

6th ORC Organic Producers' Conference

Aston University, Birmingham, 18-19th January 2012

Wednesday 18th January 09.30–11.00 IOTA meeting

10.30–11.30 Registration

11.30–13.00 OPENING PLENARY

The impact of the CAP Reform proposals on UK organic producers

Now the CAP reform proposals have been published, negotiations on the final details are taking place, with all parties – governments, farming unions and environmental groups – arguing their often very different positions. The proposals include some important new measures for organic farming that are often not reflected in debates. The plenary provides an opportunity to consider these positions and likely outcomes for the organic sector.

Chair: Nic Lampkin (ORC)

Juern Sanders (von Thuenen Institut): European organic farming policies – an evaluation of recent experiences

Over the last ten years, organic farming has expanded continuously in EU Member States. Between 2000 and 2009 the organic area in the EU15 Member States grew by 75%. At Member State level, organic farming has, however, developed very differently. There are countries such as Austria, the Czech Republic, Estonia and Sweden in which the organic area as a proportion of total UAA is above 10%. On the other hand, there are several Member States in which organic farming is still niche production with a share of less than 2%, e.g. in Bulgaria, Malta and Ireland. The large differences in the development of the organic sector are in part due to differences in the policy environment. Against this background, this contribution aims to provide a comprehensive overview of public support measures for organic farming in EU Member States. Special emphasis is given to organic support payments that are provided under national or regional rural development programmes (RDPs) in most EU Member States. These payments are implemented to compensate for additional costs or income foregone as a result of organic management and play an important role in the economic performance of organic farms. Besides organic support payments, other RDP measures that address organic farming as well as CAP Pillar 1 and regional measures including organic action plans are taken into account.

Nic Lampkin (ORC): The Commission's CAP Reform proposals 2014-2020

In October 2011, the European Commission published the legislative proposals for the next phase of CAP Reform, still scheduled to be implemented from 2014. While there is still much negotiation and debate with Member States and the European Parliament still to happen around the details of these proposals (a process likely to take most of 2012), the main building blocks are

unlikely to change significantly as they represent the culmination of a debate that started already in 2009. Key elements of the proposals with respect to the Single Farm Payment include: a phasing out of historic entitlements, a rebasing of existing entitlements from 2014 (based primarily on 2011 claims), a simplification of cross-compliance requirements and the introduction of reduced/capped payments for larger farms. The direct payment will be split into a basic payment (up to 70%) and a 'greening element' (30%). The greening element will be uncapped and organic producers will obtain it automatically. Other producers will need to protect permanent grassland, increase crop diversity and allocate 7% of land as ecological focus areas. How the delivery of the greening element under existing agri-environment schemes will be affected is still open. Organic farming also has a higher profile in rural development as a measure separate from other agri-environment schemes. However, at this stage, indications from Defra/Natural England are that OELS will continue unchanged in the next period. In Wales, a new Organic Farming Scheme is to be developed, following its disentangling from Glastir. The presentation will also consider other aspects of the proposals affecting organic producers and consider the next steps in their implementation.

Christopher Stopes (IFOAM EU Group): The European organic movement's position

IFOAM EU Group represents the organic sector in the EU 27, EFTA and neighbouring countries. CAP reform must respond to urgent environmental challenges that put our future food security at risk: degradation of natural resources and climate change. Our long-term vision for food and farming policy in Europe should be essentially transformative. Support for farmers must be re-focused towards targeted measures that deliver public goods to serve the needs of society. Organic food and farming fits this prescription, it is an effective approach to achieve the sustainability objectives of agricultural policy. The IFOAM EU Group proposes five key recommendations for the CAP 2014-2020 (see the full proposals for further details and all recommendations):

1. Sufficient funding for conversion to and maintenance of organic farming through a bigger second pillar budget (50%) and by ring-fencing a significant share (50%) of the rural development programmes' budget for measures that deliver environmental objectives, e.g. organic farming.
2. Organic farming must be a mandatory measure under rural development programmes, eligible for 80% EU co-funding (up to 90% in new MS).
3. Organic farming specifically included as priority in the European Innovation Partnership, and in relevant rural development measures (e.g. advisory services, investments, quality schemes and

producer groups. Organic farms should be allowed a 20% higher support rate.

4. Rural development programmes must specify how synergies between organic agriculture and other rural development measures can be achieved to maximise environmental and socio-economic impact.

5. Greening the first pillar must ensure improvement in the overall sustainability of food systems, and should include at least three crops in the rotation (with at least one protein crop and no one crop more than 50% of all crops). Permanent grassland must be protected with max. livestock density.

13.00 – 14.00 Lunch/networking

14.00–15.30 Wednesday 18th January WORKSHOPS 1

A1: Temperate silvo-arable systems around the world

This workshop brings a scientific perspective to temperate silvo-arable systems along with the extensive observations of a Nuffield Scholar who is travelling the world looking at such systems.

