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ELM FARM

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Livestock in focus
Mob stocking, optimal grazing and mastitis control

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Organic Research Centre

Bulletin

No. 116 – Summer 2014

News in brief

EGTOP Reports on plant protection and food

The Expert Group for Technical Advice in Organic Production (EGTOP) was set up by the European Commission four years ago in order to provide impartial advice to the Standing Committee on Organic Farming (SCOF) in its discussions on the regulations and standards. EGTOP has a core group, including Nic Lampkin of ORC, that meets regularly together with a 60-strong pool of experts that are called on for particular topics. It has recently published reports on the use of plant protection products in organic production and on flavours and their use in organic food processing. The Group evaluated a number of topics relevant for the use of plant protection products in organic production and amongst their conclusions were that the use of potassium phosphonates and piperonyl butoxide were not in line with organic principles and the use of copper should be minimised. The use of kieselgur (against pests of stored products and poultry mites), carbon dioxide (pests of stored products), potassium bicarbonate (as an insecticide) and soft soap (for disease control) was deemed in line with organic principles. The Group is against automatic approval of low risk substances in organic farming and recommends including a 'basic list of active substances' in Annex II.

New technical guide on earthworms

A new technical guide, compiled as part of the TILMAN-ORG-project 'Reduced tillage and green manures for sustainable organic cropping systems' gives an overview of the multiple services of earthworms to farmers and provides recommendations for the promotion of earthworms as ecological engineers. There is a large body of information available about their impact on soils, their interactions with other soil organisms and the influence of farming practices on their populations. Based on new research findings various agricultural practices can be recommended to enhance earthworms, among them reduced tillage. These recommendations are described in detail in the new guide, available from www.fibl.org.

US organic sales breakthrough

Organic Trade Association (OTA) figures show that in 2013 organic food sales in the US hit $32.3 billion, up 11.5% on 2012. Fruit and vegetables led the way with sales up 15% to $11.6 billion. Laura Batcha, executive director and CEO of OTA, said: "Consumers are making the correlation between what we eat and our health, and that knowledge is spurring heightened consumer interest in organic products. Consumer education is critical to grow the organic industry."

Agroecology and sustainable intensification

ORC has been awarded a contract by Scottish Natural Heritage, on behalf also of Natural England and Natural Resources Wales, to review the contribution of agroecology to sustainable intensification. The agroecological approaches to be reviewed will include integrated farming, organic farming, agroforestry and permaculture. The project will run from July to October 2014.

Focus Group on Organic Farming reports

The agricultural European Innovation Partnership (EIP-AGRI) works to foster competitive and sustainable farming and forestry that 'achieves more and better from less'. The report of the Focus Group on Organic Farming has just been released. The report focuses on how to close the yield gap in organic farming. It includes proposals for topics that Operational Groups could work on, practical solutions which have already been implemented in some areas of Europe and recommendations for future research topics.

EU states critical of new organic regulation proposals

Nearly universal and extensive criticisms to the Commission's proposals for a new organic regulation are emerging from EU member states as well as organic organisations. At least one country is proposing an outright rejection and others are talking about changes that are tantamount to it. The criticisms are in line with points we made in Bulletin 115. Defra is arranging a stakeholder meeting within the next few weeks but it is clear that officials have significant doubts about the proposals and the Commission's justification for them. This situation is not going to be resolved quickly and we will give an update in the next Bulletin.

Can fish farming be organic?

IFOAM is holding an online public consultation (ends 2nd July) on the controversial subject of 'organic aquaculture'. This is one of the fastest growing parts of the organic sector yet a significant number of people believe that many types of fish farming are fundamentally at odds with organic principles. Others feel that whilst e.g. farmed salmon is demonstrably incompatible, other types of aquaculture may not be. There is also the view that 'organic' provides a valuable option between wild fisheries and conventional fish farming. IFOAM is providing the public and professional stakeholders with a chance to air opinions. The survey can be accessed at www.ifoam.org/en/node/649.

Send us a photo of your organic farming family!

We would like to create a slideshow of photos that celebrate organic family farms to mark the United Nations International Year of Family Farming 2014. If you have a photo of your family on your organic farm, at work or at play, please send it to phil.s@organicresearchcentre.com, post it on our facebook page or tweet it to @OrgResCent with the hashtag #organicfamilyfarming. Please state the name of your family and farm and if possible something about what organic farming means to your family. Please send to us by August 31st.

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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.

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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

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Editorial: Now we're talking but are ministers listening?

In our last editorial we were gloomy about our discussions with Defra. On various issues we seemed to be at an impasse with little prospect of a positive outcome for organic farmers. Three months on we can't predict that Defra is going to deliver a glorious summer for the organic sector, but there might not be an overwhelming winter of discontent at the end of it. There will certainly be no crocks of gold, but there might be more than just crocks.

Although the English Rural Development Programme was submitted to Brussels in early June, Defra has kept to its commitment to review the basis on which maintenance payments are calculated in England. Discussions with organic sector representatives have started and there is clearly a willingness on the part of officials to achieve a satisfactory agreement. Hopefully the process will be completed by mid July, so that the results can be communicated to the European Commission and integrated with the RDP before it is finally signed off by Brussels.

On agroforestry there's a glimmer of light that a different solution to Defra's previous outright rejection might be possible. Meetings have been scheduled with key agencies and as long as we are talking there is at least some hope.

Defra has also launched a series of consultation meetings on the Commission's proposals for a new organic regulation. These meetings are now more open to interested parties than was originally envisaged. There is widespread concern amongst member states and the EU organic sector about the proposals and every reason to believe that Defra shares them.

Less good news is that within the last few weeks the EC has proposed to devolve decision-making on GMO cropping to member states. As we point out on page 8, the proposal seems to rest on uncertain legal grounds. An earlier proposal had been robustly rejected by the UK and others with the argument that it was fundamentally counter to the terms of the Single Market.

This time Owen Paterson's enthusiasm for GM has won the day, but it is clear that government and EU lawyers are going to be busy working through the ramifications of the proposal which might face a challenge from differing quarters. One highly charged issue is how Scotland and Wales – who have declared they want nothing to do with GMO crops – will be able to legally justify banning GMOs whilst England allows them and vice versa.

There has been talk of GM crops being grown in England from next spring onwards but the EC proposal has first to be approved by the European Parliament. This is not a foregone conclusion but if it is approved Defra – and presumably the devolved administrations – will have to come up with measures to deal with co-existence and liability. Paterson certainly wants commercial GM crops in England ASAP but 2015 is unlikely.

CAP organic measures and the GMO crops issue highlights how out of step Defra in England is with Scotland and Wales. There seem to be such diametrically opposed views that it is questionable how Defra ministers can satisfactorily represent the overall UK perspective on these issues in Brussels.

The tensions that are there will be exacerbated as things move towards implementation on the ground and stakeholders become fully aware and engaged. Officials are willing to talk at the moment – and we are thankful for that - but do Minister's listen?

Lawrence Woodward and Nic Lampkin

English organic producers are worried about costs but plan to keep going

An ORC survey found that the majority of English organic producers intend to continue farming organically because they believe it is best for the environment and the health of their livestock. ***Catherine Gerrard****,* ***Anja Vieweger*** *and* ***Susanne Padel*** *report on the survey carried out in November and December 2013.*

There was a widespread concern that in the future profitability may not be sufficient to cover rising costs and allow re-investment in their business. However, many producers said that if they were forced out of organic production they would still farm in a low-input or environmentally friendly manner using organic techniques.

Some producers expressed a desire for more market information and greater market transparency and we hope that this survey will be a first step towards that.

Regular surveys are carried out in Wales (by Organic Centre Wales and Aberystwyth University) and in Scotland (by SRUC) but, until now, not in England, resulting in a knowledge gap. Funding for the survey and report came from our EU OrganicDataNetwork project -'Data network for better European organic market information.'

