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ELM FARM RESEARCH CENTRE is an international research, advisory and educational organisation based in the UK.

The business of Elm Farm Research Centre is to develop and support sustainable land-use, agriculture and food systems, primarily within local economies, which build on organic principles to ensure the health and wellbeing of soil, plant, animal, man and the environment.

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The Organic Research Centre

Elm Farm Research Centre

Bulletin

*with Technical Updates from
The Organic Advisory Service*

GM co-existence - A test for Mr Miliband

Secretary of State David Miliband's new regime of openness and transparency seems not to have survived the old MAFF miasma of cynicism and disingenuity that still hangs around Defra. Slipping out the details of the proposed GM co-existence regime on a hot afternoon at the fag end of the Parliamentary session (with a consultation period that largely takes place during the holiday season) is more in keeping with the old guard - who thought stakeholders were something to do with cattle - rather than the new style bloggers.

On top of which it is proposed that the measures will be implemented administratively by Statutory Instrument, thereby avoiding discussion in Parliament. This is a technique beloved by elitist bureaucrats, oligarchs and particular types of dictators (those who claim a populist mandate) when they can't be bothered with due process, when their incompetence has led to time pressure, or when they don't think they will win a democratic argument.

Certainly nothing has happened to change the view expressed overwhelmingly in the national debate "GM Nation?" that UK citizens do not want GM crops grown in this country. Nothing has changed to alter the conclusion of the various Cabinet Office studies that there is no commercial case for growing GM crops in the UK. But neither, obviously, has anything changed the determination of the GM industry and some in this government to press this unpopular, redundant and potentially damaging technology upon the citizens and environment of the UK.

David Miliband has made an interesting start at Defra. The promise he displays has stopped us throwing this consultation document in the bin - for now. It must not be allowed to be a cosmetic exercise. It would be an undemocratic folly to foist GM crops on to the UK - at least without a comprehensive co-existence regime that will properly protect organic and all non-GM production. In that hope, we will be taking part in the consultation and urge all readers to do the same.

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Battling on for Avian Flu preventive vaccination

The hottest July day on record (July 19th) saw EFRC/The Organic Research Centre, along with an extensive alliance of like-minded poultry organisations (see list) busy at the heart of the political establishment - Dining Room B of the House of Commons. There to drive home to the assembled MPs, Lords, Defra officials and other interested parties the core message that the time has now come to deploy preventive vaccination in the UK as a key tool in the fight against the looming endemic status in wild birds of the H5N1 avian influenza (AI) virus.

The reception also saw the launch of the EFRC report - "**Vaccination Nation**" - a study of the arguments surrounding the use of preventive vaccination for the control of H5N1 avian flu in poultry.

Says EFRC director Lawrence Woodward - " We must be prepared for the H5N1 strain of avian flu to become endemic in the UK and deploy every civilised element in the animal health arsenal to control and manage it. We must show that we have all learned the lesson that planned and timely preventive vaccination is the scientifically proven, politically and socially acceptable route for controlling such serious diseases. "

At the launch of Vaccination Nation the call was for Defra to commit itself publicly and clearly to the drafting of an AI preventive vaccination plan/campaign ready for EU approval, well in time for Autumn 2006. The Defra announcement of July 11th that it is seeking tenders on an option to supply 10 million doses of AI vaccine is a welcome step in the right direction. But it is not enough and the declared Defra policy is still not to use preventive vaccination as a control measure.

Without such vaccination, the only current solution in attempting to separate poultry from wild birds is biosecurity and shutting up (housing). "Shutting up signals the effective end of environmentally-friendly and sustainable poultry systems in the UK. It would be a catastrophe," says Lawrence Woodward.

Consumer commitment to such outdoor production systems is growing fast. The latest data from the British Egg Industry Council shows over 30% of all UK egg retail sales are free range (3% are organic). The Soil Association reckons that nearly 9 million organic table birds were consumed in the UK in 2005. Add to those commercial birds the breed society enthusiasts, the rare breeds, the waterfowl, show birds and there is a huge body of poultry that requires a civilised strategy of protection from H5N1 AI.

But, set against the enthusiasm of most outdoor poultry producers and keepers are grave reservations from the "industrial" poultry sector.

They consider any move to an AI vaccination policy should not be undertaken lightly. It is not like vaccinating for other poultry diseases - do it and forget about it, they say, because AI would require on-going serological monitoring both pre and post vaccination to eliminate the possible masking of field challenge. Crucially the biggest worry is over the use of vaccination possibly compromising the UK's export status.

The UK egg industry relies on exports to third countries for the disposal of most of the end of lay hens. Without that they say there would be a real disposal problem - it could be done in existing hen plants on a 'kill and render basis', but the cost to the producer would be considerable. In the UK there are also "Grandparent" layer breeder operations which export day old parent stock around the world.

In the poultry meat industry there are also significant exports with a reliance on them to soak up the wings and legs that are not in demand on the domestic market. UK demand is very heavily skewed to breast meat. There are also world class primary broiler breeding companies in the UK who rely totally on the ability to export.

When limited vaccination was approved by the European Commission in Spring 2006 in response the AI in wild birds in France and Germany some countries - both within and without the EU - used this as a reason (excuse) to ban imports. UK industrial poultry will need some real reassurance that they are not to become trade pariahs if AI vaccination is allowed.

The next move in this campaign is to bolster the "alliance" with animal welfare and veterinary bodies. Bi-lateral meetings are also being planned with Defra to add some detailed flesh on our outline, preventive vaccination proposals. It seems that unless concerned parties - such as us - do draft this detail, Defra is unwilling or unable to embark on the process.

Supporters of the need for a UK preventive vaccination policy for H5N1 AI

Elm Farm Research Centre
Organic Food Federation
Organic Farmers and Growers
Farm Animal Initiative
Sheepdrove Organic Farm

Poultry Club of Great Britain
British Waterfowl Association
The Henkeepers Association
Poultry breed Societies
Wootton Organic Farms



"New dawn" plea for UK organic sector

A little bit after the dawn of the modern organic sector (circa 1986) the Ministry of Agriculture decided to bring organic affairs into some sort of order and it formed the United Kingdom Register of Organic Food Standards or UKROFS.

There was a great deal of disquiet amongst organic producers about this initiative because many of them tended towards the disorderly; or at least away from the bureaucratic notion of order. However, bringing the organic market into some sort of regulatory framework was the only thing that mattered to governments and the EU; if it was killed in the process, well ok; if it was changed along the way, that would be a good thing; if it was transformed into a shape that resembled the rest of the food sector, that would be just great.

The annual Soil Association Organic Market Report is just out and is a dramatic confirmation that the organic market hasn't been killed. It has been transformed and resembles the mainstream food sector far more than it does an example of how to live in harmony with a small, fragile planet and equitably as producers and consumers.