Chair: Mike Turnbull (International Tree Foundation)

Jo Smith (ORC): Productivity and economics of a diverse temperate silvo-arable system

A key benefit of integrating trees and agriculture in an agroforestry approach is believed to be higher overall productivity due to trees obtaining resources from different parts of the environment to the crops. In temperate climates, however, there is likely to be competition for light, water and nutrients between the crop and tree components, and careful design and management is needed in order to maximise positive interactions and minimise competition between the trees and crops. The presentation uses examples from Wakelyns Agroforestry to illustrate the productivity and economics of silvo-arable systems.

Stephen Briggs (Abacus Organic Associates): Temperate silvo-arable systems from around the world

Agroforestry provides multifunctional land use benefits. Improved soil, water and resource protection can be a direct benefit of agroforestry. Whilst systems change over time, net output per unit area is often greater under agroforestry than under monoculture. Agroforestry has the potential to be a more robust form of production in a climate change world. Silvo-arable agroforestry combine tree and arable crops on the same land area. Many combinations of different tree and alley crop are possible. Systems need to ensure that tree and crop components are complementary in terms of resource utilisation (sunlight, water, nutrients). Experiences of different temperate silvo-arable systems from around the world (USA, Canada, Europe, China) will be presented in the context of resource protection, productivity and sustainable intensification.

H1: Untapped horticultural markets – what do you sell apart from veg?

Selling vegetables can be a tough job and this session will explore viable alternatives/additions to edible crops as ways to increase sales and attract more customers (organised with OGA).

Chair: Roger Hitchings (ORC)

Arjen Huese (Wealden Flowers): Cut flowers - a beautiful niche market

When we think about growing produce we usually think about vegetables and fruit. However, traditionally most market gardens would also grow a range of cut flowers to sell on their market stall, or to specialist outlets. The cut flower sector in the UK has declined sharply in the last 20 years, and the UK is only 10% self-sufficient, down from 45% in 1990. However in the last few years there has been a surge in interest in British-grown flowers from all levels within the sector: customers, flower shops and supermarkets. There is a huge opportunity for British growers to make a decent income from cut flowers even when organic growers don't usually get a premium over conventionally grown produce. Growing annual cut flowers like sunflowers, snapdragons, zinnias and some of the foliage is very similar to growing vegetables: growing transplants, planting out, looking after them until they're ready to cut and then harvesting. Perennials need a different approach, usually involving Mypex. Post-harvest and packaging are obviously very different from vegetables and need to be considered carefully. Selling to florists or wholesalers is much more lucrative than selling directly to customers at farmers' markets.

Jason Horner (Leen Organics): Organic eggs in a horticultural enterprise

Leen Organics bought their first flock of laying hens in 1998 when commercially produced compound organic feeds became available in Ireland. There was a desire to diversify from growing just vegetables to producing eggs as well as fruit, herbs and flowers. Beginning with a small flock of 25 hens bought at point of lay in '98, we have in recent years reared 150 day old chicks ourselves. It has been an interesting learning curve, trying different breeds, feeds, grazing schedules and management techniques. We found hens work well alongside horticulture in building fertility, reducing pests and also making use of out grade vegetables and weeds. It is a viable diversification that works well for vegetable producers particularly those involved in direct sales. Having a bigger range of produce available can often be critical for the long term financial viability of a holding. From a direct sales point of view eggs are one of the best-selling lines on our market stall and are often the first thing to sell out. They attract people to the stall who will then buy some other produce along with their eggs. I would encourage growers to look at hens as an option for diversification to provide extra income and other benefits.

**John Roberts (Pencoed Growers):
Christmas trees, willow and flowers**

Six years ago, as a way to develop long term income from the farm, we planted a total of 500 trees of a mixture of Norway Spruce and Nordman Fir to grow for sale as Xmas trees, and have planted more batches every other year since. We are trying to develop a sustainable approach to Xmas tree production which maintains fertility and biodiversity. The discussion is about what we have learned over the last six years.

D1: Grass seed/variety availability

This workshop will examine whether or not organic producers are making best use of available forage varieties or whether they are being hampered in accessing the most appropriate varieties because of the constraints of the organic regulation to use 65% organic seed (organised by Abacus Organic Associates).

Chair: Lois Philipps (Abacus Organic Assocs.)

John Downes (Organic Farmer and President of BGS): A farmer perspective

We have always used NIAB recommended grass and clover varieties from a local supplier who understands our needs. He has worked very hard to utilise the maximum percentage of high quality varieties in our mixtures, but has to compromise in most seasons due to organic availability. I appreciate we must encourage organic seed producers to increase their production with a proper return on their investment. There may be a way in which all their quality seed is utilised first and then we select the best available. In my role with the British Grassland Society I regularly see the importance of quality leys in livestock production. I firmly believe the future for most of these farms will be driven by excellent grassland husbandry. The key factors of sound soil and fertility management, grassland measurement and allocation and conservation of winter forage planned to maintain high quality grazing all lead to productive stock, contented farmers and PROFIT.

