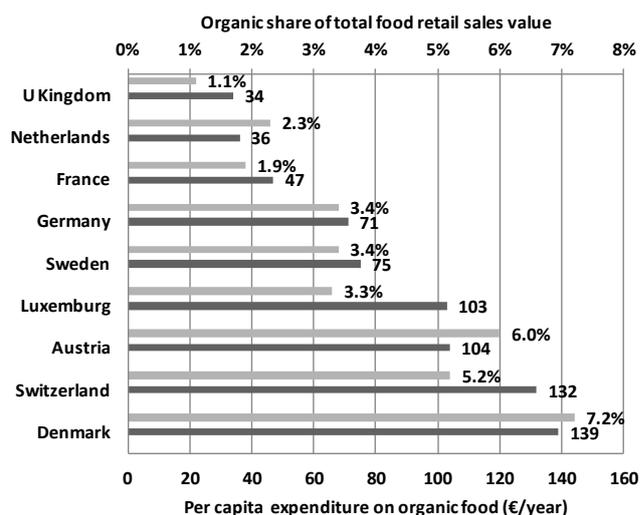


Figure 2: Consumer engagement with organic food in leading European markets, 2009.

Source: Willer, 2011

The fact that the UK organic market went into decline as sales in other European countries were maintained and often increased does need to be addressed. There are many views on this – elitism, political indifference, a once friendly, now antagonistic media, supermarket policies, a perception of high price, supply chain problems, lack of support from environmental bodies, the lack of a clear message, cultural differences – have all been put forward as reasons. All have merit, but none is entirely convincing in isolation.

However, the dominance of a small number of major retailers, and within them the dominance of own-label organic products, makes it much easier for the decisions of a few retailers to have a big impact on total sales. Between them, the five main retailers account for 86% of organic retail sales (excluding direct marketing), with about 80% of those sales branded own-label.



Of the major retailers, Waitrose is the only one to have maintained retail sales and market share in 2010 and 2011, with its relaunched Duchy Originals own-label brand growing by 6% in the last year (Figure 3). Although it has a small overall share of the grocery market, Waitrose, with a 20% share of the organic market, has nearly five times the sales per customer compared with the average for all retailers (index = 473). Due to their size, Sainsbury's and Tesco have a larger share of the organic market, with Sainsbury's, at 1.5 times the average consumption level (index = 150), experiencing only a small decline in sales. Asda and Morrisons on the other hand both significantly undertrade in organic (with around half the average sales per customer), and have experienced significant declines in all organic as well as organic-own-label ranges.

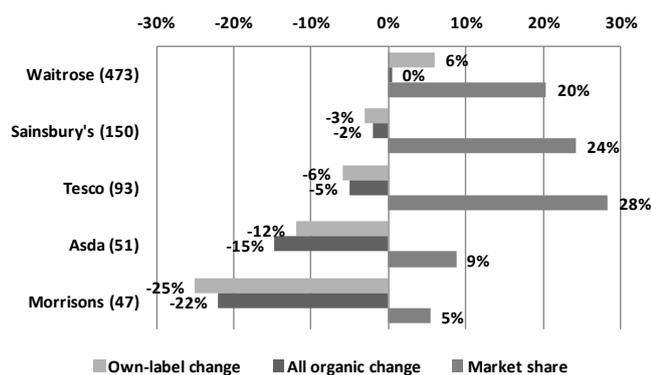


Figure 3: Organic retail market shares of the five major organic retailers, with change in sales over 12 months to August 2011 for own-label and all organic products.

Source: Kantar Worldpanel, 2011

Consumer commitment is key

Figure 4 illustrates that the most committed 20% of organic consumers, purchasing organic on 13 or more occasions annually, account for 75% of organic sales. By contrast, 63% of organic buyers do so on 6 occasions or less per year and account for only 13% of spend.

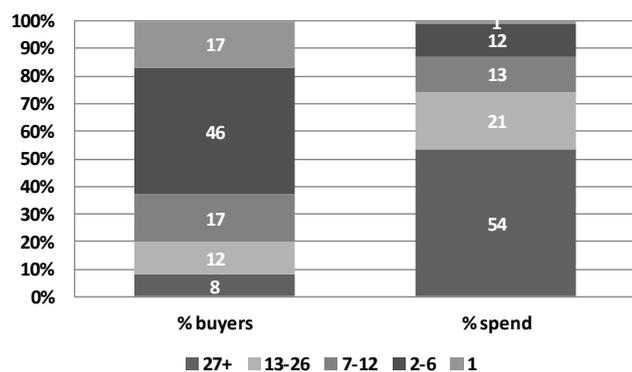


Figure 4: Proportion of buyers and spend according to number of occasions per year organic purchases made.