Despite much talk and attention to direct sales, the vast proportion of organic sales in the UK is through the supermarkets and much of it is indistinguishable from conventional. The product on the shelf by and large looks the same - the same varieties, breeds (and often processing methods) are used; the packaging looks the same; the supply and distribution chain (including food miles) are virtually the same; and the suppliers are often the same - a limited number of suppliers or category managers supplying both conventional and organic products.

The story of supermarkets and the organic sector is a complex one but the essential factor is that in three key areas - type and range of product, quality specifications, continuity and availability - organic production is required to more or less meet the same criteria as conventional production systems and in a price range set by the supermarket's perspective of its customer base.

A living, ecological system

Meeting these criteria in living ecological systems is extremely difficult - almost impossible - to do consistently and has only been achieved by firstly; concentrating production into fewer and fewer companies who have well established relationships with the supermarkets, often supplying both organic and conventional product. This has tended to be to the

detriment of dedicated organic only operations and producer co-operatives.

Secondly, by the misuse of derogations, exploiting loopholes and grey areas in standards and lax certification at national and international levels. The poultry sector is one of the worst in this respect. Elsewhere in this *Bulletin* we have examined one of the best certified egg supply chains to the supermarkets but even here unjustified derogations have been allowed in a less than transparent way and practices allowed - such as long periods of artificial lighting - which the consumer would find hard to recognise as organic.

Thirdly, by the use of imports from both within and outside of Europe which are produced using methods that are not compliant to UK standards. This has been possible because of the less than robust regulatory system and a measure of duplicity by some certification organisations.

Not anti-supermarket

This is not an anti-Supermarket rant just for the sake of ranting. But the concentration of production aided by standards and certification loopholes and malpractice is putting financial pressure on smaller, family farms in the non-supermarket chain because there is inadequate differentiation in the marketplace.

For example, organic certification conveys the same status and price range for the egg sold in the supermarket as the egg sold by the small farmer in the farmers market: even though the former is likely to have been produced using conventional chicks in a flock of anything between 2000 and 10,000 birds, using 15% conventional feed and 16 hours of artificial light compared to the latter using more expensive organic chicks, in a flock of 500, approaching 100% organic feed and using natural light.

At the moment those organic producers who wanted the movement to go it alone might be feeling vindicated and depressed. But hopefully not passive; the market can and should be brought in line by proper regulation and certification but a revival of the radical energy of organic producers is needed to develop alternative and sustainable production methods and patterns of consumption which is what we were trying to do in that dawn many years ago.

Lawrence Woodward



Organic Columbian Blacktail eggs - the Stonegate/Waitrose supply chain.

A feature of UK supermarket shelves these days is the diversity of egg types they contain. Barn laid, free range, organic, woodland reared, white, brown, blue, duck's eggs, quail's eggs - you name it and the supermarkets have added it as a premium egg product.

Nowhere is this premium egg choice more pronounced than at Waitrose. Its national chain of 180 stores stock no conventional, intensive, battery eggs. Alongside premium, barn-laid eggs, its key product is free-range Columbian Blacktail (CBT) eggs. A dozen medium CBT eggs (2 x half dozen boxes) cost £1.78. Alongside sit organic CBT eggs, retailing at £3.18 per dozen, medium. Waitrose egg sales currently break down to 70 per cent free range, 20 per cent organic, 8.5 per cent barn and 1.5 per cent non-hen (duck, quail etc.)

At 26.5 pence an egg, the price and the apparent scale of the Waitrose organic operation beg the questions - what am I getting for this premium price, where are all these organic eggs coming from and what checks are in place to ensure their proper "organicness"?

The sole supplier of eggs to Waitrose is Stonegate, the nation's second largest egg producer and packer. It has an annual turnover exceeding £100 million. Policing of the supply chain is delegated by Waitrose to Stonegate and the trading relationship is so close that Stonegate is now building a dedicated packing plant for Waitrose at its Lacock headquarters in Wiltshire. Waitrose is the only national supermarket chain supplying organic eggs to Soil Association (SA) standards, widely recognised as being the toughest available set of UK rules. Two years ago, SA certified suppliers were dropped by Sainsbury's.

Stonegate describes the CBT business as follows -

"This is a good example of Stonegate working with their customers at a strategic level to add value and points of difference. Columbian Blacktail is a brand developed in a joint initiative between Stonegate and Waitrose and is now used exclusively by Waitrose as the brand on their own label eggs.

Columbian Blacktail hens are vigorous, hardy, robust and thrive outdoors. They are bred and farmed in traditional manner with increased space to live and roam, in line with the expectations of Waitrose customers. It is a unique scheme in the UK, and we believe the world, in terms of delivering continually higher standards and fair returns for all parties involved."

The Columbian Blacktail hen is a cross between Rhode

Island Red, Sussex and other "hardy breeds" and was first bred 15 years ago for this Stonegate/Waitrose enterprise.

Strong growth

The CBT operation comprises over 40 organic egg producing sites/farmers and 90 free range suppliers. The organic CBT market at Waitrose has, until recently, been growing at 25 per cent year on year. This has now slowed slightly to 17 per cent, compared to a growth in general egg sales nationally of about 2 per cent. It is an impressive performance and a measure of consumer hunger for wholesome, organic eggs. When demand outstrips supply, for the moment, shortfalls are made up by sourcing other non CBT organic eggs from farmer suppliers (clearly labelled) operating to Organic Farmers and Growers (OF and G) standards.

A typical Waitrose organic producer is Rachel Rivers who runs two 2000 bird units in Wiltshire. The sheds sit in large pasture fields, far exceeding the SA minimum requirement of 100 metres of outside range. The egg enterprise is part of a long established organic unit running to some 1200 acres. Until recently it had a 200 cow dairy unit, but with the realisation that two eggs were now worth more than 1 litre of milk, the cows have gone. The weekly income from 4000 laying hens is far greater than the recent dairy receipts; another shed of 2000 birds is planned.

Typical daily lay peaks at about 1850 eggs per 2000 bird unit, giving an average of 2000 dozen a week. Over the year of lay the CBT hens of Rachel Rivers are expected to give about 285 eggs each. Rachel is a star performer for Stonegate, her birds lay a high proportion of large eggs with few breakers and therefore generate a high return.

The birds are fed an 85 per cent organic ration with the aim of working towards 100 per cent organic rations when available and when required by certification. The feeders are run 9 times a day for 14 minutes.

All hens on the farm are currently from the Stonegate hatchery near Peterborough (a non-organic hatchery) located in the vicinity of the parent flocks. The day-old chicks are raised at a specialist rearer and then moved at 16 weeks of age to this laying farm.

By Spring 2007, all of Stonegate's organic CBT layers will be sourced from dedicated organic rearing units (SA certified).



As an aid to nesting and egg laying the standard light regime for the CBT organic layers is 16 hours of artificial light a day. Most CBT units are fitted with solar and wind power generators to supply electricity for the lights, feeders and egg collection machinery in a bid to be energy efficient and eco-friendly.