**Dr Athole Marshall (IBERS):
A breeder's perspective**

The forage grass and legume breeding programmes at IBERS are focusing on the development of new varieties that combine improved agronomic performance with incorporation and selection of traits that will reduce the environmental impact of grassland agriculture and improve the ability of grasslands to adapt to climate change. This presentation will summarise the target traits of the breeding programmes, the selection criteria and approach to selection currently being adopted and how this knowledge is being integrated into current selection to breed improved varieties. Using examples from the perennial ryegrass and white and red clover breeding programmes some of the challenges of integrating selection for these traits into existing breeding programmes will be outlined. Availability of organic seed of improved varieties is important and the problems associated with organic production of forage seed will be considered.

**Stephen Clarkson (OF&G):
The control body perspective**

The question, are the available organic varieties suitable, can be answered in part by looking at the number and type of enquires received by the Control Body and the number and different varieties of grass and forage derogations approved by the Control Body. The UK is somewhat different to other member states in its approach to grass and forage seeds. It is one of the few member states that have developed a percentage-based approach to derogations. The number of derogations approved for mixes below the 65% will give an indication if this approach is working or is too restrictive.

**James Winpenny (Organic Team, Defra):
What the Regulations say**

The EU organic Regulations allow Member States to authorise the use of non-organic seed where organic seed is not available. The UK allows operators to use an organic grass seed mix whereby a defined proportion of the mix must be organic. This approach takes account of the availability of organic grass seed, demand from operators and the need to increase the supply of organic seed over time. In accordance with the principles of the EU Regulations, Defra wishes to increase the supply of organic grass seed with a view to supply meeting demand in the future. Defra and representatives from the grass seed sector meet regularly to discuss the availability of organic grass seed and to consider the percentage requirements for organic seed in the mix. This enables Defra to monitor the situation and to encourage the industry to increase the overall supply of organic seed while ensuring that a pragmatic approach is adopted. The proportion of organic seed in the mix has increased over time and is currently 65%. It is intended that the percentage requirement will be increased to 70% as of 1 January 2014 and the industry is working together to achieve this. The industry will be encouraged to further increase the supply of organic seed although it is acknowledged that this will be harder as the percentage requirement increases.

**M1: Changing organic feed regulations
– principles or pragmatism?**

This session will explore the drivers behind recent and planned retrospective changes to the EU Regulations and to question the motives of policy makers.

Chair: Bruce Pearce (ORC)

**Robin Fransella (Organic Team, Defra):
An update on recent developments at the EU
Standing Committee on Organic Farming**

Ensuring high animal welfare and consumer confidence in this and other organic principles are the aims of Defra regarding organic livestock issues. The Europe-wide expression by the organic movement that there are insufficient supplies of organic materials has led the Commission to propose extending the current 5% allowance. This is widely supported in Europe due to concern that there are insufficient protein inputs available. A

non time-limited inclusion of 1% organically unavailable minor ingredients and regional sourcing of a minimum 20% are also proposed. Defra proposed the use of amino acids to enable moving to a fully organic monogastric diet, as is the case in the US; however this was not supported by Member States. Defra also proposed assessment of the organic feed situation by the Expert Group for Technical Advice on Organic Production, the Commission now agrees.

Peter Griffin, Mike Burrows (HiPeak): Implications of recent changes for feed cost/supply

Organic standards within the monogastric sector need to be driven forward in order to generate a blue print for sustainable organic farming systems. Recent changes in EU regulations have meant a delay to this progression. Feasibility of fully organic monogastric diet-formulation can be achieved if a realistic view is taken on formulation and production expectations within the organic system. Key drivers to achieve this goal are based on a better understanding of raw material availability and their use in organic formulations, breed selection, environment, and management. At present there is a misconception that the cost implication of committing to 100% organic diets will be too severe for producers to cope during these difficult times, this simply is not true. If we look at the feed solely, the actual cost ranges from zero to £5/t without any loss in production. We need to remember that feed is intended to ensure quality of production rather than maximising production while meeting the nutritional requirements of the livestock at various stages of development.

Mike Colley (FAI): A poultry farmer's view

100% organic is good for the producer? The Food Animal Initiative, FAI, was born out of concern for the responsible use of the Earth's finite resources and how Farm Animal Welfare focused on economics and consumer pressure rather than needs of the animals themselves. We farm close to 1500 acres around the flood plain of the Thames on the western outskirts of Oxford. As a mixed farm we have some land given over to cereals and fodder crops, as well as rich pasture used for grazing. The poultry operation is currently focused on the welfare of broilers and the parents of these birds. We are particularly interested in mobility in the broiler; the need to restrict feed the parent and the use of alternatives to soya and grain. Organic feed affects the producer in three main areas - availability, cost and quality. In commercial poultry production, ration flexibility is very limited.