There are approximately 2724 English organic producers and with 223 from a range of farm types participating in the survey we were able to get a good snapshot of the overall situation albeit with perhaps an over-emphasis on beef and sheep and under-coverage of cereals and a slight under-coverage of the east of the country (Figure 1).

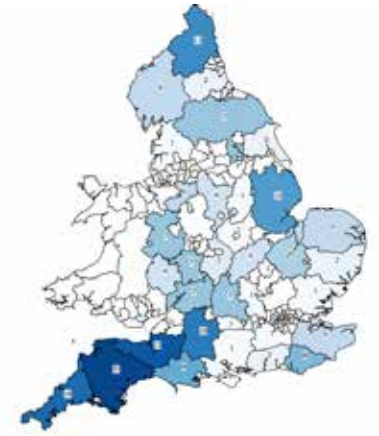

Figure 1: The geographical distribution of English organic producer survey respondents.

The majority of respondents indicated that they were not planning to change their businesses but some indicated that they may increase/intensify production. Almost all indicated that they plan to remain in organic farming in the medium to long term with 40% saying they plan to remain in organic farming for over 10 years (Figure 2).

The survey gave a mixed picture of the performance of the individual organic enterprises over the period November 2012 to October 2013. Beef producers reported that prices had been reasonable or good for most of the year although

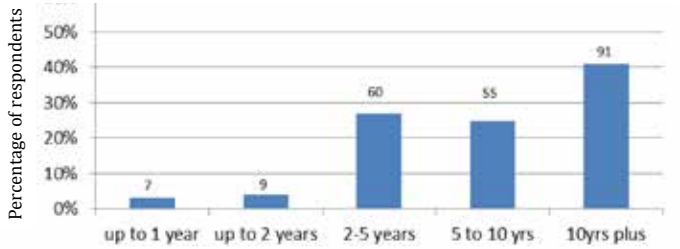

Figure 2: How long are you intending to farm organically? The y-axis shows the percentage of responses and the values over the columns indicate the number of responses.

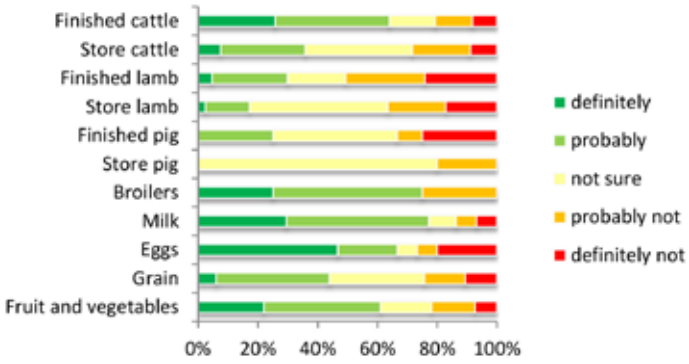

Figure 3: Is current price high enough to stay organic?

there had been a sudden drop in demand and prices in the last few months of the year whereas lamb producers were much less positive about their situation (Figure 3).

Responses from milk producers suggested a feeling of cautious optimism, with many reporting increasing prices and a hope that supply and demand were equalising. Some expressed the hope that prices would continue to increase to enable reinvestment as well as covering increasing costs of feed, energy and fuel.

Very few pig producers were interviewed in the survey and the majority had concerns about feed prices (a concern also raised by egg producers). Many pigs were kept as a hobby or as a farm tourist attraction. Broiler producers suggested that prices would probably support continuing organic production.

Arable output had been affected by adverse weather conditions in the period covered by the survey reflected in a wide range of reported yields. Horticultural producers were more aware of, and concerned about, consumer perceptions of organic produce than other producers. They were, however, generally positive about the current level of prices and their ability to support organic horticultural production.

The differing fortunes of the organic enterprises are reflected in the intentions of producers over the next two years, with milk and horticultural producers indicating that they plan to increase production but other producers planning to remain at current production levels (Figure 4).

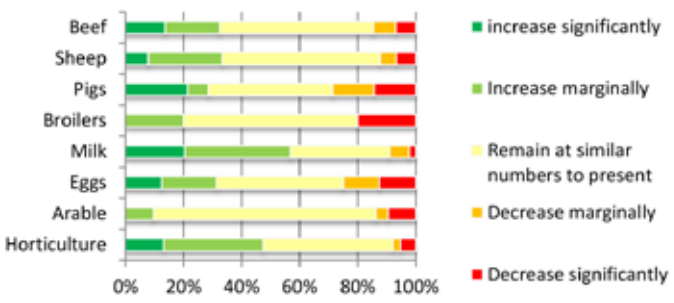

Figure 4: Intentions in the next two years with regards to production levels.

Considering the overall economic downturn, the mixed media coverage of organic farming and food, and the woeful neglect of organic issues by ministers during the period, the survey reveals a remarkably positive attitude and commitment from English organic farmers.

Acknowledgements

The authors would like to thank all the producers who took part in the survey, the survey team (Martin Steer, Tamara Schiopu, Pauline Pears, Deborah de Beukelaer, Yvette Attia, Vicky Tayler, Niamh Mahon), Simon Moakes of Aberystwyth University for his advice on the survey and data analysis and the Soil Association and OF&G for providing their contact lists.

The OrganicDataNetwork project has received funding from the EU's 7th Framework Programme under grant agreement no 289376. The opinions expressed in this contribution are those of the authors and do not necessarily represent the views of the European Commission.

Defra publishes latest organic farming stats

Defra's latest statistics, based on certification body data from 2013, show a decline of 4% in the area of UK organic land compared with 2012. Sheep and pig numbers fell by 13%, but cattle only by 2.4% while poultry increased by 1.2%. The number of organic producers and processors fell by 6.4%. The largest reductions took place in Wales and Scotland, with southeast England recording an increase. See News section of ORC website for further information.

CAP implementation in England

Defra has now published further information on the implementation of the new basic payment scheme and the options for ecological focus areas (EFAs) as part of Greening (30% of the total basic payment). While most organic producers will qualify automatically, those with both organic and non-organic land will still need to comply with Greening prescriptions on the non-organic land. It is understood that features on the organic land cannot help meet the requirements on the non-organic land. To meet the 5% EFA requirement on such land, farmers will be able to choose from five options: leaving land fallow, buffer strips, cover crops for game birds, growing nitrogen-fixing crops including peas and beans, and hedges.

As a result of this decision, Defra has identified the need to make double-funding deductions for some 2012 and later ELS participants, include some OELS participants. It is understood that this relates to the ELS rather than the organic parts of their agreements and that only a few organic producers are affected. Negotiations are continuing to ensure that double-funding issues are addressed without the need for deductions with respect to new organic option agreements. For further information, see: www.gov.uk/cap-reform.

Welsh organic producers to get enhanced maintenance support

Proposed payment rates for organic producers under the new Glastir Organic scheme from 2015 have been announced by the Welsh Government. These payment rates are subject to approval from the European Commission.

	Conversion		*Maintenance*	*Certification*
	Years 1-2	Years 3-5 (£/ha)	Years 1-5 (£/ha)	(£/ha)
Horticulture	£600/ha	£400/ha	£400/ha	£80/ha*
Enclosed land	£130/ha	£65/ha	£65/ha	£10/ha*
Rough grazing	£15/ha	£15/ha	£15/ha	£3/ha*

**Certification costs will be capped at £500 per contract per year*

Horticulture includes land with at least 40% horticultural crops in a rotation with temporary grassland as well as top fruit producers, but there is likely to be a maximum area limit. Rough grazing includes enclosed upland, sole grazed commons, grazed woodland, as well as lowland bogs and heaths. The total area supported across all areas will be capped at 400 ha.