Stonegate operates a Guild of CBT producers which is run by a committee including 4 elected farmers. It holds technical meetings during the year. Producers are "policed" by numerous inspections including Stonegate, the SA and RSPCA Freedom Foods. Due to the integrated nature of the business with Stonegate it is simple to apply a computed profile of production to the age and condition of the supplying farmer to assess the likely predicted level of egg production at any one time. Such data can be used to detect any perceived under or over supply which might indicate additional egg flows from outside the CBT flock or a diversion of CBT eggs to non - Stonegate marketing, which is expressly forbidden in the contract. Due to the current undersupply of CBT eggs, Waitrose is obviously anxious to access all CBT output.

Fully traceable

Scrupulous attention to detail and record keeping is also much in evidence at Stonegate's packing headquarters at Lacock. This unit only grades and packs barn, free range and organic eggs. Different coloured egg trays indicate the type of eggs being handled on to the grading line in discrete batches.

The paper trail that accompanies the eggs from the farm includes all organic certification details, dates of lay, numbers of birds and their age along with flock number and producer number. The grader's computer produces a detailed breakdown of how the batch is graded and analyses quality elements, whilst in the final packing stage all eggs are coded on the shell with inkjet and boxes are labelled with the same information of producer and batch, best before and display dates.

The paper chain allows full traceability back to individual farms and sheds for the purposes of quality control, food safety and organic audit.

All collected data is freely available and subject to unannounced Egg Marketing Inspectorate visits along with the whole packing plant operations. As with the individual producing farms the Soil Association also inspects the Lacock plant, as does the British Egg Industry Council Lion mark inspectorate. Waitrose runs an independent audit of its egg supply operation every 18 months.

It is interesting to note that until recently all control of

egg organic standards, including record reconciliation at egg packing stations such as Lacock, has been the delegated responsibility of the organic certifying bodies - such as the SA. To date organic eggs have been specifically excluded from the UK's Egg Marketing Regulations (EMRs).

New rules being brought in by the Government's chief egg marketing inspector are set to change that exclusion. Because of the latest changes to the EMRs, primarily to facilitate traceability, record keeping for all marketing terms, including organic, now falls within the jurisdiction of the EMI, says chief inspector Bruce Pattern. In recent weeks he has been notifying the industry of the change to include organic eggs in future record reconciliations to apply the same rigour of audit across all egg types.

Wider industry standards

The SA organic egg standards state that the basic maximum stocking rate for laying birds is 500 in any one housing unit. "Occasionally permission to allow up to 2000 birds is permitted, but a 100 metre ranging distance must be supplied outside and the birds are not allowed to be housed at a density of more than six hens per square meter," says the standard. To achieve such a permission from SA Certification, producers must be able to demonstrate high levels of bird welfare along with good environmental conditions inside and outside the housing and in the ranging area.

Economic pressures on Soil Association certified producers appear to have forced this 500 bird maximum to become a de facto 2000 bird maximum, with the regular (routine) granting of such permissions. It is the view, however, of EFRC that well designed and managed 2000 bird organic layer systems are welfare friendly. The most important outcome must be the good health and welfare of the hens.

The Soil Association 500 bird maximum appears to have been superseded through the development of commercial best practice and therefore needs to be clearly updated to state the "new" 2000 maximum in its published organic egg standards.

Under SA rules organic layers must be fed with a minimum of 85 per cent of their feed grown to SA organic standards. The ambition is to get to 100 per cent as soon as possible. The practice of de-beaking (beak trimming) is absolutely prohibited in the SA standards as is the routine use of antibiotics.

It is clear that committed Waitrose/Stonegate producers such as Rachel Rivers do adhere closely to the SA standards as interpreted for this large-scale operation.



Elsewhere, other UK organic certifiers allow larger organic flocks. The Defra organic branch confirms that based on UKROFS/ACOS standards, Organic Food Federation (OFF) and OF and G certified flocks contain between 6,000 and 12,000 birds - greater numbers than some "conventional" flocks and at great variance to common consumer perceptions of organic egg production. Such large flocks will continue to be allowed in the UK until at least 2010.

In 2003 the Soil Association published a study of organic farming and animal welfare - *Batteries not included*. Its key conclusions for organic egg production were a need "to limit and phase out current derogations given for the sourcing of non-organic day-old chicks and larger flock sizes".

Batteries not included stated that "the larger the flocks, the greater the pressure on available pasture, the greater the likelihood of a parasite build-up and the greater the likelihood of bullying. When flocks are large, some birds never venture outdoors and the more aggressive birds control the use of pop holes and chicken runs."

When *Batteries not included* was written the ambition was that by January 1st 2004 organic standards would stipulate that poultry farmers must acquire their stock from organic rearers or rear the birds themselves. Two years further on and this standard has yet to be fully implemented.

Two tier organic?

Also in 2003, a technical manager for the then Stonegate rival Deans Foods Ltd, Lorna Aucott, carried out a Nuffield Farming Study on *The feasibility and future of organic egg production*. She calculated that at the time there were 1 million organic layers in the UK, the vast majority certified by OFF and O F and G.

She observed supermarket domination of organic sales with an 82 per cent share of organic egg sales. Thus she summarised - "the emphasis for egg companies has been to develop production units that are economically viable, meeting the organic standards but at the same time fulfilling the volume and value aspirations of the supermarkets....a two tier organic system is developing; those supplying to supermarkets with commercial constraints versus the purist supplying direct to niche outlets." Waitrose and Stonegate assert that their organic egg supply chain represents a unique third approach (tier), sitting between mass supermarket supply and the niche outlets of farm shops etc.

Lorna Aucott also identified a push from retailers for a much greater proportion of larger eggs to be delivered from organic flocks - "because this is what the organic

consumer wants to buy".

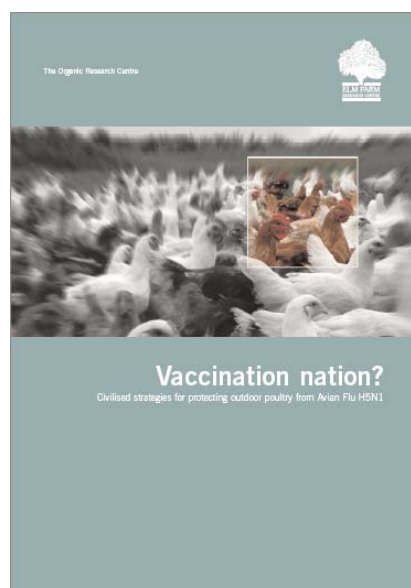
This presents a particular challenge in meeting the higher health and welfare expectations of the organic system whilst at the same time pushing layers to produce large eggs for market. [Waitrose's 'whole carcass' philosophy has enabled the introduction of a Medium 12 pack, thereby utilising the majority of the eggs laid.]

After studying organic egg production in Germany, Austria and New Zealand her report also concluded that layer systems do not fit easily with organic ideals and the notion of integrated systems. In the UK we have dedicated poultry units and a monoculture. "In all my travels I have seen only one fully integrated organic egg unit where the laying hens are an important part of the organic rotation - and that was in New Zealand."