Source: Kantar Worldpanel, 2011

This is often presented as a weakness of the organic sector due to the narrow consumer base, with the suggestion that marketing and promotional effort should be focused on those who buy less frequently. Yet the reality is that the committed consumers are the people who are more likely to engage in ideas, understand the ethical concepts, and are buying with a purpose that is more than filling the shopping basket.

This is something that Waitrose have clearly grasped. As the IGD point out, the buying habits of these people are resilient. It is likely that as the world's environmental problems grow these habits will strengthen and more people will join the ethical core because there is a growing realisation that supporting things such as organic farming is an effective way of having a say about the state of the world and doing something about it. This is something we should reflect on when deciding future marketing campaigns: today's students may not have a lot of money to spend, but will become tomorrow's committed buyers.

How are producers responding?

If recent headlines are to be believed, producers are now leaving organic in droves. However, the data published by Defra in August tell a different story – in England, Wales and Northern Ireland, the total certified areas has continued to increase (Figure 5). Only in Scotland has there been a significant decline, and there are particular circumstances there that merit more detailed separate analysis. What is clear though is that interest in conversion has declined significantly, which is not surprising given the importance of conversion in the organic market as a factor influencing conversion rates (compare Figures 1 and 5).

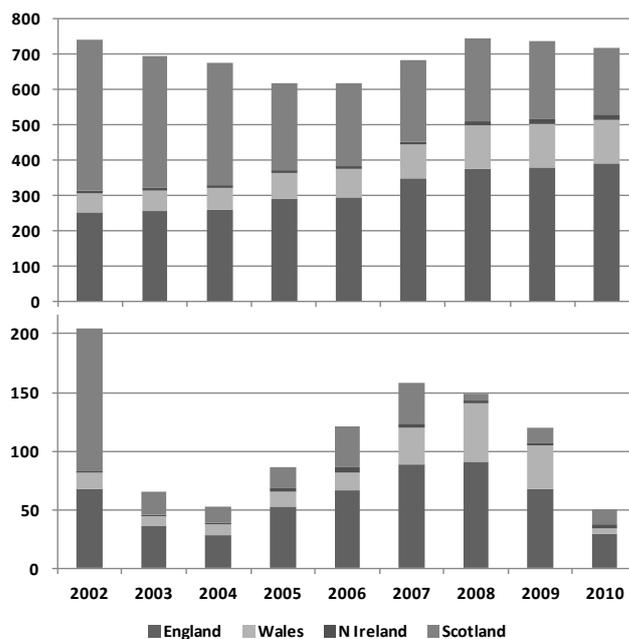


Figure 5: Total certified land area (kha, top), of which in conversion (kha, bottom), in UK nations, 2002-2010

Source: Defra, 2011

Crop areas have followed similar trends to the overall UK land area – increasing in England, albeit with a reduction in in-conversion area, and a slight reduction in total UK area since 2009, reflecting the changes in Scotland.

Due primarily to changes in Wales, cattle numbers have continued to increase to nearly 350,000, while total sheep numbers are up to 1 million in 2010. Poultry numbers have declined from a peak of 4.4 million in 2007 to 3.9 million in 2010, perhaps not as large a decrease as the 20%+ decline in sales would have suggested. However, pigs have seen the largest proportional decrease, from a peak of 71,000 in 2008 to just over 47,000 in 2010.

Financially, producers have been seeing some increases in prices received, with milk up 1.5ppl compared with 12



months ago. Cereal prices were up earlier in the year, though down currently following a better than expected harvest. Beef and lamb price premiums have started to improve due to the shortages in supply that have been emerging this year, despite the large increases in numbers reported by Defra. In the case of lamb high conventional prices have provided a floor to organic prices that is still higher than the price being received before the recession.