The new payment system compliments the suite of Glastir components, avoiding potential double funding problems, both with respect to Greening and to other agri-environment support. Arable options will be supported under Glastir Entry and Glastir Advanced where the environmental outcomes will be better realised. This system also allows maximum flexibility to the organic producer to change farming practices to reflect the organic market with limited impact on the organic payment.

Conversion support is being offered at a higher rate for enclosed land and horticulture for the first two years and then reverts to the same as the maintenance payment for the remaining three years. This is to compensate producers during the time that the product will not be organically certified and to offset additional land management costs associated with converting to organic farming. Both the conversion and maintenance contracts will be for five years.

It is planned to have full details of the Glastir Organic Scheme available at the Royal Welsh Show and the application window will be open late summer/early autumn so that contracts will commence on 1 January 2015.

The announcement represents a significant improvement on rates previously available, where the most recent converters were qualifying for maintenance payments of £14/ha for improved land and £5/ha for rough grazing. The new rates, together with signs of recovery in the organic market, should help stem the tide of producers leaving organic farming in Wales, where 400 of 1000 plus producers having dropped out in the last two years. The support for horticulture also reflects the Minister's interest in supporting the development of Welsh horticulture generally.

Concerns about the future prospects for organic farming were highlighted in the latest Welsh organic producers' survey for 2013, published by Organic Centre Wales, which found that the area of land under organic management in Wales had fallen back from a peak of 8% to 5.5%, with 20% of organic grassland and up to 30% of organic beef and sheep production have reverted to non-organic. Given that up to 40% of Welsh organic beef and lamb were being sold into conventional channels, the scale of this reduction is likely to have some impact on supply and prices in 2014.

Moakes S, Lampkin N, Pearson N (2014) Welsh organic producer survey 2013. Organic Centre Wales, Aberystwyth.

The myths and truths of mob stocking

*IOTA director **Mark Measures** mistrusts panaceas and in recent years has been concerned about the claims made for mob stocking that irrespective of local farm conditions and environments it will work and will be profitable. So he set out to investigate and this is what he found.*

I met Allan Savory – the founder of Holistic Management and chief proponent of mob stocking; discussed with colleagues in Argentina; visited farms practising the technique in Kenya; read articles and papers about it and I found that there is as much forthright criticism as there is support. And critically, under UK conditions at least, some of the underpinning ideas of mob stocking simply may not stack up.

Mob stocking and organic approaches

Mob stocking is a management strategy of stocking at a high grazing pressure on long forage for a short period of time. This is followed by long rest periods, of between 60 and 100 days, between grazings. Mob grazers typically move cattle to new, small paddocks once or twice a day, in some cases more frequently. This results in much selective grazing, trampling of forage and high grass residue left after grazing[1]. Elements of mob stocking are similar to some widely used organic farming practices such as diverse swards including many species of herbs, grasses and legumes. Other practices such as prolonged grazing intervals are also used successfully by farmers who extend grazing regimes to ensure winter cover and spring grass by shutting up fields in early autumn; by those on drier ground operating 'foggage' systems, feeding standing grass over winter; and, of course, by those using the now standard practice on UK dairy farms, of paddock grazing, moving cattle every one to two days.

The key differences are that mob stocking advocates routinely leaving very long rest periods, even during the spring and summer, grazing swards at greater height and leaving high residues of trampled grass.

Contrary to evidence and experience

The arguments made in favour of the system are that long grazing intervals will result in greater root biomass; that cattle will selectively graze, by picking the higher nutrient value parts of the plant; that by trampling the high plant residue back into the ground soil carbon levels will be increased, resulting in increased water holding capacity, improved soil structure and overall forage yield; and higher stocking rates with healthier animals.

But mob stocking was developed to address problems of over-grazing, deterioration of natural pastures, soil erosion and water stress in East African rangelands and subsequently applied elsewhere in Africa and North and South America. Even if it works in those regions, is the system suitable for the cool temperate maritime climates of the UK and does it deliver the claimed benefits?

Mob stocking is completely contrary to current thinking on optimum grassland management, particularly that for dairy cattle, which involves careful control of sward height at the start and end of grazing and operating a strict grazing

rotation typically of 20-28 days, depending on growth rates, sward height and maturity. This approach is based on the understanding that after the grass plant has produced 3 leaves there is leaf senescence as subsequent leaves are produced. So optimum animal performance is achieved by a 20-28 day rotation and a start height for grazing of 8-10 cm leaving a residual height of 4 cm[2]. It is certainly true of ryegrass and timothy, the predominant grass species used in the UK, and observation will tell you that it is probably also true of white clover which, while holding its quality a little longer than grass species, also deteriorates after 30 or 35 days, when senescence sets in.

Some pros but mainly cons for UK production

Research from the Agri Food Biosciences Institute at Hillsborough shows that if the sward at the commencement of grazing is around 8-10 cm. (3000 kg DM/ha), then the herbage will be higher in protein and energy ,e.g. 11.7 ME, and that the higher energy also results in higher herbage intakes. The Institute found that, with dairy cows, excessively high pre-grazing cover results in a loss of 5 litres/cow/day over the whole grazing period due to lower forage quality and lower quantity.

Current practices for beef cattle and sheep are based on similar principles, although grazing periods are frequently longer than the optimum one to two days due to the excessive fencing costs involved with paddock grazing for the relatively less profitable beef and sheep. The principle remains the same for dairy, beef and sheep; long swards are lower in energy and protein and yield less over the year; and high residual biomass of grazed swards results in 'waste' and poor utilisation of the total herbage grown, slower recovery, poorer quality regrowth and lower stocking rates and animal production.

There may be advantages in increased root development from longer grazing intervals, and there is some evidence to that effect, with benefits to carbon accumulation and drought resistance. Another way of exploiting that is by occasional longer rest periods and integrating silage/hay conservation and its long 'rest' period with the grazed area. There is therefore a case that mob stocking with its long rest periods, grazing swards at greater height and leaving high residues of trampled grass may increase carbon

sequestration and possibly drought resistance. However there is no evidence on how stocking rates and animal production from mob stocking compare with more intensive grazing; but from what we know about forage in the UK they are likely to be significantly lower.

More evidence needed

Tom Chapman is a farmer who is an enthusiastic supporter of mob stocking. His Nuffield Scholarship report reviews some practice and evidence[1]. Whilst his study showed many of the benefits of organic farming – ley/arable rotations, and diverse swards including legumes – it did not convince me that the claims for mob stocking of increasing stock carrying capacity by three times would be achieved in the UK. On the other hand a 14-year study using satellite data across South Africa to compare grazing practices found that the higher stocking rate of intensive mob stocking systems resulted in a consistent reduction in above-ground biomass when compared to non-selective grazing more typical of standard grazing systems[3]. While there is certainly some evidence that high post-grazing forage residue results in higher soil carbon what is the cost in terms of stocking rates and animal performance?[4] Mob stocking remains an interesting concept, and is being followed in the ORC/IOTA SOLID dairy research project (www.solidairy.eu) but in the absence of clear evidence I would not currently be advocating it on commercial grounds for farms in the UK.

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Developing an optimal grazing strategy for dairy cows

Grazing pastures and leys and the use of conserved forage underpin organic and low-input dairy systems. To do this successfully requires balancing feed quantity and quality whilst minimising the nutrient loss through efficient feed utilisation by grazing cows. ORC is participating in 'OptGraze', a four-year Norwegian research project evaluating different grazing management systems. ***Konstantinos Zaralis*** *discusses its aims.*

Studies on dairy cows and finishing steers have shown that different grazing management systems result in differences in the efficiency of use of forage, milk production, live-weight gain and methane emission. Such differences are attributed to changes in the quality of the grazed diet since the proportions of morphological fractions, their chemical composition and their physical architecture in the grazed profile vary along with the selective grazing nature of animals.