Stonegate and Waitrose deserve credit for their commitment to poultry welfare and quality egg supply. Between them they do currently represent the best supply system of organic eggs for UK supermarkets. They freely admit there is continuing work required to develop and enhance the standards further and they are working with all stakeholder groups to achieve this.

Richard Sanders

The EFRC/ UK AI Preventive Vaccination Alliance publication - **Vaccination Nation** - is now available, donation of £2.00, to cover production, post and packaging. It details the reasoning as to why preventive vaccination offers the only long-term protection from Avian Influenza H5N1 to UK outdoor poultry.



To order, please send cheques made payable to Progressive Farming Trust Ltd fao Pam Tibbatts.



UK co-existence for GMO and non-GMO Crops

How not to consult

The long-awaited UK Government consultation on managing co-existence between GMO and non-GMO crops in England was published at the end of the Summer session of Parliament in July.

The document sets out Government thoughts and recommendations on a GM co-existence regime for England and (putting it politely) is something of a disappointment. It appears that nothing has been learned from previous exercises in public consultation on GM crops (*GM Nation*) with little, if any, change in the Government's previous position. They appear to be driven by an unswerving desire to produce GM crops in England and display an unhealthy close relationship with the agro - biotech industry. The bias of the document is such that it does not even deliver a nod in the direction of the GM sceptics and fails to consider a GM-free option.

The overarching assumption of the consultation document is that GM crops are safe. As the approval of GM crops in the EU is already heavily regulated and because no GM crop can be cultivated unless it has met these regulations, the document deems them to be safe for human health and the environment. Proposed co-existence measures are therefore not needed for safety reasons. At EFRC/ The Organic Research Centre, we do not agree with this as there are no clear answers to the questions of long-term effects on human health and the environment of producing and consuming GM crops. We would much prefer to see a more precautionary approach used.

Contamination threshold

The Government's recommendations are that the EU threshold of 0.9% (presence of individual product) is acceptable and this threshold is subsequently used as the basis for the co-existence measures. As we have stated in previous Bulletins, we have grudgingly had to accept this threshold for organic producers due to the costs of maintaining any lower level being passed onto them. However, this does not mean that a measure should not be put in place to produce lower levels of GM contamination, below 0.9%.

Having accepted the 0.9% as a threshold, the proposals working towards this would result in contamination levels close to that figure. There appears no appetite to introduce and develop measures that would minimise contamination. The reason for this appears to be set out in the document's Annex B Regulatory Impact Assessment. This explains how they are more concerned

with reducing barriers to the production and growth of a non-existent and publicly rejected GM farming industry than supporting flourishing production systems such as organic or "conventional" GM free. Worryingly it appears that the 0.9% threshold is actually being used as a target ceiling rather than a threshold that should not be approached.

Generally, the issue of co-existence is analysed through either voluntary agreement or statutory instruments. It includes the crops of winter and spring oil seed rape, fodder and grain maize, sugar beet and potatoes. Statutory separation distances are suggested for oil seed rape and maize which appear to be wholly inadequate. These are based on work undertaken by NIAB that ignores the factor that contamination can come from other sources such as volunteers and hybrid weeds and assumes stringent crop hygiene with no human error.

Controlling contamination

Notification of plans to grow GM crops will be also be a statutory requirement. However, control of other methods of contamination such as cleaning of machinery, control of volunteers etc will be left to a voluntary code of practice. A review is proposed of the system within 2-3 years of implementation.

The proposals contained within this consultation document are wholly unacceptable. They are extremely weak and will lead to the GM contamination of our food and farming systems. The plight of farm-saved seed, gardeners, allotment holders or bee keepers is ignored. There are also no clear proposals for dealing with liability for crop contamination or loss of income. The proposal is skewed to support the drive for large agribusiness and does little to protect the smaller or other non-GM producer.

The consultation makes many references to a market that will decide the success or failure of GM crops in England. However, the Government has failed to listen to consumers and are driving ahead with the commercialisation and release of GM crops when there is no market in the UK for foreign produced GM products, let alone UK produced. The consumer and hence the market has decided already - they do not want them.

The consultation document can be found on the Defra website - (<http://www.defra.gov.uk/corporate/consult/gmnongm-coexist/index.htm>) and the consultation process runs until 20th October 2006.

Dr Bruce Pearce



The world beneath our feet

Do farm management practices alter belowground biodiversity and ecosystem function?

Soil, of course, lies at the very heart of organic production. A healthy soil is the basis for healthy plants, healthy animals, healthy humans and a healthy environment. But what detailed knowledge do we have about the life beneath our feet?

Soils contain a very high diversity of organisms; many of which remain unknown or, at least, little studied. In fact more is known about the fauna and flora of the Amazonian Rainforest than about the components and biodiversity in UK soils.

Why is soil biodiversity important?

The term "biodiversity", is the widely used shortened form of biological diversity, and is used to refer to diversity at various levels:

- **Genetic**

Within and between species diversity, identification of individual organisms from some unique part of their DNA or RNA.

- **Taxonomic.**

Diversity, density and occurrence of species groups, most commonly referred to as species richness. Taxonomic diversity can also be defined at higher taxonomic levels e.g. phyla, orders or families.

- **Ecosystem.**

Diversity of species assemblages and their environments.

- **Ecological/functional.**

Density and occurrence of ecological/functional groups. Differences between groups are expressed in terms of differences in body size behaviour, resource and habitat preferences etc. rather than taxa. Several species might carry out the same processes leading to apparent functional redundancy; species might also interact leading to functions which are not performed by any individual species. In this instance this is the definition that is being used.

The Convention of Biological Diversity defines its area of concern as: "*the variability among living organisms from all sources, including, inter alia, terrestrial, marine and other aquatic systems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems*" (Heywood 1995).

The linkages between different functional groups are described as a food web. The disruption of soil food webs, though natural processes such as weathering or flooding or by human intervention e.g. tillage, fertilisation can have wide implications in terms of

biodiversity supported and ecosystem functions supplied, for example, below ground food webs influence above ecosystems. In Figure 1 the roles of below-ground ecology in delivering the "support of ecological habitats and biodiversity" is described.

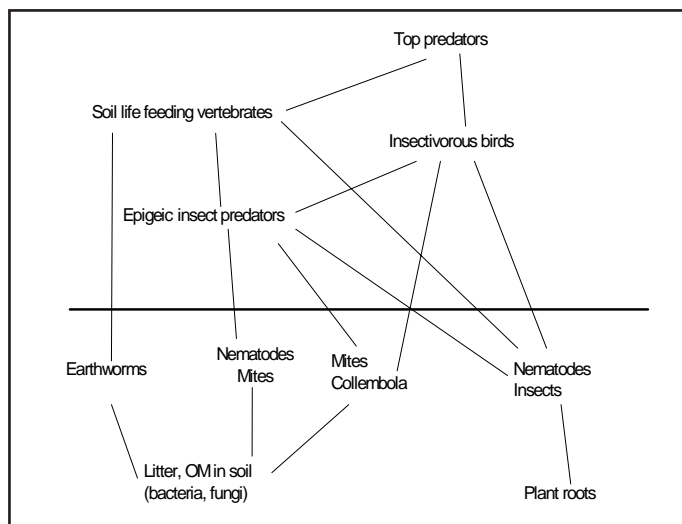


Figure 1. Interaction web showing the direct role of below-ground ecology in providing food sources for birds and mammals.