The modern hybrid is very unforgiving of variations in its diet, which may lead to poor yield, vice and physical abnormalities. It is vital that we build strong working relationships with our nutritionists based on openness and trust.

01: Practical steps to supply chain sustainability

This session combines the results of work that looked at sustainability issues in the supply chain with the direct experiences of two Welsh companies that contributed to it (organised by OCW).

Chair: Andrew Jedwell (Food Consultant)

Sue Fowler (OCW): Aspiring to supply chain sustainability: Better Organic Business Links

The BOBL project was asked by the organic food supply chain sector in Wales to look at sustainability in the supply chain. Work was commissioned using an innovative approach to provide a visual assessment of sustainability indicators using radar diagrams. The organic sector, while doing some things well, is constrained by the wider system. The work is reported to stimulate discussion on if and how the organic sector can move forward.

Roger Kerr (Calon Wen): Aspirations to realities

Calon Wen participated in the BOBL project and Roger will discuss the elements that he feels could be addressed and those that couldn't. He will set out his ambitions for Calon Wen and discuss his view on how organic businesses need to embrace all the aspects of sustainability and communicate their approach to customers.

Iain Cox (EcoStudio): Sustainable inspiration

Sustainable development and sustainability are often used interchangeably to describe a broad number of issues to do with community, profit and environmental performance.

For small businesses this can seem complicated and the commercial benefits that can be gained from making positive changes are can be lost.

Drawing on EcoStudio's experience and using practical examples this short talk aims to outline opportunities that exist for small companies that embrace more sustainable ways of doing business.

15.30 – 16.00 Refreshments

16.00–17.30 Wednesday 18th January WORKSHOPS 2

A2: Biosolids and biosolid products: the way forward

Discussions about biosolids always lead to intense debate. This session will look at products derived from biosolids for their potential use in organic systems. There will also be a presentation and discussion around the use of food waste in

the production of green waste compost. (Organised by SAC)

Chair: Christine Watson (SAC)

Peter Vale (Severn Trent): Phosphorus recovery from sewage sludge

Severn Trent Water Ltd produces and treats circa 240,000t (as dry solids) per year of sewage sludge. Through anaerobic digestion this re-

source is converted into circa 165,000t of agricultural fertiliser and 175 GWh per year of renewable electricity. Significant research and development activity is going in to further optimizing both energy recovery and nutrient recovery from this valuable resource, and one area of particular focus is recovering the phosphorus present in digested sludge liquors in the form of struvite (magnesium ammonium phosphate). Struvite appears to have a great deal of potential as a sustainable phosphorus fertilizer. This paper discusses the potential of sewage as a phosphorus resource, and outlines the processes available for recovery as struvite.

Arnie Rainbow (Vital Earth): Food waste in green waste composting

The ability of compost to transform the chemical, physical and biological properties of over-exploited soils and low quality soil-like substrates is well known. The use of green compost in growing media is less well-known. The UK government aims to end the use of peat in horticulture in England by 2030, with interim target dates of 2015 (local government) and 2020 (retail market). The main driver was protection of biodiversity, but carbon fixation/ global warming/ climate change is now their chief concern. For historic reasons, green compost is often still regarded as having little potential in growing media. Yet considerable progress has been made and several new benefits have been realised in container nursery stock and other high value crops. At present, the potential for green compost to replace peat in growing media can be estimated at approximately one million m³ per annum. Manufacture of peat-free growing media is limited by availability of suitable low-nutrient diluents (such as bark), not green compost. Vital Earth compost green waste in mobile ventilated containers for one week at 75°C, followed by one month in indoor aerated static piles (as per ABPR 2002). Temperature and fan output are monitored and recorded throughout the process. Size-graded green compost is blended with processed forestry co-products (UK FSC sources only) and other diluents, plus a proteinaceous meal which acts as a slow-release source of nitrogen, with excellent storage and in-use life.

Robin Walker (SAC): Source separated human urine

In non-organic cropping systems, fertiliser costs are high and are unlikely to reduce substantially in the near future as energy prices remain elevated. Growers are looking for ways to provide adequate fertility to their crops and yet limit costs to economically acceptable levels. The use of biological N fixation has many benefits, but there can also be problems associated with the use of legumes and other N fixers in terms of optimising their N fixing capacity and release of N in an available form as the crops require it. The use of alternative N (and P and K) sources should be explored beyond those traditionally used. The potential use of source separated human urine for use on UK crops is outlined and illustrated with examples of systems being developed in other countries. The paper discusses legislative issues as well as some of the likely environmental bene-

fits and potential barriers to the broad scale use of source separated human urine in this context.