This suggests that over a period of set grazing the daily intake of nutrients can be unbalanced unless a very generous amount of forage is available to the animals to allow selection of the most nutritious part of the herbage all the time. This results in reduced nutrient utilisation efficiency as wastage of a part of the offered dry matter occurs, whilst unbalanced uptake results in wastage of ingested nutrients through excreta and belching.

Organic and low-input dairy systems rely on grazing and conserved forages; however, there is often a necessity for supplementation with concentrates. This comes with extra cost in the face of the current competing demands for cereal grains while the supply of protein is often asynchronous to the supply of energy available to rumen microbes resulting in nitrogen (N) losses.

Low nutrient utilisation: low productivity and high pollution

Low efficiency of nutrient utilisation comes with an associated cost in environmental pollution. The degree of N loss through urine and faeces increases with the increased supply of N in the diet or with daily quantitative N intake. In addition, this can cause high levels of N in the blood which are also known to have toxic effects on reproductive tissues and hence reduced fertility in dairy cows.

With respect to energy efficiency, a portion of gross energy intake is lost as methane [greenhouse gas (GHG)] in dairy cows. This can range from 2 to 12% depending on feed type and quality. This suggests that there is still considerable room for improvement in the utilisation of feed whilst reducing GHG emissions. Decreasing emissions without adversely affecting animal productivity and product quality is desirable both as a strategy to reduce GHG emissions and as a means of improving feed conversion efficiency. Therefore, there is a need for balancing feed quantity and quality whilst minimising the nutrient loss through efficient utilisation by grazing cows. Furthermore, proper recycling of nutrients through excreta by fine-tuning grazing management may improve product quality and yield, bring farm sustainability and herd health, and reduce environmental pollution.

Balancing skills

Skills and possibly extra resources are required to implement better grazing systems to sustain high-yielding dairy cows on pasture and leys within organic and low-input systems. Different strategies for mitigation are available, each with advantages, and with limitations under practical conditions. The main objective of 'Optgraze' is to assess three different grazing management systems – i) set-stocking for 7 days, ii) daily strip-grazing and iii) frontal grazing, whereby cows are offered a new paddock daily, in addition to the previous grazed pasture – for feed utilisation efficiency, milk yield and milk quality, N utilisation efficiency, N excretion, methane emission and economic cost/benefits. Trials will take place at two different sites in Norway (Tingvoll and Ås) and the research partners are Bioforsk (NO), the Norwegian University of Life Sciences (NO), the dairy cooperative TINE (NO) and the James Hutton Institute (UK).

An unholy alliance clears the way for GM crops in Europe

Pro- and anti-GM countries have struck a deal that could sweep away the obstacles to genetically engineered crops in the EU. ***Lawrence Woodward*** *explains why he think this proposal is messy, legally unsound and fails to address critical problems in the relationship between organic, conventional non-GM and GM crops.*

EU Environment Ministers have agreed the proposal and it will now go to the European Parliament (EP) for approval, amendment or rejection. The EP amended a previous proposal to give some protection to organic and non-GM farming; hopefully the newly elected EP will be the same.

The significance of this move is that it breaks the political stalemate that has largely prevented GM crops from being grown in the EU. But it is based on the deceit that both pro and anti-GM countries can have what they want and the unity of the EU Single Market can remain intact.

Pro-GM Britain hopes it will allow for more rapid approval of GM crops in the EU: "This proposal should help unblock the dysfunctional EU process for approving GM crops for cultivation," according to UK Minister Owen Paterson. Anti-GM France welcomed the deal as 'good news' and has recently imposed a domestic ban on GM maize. Whilst Germany, which is inconsistent on the issue, whose abstention cleared the way for EU approval of a GM maize and whose Ministers have been quoted as saying they wanted to break the EU logjam – praised the deal, saying it opened the way for a formal ban in Germany.

Widespread criticism

There is concern outside of Brussels about the deal. Environmental campaigners say it gives too much power to corporations. The EU's Green Parties say it is a legally weak and "misleading proposal" which only "pretends to give Member States more freedom to ban GMOs on their territory" and may be instrumental "in allowing numerous new GM crops for cultivation in the EU."

Remarkably, the GM industry is also unhappy with the deal. They say it could allow crops to be banned on "non-scientific grounds" and undermines the Single Market. "To re-nationalise a common policy, based on non-objective grounds, is a negative precedent and contrary to the spirit of the single market," said André Goig, Chair of EuropaBio, the European Association for Bioindustries.

Trouble in the UK

An earlier version of the proposal put forward by the Danish Presidency several years ago was rejected by a number of Member States on the grounds that it was legally incompatible with the Single Market. The UK robustly held that position but Owen Paterson has allowed his pro-GM views to win out this time.

There is a question about how closely UK lawyers have looked at the tortuous contortions the proposal contains in order to pretend that the Single Market can remain intact when significantly different rules will be enacted in various member states. How the non-GM cropping commitments of Wales and Scotland are going to be met and justified politically and legally is a particularly difficult issue.

Deceit and self-deception

The deal rests on self-deception and a readiness to deceive the citizens and stakeholders of the EU. The proposal contains a number of elements which are questionable and open to challenge.

- Before banning an approved GM crop Member States have to seek agreement from GM companies to having their product excluded from a specific territory
- If the companies refuse, Member States can proceed with a ban but only on grounds that to do not go against the EU approval and assessment of health and environmental risk
- These Member State specific grounds for a ban can include things like protection of Nature Reserves and areas vulnerable to contamination; but they can also include socio-economic impacts

The deception at the heart of the proposal is the claim that these grounds will be wide-ranging and legally defensible against a challenge from industry, the WTO and a range of stakeholders. It is almost certainly the case that if they are wide-ranging enough to satisfy the EU's GM sceptic citizens they will not be restrictive enough to withstand a legal challenge and vice versa.

The heart of the matter

Much has been made by campaigners of the requirement to seek approval from GM companies. But this is not the major and most critical problem. There are three fundamental problems which this proposal fails to address:

- The weaknesses in the EU's GMO assessment and approval system and pro-GM bias at the centre of the European Food Safety Agency (EFSA).
- The failure to implement an EU-wide and rigorous co-existence and liability regime. To date the EU has only produced non-legally binding recommendations for co-existence.
- The absence of an agreed protocol for post-market monitoring of the environmental impact of GM crops.

As it stands this deal is a messy and unprincipled compromise which could lead to the kind of devastation of the EU countryside and food system that genetic engineering and the unrestrained activities of GM companies has brought on the US.

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An earlier version of this article appeared at www.gmeducation.org

Guess what the differences are between organic soybeans and GMO ones?

Herbicide residues, of course – organic has none; GM ones have plenty – but the nutritional profile of organic soybeans is also significantly higher. ***Meg Noble*** *and* ***Lawrence Woodward*** *look at new research showing striking differences.*

The research – published in the scientific journal Food Chemistry - examined the nutrients and composition, including residues of herbicides and pesticides, of 31 soybean batches from Iowa, USA.

The samples were grouped into three different categories:

1. Genetically modified, glyphosate-tolerant soy (GM-soy);
2. Unmodified soy cultivated using a conventional 'chemical' cultivation regime; and
3. Unmodified soy cultivated using an organic cultivation regime.

These three growing methods represent the US soy industry- with GM 'Roundup Ready' (glyphosate) soy being the most widely grown of all the soybean crops.

High chemical residues in GM soy

Unsurprisingly, GM-soy contained high residues of glyphosate and AMPA, which is a breakdown product of the herbicide.

This has worrying implications for health, as more studies emerge linking Roundup and its active ingredient glyphosate to reproductive disorders, endocrine disruption (hormone damage) and organ toxicity.