The decline in farm land birds can be attributed, in part, to the disruption of the belowground organisms that make up the food chain.

What are ecosystem functions?

Soil organisms not only occupy soil; they are a living part of it and as a result of their interacting activities also change it (Killham 1994). There is a broad consensus on many aspects of the relationship between biodiversity and ecosystem functioning. Examples of ecosystem functions are given in text box 1

Text Box 1: Ecosystem services of soil used for agricultural production

After the production of crop and/or animal biomass soil functions can be described as:

- degrading synthetic/foreign chemicals used in crop and animal production;
- a sink/source for nutrients;
- a source of food for birds and mammals;
- a sink/source for carbon;
- a sink/source of water (flood defence/ water resources);
- degrading organic wastes and associated contaminants;
- a sink/source for inorganic contaminants, trace elements;
- a sink/source for atmospheric pollution and greenhouse gases;
- a habitat for plants and animals;
- a sink/source for sediments.

Adapted from report of R&D project P5-053 PR/02 (Loveland and Thompson 2002)



The types of organisms providing different ecological services are described in Table 1.

Table 1: Functional groups involved in the provision of ecosystem services Adapted from Wall et al. 2004

SERVICE	FUNCTIONAL GROUP
<i>Provisioning</i>	
Animal food production	None
Plant food production	Primary producers, decomposers
Biochemicals/medicines	Decomposers, primary producers
Fresh water regulation	Decomposers, macroengineers
Non-living materials	Decomposers, N ₂ fixers, primary producers
<i>Supporting</i>	
C sequestration	Decomposers, microengineers, primary producers, macroengineers
Trace gases/ atmospheric composition	Trace gas producers/removers; decomposers, macroengineers
Soil formation and habitat provision (structure)	Decomposers, microengineers, primary producers, bioturbators, macroengineers
Nutrient cycling	Decomposers, mutualists/symbionts, N ₂ -fixers, S transformers, trace gas producers/removers, primary producers, detritivores – litter transformers, predators, bioturbators, macroengineers
Biocontrol	Mutualists/symbionts, predators (particular species within these groups including insects, nematodes, fungi, bacteria, viruses)
Detoxification/ waste treatment	Decomposers, trace gas producers/removers, primary producers
Flood/erosion control	Microengineers, primary producers, decomposers, bioturbators, macroengineers
Climate regulation	Decomposers, mutualists/symbionts, N ₂ -fixers, S transformers, trace gas producers/removers, bioturbators, macroengineers
<i>Cultural</i>	
Aesthetic	Decomposers, bioturbators, macroengineers.

Evidence suggests below ground biodiversity benefits from a reduced intensity of use of mechanical and manufactured inputs in lowland systems. Evidence from hill and upland systems is insufficient to allow such conclusions.

Table 2 provides examples of direct and indirect impacts of a selected number of agricultural management practice on the soil population and indirect impacts as a

Practice	Direct effects on inhabitants	Indirect effects – effects on structure, composition and flows within the habitat mosaic							
		Roots	Root surfaces	Rhizosphere	Organic residues	Chemical environment	Transmission pores	Storage pores	Residual pores
Tillage	Kills soil macrofauna, earthworms and beetles	Destroys/damages root systems		Stimulates mineralisation	Mixes/blends But can slow decomposition rate	Aerates and allows oxidation	Reduces connectivity to depth, may decrease	Increases	Changes distribution
FYM		Fertiliser effect stimulates growth	Increase	Increase volume	Increase Stimulate/ reduce mineralization depending on C:N ratio	Usually raises pH Increase N,P, K availability. Medium term availability	Stimulates structural formation processes after disturbance. Improve structural stability in some soils		
Grass/clover mixture	Habitat for rhizobium population to develop	Reduced biomass compared with grass only	Reduced area compared with grass only, nodules create different habitats	Reduced area compared with grass only. Different bacterial communities observed with grass than clover roots	Lower C:N than grass only	Legume root activity is more acidifying compared with grass only	Increase pore numbers and connectivity with clover compared to grass only		
Fungicide	Cu-based fungicides accumulate and have toxic effects				May change quality of residues returned	Accumulation of Cu in soil where Cu-based fungicides used			
Increasing grazing intensity		Fertiliser effect stimulates growth					Distribution change if compaction occurs	Increase if compaction occurs	

Table 2. Examples of direct impacts of agricultural management practice on the soil population and indirect impacts as a result of impacts of soil habitats.

result of impacts of soil habitats.

However, the evidence is not strong enough to draw conclusions about the effects of farming systems per se (e.g. organic versus integrated). This in part reflects the limitations of experimental design and the difficulties of transferring the results of 'reductionist' research approaches to practical agriculture. This relates specifically to interactions between individual practices associated with producing a particular crop/crop sequence.

In relation to policy development, there is a parallel need to collate evidence on whether management practices that contribute to this effect above-ground (e.g. prohibition/reduced use of chemical pesticides and inorganic fertilizers) similarly affect below-ground biodiversity.

It is clear that best practice is likely to be farm and even micro-site specific due to the complexity of interactions between soil organisms, soil type, weather and management factors.

The full report will be available at www.jncc.gov.uk JNCC Report Number 364.

Lois Philipps

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Aspects of Poultry Behaviour - Providing "cover" inside the house

In natural environments, animals use the complexity of the environment to avoid social contact. This complexity and cover provides them with the opportunity to hide from aggressive individuals in the group and, by reducing visual contact between animals, there is a reduction in inter animal communication (Cornetto and Estevez, 2001).

External cover can be multi-functional and is obviously an important aspect of the outside environment to encourage ranging and natural behaviour. However, internal cover has also been shown to affect the behaviour of chickens. It has been observed that the use of space by chickens within a pen is non-random; chickens tend to stay near the walls of pens or houses more than expected by chance (Preston and Murphy, 1988; Newbury and Hall, 1990), as these areas can be seen as offering cover.

In the previous aspects of poultry behaviour article (*Bulletin* 83), the concept of free-range was discussed. It was identified that although there is extensive ranging of their wild counterparts, and despite being given access to a ranging area, many of the birds in free-range poultry production systems do not leave the houses (Weeks, et al. 1994). Unfortunately this observation appears not unusual and has been identified by a number of authors in both free-range layer and broiler flocks.