H2: Community vegetable production - adding values to local food

There appears to be a ground swell from consumers about closer connections with their food supply including active participation in community schemes. What can growers learn from the experiences so far and what help is available? (Organised by OGA and Soil Association)

Chair: Ben Raskin (Soil Association)

Will Johnson (Canalside CSA): Connection to the farm - a grower's experience of a CSA

Gives the growers experience of working on the Community Supported Agriculture (CSA) project at Canalside. How does the community get involved and what benefits does this bring both to the farm and grower, and to its members? How much does the close connection the farm has with those that eat the food produced on it ensure the long term success of the farm? Will also examines what changes have occurred in the community as a result of having a CSA.

Jade Bashford (Soil Association): Investment in the farm and the impact of CSAs in England

Community investment is becoming more popular, Jade looks at some of the more inspiring models used by food producers to finance local food production without having to borrow money from the bank. CSAs can operate on a range of financial models from full shareholding to more informal membership arrangements. Jade explores some of the benefits and risks of different options. Jade also gives some headlines from the latest evaluation of CSAs in England, what does this mean for community vegetable producers.

John English (Community Farm): Learning on the farm - an apprentice's view

Many people who volunteer on, or buy from their local vegetable producer do so because they want to learn more about growing their own food. The Community Farm in Bristol puts education at the heart of its business, but how does this work in practice. John talks about his own experience of starting as a volunteer to becoming a full time apprentice on the farm. John also takes us through how the farm manages its volunteers to ensure they get a good experience while still making a useful contribution to the farm's work.

D2: Sustainable Organic and Low Input Dairying project - innovation needs for dairying

The SOLID project is aimed at addressing the needs of dairy farmers using innovative approaches that are sustainable and low impact. This participatory workshop will discuss practical problems and research initiatives to address them. (Organised with IBERS)

Chair: Susanne Padel (ORC)

Pip Nicholas (IBERS): Introduction to the SOLID project

This workshop gives participants the opportunity to contribute ideas to a major research project. ORC, IBERS Aberystwyth, AFBI in Northern Ireland and industry partners OMSCo and Calon Wen are the UK members involved in the EU funded project on Sustainable Organic and Low Input Dairying known as "SOLID". The main aims of SOLID are to facilitate the use of appropriate breeds and feeding strategies to maintain productivity, and improve animal health and welfare, while meeting the market requirement for high quality milk. Farmers are being consulted on the direction of parts of the research and will host on-farm trials. ORC is leading this work on participatory research methods across Europe and will develop a number of on-farm projects in close collaboration with OMSCo and Calon Wen.

Katharine Leach (ORC):

Participatory exercise: sustainability for your business – how can research help?

Within the EU-funded SOLID project we have the opportunity for some on-farm research projects. This workshop will explore participants' ideas of what sustainability means to them in their personal situation. It will go on to develop ideas about the types of research that could help to improve various aspects of the sustainability of dairy businesses. Come prepared to contribute; your ideas are needed and will have the chance of becoming reality.

M2: Sheep scab: scratching beyond the surface

Sheep scab is an extremely contagious disease that has an impact both on welfare and economic return. Organic farmers have limited options for treating scab so the organic principles of management to promote health and avoid disease are of extreme importance. The session focuses on the extent of the problem and provides an assessment of pros and cons of current methods of control and treatment options. It also provides an update on current research and an insight into practical eradication programmes and campaigns. There will be an opportunity to ask our veterinary speakers about other livestock health issues. (Organised by the Soil Association)

Chair: Anna Bassett (Livestock consultant)

Arjen Brouwer (Vet. Advisor, Welsh Govt): Scale and prevalence of sheep scab in Wales

The presentation will cover the most recent GB and Welsh surveys and thinking on sheep scab occurrence from a Welsh perspective, covering some perceptions about the organic sector, some of the efforts that were and are ongoing in tackling sheep scab in Wales, and reasons for and against government intervention.

Dr Peter Bates (Veterinary Medical Entomology Consultancy): Prevention and control

Sheep scab is a highly deleterious form of allergic dermatitis initiated by faecal antigens of the mite

Psoroptes ovis. Scab continues to be a serious problem for conventional and organic producers alike. *P. ovis* is unable to complete its lifecycle off the host and can remain in an asymptomatic sub-clinical phase for weeks or months following initial exposure. Preventing the introduction of *P. ovis*, through quarantine and effective fencing/hedging, is therefore the first line of defence. If scab enters a flock it may not be recognised for weeks or even months after its introduction. During this period it can spread throughout the flock. If scab is suspected it is important to have the parasite diagnosed by a vet and the correct treatment applied. Application of the wrong treatment can be costly and prolong the suffering of infested sheep. The range of effective scab treatments available to organic producers is extremely limited and is currently based on the macrocyclic lactones (MLs), all with very long meat withdrawal periods. Overuse of the MLs may also lead to ML resistant gut worms and worse still, ML resistant scab mites. It is essential to investigate new, alternative methods for controlling scab, such as vaccines or biological control agents.