Conventional and organic soybean batches did not contain these residues. Of course organic farmers do not use glyphosate. Generally in the U.S. conventional, but non GM farmers, do not use it on growing crops, but do use it between crops and before the crop emerges.

In parts of the EU, and especially the UK, Roundup is increasingly used on standing crops just before harvest which is probably why glyphosate residues are now often found in cereals and baked products.

Organic comes out on top on nutritional qualities

The organic soybeans showed the healthiest nutritional profile, with more sugars, such as glucose, fructose, sucrose and maltose. There was also significantly more total protein and zinc and less fibre than in both conventional and GM-soy. Organic soybeans also contained less total saturated fat and total omega-6 fatty acids than the other samples.

GMOs are substantially 'non-equivalent'

The researchers used 35 different nutritional and elemental variables to characterise each soy sample. They were able to discriminate GM, conventional and organic soybeans without exception, demonstrating significant differences in the compositional characteristics for 'ready-to-market' soybeans. This shows – yet again – that it is erroneous to argue that GM and non-GM crops are 'substantially equivalent'. It is this argument which has enabled GM crops to pass through the US regulatory system and onto the market so readily. They do not have to be thoroughly tested because, it is argued, they are compositionally the same as non-GM crops.

Organic for health

The scientists involved in this research argue that "pesticide residues should have been a part of the compositional analyses of herbicide tolerant GM plants from the beginning. Lack of data on pesticide residues in major crop plants is a serious gap of knowledge with potential consequences for human and animal health."

So far the safety recommendations for GM crops – particularly herbicide tolerant crops – do not take into account the high levels of contamination in the end product. This makes a mockery of the safety testing, and all the recommendations based upon it.

This paper strengthens the evidence that organic practices and organic food production represent the healthiest model of agriculture. And that GMO-based industrial agriculture is just the opposite.

Sources

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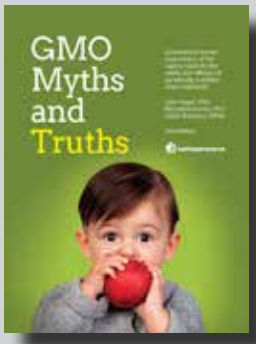
A version of this article first appeared on www.gmeducation.org

GMO myths and truths



GM foods neither safe nor needed, say genetic engineers. The second edition of 'GMO Myths and Truths', co-authored by genetic engineers Dr John Fagan and Dr Michael Antoniou and researcher Claire Robinson, has been released as a free online download by the sustainability and science policy platform Earth Open Source.

The second edition follows the publication two years ago of the first edition, which was downloaded 120,000 times just a few weeks after publication and was read online by several times that many visitors. At 330 pages, the new edition is nearly three times the length of the original and summarises many new studies.

Complementary and alternative medicine for mastitis control

The average milk yield for organic dairy cows in the UK is around 6,592 l per cow per year (Kingshay Dairy Costings Report 2013). As on conventional farms the major health risk facing organic dairy farms is problems with udder health and especially mastitis. Prevention is the first line of defence but when that fails treating mastitis without recourse to antibiotics can be challenging. Here ***Gonzalo Palomo,*** *a recent intern at ORC, reviews some of the alternatives to antibiotic use.*

Mastitis is the inflammation of the udder in response to microorganism infection. In addition to affecting the cow's health, both clinical and subclinical mastitis have important and adverse impact on the quality of milk and, therefore, economic value of the product.

There are two basic types of mastitis: environmental and contagious. The main bacteria implicated in environmental mastitis are coliform bacteria, specially *Escherichia coli*, and streptococci. *Staphylococcus aureus*, *Streptococcus agalactiae*, *Strep. dysgalactiae* and *Mycoplasma* spp. are responsible for almost all the contagious mastitis. Progress has been achieved in reducing the incidence of contagious mastitis while environmental bacteria cases, especially *Strep. uberis*, incidences have increased in the UK since 1995 (Table 1).

	Cases of clinical mastitis %		
Type/year	**1968**	**1995**	**2007**
Coliform (inc. *E. coli*)	5.4	26	26.9
Staphylococcus aureus	37.6	15.4	10.8
Streptococcus agalactiae	3.0	0.0	0.0
Strep. dysgalactiae	20.1	10.8	2.0
Strep. uberis	17.7	32.0	32.0
Others	16.3	15.8	28.3
No. of cases per 100 cows per year	21	50	47

Table 1. Main environmental and contagious mastitis bacteria in the UK[1]

Organic regulations and antibiotic use

According to European organic regulations (EC 834/2007, EC 889/2008) the usage of antimicrobial agents is forbidden for prophylactic purposes and as a first choice treatment unless animal welfare is threatened. Certified organic dairy farmers are allowed to use up to three antibiotic treatments per animal and year.

Antibiotic use is not allowed in certified organic husbandry in the United States. As a result of the recent EU and US agreement on mutual recognition of organic regulations, EU organic producers who would like to export to the US have to be certified that their livestock are antibiotics-free.

Mastitis and complementary and alternative medicine

According to the US National Center for Complementary and Alternative Medicine (NCCAM), complementary and alternative medicine (CAM) is a 'a group of diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine'.

For the treatment of clinical mastitis these alternative therapies would include whey-based products, botanicals, vitamin supplements, and homeopathy[2].

In a recent search[3] nearly 90 peer reviewed papers were found containing the word 'mastitis' and different CAM terms (see Table 2). A review of the 'grey literature' (conferences, magazines and unpublished articles) reveals that homeopathy and phytotherapy are the most common CAM for mastitis treatment.

Search: mastitis +	*Papers (no)*
Selenium	43
Homeopathy	11
Teat seal	12
Bismuth	11
Udder cream	4
Marigold	1
Essential oils	2
Thyme	1
Propolis	4
TOTAL	89

Table 2. Number of peer reviewed papers in PubMed searching 'mastitis' and adding the different cited CAM treatments.

Homeopathy

Homeopathy was initially developed at the end of the 18th century by of the German doctor Samuel Hahnemann who formulated the hypothesis that 'like could cure like'. According to leading homeopathic vet Chris Day[3] the main benefits of homeopathy for veterinary medicine are:

- No side effects.
- No requirements for laboratory animal experiments.
- No residues in tissues or milk.
- Affordability and withdrawal period, then low cost associated.
- Animal welfare.
- No real dependence on diagnosis in the conventional sense.
- Non-suppressive.
- Efficacy.

Day recommends the use of nosodes (via drinking water) – as a prophylaxis method – to reduce the incidence of mastitis and cites a case where incidence was reduced from 47.5 to 2.5% in a herd of 20 cows. Other experiments have also shown a reduction from 42.8 to 7.1% in clinical mastitis within a herd of 26 cows in two groups of 13 but overall there have been less conclusive results in trials with larger numbers of animals.

Some research has used Somatic Cell Count (SCC) as an indicator of udder health and there are reported cases where SCC is higher in organic cows than in control groups in similar sized herds.

Farm homeopathy in the UK

Many long-standing organic farmers – including dairy farmers – have used homeopathy successfully for many years. 'This is Farm Homeopathy' is a publication from Homeopathy at Wellie Level (HAWL) in which farmers describe their experiences. HAWL also runs regular training courses: see www.hawl.co.uk and download the publication from http://www.hawl.co.uk/uploads/media/this_is_farm_homeopathy_newspaper.pdf

In contrast to what may be considered the paucity of scientific evidence about the effectiveness of homeopathy there is extensive experiential evidence from many long-standing organic and some conventional farmers (see box above). Although most of these farmers would agree and stress that the health status of the cow is influenced by environmental and welfare factors, including the method of rearing replacement animals, type of housing and the geographical and climatic conditions of individual farms and that preventative management is critical, they would point out that experience shows homeopathy to be an effective treatment for mastitis.