As part of their behavioural repertoire, chickens engage in lengthy amounts of resting, preening and dust bathing - all these behaviours involve long periods of eye closure. With their eyes closed or obscured by feathers, the birds are vulnerable to potential predators or aggressive individuals in the group. For protection during these vulnerable periods, the birds position themselves close to other birds and select protective locations that offer cover. Newberry and Shackleton (1997) found that domestic fowl rest and preen more in areas with cover and in the absence of true cover rest and preen close to pen walls. Due to this, the aggregations at the edges of the house or pen can be attributed to the need to be close to other birds (Murphy and Preston, 1988).

When chickens move from one location to enter a group of individuals that are resting they take the most direct route, often walking over other birds rather than manoeuvring around individuals. This behaviour occurs most often when the birds are kept in high numbers and density. As a result, this disruption can reduce the amount of time birds can spend in bouts of unbroken rest. Murphy and Preston (1988) found this to be true,

with birds experiencing shorter bouts of unbroken rest due to disturbances caused by other birds stepping on them.

This disruption during the resting periods may have negative consequences for bird performance as different physiological processes, including energy conservation, tissue restoration and growth, take place during rest (Cornetto et al. 2000). Birds clambering over one another could also increase the likelihood of back scratches and bruising, resulting from claws of moving birds sliding down the back of resting birds (Cornetto et al. 2000). However, by placing vertical sheets or panels of plastic within houses, to provide artificial cover and edge areas, Cornetto et al. (2000) found that unnecessary interaction between birds was reduced.

Cornetto et al. (2001), suggest that when the birds are very young some of the panels could be acting as barriers instead of cover, and could be preventing them from interacting. However, they found a significant increase in the use of the pen centres in houses with panels when the birds were between the ages of three and six weeks. This shows that as the birds got older they were motivated to occupy the areas close to the panels, suggesting the panels - instead of trapping the birds - were actually attracting them, due to the cover they provide.

Inside and outside cover, then, is very important to chickens. External cover is an important aspect of pasture and range for free-range poultry, to allow the birds to be able to use the range contentedly. Internal cover can provide safe resting areas and free birds from disturbance. Cover is a most important tool both inside and out for improving poultry welfare on the basis of expressing their natural, behavioural needs.

Josie O'Brien

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An organic future for Wales?

Organic Centre Wales hosted a one-day event on July 5th at the Welsh College of Horticulture to look at issues of viability and sustainability for growers of organic produce in Wales.

What are the problems? Is the cost of organic certification too high and can it be justified? Are standards too rigid and is it true that they were written for farmers and not growers? What about the vexed question of polythene tunnels? Do we really need animal inputs for a healthy and safe production system? What about the energy uses of organic horticulture? Are F1 hybrids produced using a form of genetic manipulation? Do growers need an independent

representative body? Can local producers meet quality and consistency requirements?

The day also included access to the organic facilities of the Welsh College of Horticulture and delegates were conducted around the 15 acres of field grown vegetables, 4 field poly-tunnels, the largest organic orchard in Wales, the organic propagation unit, and the in conversion heated glasshouses. Between them these facilities feature among the best in the UK.

The event was supported by the Welsh Assembly Government as part of the dissemination and knowledge transfer activities of Farming Connect.

CAP in the service of biodiversity, says European Commission

The reformed Common Agricultural Policy could play an important role in protecting biodiversity in the coming years, particularly by better integrating biodiversity concerns into rural development policies, according to a report "Halting the loss of biodiversity by 2010 - and beyond" recently published by the European Commission. The 15-page document points out that more than half of the EU's wetlands & most of its "high-nature value farmland" have been lost since the 1950s, and outlines ten major objectives to halt the decline by 2010, such as safeguarding the EU's most important habitats and species, conserving and restoring biodiversity in the wider EU countryside and restoring biodiversity in the marine environment.

Amongst the actions outlined in an accompanying EU Action Plan, the Commission says it intends to assess Member States' Rural Development programmes & "seek amendments" when they do not sufficiently take biodiversity concerns into account. The Commission might also consider a review of cross-compliance requirements for the preservation of biodiversity as part of the 2007 review of the whole cross-compliance system. It also wants to see "high nature-value farmland"

identified & protected, and evaluate whether national governments have used the first pillar of the CAP (cross-compliance, decoupling, modulation) to support biodiversity.

Various benefits could come from last year's Rural Development Regulation such as increased support for Natura 2000 & agrienvironment measures but this would depend on its implementation by Member States and the "available budget". Although partially responsible for loss of biodiversity before 1992, the CAP has since "favoured farmland biodiversity" through agri-environment measures, Good Farming Practice, organic farming and support for Less Favoured Areas, according to the paper.

Following the Fischler reforms, the introduction of cross compliance, decoupling and modulation should now "provide indirect benefits to biodiversity". The paper also makes reference to "improving the quality...of soils and...reducing diffuse pollutant pressures" including nitrates from farm sources & pesticides, which will also be examined in two upcoming DG ENVI thematic strategies.

EU officials out to organic lunch

The first week of June saw the IFOAM EU Group and Bioforum inaugurate "Organic Week" in the canteens of the European Parliament, the Committee of Regions and the European Economic and Social Committee. The initiative was officially supported by these European institutions and aimed to promote the use of organic food in public canteens.

"The experience of our members has shown that public procurement is an important strategy tool to promote organic food and farming and to ensure a dynamic development of the organic sector", said Francis Blake, president of the IFOAM EU Group.

"It is now up to the European Institutions and governments to take up the initiative and to ensure that organic food becomes an essential part in the daily menu of the canteens of the European institutions", added Marco Schlüter, head of the Brussels office. "This would be a natural consequence of the European Action plan on Organic Food and Farming which was welcomed by all EU institutions. They now need to practice what they have preached."



Seeing the Wood, the Trees and the Catch 22

Is European agroforestry on the verge of a renaissance?

Up to the middle of the last Century, agroforestry (the integration of trees into farming systems) provided a rich backdrop to large areas of European farmland (see, for example, fascinating pictures at www.montpellier.inra.fr/safe/). However, specialisation in recent decades led to antipathy between agriculturalists and foresters, which has been bad for the development of agroforestry. It could be that this is now changing.

Some of the multiple values of agroforestry systems were recently re-examined at the **Twentieth meeting of the Agroforestry Forum** (recently re-named Farm Woodland Forum; see www.agroforestry.ac.uk), which took place at the Northmoor Trust, Little Wittenham, Oxon. in June. The wide-ranging meeting often fitted with the EFRC view of the need for both appropriate genetic material and the right ways of using it. One striking example was a comparison of ash stands grown from different parts of the UK and mainland Europe. The ash from Wales was clearly adapted to that part of the world, but not to Oxfordshire. However, the ash from north Yorkshire was as good as the best provenances from the Continent - but it then turned out that this was probably the area from which this particular stock had originated.

The field trials also underlined the need for nurse shrubs or trees for walnut in the UK, to avoid the risk of cold damage during the formative years. This observation is important because of the potential for walnut in UK agroforestry systems. A wide range of walnut provenances were under observation, which led to discussions about global climate change and indigenous trees. There is a need for recognition of the declining role for such trees in the face of rapidly increasing temperatures and the complementary need for careful introduction of relevant foreign species and provenances for woodland and for agroforestry.