Chris Lewis:

The Cheviot Hills form part of the North Northumberland National Park and are a unique area of outstanding natural beauty. In addition they provide the livelihood for several hundred beef and sheep farmers, many of whom have lived in the area of for a long time. Around the mid to late 1990s sheep scab was becoming an ever increasing problem for a number of sheep farmers in North Northumberland and the Scottish Border areas of the Cheviots. The problems posed by this large area for control of sheep scab are discussed with particular reference to the type of farming and other land use within the area. The control strategy is detailed with reference to the organization and co-operation of farmers and the use of a voluntary treatment period. The challenge of ensuring correct product use was achieved by all farmers (including organic) is highlighted.

O2: Corporate organics & organic/ethical principles: the debate

This session debates what is sometimes perceived as a disconnect between large-scale organic production/marketing and the founding principles of organic/ethical production.

Chair: Bruce Pearce (ORC)

Andrew Burgess (Produce World): Large Business & IFOAM

I will give some context to Produce World Ltd and its subsidiary RB Organic and then demonstrate that larger companies can behave in an ethical and high integrity manner, in line with the IFOAM principles of Health, Ecology, Fairness and Care. I will also attempt to demonstrate that when a large company behaves in this way the benefits can be magnified.

Finn Cottle (Soil Association):

There is a perceived disconnect between large-scale organic production and marketing the

founding principles of organic/ethical production. Although small and local can perhaps more easily meet the founding organic principles, there is plenty of positive evidence and successful examples of larger scale processors and retailers who fit comfortably within the IFOAM principles.

**Adrian Dolby (Barrington Park Estate):
A large farm perspective**

I will give some context to Barrington Park Estate to demonstrate that larger scale producers can operate ethically, addressing key principles within a tough trading environment.

17.30–18.30 Wednesday 18th January Informal meetings

Access to Land (ORC and OGA)

The greatest frustration experienced by young people wanting to produce food is actually gaining access to land. This meeting will hear from **Frank Gundry-White** of Reclaim the Fields, a campaigning organisation active in this area, followed by a general discussion.

Participatory Research and Development Network (ORC and IOTA)

ORC launched this network in July 2011 with the intention of building on the many participatory

research projects that ORC has run in recent years. The primary aim is to bring producers and farmers together to make the process of knowledge exchange easier and quicker, and this session is intended to give farmers an update and outline future activities.

Homoeopathy at Wellie Level (HAWL)

For farmers using homoeopathy, those who might want to use it and those who are just interested. Exchange ideas and experiences and discuss HAWL's programme and activities.

19.30–24.00 Conference dinner followed by *Steam Chicken*

09.00–10.30 Thursday 19th January

WORKSHOPS 3

A3: Optimising nitrogen inputs and timing for cereals

Managing nitrogen fertility for organic cereals can be a challenge. The session explores ways of ensuring that adequate supplies of nitrogen from inputs and green manures are provided to the crop when needed.

Chair: Francis Rayns (Garden Organic)

Sarah Clarke (ADAS): Cereal N agronomy

The key principle in optimising nitrogen inputs to any crop is to match the nutrient supply to the crop demand, both in terms of the amount and timing of nitrogen. This talk will describe the basis for this statement, as well as how nitrogen requirements differ with cereal species, variety, previous cropping and other environmental factors.

**Stephen Briggs (Abacus Organic Associates):
Organic sources of nitrogen for cereals**

The presentation considers optimum sources of nitrogen in organic systems, from the perspectives of cereal quality, environment and farmer. Based on a broad-reaching review paper written by Abacus, it offers a summary of knowledge and experience in the following areas: nitrogen fixation; nitrogen recycling; the effect of the length of the fertility building phase or ley and the effect of green cover management; type and management of green manures; soil management; the impact of undersowing; seasonality of crops and the impact of manure use and management.

Richard Gantlett (Yatesbury Organic Farm): A farmer perspective on managing N for cereals

The rotation on the 600 ha of farmland Yatesbury House Farms in Wiltshire comprises several cereals. On-farm livestock and leguminous pastures

are part of the nitrogen management regime, and the farm's team are experimenting with low-till to find a tillage system which optimises fertility maintenance. The presentation introduces Richard's experiences with managing soil nitrogen and identifies what has worked well for cereals.