There is no doubt that the market downturn has hit organic farmers and has caused conventional farmers to take a deep breath and hold off converting. At the same time, many farmers testify that they are financially as well off since they started farming organically and maintain that they will never return to conventional production. This is supported by the organic farm income data reported in ORC Bulletin 105 (Summer 2011), which shows most organic farmers continuing to perform as well as or

better than their conventional counterparts. Here again is a real example of organic resilience. With the CAP reform proposals set to give organic farming a more upfront and significant place in EU agriculture, let's hope that policy-makers, producers, consumers and the media will recognise the real potential that still exists in organic farming, and will once again get behind what is still, after all, one of UK agriculture's success stories.

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Community Supported Agriculture in the UK

Since they first emerged in the 1960s, Community Supported Agriculture (CSA) initiatives have been developed in Japan, the US and Europe. There are now over 80 active CSAs in the UK. As part of the Making Local Food Work Lottery funded programme the Soil Association has been running a project to support the development of CSAs. Lawrence Woodward attended their recent conference.

The first thing that struck me was the energy and positivism that was around in this meeting and the mixture of ages that are involved, with many young people eager to share experiences. CSAs are very varied: some that are essentially box schemes, some stand alone enterprises, others based on larger farms, some that buy in, some that are exclusively own grown and plenty in between.

Most are organic, but there are some conventional ones. There are producer led CSAs, ones run entirely by volunteers, some employ growers, many have a requirement for members/subscribers to work on the holding for a defined period. The SA website www.soilassociation.org/csa.aspx features case study examples of a range of CSAs.

Nick Saltmarsh of Provenance – a consultancy specialising in local and sustainable food – provided a definition:

“Community Supported Agriculture means any food, fuel or fibre producing initiative where the community shares the risks and rewards of production, whether through ownership, investment, sharing the costs of production or provision of labour”.

CSAs in the US have been critical to the survival of some organic growers and farmers there but they have to date largely by-passed the UK.

Given that the concepts of local supply and consumption and local economies go hand in hand with organic, this is surprising. But now, with initiatives like The Community Farm near Bristol, in which long term organic stalwart Phil Haughton is closely involved, this might be changing.

Provenance has been evaluating the Soil Association's CSA project and Nick Saltmarsh, with his colleague Josiah Meldrum, gave an excellent presentation which outlined the current status of UK CSAs. There is more information on the SA website and on www.provenancesupply.co.uk.

The key points are as follows:

- There are currently over 80 active CSA initiatives in the UK with membership ranging from less than 10 to 100s (an average of 69 trading members)
- Although 4 have been trading for over ten years, the average is 3 years and at least 20 have started in the last year
- 90% have received external support, almost all of these from a social enterprise or co-operative organisation
- Over two thirds provide employment opportunities, averaging 2.6 full time equivalents
- The vast majority provide volunteering opportunities
- 67% reported a profit in the last year and 22% broke even
- Most of the CSAs are small in economic terms; 58% have an annual income under £20,000 but 17% have over £100,000 and a few over £500,000.
- 85% of CSAs take payments from members in advance
- 70% of CSA members say that their quality of life has improved since they joined citing health, social, educational benefits and general wellbeing
- Access to healthy, sustainable and affordable food are the primary reasons given by members for their involvement
- CSAs provide a significant proportion of their members' food needs – in the case of vegetables 62% supply all or nearly all of their members' requirements
- 37% aim to service those at risk of social exclusion
- 45% of members feels that their CSA has had a positive impact on their community

During the discussions many people mentioned their need for technical support and advice and it reminded me of the early days of OGA where growers had little option but to provide mutual support in these areas.

It is not clear that there is as yet something that could be called a CSA movement in the UK in the way that organic farmers and growers became a movement. There could be opportunities for closer links with OGA. It is early days, but there is so much common ground, shared views and outlook between many of them and the traditional organic movement that it must be worthwhile to forge links.



Legume Pick 'n' Mix

In Spring 2009, ORC set up a legume trial on an organic farm, Barrington Park in Gloucestershire, as part of a large research project called Legume LINK. One of its aims is to compare the performance of several legume and grass species for use in fertility building leys. ORC researchers **Thomas Döring** and **Oliver Crowley** report that the trial shows the advantage of mixing species grows over time.



Photo: The species mixture of 10 of the legumes and all the grass species in its glory

Overall, 12 legume species and 4 grass species are included in the trial (see Table). A species mixture of 10 of the legumes and all the grass species is also included (see Photo). Some of these species, such as white clover, red clover and perennial ryegrass, are already commonly used in organic rotations. Others, such as crimson clover, alsike clover, sainfoin or birdsfoot trefoil are less frequently grown in the UK.