Northern Ireland success

One example of an agroforestry success story is the ash/pasture/sheep system developed in Northern Ireland. Planted in 1989, the ash grew well in countryside with some of the most sparse tree cover in Europe. As the tree shade increased, the pasture composition shifted towards more shade tolerant pasture species, helping to maintain the sheep. However, in recent years, with a continuous crown cover over the pasture (400 trees per hectare, equivalent to 25 sq m per tree), it became necessary to remove about 20% of the trees to maintain grazing for

the sheep. The trees had a larger girth but were less dense in terms of wood quality than their forest grown controls. However, it turned out that they were of excellent quality for hurley and hockey sticks and found a ready market.

Here, the amount of timber produced was sufficient for commercial processing. This might not be the case on a smaller, diversified organic agroforestry holding. However, we were treated to a demonstration of chain-saw wood milling which, with some skill, could be a thrifty solution for a small-scale agroforester. Growing, processing and drying on-farm should easily triple the value of wood at harvest.

Our own contribution, based on Wakelyns Agroforestry and the silvo-poultry system at Sheepdrove, stressed the numerous benefits from organic agroforestry in relation to productivity, soil fertility, biodiversity and social benefits. These depend, of course, on applying organic principles to the development of the systems with the inclusion of tree and crop diversity and no synthetic inputs (except for mulch mats to control weeds during tree establishment).

The need for organic standards for agroforestry in practice was stressed and underlined further in relation to wood products. For example, do we really want accumulated pesticide residues in forms of wood used in food preservation, processing and presentation, or in children's toys, or in animal fodder?

Agroforestry policy

But, if the claims for agroforestry are justified - organic and conventional - and they support strongly Government policy towards sustainable food and farming, biodiversity, clean water and so on, why is agroforestry not actively supported in the UK's new agri-environment schemes?

This seems to be the core of the Catch 22. There is no real promotion for agroforestry because the practice is rare. But, of course, the practice is rare because there is no encouragement for farmers and landowners to undertake the relatively complex investment required.

Not surprisingly, therefore, a significant part of the discussions at the meeting were concerned with policy in this context. At the level of the EU, there is some recognition of agroforestry and its promotion. But, interpretation at national level varies, for example, with the UK some way behind France.



Initiatives to try to improve the situation include a recent e-conference on the subject to develop submissions (by no means the first) to the EU to bolster agroforestry policy. But more needs doing, particularly at the national level. Another initiative which is apparently under way is to develop a new EU COST Action for agroforestry, which could help to mobilise interest and information exchange among interested parties across the EU.

One obviously important initiative for us would be to try to fund a project that would tease out and demonstrate the multiple benefits of organic agroforestry systems for society and the environment. Well, we've tried that - several times - but so far without success. Is there another Catch 22 at work? Or is somebody really not seeing the trees for the wood?

Prof. Martin Wolfe

Helping organic farming in the Caucasus

The Caucasus region is a world hotspot of biodiversity. Along with partners in Germany and elsewhere Elm Farm Research Centre is helping fund its preservation through the development of organic farming systems.

One of the focal points of the Caucasus Initiative of the German federal government is the establishment of biosphere reserves to preserve and develop this hugely important biological resource. The German Federal Agency for Nature Conservation is now promoting capacity building in the field of landscape planning, farming and forestry in the southern Caucasus.

Biosphere reserves are characterized by the sustainable use of natural resources, which is essential for the preservation of biodiversity. To foster the development of organic farming in the southern Caucasus region, a Memorandum of Understanding between the University of Kassel/Faculty of Organic Agricultural Sciences and the Georgian State Agricultural University, Tbilisi has been signed. This has allowed the establishment of a "Division for Ecological Farming and Nature Conservation" at the Georgian State Agricultural University, Tbilisi. This division is financed by a group

of sponsors (companies, foundations, individuals) from the fields of organic farming and recycling in Germany and the UK.

"After the collapse of collective farming in the Caucasus States, there is almost no concept of new structures of medium and small sized farms in existence. With this new Division for Ecological Farming and Nature Conservation we are making not only a contribution to the preservation of biodiversity but also helping socio-economic development and stability for numerous people, working in the region's agricultural sector," says EFRC Trustee Prof. Dr. H. Vogtmann.

The close cooperation with successfully established facilities like the Faculty of Organic Agricultural Sciences at Kassel University, will give real help and guidance to the new Division.

"Elm Farm Research Centre is delighted to be one of the sponsors but is also in great demand for its expertise in research and teaching by the Agricultural University in Tbilisi," confirmed Lawrence Woodward, director of EFRC/The Organic Research Centre.

Farmers and fashion - from harvest to high street

Tickets are now available for the Pesticide Action Network's (PAN-UK) keenly-awaited Rachel Carson Memorial Lecture 2006.

From the underwear next to your skin to the shirt on your back and the sheets on your bed, cotton is part of everyday life. In her talk *How British consumers can support African cotton farmers*, Dr Camilla Tourmin will reveal the stark reality of life for men and women cotton farmers in semi-arid West Africa. As Director of the International Institute for Environment and Development, she will explain how retailers, wholesalers and each of us, as consumers, can support more sustainable alternatives. PAN UK's Organic Cotton Project works with farmers, designers, suppliers and retailers ranging from mass market High Street names to small cutting-edge designers.

More than 10 million West Africans depend on cotton. How can we make a difference?

Held on 5 December 2006 at the Royal Society for the Arts, the evening includes a buffet, organic drinks and music. Tickets - £18 before 5 November, £20 thereafter, can be booked on line via the website www.pan-uk.org or can be ordered from Deanna Johnson 020 7065 0905 deannajohnson@pan-uk.org



Beware of organic market "statistics"

Imports and UK sourcing is a topic on many peoples' lips just at the moment. The Soil Association recently announced what is said to be a significant improvement in the proportion of UK organic produce on supermarket shelves. This is clearly good news, but are the facts absolutely verifiable? Observations were made in a range of supermarket branches during the months of November and December. As the Soil Association notes, this is a time of year when UK availability of a wide range of crops is at its highest. The frequency of occurrence of UK and imported crop was compared to a similar exercise carried out a year ago.

A number of what appear to be firm conclusions have been drawn from this exercise. These include extrapolations from the number of sightings on the shelf to a definitive conclusion on the level of home grown sourcing. This is a somewhat shaky way to proceed as there was no attempt to quantify the amounts of crop bought by the retailer or the consumers. Extrapolating from only two months of observations of supermarket shelves mean that conclusions for the whole year are, at best, somewhat tenuous.

If we look at onions as a particular example we see that the proportion of home grown bulbs has increased from 38% in 2004 to 73% in 2005 according to the Soil Association survey. As already noted this is extremely good news and might even suggest that the need for new organic growers is less than has been suggested. The reality is, I suggest, quite different and *Bulletin* readers will know from previous articles of the important research work carried out by other organic organisations. The Organic Vegetable Market Study led by the Henry Doubleday Research Association (in which the Soil

Association has been a partner) has been quietly working for the last four seasons. The work has clearly demonstrated - from a review of volumes actually traded - that the volume of UK grown organic onions has remained more or less constant at around the 38% mark.