H3: Functional biodiversity for growers

It has always been assumed that the encouragement of biodiversity on horticultural holdings is a good thing in the control of pests and diseases, soil fertility management and general system robustness. This session provides guidance on functional biodiversity and pointers on how to manage it. (Organised with OGA)

Chair: Phil Sumption (Garden Organic)

**Rob Brown (University of Reading/ORC):
Diverse legumes for increased pollination**

Agriculture is reliant on a number of ecosystem services that support, maintain and regulate the production of goods. As well as maintaining wildlife diversity, pollination is a highly valuable service within the agricultural sector, contributing to 35% of global food production (23 x 10⁸ Mt). Within the UK alone, the annual value of pollinators to agriculture has been estimated at £440 million. Therefore the loss of pollinators poses a potential threat to food security. However, many pollinator groups, including bees and butterflies, have seen a steady decline in recent years. This is attributed to habitat loss, agricultural intensification and pesticides. This reduction in pollinator diversity and abundance is likely to reduce the efficiency of ecosystem function, as pollination limitation can reduce fruit production and seed set in flowering crops and wild flowers.

A successful management strategy to increase pollinator numbers must consider all aspects of its life cycle, including both nesting and foraging

habitats. Bumblebees require nectar and pollen resources throughout the flowering season (spring, summer and autumn) as well as suitable undisturbed nesting sites to establish a successful colony, butterflies and hoverflies require suitable plants to lay eggs and provide food for larvae. Actions like the introduction of 'bee hotels' or planting diverse flowering mixes into agricultural landscapes, may help to mitigate against the decline of pollinator species, help to increase crop yield, sustain wild flower numbers and provide a food resource for larger animals such as birds.

Dan Carpenter (Natural History Museum/ Earthworm Society of Britain): Earthworm biodiversity and functioning

Earthworms are an important part of the soil ecosystem. They play a vital role in the decomposition process, incorporating organic matter into the soil. Earthworm burrows and casts have an impact on soil structure by producing stable aggregates, creating pores and mixing soil horizons. So important is their role in creating and maintaining soil structures that they have been called 'ecosystem engineers'. Earthworm activity is vital for creating healthy and fertile soils. The talk outlines the diversity of earthworms in UK soils, the ecological roles of different species and suggests strategies for managing soils to protect/enhance earthworm populations and maintain soil health/fertility.

Iain Tolhurst (Tolhurst Organic Produce): Functional biodiversity in practice

The development of bio-diversity on farms is often seen as an additional activity to the main farm role of food/crop production. It tends to be something that producers do on odd corners and unusable areas of land, the odd beetle bank here and nesting box there- a bolt-on extra, something to do when all else is done. There is another and I would say easier way to achieve a far more comprehensive approach to the creation of a viable and creative bio-diversity and that is to consider it as a part of the "systems approach" to agriculture. This is an integrative method whereby bio-diversity becomes the main driver of the production system, fruit and vegetables become the by-product of bio-diversity. This approach starts from the soil up with the development of a soil rich in microbes, rotation design, green manures, choice of suitable cropping and appropriate compost applications. Above ground, as well as cropping there will be beetle banks, field margins, hedgerows and managed wildlife habitats. The whole system allows healthy cropping with few pest problems, working with nature rather than trying to dominate it.

D3: Healthy Feet and more: improving dairy cow health and welfare

There has been a focus on dairy cow health and welfare in a number of recent and current projects. This session will report on two of them, with an opportunity to discuss different perspectives on animal welfare assessment.

Chair: Katharine Leach (ORC)

Phillip Day (Merrimoles Dairy Unit): The Healthy Feet Project and beyond

Philip Day is Farm Manager at Merrimoles Farms, a 1000 acre organic mixed farm with a 150 cow dairy herd. In 2007, the farm joined the Bristol University "Healthy Feet Project", which aimed to reduce lameness in dairy herds. Following discussions with project staff, farm staff and the farm's vet, the agreed actions were to improve walking surfaces, establish a regular foot bathing regime, invest in cattle crush with foot trimming facilities, ensure regular trimming and timely intervention for lame cows, and improve diet, especially for transition cows. Over five years, this has resulted in a substantial reduction in both the number of cows lame at annual mobility scoring, and the number of cows needing treatment. Philip has calculated that the cost of implementation, spread over five years, amounted to £2500 per year while the cumulative saving on cases of lameness avoided since the start of the project (assuming a conservative cost of £180 per case) is estimated to be £14040. The investments have had additional benefits beyond lameness reduction, further increasing their cost effectiveness.

Iain Rogerson (Soil Association) and Federica Monte (University of Bristol): Animal welfare and certification – improving the links

The session starts with a brief update of the progress of the AssureWel project and its work on developing potential welfare outcome assessment measures to use in farm assurance/organic certification assessments on dairy farms. The main part of the session is an exercise asking you to give your (the farmer's) perception of farm assurance procedures and the interactions between farmer and assessor. You will be asked to score a series of quotes and suggestions made by a group of Soil Association farm assessors which might promote discussion with farmers on the management of their livestock and establish whether farmers share the same opinion as the assessors and how assessors can promote interest and discussion within the assessment. Participants will be asked to suggest potential welfare outcome measures for dairy cattle which could be used in farm assessments.