Phytotherapy

A substantial body of research into herbal approaches of mastitis treatment and prevention exists – although some studies show differences between in vitro and in vivo assays – but information on dose-response and drug residue in organic systems is limited.

Essential oils and other herbal extracts have been used for disease treatment since the origin of medicine. The antibacterial effect of different parts of *Calendula* sp. (marigold), *Melaleuca alternifolia* (tee tree), *Thymus vulgaris* (thyme), *Hypericum perforatum* (Saint John's wort) and *Allium sativum* (garlic) are widely used as prophylactic and mastitis treatment through feeding, intramammary and/or external udder creams.

Other common plants reported to be used successfully in mastitis treatment are *Achillea millefolium* (yarrow), *Arctium lappa* (burdock), *Salix alba* (willow), *Teucrium scorodonia* (wood sage) and *Galium aparine* (cleavers). Also *Anethum graveolens* (dill) and *Rubus* sp. (berries) are given for increased milk production and *Taraxacum officinale* (dandelion), *Zea mays* (maize), and *Symphytum officinale* (comfrey) are used for udder oedema.

There are reports that feeding cows with kelp (A*scophyllum nodosum*) can significantly reduce the incidence of mastitis and increase milk yield.

Other mastitis treatments

Selenium is the mineral most cited in peer reviewed papers in association with mastitis (Table 1), although its relation to udder health is not completely clear. Propolis has an important antibacterial effect and has been shown to be effective as an intramammary treatment. Non-antibiotic bismuth-based intramammary teat seal seems to be effective if properly used in a hygienic manner.

Effective alternatives to antibiotics for mastitis treatment in dairy cows exist. In some cases there is a need for more information about dose rates, residues and active compounds; affordability may be an issue in other cases; and there are differences within EU countries about use restrictions which should be resolved.

But overall within the context of a health enhancing, disease preventing organic farm management system various CAM approaches can be used with confidence.

X-ray plate illustrating the appearance and position of teat seal in the teat sinus, teat canal, and teat orifice[5].

Selected references

1. Blowey RW. & Edmondson P. (2010). Mastitis Control in Dairy Herds, CABI.
2. Ruegg PL. (2012). New perspectives in udder health management. Vet Clin North Am Food Anim Pract 28(2): 149-163.
3. US National Library of Medicine National Institutes of Health (PubMed). www.ncbi.nlm.nih.gov/pubmed. Accessed 7 Sept 2013.
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A full list of references is available on request from ORC.

Field lab - Reducing antibiotic use in dairy farming

This field lab run by the Soil Association and ORC as part of the Duchy Originals Future Farming Programme has focused on reducing the antibiotic use of participating dairy farmers and in particular on mastitis control. They meet on different farms (five times last year) supported by an advisor, William Waterfield, who facilitates and chairs the discussions.

The group has been trialling a commercial udder treatment on 500 cows from 9 different herds in the south-west of England. Uddermint® is a specially formulated liniment cream containing 35% mint oil which is commonly used in organic dairy farms in an attempt to mitigate the use of antibiotic treatments.

At field lab meetings the group members share their herd data and discuss points which arise from this and learn about the management techniques on the host farm. The benefits and effectiveness of Uddermint as part of a strategy for reducing antibiotic use are also discussed. In the 2014 calving season participating farmers have committed to use a protocol which comprises Uddermint treatment for every second new-calved cow showing signs of mastitis or a high somatic cell count and report the results for all cows showing signs, treated and untreated.

The farmers are reporting that when it is used early in non- severe mastitis there has been a 50% reduction in antibiotics doses per animal. The seventh and final meeting will take place in June and following that data from the farms will be analysed.

Taking a FORC to R&D

ORC has always involved producers in all aspects of its work but in recent years the Participatory Research Network has taken this to a new level. We have now re-launched it as the Farmers' Organic Research Club (FORC) to create an even closer, more innovative and collaborative relationship between producers, researchers and advisers. During his internship at ORC, ***Vincent Delobel*** *(apprentice organic goatherd and MSc student in Rural Development & Innovation at Wageningen University) has looked at different ways of relating with farmers to develop more jointly-run research processes.*

ORC staff and producers who have collaborated with us in research projects came together in a workshop in April to discuss research topics and how to make them happen. The producers were clear that they wanted a closer relationship with ORC and so we have launched the Farmers' Organic Research Club (FORC).

It will create more collaborative and jointly-run knowledge production processes with participation and co-ownership from problem definition and research design, through establishment and implementation, to discussion and dissemination of results. Its basis will be topic-related sub-groups such as diverse swards, fertility-building leys, woodchip uses, antibiotics, and non-timber tree products.

These will work according to the following methodology.

Step 1: Listening

This consists of on-farm, phone or e-mail interviews aimed at a fuller understanding of farmers' context; their situation and how they experience it; their problems; their definition of issues to be addressed; and the 'novelties' i.e. novel practices and ideas about potential solutions to be developed.

Step 2: Discussing

The second step is a tri-aspect discussion between producers and scientists about (i) the different possible options (ii) what knowledge process is needed (e.g. observation, experiential learning, sharing information, learning new techniques, developing new ideas, new designs, and testing different options) and the associated activities to be co-organised (e.g. on-farm trials, on-farm experiments, workshops, group discussions, conferences, farm walks, excursions), and (iii) the related stakeholders who should be included and who may be interested in the process.

This discussion should ideally take place on a farm which can provide access to key information on the topic or novelty-production process and its context. Group discussions during workshops at ORC can be valuable but being away from the farm for a day and travel costs can be important barriers. On-line information-sharing and discussion pages are also valuable resources.

Step 3: The Deal

This step is an overarching one: that of ensuring that a balance is achieved throughout the relationship and activities. All parties have rights and responsibilities; they all give and they all get. The quest for external funding is the joint responsibility of both farmers and scientists; attention should be paid to what can be 'monetised' and what cannot.

	What one gives	*What one gets*
ORC	Staff costs, measurement tools, access to papers, access to experimental farms and conference hall, travel costs…	Publication, research topics, questions, hypotheses, financial compensation, 'participatory' activity for funded research projects…
Producer(s)	Work time for data collection, report writing, experiment treatment, access to field, financial participation, travel costs…	Development of their farm, cost reduction, new income, increased sustainability, financial compensation…
Exterior	External funding (EU, Defra, DOFF, donors etc.)	Positive externalities: knowledge made available, social, economic, and environmental impacts

Step 4: Report

The last step consists of reporting the **outputs** (learning points, experiment results, trial evaluation, etc.); a short reflection on what went **well/wrong**; and ideas of **next topics**. Producers will input into the elaboration of the report and its dissemination. The report is made accessible (not only available) to other farmers and scientists though different channels – academic channels as well as farmers' networks.

If you are interested in joining FORC, please contact research@organicresearchcentre.com

Further reading

Katharine Leach (2013) SOLID document presenting "insider" perspective and participatory research – Workshop on participatory research held in Helsinki, January 2013.

RELU (2007). Rural Economy and Land Use Programme Briefing Series No 6. Common knowledge? An exploration of knowledge transfer. June 2007.

Blog: Vincent's organic goat farm in Belgium http://researches.chevreriedelobel.over-blog.com/

Farmers and researchers looking for black grass at the Field Lab at John Pawsey's Shimpling Park Farm

Field labs turning farmers from advice takers to advice makers

"This is the first time in my 19 years of farming that a research organisation has come to me to ask if they can help me trial something on my own farm respecting the fact that in all those years I might just have had an idea of something worth trialling. And I have, and I am." Says ***John Pawsey,*** *who farms over 2000 organic acres in Suffolk.*

John Pawsey at the Field Lab on his farm earlier in the year

When I finished agricultural college in 1984 aged 21, I left with my college notes, a copy of 'The Agricultural Notebook' by R. J. Halley, an 'Introduction to Crop Husbandry' by Lockhart and Wiseman and armfuls of booklets written by ADAS, the Agricultural Development and Advisory Service, which at the time was an independent research organisation fully funded by the government providing independent advice to farmers.