Apart from assessments of plant height, biomass and flowering time, we repeatedly estimated crop and weed cover in the trial plots. Here we report on these cover results for selected species – with more comprehensive analyses following in separate publications. In total, cover was assessed ten times, starting in May 2009 shortly after sowing and ending in July 2011. The plots were repeatedly mown and also, in 2010, occasionally grazed by cattle and sheep.

One of the early champions in establishing and covering the soil was crimson clover. This annual species germinated very quickly and its relative plant density was ahead of all other species during the early establishment phase.

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Table: Average crop cover (%) of legume and grass species trialled in the Legume LINK project.

Species	incl. in ASM?	Aug. 2009	May 2010	July 2011	WC vol.*
Clovers					
Alsike clover	Yes	60	58	8	35
Crimson clover	Yes	35	32	1	45
Red clover	Yes	88	72	46	5
White clover	Yes	68	83	73	-
Other legumes					
Birdsfoot trefoil	Yes	78	58	73	0
Black medic	Yes	48	43	62	2
Large birdsfoot trefoil	Yes	5	0	4	50
Lucerne	Yes	65	72	67	0
Meadow Pea	Yes	12	20	0	83
Sainfoin	Yes	37	33	0	17
White sweet clover	No	37	33	0	6
Winter vetch	No	42	0	0	30
Grasses					
Italian ryegrass	Yes	70	59	49	53
Meadow fescue	Yes	68	70	53	43
Perennial ryegrass	Yes	78	58	44	63
Timothy	Yes	75	60	73	20

Incl. in ASM = included in all species mixture.

WC vol. = average cover (%) of white clover volunteers in July 2011.

However, over the summer of the first year, it spent most of its resources on flowering and seed production and this greatly reduced its vegetative growth. As a consequence, it covered the soil to a much lesser extent than the other clover species in late summer and autumn. Crimson clover is known for its ability to self-seed, and indeed we found new plants in spring of the second year. Finally though, in the third year, it was almost completely gone.

The Legume LINK project

Led by the Organic Research Centre, the Legume LINK project aims to improve fertility building using green manures. It will develop the means to create tailored legume mixtures optimized to fix the required quantity of nitrogen and perform reliably under varied local environmental conditions. Twelve legume species with a range of growth habits and physical compositions, together with four grass species are being trialled at six research sites. In addition, a mixture comprising the grasses and ten of the legumes is being grown on 34 farms across the UK.

Research partners in the project are Duchy College, IBERS Aberystwyth, The Arable Group, Rothamsted Research, and the Scottish Agricultural College. Industry partners are Abacus, HGCA, the Institute for Organic Training and Advice (IOTA), Organic Farmers and Growers, Organic Seed Producers, Scottish Organic Producers Association and the Soil Association. The project is funded by DEFRA through the Sustainable Arable LINK programme and by industry partners.



White clover, while it was looking good on its own plots, also started to look rather strong on the other plots where it hadn't been sown. With its creeping habit it encroached on almost all other species' plots. Notable exceptions were the lucerne and black medic plots where white clover was completely absent. Possibly this was because lucerne and black medic produced substantial amounts of biomass and grew relatively tall, thereby keeping the light-loving white clover out.

Lucerne itself, with its deep roots was well positioned to cope with the dry springs in 2010 and 2011. In contrast, sainfoin seemed promising in the first season, but then, at this trial site, substantially decreased in cover, and was completely lost from the area by July 2011.

An obvious way to make simultaneous use of the benefits seen in the different legume species is to grow a mixture of them. Also, a mixture provides insurance against uncertain growing conditions. If one species fails, another one, with different properties, will compensate for that failure. In addition, it can be expected that the mixture will also grow better than monocultures, since different species will complement each other in the ways in which they use the available resources.

This expectation is confirmed by our data: the All Species Mix (ASM) had a higher crop cover than the average of all its components when they were grown in monocultures. Even when compared with the average of the best five monocultures, the ASM came out on top – and its advantage over the monocultures grew over time (see Figure).

This clearly demonstrates the advantages of growing a species mix. Further ongoing research will fine-tune the composition of legume based mixtures so that their benefits can be maximised.