The reasons for this include the fact that this is a particularly challenging crop to grow in the UK under organic conditions. The timing of weed control is crucial and two or more passes by the hand weeding teams may be needed. The timing of establishment is key- any delays due to adverse spring weather can knock the yield back significantly. Storage costs have also to be considered. When the costs of crop production are set against the cost of imported crop from South America it is not surprising that the home grown crop has such poor market penetration. We also import the crop from the Netherlands but it is worth noting that some Dutch organic growers are also having trouble producing the crop economically.

We are all interested in promoting good news stories about organic production and the organic market but we do not serve the best interests of the sector by promoting apparent good news on the basis of shaky conclusions. Supermarket surveys have an important role to play and the results of a survey by HDRA members have been used to good effect in the Import Supply Chain Study currently in the final report writing phase.

(Organic Market Report 2005 - Soil Association, Bristol. £20.00)

Roger Hitchings

It's coming...advance notice

The 2007 Organic Farm Management Handbook will be published this September.

The fundamental EU and UK policy change of the Single Farm Payment (SFP) has meant a radical re-design of much of the economic data in the booklet with a strengthening of the whole farm profitability section. The changes are covered in detail for all four of the UK farm support regions. There is also a detailed update on organic market developments during 2005.

Individual copies: £16.50 + postage (£1.50 for UK),
Trade and bulk orders (5 copies or more): £11.50 + postage

Contact -

EFRC Publications, Hamstead Marshall, Newbury, Berks, RG20 0HR
Telephone: 01488 658298



A central role in energy reviews

"Swipe card plan to ration consumers' carbon use" ran a typical national headline as Defra Secretary of State David Miliband unveiled his plans in mid July for a pilot scheme in the UK to ration energy use.

In fact the scheme is modelled on work part-funded by Elm Farm Research Centre under The Lean Economy Connection, working with Dr David Fleming and detailed as TEQs - Tradable Energy Quotas in EFRC *Bulletin* 81 in December 2005. We are delighted Mr Miliband has taken notice.

The latest publication from Dr Fleming is *The Lean Guide to Nuclear Energy - A life-cycle in trouble.*(LEC, Price £5.00) In review it is described as "the final proof that nuclear power is a dangerous cul-de-sac".

www.theleaneconomyconnection.net

www.teqs.net

NUCLEAR ENERGY In Brief

1. Each stage in the nuclear energy life-cycle, apart from fission itself, produces carbon dioxide. As the industry is forced to turn to poorer-quality ores, the quantity of carbon dioxide produced by the industry will rise.
2. The nuclear industry has fifty years of accumulated waste in temporary storage, much of which is already unstable and, unless made safe and placed in permanent disposal sites, will break down, causing many centuries of recurring radioactive shock.
3. That backlog includes wastes which have escaped attention, notably uranium hexafluoride, a halogenated compound. The global warming potential of halogenated compounds ranges up to 10,000 times that of carbon dioxide.
4. The industry therefore faces the prospect of "energy bankruptcy". This will occur when the energy obtainable from the remaining uranium ore is less than the energy needed to deal with the waste. The date of energy bankruptcy is not known but, as a provisional estimate, it may be expected in the 2020s.
5. The nuclear industry's priority should now be as follows:
 - (a) Produce a detailed worldwide nuclear energy budget showing how all present and future nuclear wastes and facilities - including nuclear power stations due to be flooded by rising sea levels - are to be made safe, how much energy this will require, and how the energy needed for this will be generated.
 - (b) Produce no more nuclear energy over and above current contracts until that energy budget has been drawn up, agreed by independent review as realistic, and action on it started.
6. We face a profoundly destabilising energy gap. Nuclear energy provides a false sense of security, deterring us from facing up to the reality of that gap and taking action.
7. It is essential now to focus on the strategy of "Lean Energy". Lean Energy consists of: (1) energy conservation and efficiency; (2) structural change to build decentralised local energy systems; and (3) renewable energy; all within (4) a framework, such as tradable energy quotas (TEQs), leading to deep reductions in energy demand.
8. Further commercial development of nuclear energy will have two effects. It will divert resources from developing Lean Energy at the needed scale and speed, making that core programme harder, or impossible. And it will condemn the world to an inheritance of untreatable waste and radioactive shock.

Dr David Fleming



How YOU can help EFRC/Organic Research Centre...

Our work at EFRC is unique and vital to the future of Organic Farming, but we need ongoing support that will enable us to continue our important research, training and policy work and to demonstrate solutions to seek permanence...

As an individual or as an organisation you can make a valuable difference if you help us in one of the following ways:

Become a **Friend** of Elm Farm Research Centre. In addition to the regular *Bulletin*, you will also receive newsletters on our activities, free EFRC publications, discount on specified events from our Annual Events Programme and many more of our Special Invitation-Only events. Please contact us for a Friends Donation form.

You can make a **Donation** to Elm Farm Research Centre, or if you have done so in the past, please contact us for a **Gift Aid** form as we can claim back the basic rate tax on your donation, increasing its value by 28%. Please contact us for a gift aid form.

You can donate **Shares** to Elm Farm Research Centre and significantly reduce your income tax bill as there would be no capital gains tax due on such a donation. This applies to many listed shares and unit and investment trusts.

You could leave a **Legacy** to Elm Farm Research Centre. By including EFRC in your Will, you are enabling us to continue to develop our work and activities.

As we are a charity, all legacies to EFRC are free from inheritance tax, so your family has less to pay. Please ask us for a legacy leaflet.

For more information on any of the above, please contact Rosie Jordan on 01488 658298 or email rosie.j@efrc.com

Thank you for supporting us.

On the trail of Elm Farm

The farm trail at EFRC is a permissive path, with free public access at all times, and has been part of our Countryside Stewardship Scheme since 1992. The old farmyard barn at the start of the trail is a roost for different species of bat, and this year we were delighted to see that a barn owl is a regular visitor, among the old beams.

We have farm trail information available in the barn, and boards along the way that describe the most interesting habitat features. Local people regularly use the trail, with dogs always on leads, enjoying the great variety of wildlife in the habitats that we have created and now maintain around the farm.

A local journalist, Nicola Chester enjoyed a walk round the trail in early Summer with Education specialist Bob Winfield. She wrote an especially good appreciation in the *Out and About* colour supplement of our local paper - the Newbury Weekly News.

On June 11th, coinciding with the national *Farm Sunday* event, Bob led a party of 16 adults and children from West Berkshire on a two-hour walk around the trail. Bob works in both the Education Department and the Organic Advisory Service, so he was able to describe the key principles of the organic system and relate them to the farming practice and wildlife conservation that could be seen so clearly. The walk was greatly enjoyed by all and will be repeated in September during Organic Fortnight.

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