1980s arable farming seemed a relatively uncomplicated industry with very few chemicals to choose from and cheap fertiliser to be flung liberally into the four corners of each field without even a nod to health and safety or environmental consequences. Arrogant with the belief that with plant breeding and increased doses of ammonium nitrate wheat yields would continue to soar year on year, I paid little attention to the whys and wherefores of my financial success. I followed the lucrative East Anglian Cereal Baron dream of continuous wheat, or as my ex-college lecturer called the rotation, "Winter wheat, Winter wheat, Winter cruise."

Losing the chemical battle

But then it all got complicated. Only so much yield could come from artificial fertilisers and there were other downsides. The weakened crop now needed help to remain standing for the harvester and its fleshy cell walls needed protection from foliar diseases. We weren't only feeding the crop, we were feeding the weeds as well. Previously happy to relax in the bottom of the crop, they now competed with it sapping that extra yield. Growth regulators, herbicides and fungicides became increasingly more technical as we battled with disease and herbicide resistance and I found myself losing grip with the technical challenge.

Local advice was at hand from the now newly privatised ADAS. The Morley Research Centre was a mere 40 miles north of my farm and was the emerging champion of research advice for East Anglian cereal growers. Morley was stuffed with expert agronomists with time and money to work out what cocktail of chemicals would best suit my continuous wheat quest. Having walked my fields and supplied the experts with the list of my emerging weed species and various fungal growths, I hovered by the fax machine at 6.30am on a Monday morning, sprayer quivering outside with anticipation, to receive my instructions for the week.

But as the jobs kept mounting up, and becoming a slave to chemical and fertiliser application leaving precious little time for field walking let alone keeping up with continuous developments in agrochemicals, I begrudgingly employed an agronomist.

Becoming a farmer again

One day while glued to my sprayer, I saw the agronomist walking my fields in the distance. It was a beautiful May afternoon, I saw him stop, put his hands on his hips and raise his head. I imagined he was drawing in the air and thinking to himself what a wonderful job he had. I however, was in a carbon filtered, hermetically sealed cab spraying chemicals that no longer worked, whose long term effect on water quality and wildlife were unknown to me.

I was no longer a farmer, I was an operator. With wheat at £55/t I was also producing something that nobody wanted. The year was 1998 and I was not in control of my own business either financially or environmentally.

The next year I started conversion to organic production.

At that point in time, as far as I was concerned, research in agriculture was for others to do and for me to react to. I was an advice taker, not an advice maker.

The field labs run by ORC, with the Soil Association have turned all that on its head. Working with researchers has been enlightening and exciting. I am now part of turning a farmer led hunch into something robust that we can hold up to other organic and non-organic farmers alike and say, "Try this, it works, and here is the data to prove it." Not only that I am learning from researchers the skills to trial effectively so that R&D expertise can be used more extensively.

Field Labs are run under the Duchy Originals Future Farming (DOFF) programme which is funded by Waitrose and the Prince of Wales's Charitable Foundation. Without this kind of farmer/researcher collaboration we will continue to deskill our farmers. It has to be the future of farming R&D and I look forward to other retailers taking a leaf out of Waitrose's and Duchy Originals' book.

Follow John

John regularly posts video clips about his farming on http://www.youtube.com/user/JohnPawseySPF and on Twitter https://twitter.com/hanslope

A Tale of Two Studies ...

Reliable statistics on the financial performance of organic farming in the UK are not easy to come by, but more data are available than is often realised. Since the mid- 1990s, Defra has funded Aberystwyth University and the Farm Business Survey to collect and analyse data from organic farms in England and Wales. For more than 15 years, a series of annual reports were produced by Aberystwyth University, comparing the financial performance of organic farms with that of similar non-organic farms. Two years ago, Defra asked Newcastle University as one of the English FBS data collection centres, to produce the reports instead. With our own resources and some Welsh government funding, Simon Moakes at Aberystwyth University, working with Nic Lampkin and Catherine Gerrard at ORC, has continued to produce reports in the original format. We now have two years of data analysed by the two different teams, which gives ***Nic Lampkin*** *an opportunity to ask the question – how much difference does it make who does the analysis?*

Firstly, what obvious similarities or differences are there between the two reports?

Parameter	*Aberystwyth*	*Newcastle*
Geographical coverage	England and Wales	England only
In-conversion farms included?	Only if > 70% fully organic	Not mentioned specifically
Partly organic farms included?	Yes if > 70% organic	Yes, if >70% organic
Results differentiated by farm type	Yes	Yes
Number of farms in study	198 fully or partly organic	140 fully organic, 19 partly organic
Comparison with identical samples between years?	Yes	Yes, but only organic
Comparison with non-organic farms?	Yes, using clustering procedure (see text)	Yes, using a weighting procedure for both organic and non-organic farms, purpose not described but assumed to match farm type samples to population from census data
Statistical testing of differences?	Yes, for FBI per ha	Yes, for FBI per farm
Time period covered	Financial years ending early 2013, i.e. 2012 harvest and lamb crop	Financial years ending early 2013, i.e. 2012 harvest and lamb crop
Previous year data	All categories incl. non-organic identical sample and full samples	Only organic identical sample
Physical data reported	Break down of land use, stocking rates, and yields by farm type and in enterprise margins	Total area and livestock units only in whole farm data, but yield data in enterprise margins

With respect to the farm type classification, both reports use the Standard Output method (based on conventional farm data) to allocate farms to robust farm types using standard methods. Due to the low sample size, specialist cereals are merged with general cropping farms into a single group in both reports. Both emphasise the need for caution in interpreting the horticulture results due to sample size issues and the diverse range of sub-types and holding sizes within the sample. Both reports exclude the pigs and poultry farm type category due to the low number of such farms surveyed.

On the face of it, apart from the inclusion of Welsh data in the Aberystwyth study and the procedure for selecting comparable conventional farms, most of the approaches used are similar between the two studies. So how does this impact on the results? In the table, we've used farm business output, costs and income, total area and livestock numbers to contrast the results reported. We've also included agri-environment income, given the current debates on the future level of organic support payments.

The first obvious issue of difference is that the two reports have different sample sizes for both organic and non-organic farms, with different areas and livestock numbers per farm across most farm types. In part, the organic sample size differences may relate to valid but slightly different decisions on whether to exclude borderline or outlier cases. The lowland and LFA cattle and sheep samples are also substantially affected by the inclusion of Welsh holdings in the Aberystwyth report. But even where sample sizes are similar, the average area per holding can differ widely – illustrating how even in a sample of ca. 15 farms, an outlier holding (such as a large horticulture operation in a group dominated more by market gardens) can make a big difference to the average values.

Comparing like with like

The Aberystwyth report shows organic farms typically as larger than comparable conventional farms, whereas Newcastle shows them as smaller. This raises the questions of how comparisons are made and how valid they are. The FBS sampling procedure does not ensure that the organic farms selected are representative of all organic farms, and the range and proportions of farm types represented by the organic farms is not necessarily the same as for agriculture in general. Therefore simply comparing a group of organic farms with the average of all conventional farms, even of a similar robust type, is not necessarily a valid comparison.