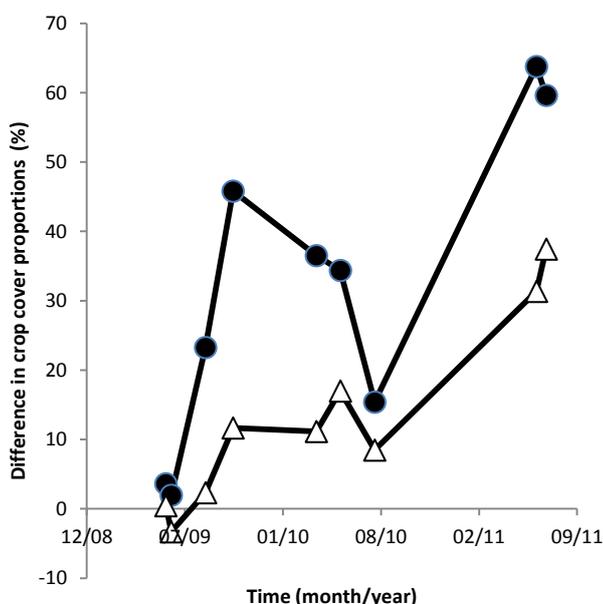


Figure: Absolute difference in crop cover proportions (%) of the all species mixture over the average crop cover % of several single species grown in monocultures.

Filled circles represent the difference when all single species are included in the monoculture average; open triangles represent the difference when only the five best species (red/white clover, black medic, perennial ryegrass and timothy) are included.

Legumes and nitrogen in organic farming

Estimating how much nitrogen legumes fix in organic systems, how much is then lost and how much is available for subsequent crops is notoriously difficult.

In 2003, Defra funded a project which reviewed the subject "Leguminous fertility-building crops, with particular reference to nitrogen fixation and utilisation: Defra Project OF0316". Written by Cuttle, Shepherd and Goodlass, it is well worth reading and can be accessed via www.organicadvice.org.uk/soil_papers/leguminous_fert.pdf

There are no definitive answers to these questions – for example estimates for N fixation are enormously varied in range:

- white clover from 100 to 200Kg/ha/year;
- red clover from 230 to 460;
- lucerne 230-340;
- field peas 70 – 200;
- field beans 150-250;
- lupins 150-200.

Arguably these are the biggest and most crucial questions relating to how the productivity of organic systems can be improved. And have been for so long, that they rank alongside questions about the meaning of life.

In fact getting nitrogen into the system by natural fixation is relatively easy. Keeping it there and being able to access it when the crop needs it, is another story altogether; the first is too easy, the second can be difficult.

This is why innovative research and development approaches like the Legume Link programme taking place in partnership with farmers on farms are so important.

Region, soil type, season and weather are critical factors – as is management, including rotational design, cultivation methods and timing and manure management.

There are strong reasons to suppose that the often observed experience of farms performing better the longer they are organic is really to do with the farmer developing knowledge and intuition about the farm's specific idiosyncrasies in relation to nitrogen accumulation, retention and supply.

Which is another way of saying; there is no blueprint, each farm is different.

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ORC's annual report provides an overview of our work during the year, including research projects, advisory and information activities, policy engagement and much more. It also provides a summary financial report for 2009/10.

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Feeding and Tilling: two new projects start at ORC

On 1st October, we began two new projects in collaboration with European research partners, one on feeding organic monogastrics and the other on reduced tillage in organic systems. Both projects are funded by Defra as part of the CORE-Organic II ERANET, the new incarnation of the European level collaboration between national research funders. **Bruce Pearce** reports.

ICOPP

The monogastric feed project is called “Improved contribution of local feed to support 100% organic feed supply to pigs and poultry” or **ICOPP** for short. This three year project is led by Aarhus University and has 13 partners across 10 countries. In the UK we are working with FAI Farms Ltd near Oxford.

The aim of the project is to produce economically profitable feeding strategies based on 100% organic feed which will supply poultry and pigs with the required level of nutrients in different phases of production and support high animal health and welfare. This is particularly timely ahead of the introduction of the regulation to feed 100% organic feed to pigs and poultry from the 1st January 2012 (although this now looks like it will be postponed). The project includes the following tasks:

- Improve knowledge of availability and nutritional value of underutilized or new organic feed ingredients with a focus on local feed resources.
- Improve understanding of the possible benefits of roughage inclusion in relation to nutritional and behavioural needs as well as its impact on health and welfare.
- Understanding how direct foraging in the outdoor area can contribute to meeting the animals’ nutritional needs.
- Assessing the economic and environmental consequences of increased reliance on local organically produced feed.