If farms differ in terms of size, whether land, dairy quotas or building capacity to house livestock, is this because they are managed organically or because of differences in the underlying resource endowment of the farms, whatever their management system? Aberystwyth has attempted to address this problem by using a clustering approach, whereby each

Farm type	Sample size (n)		Farm size (ha)		Livestock (GLU)		Agri-env payments per farm (£'000)		Farm business output per farm (£'000)		Farm business costs per farm (£'000)		Farm business income per farm (£'000)*		Farm business income per ha (£)*		Identical sample % change in FBI since year before*	
Report	A	N	A	N	A	N	A	N	A	N	A	N	A	N	A	N	A	N
Cropping (O)	20	23	254	170	11	13	26	21	401	250	318	194	83.7-	56.6*	330-	291*	-21-	-22
Cropping (C)	178	468	211	186	14	14	8	7	330	336	260	262	68.6-	75.4*	325-	387*	-35**	n/a
Hortic (O)	14	13	54	28	26	11	5.5	1.5	180	76	371	61	21.0-	15.7**	391-	550-	-4-	-38
Hortic (C)	75	194	35	31	3	2	2.3	1.9	269	364	103	332	27.4-	31.2**	784-	903-	-26-	n/a
Dairy (O)	42	39	152	145	196	175	12	10	377	348	322	294	55.4-	53.3-	364-	394-	-27-	-22
Dairy (C)	238	275	130	142	207	234	4	4	394	471	351	421	42.2-	51.1-	325-	370-	-45-	n/a
Mixed (O)	27	25	228	131	118	72	24	17	316	161	283	145	33.1-	16.3**	145-	120**	-7-	-28
Mixed (C)	370	168	187	148	124	93	9	7	270	264	224	226	45.3-	39.3**	243-	257**	-29**	n/a
Lowl C&S (O)	41	33	145	91	119	70	17	9	149	90	117	70	31.9-	19.2-	220-	204**	-27*	-27
Lowl C&S (C)	287	234	133	101	110	95	5	4	125	107	108	91	17.8-	16.0-	133-	158**	-50***	n/a
LFA C&S (O)	47	22	192	147	166	109	27	17	178	130	126	90	52.0**	40.2**	271**	168**	-17*	-18
LFA C&S (C)	312	224	163	123	156	94	13	11	145	105	116	86	28.5**	19.1**	175**	130**	-34***	n/a

O: Organic; C: Conventional/Non-organic; A: Aberystwyth; N: Newcastle

*Symbols after numbers indicate statistical significance reported, *=low,***=high, -=not significant

organic farm is matched to a group of similar conventional farms in terms of their resource endowment, before the whole group averages for both organic and conventional farms are calculated. In theory, this means that if there are differences in terms of the key characteristics of the organic farms in the farm type group compared with the conventional farms that do not relate to the management system directly, this can be taken account of in the comparison. However, the clustering parameters often require relaxation to avoid excluding organic farms from the sample, which seems to result in organic farms being physically larger at a similar business size (based on Standard Outputs). In the Newcastle case, both the organic and the non-organic samples are weighted in order to match them more closely to the overall population. However, this does not take account of structural differences within the group.

There is clearly a need to revisit this question of how representative the samples really are, and how best comparison groups are selected. In the meantime, it may still be better to focus on per hectare values, as Aberystwyth does, rather than per farm values, which is the primary focus of Newcastle's reporting, as differences in size not related to organic management may distort the conclusions, not least because of the potential effect of spreading fixed costs over larger areas.

How are organic farms really performing?

The financial values presented in the table make it clear that it is very easy to get widely differing values from essentially similar data sets. Although the reports differ, sometime quite markedly, in terms of the absolute value presented, the trends and relative positions are more consistent. Therefore it is probably more important to focus on general trends and patterns, rather than on absolute amounts or differences, which are rapidly out of date in any case. So here are a few conclusions based on the published results to consider:

- Organic farm business incomes declined by a large amount , typically around 20-25%, in 2012/13, due in large part to the difficult farming conditions with very low crop yields a key factor, BUT
- FBI on non-organic farms declined EVEN MORE, by as much as 50%, due to the same difficult conditions, so that whereas for some farm types non-organic had moved ahead of organic in terms of incomes per ha in 2011/12, the 2012/13 results showed organic ahead of non-organic again. It's clearly important not to see organic results in isolation from wider trends.
- However, for many of the farm types, the differences are not statistically significant, in part due to relatively small sample sizes, so the best that can really be said is that organic and non-organic farm incomes are generally similar. This is also shown in our recently published analysis of the long term time series data from 2005/06-2011/12.
- Horticulture and mixed farms stand out, with much poorer performance. For horticulture, differences in cropping, with land used for fertility building not generating high horticultural margins, is one factor. For mixed farms, the reasons are less clear.
- One farm type, LFA cattle and sheep, shows consistently better performance for organic than non-organic, even though premiums are low for beef, minimal for sheep, and reduced stocking rates would be expected to have reduced profitability.
- Organic farms consistently receive more income from agri-environmental (including organic) support payments, accounting for up to £15,000 of the difference in incomes between organic and non-organic farms.

If organic farms can continue to perform relatively as well as non-organic and continue to receive additional support for their agri-environmental contribution, even when markets and weather conditions are difficult, then there are reasons to remain confident that organic production is worth sticking with despite the challenges. But it pays to keep looking at the figures!

References

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Lampkin N, Gerrard C, Moakes S (2014) Long term trends in the financial performance of organic farms, England and Wales, 2006/07-2011/12. Organic Research Centre, Newbury. http://orgprints.org/26339/

For previous annual reports, search www.orgprints.org with keywords 'organic farm incomes England'

Events and announcements - details at www.organicresearchcentre.com

Events

1 July 2014: National Organic Cereals 2014. Rectory Farm, Milton Keynes

7-9 July 2014: SOLIBAM final congress. Diversity strategies for organic and low input agricultures and their food systems. Nantes, France.

10 July 2014: Participatory plant breeding with diverse wheat populations. Field lab at Shimpling Park Farm, near Bury St Edmunds

21-24 July 2014: Royal Welsh Show, Builth Wells. OCW Organic Food and Farming Centre.

22 September 2014: Field Lab: Woodchip Compost Part 3: Discussion of final results, Tolhurst Organic.

13-15 October 2014: IFOAM World Congress 2014 - Building Organic Bridges, Istanbul.

25-27 November 2014

Soil Association National Soils Symposium and the ORC Organic Producer Conference

St. Johns Hotel, Solihull

The Prince of Wales's Food and Farming Summer School

16-18th July 2014

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We're appealing!

Can you help us raise £50,000 by October?

We know organic farming can make a positive impact, for farmers, environment and society. With more research, and better communication of knowledge, we believe it can do even better.

ORC is working hard to deliver this. We're growing fast, with more funded projects than ever before. We have ambitious plans to develop our resources and new initiatives. But we still need your financial help.

Two years ago, we asked for £100,000 to get through a challenging financial period – you helped us meet the target and we're moving forward again.

Last year, we launched a policy appeal to help with all the work we are doing with Defra, the European Commission and others – you again came up with the goods, donating over £25,000.

We'd like to say a big thank you for this help.

This time, we want to build on that success, supporting pilot research projects and PhDs, better communications through our publications and websites, new training initiatives and bursaries, as well as improved facilities at Elm Farm and Wakelyns.

We've started the work – please help us raise the funds we need to progress it.

Agroforestry researcher needed

12 months Maternity Cover with the potential to become a permanent position

The Organic Research Centre is looking to appoint a researcher to work within our crops and agroforestry team. The post will work primarily on the European project 'Towards Eco-Energetic Communities' (TWECOM) that aims to develop short chain systems of harvesting biomass from existing landscape elements (e.g. hedgerows) for local energy use but on other related projects too.

The post will be based at our Elm Farm offices near Newbury in Berkshire. Some UK and EU travel will be needed and an ability to drive is essential.

The closing date for applications is 9am on 14th July 2014. Interviews will be held at the Organic Research Centre on 28th July 2014.

Other employment opportunities

We will shortly be advertising for technical writers to help prepare technical guides and website content, and for a temporary (3-months August-October) research technician at Wakelyns Agroforestry.

Further details: www.organicresearchcentre.com