The working hypothesis is that it is possible - through an extended knowledge of the characteristics of different local feeds and their wider impact on growth, health and welfare and environment - to produce strategies which comply with the aims for high animal welfare, production economy and environmental concerns.

A range of feeding experiments will be carried out on concentrate feedstuffs, roughage, and foraging. The insight gained from these activities will be used to analyse and produce feeding strategies adapted to the differences in local feed supply, the economic impact related to different feed procurement, and variations in production structure in different countries/agroecological zones in Europe.

ORC will work on availability of feedstuffs, feed trials on pigs and poultry, assessing the value of the range for feed resources, as well as being responsible for overseeing the knowledge transfer within the project.

Tilman-Org

The second project is called “Reduced tillage and green manures for sustainable organic cropping systems, or TILMAN-Org. Led by the Swiss Research Institute for Biological Agriculture (FiBL). It will run for three years and will bring together information from several European long term experiments on reduced tillage.

The project’s overall aim is to make use of the benefits of reduced tillage under organic farming conditions. Currently, technical difficulties, most notably in weed control, mean that not using the plough can be challenging for organic farmers. To make use of fuel saving and soil conservation associated with reduced tillage, it therefore needs to be adapted to the special conditions in organic agriculture.

Thus, the project will develop optimum techniques of reduced tillage for organic systems. The following tasks will be undertaken during the project:

- Farmers’ experiences/perceptions of reduced tillage and green manures will be assessed in interviews.
- Existing data from medium and long-term trials on reduced tillage and green manures provided by the consortium and the published literature will be evaluated with respect to yield stabilisation, soil quality and biodiversity.
- Experimental Case Studies on soil quality and greenhouse gas emissions, weed management functional biodiversity and improved nutrient management will be carried out, and carbon stocks under reduced tillage will be compared to under ploughing.
- Based on results from the literature and case studies, optimised cropping systems will be designed using modelling approaches. This will also involve the preparation of guidelines focused on helping farmers to address weed management challenges, and temporary shortages of nitrogen supply in order to improve yields and yield stability, thus improving both the environmental and economic sustainability of organic farming systems.

ORC’s role is to run an on-farm trial at Duchy Home Farm, where conventional ploughing is compared with the use of a reduced tillage machine (the Ecodyn cultivator, see previous Bulletin issues). The trial that was started by Duchy Home Farm in 2010 in collaboration with the Institute of Organic Training and Advice (IOTA), will run until 2014 under TILMAN-Org. We will continue the investigations into the agronomic and ecological effects of using reduced tillage, with a special focus on weeds.



<http://www.coreorganic2.org/>



Events and announcements

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Events

ORC is holding, or is involved with, a series of major events this year, to which you are warmly invited.

27th October 2011: Organic – Better Business. Welsh Organic Conference organised by OCW at Llanellwedd. For further details, visit www.organiccentrewales.org.uk

27th October 2011: Non-inversion tillage. An ORC Participatory Research and Demonstration Network event at Duchy Home Farm near Cirencester.

18-19th January 2012: Organic Producers Conference Aston University, Birmingham. Please see details and registration form on separate sheet with this Bulletin. Offers of ideas for speakers and workshops still welcome!

For further details, visit the Events link at www.organicresearchcentre.com or contact Gillian Woodward, gillian.w@organicresearchcentre.com, 01488 658298

Friends of ORC may qualify for free or reduced rates on events. Please check for details. Not a Friend yet? You can become one using the 2011 Appeal form.

ORC Conference Centre

We've used the new conference facilities at ORC and we're coming back again! Why don't you?



Triodos Bank, our bankers and active supporters of the organic movement, holding an event for their customers in ORC Elm Farm's recently converted, 18th Century, Grade II-listed barn.

Our facilities are located in a quiet, rural location in the North Wessex Downs AONB, only an hour from London or Bristol.

They provide the ideal venue for getting out of the office for a staff away day, for a conference, for a party or even a wedding.

Our caterers can provide fully organic menus, or you can organise your own, with overnight accommodation available locally opposite Elm Farm or in Newbury.

For further information, visit our website at: www.organicresearchcentre.com or contact Pam Bijak by e-mail pam.b@organicresearchcentre.com or phone 01488 658298.