M3: Carbon emissions from extensive organic livestock systems – can organic deliver?

This session is intended to bring the audience up to date on the latest experiences of Carbon Footprinting, explore how extensive organic systems can contribute to lower emissions and identify practical steps that can reduce emissions and save costs. (Organised by IOTA)

Chair: Mark Measures (IOTA)

Chris Lloyd (EBLEX): Beef and Sheep Environmental Roadmap - Carbon benchmarking/ improving performance in different systems

Over recent years EBLEX has looked to actively engage in the Climate Change debate on behalf of the English beef and sheep sectors. In 2009 it

worked with Cranfield University in their development of the Life Cycle Analysis for beef and lamb. For the past two years EBLEX has done a number of on farm carbon audits to understand more about the drivers for carbon emissions and is using this information to engage with beef and sheep producers at a practical level. This work has been about gaining a better understanding of the beef and sheep sector's position, enabling us to engage in the debate with Defra and others to establish how the industry can take its share of the responsibility for working towards Defra's 2020 mitigation targets. No one farm is the same and using carbon footprints to compare enterprises or measure them is too simplistic and fails to recognise the wider benefits beyond food production they offer society. However, it is appropriate to encourage all producers to understand the efficiencies within their system and to find the right formula to make best use of the resources their farm offers.

Poppy Johnson (Soil Association): New carbon benchmarking results from organic farms.

The Soil Association's Low Carbon Farming project launched in April 2011 aims to support farmers and growers in understanding their farm's greenhouse gas emissions and in assessing current farm practices and possible improvements that could be made to both reduce their emissions and improve their productivity and performance. The project intends to provide high quality information through the provision of technical information sheets, case studies and an online toolkit to monitor farm improvement as well as a series of on-farm training events and workshops. The project has reviewed the carbon calculators currently available for general farm use using a sample of farm data across a variety of enterprises to illustrate and explain the differences between the tools and to assess their suitability and practicality as a tool for monitoring improvement at farm level. This study has informed the development of a toolkit which will assess and monitor farm practices relating to livestock management, nutrient management, carbon sequestration and energy and fuel use to highlight areas for improvement in terms of emissions, productivity and financial costs.

Bill Grayson (Farmer): Carbon foot-printing on an upland farm; practical experiences and ideas for the future.

This presentation describes the range of values obtained for a single upland beef farm when a number of different carbon-calculators were used to assess its GHG emissions. This farm specializes in delivering nature conservation objectives across a range of semi-natural habitats and therefore operates at very low stocking rates. These are the kind of extensive systems of production that many leaders in the red meat sector consider to have a higher C-footprint than more intensively managed systems with their greater productive efficiency. The comparison demonstrates how the conclusions about this farm's emissions-

performance depend on the specific C-calculator that is used. Those that included measures of C-sequestration by woodland and soil all agreed that this farm acts as a net C-sink, with uptake exceeding emissions by nearly 600%. The choice of methodology for assessing emissions is therefore of crucial importance both for deciding practical mitigation measures on any given farm and for determining wider policy initiatives aimed at delivering national targets.

03: Communicating organic: are ads, apps & raps the way forward?

If you produce organic food and drink, you need to sell it! The advertising of organic products has become more mainstream recently and many producers are using social media to communicate with customers. This session will report on the relevance of recent trends in communication and provide guidance on how to use them. (Organised by OCW/OTB)

Chair: Sue Fowler (OCW)

Catherine Fookes (Organic Trade Board/Why I Love Organic): How have organic adverts changed over the years? A fun look at selling organic and the Why I Love Organic campaign

I will show the evolution that organic food and drink brands have been on with their advertising, and will show organic ads through the ages. How has marketing changed over the years to reflect the growth in organics? What different tools are brands using now? I'll look at some case studies on different brands, and show some of the trends we are seeing in marketing now including the use of Social Media. I will also cover the Why I Love Organic Campaign so far. It will be a journey from the hippy to the hip hop - the new era of ads, apps & raps!

Richard Arnold (Calon Wen): Engaging with customers and marketing your products using modern techniques - Cows that Tweet!

How Calon Wen has tried to embrace social media, and how its then integrating the newer consumer reach, with its more traditional forms of marketing.

Elisabeth Winkler (Journalist & PR expert): A step by step guide and take-home tips on how to use social media

What is social media? How can it help organic farmers? New web technology increases the powerful effect of word-of-mouth - the best recommendation in the world. It also enlightens the public about the benefits of organic farming. In turn, the transparency afforded by the web suits ethical, authentic businesses such as organic farming. We alight briefly on the four main social media sites to (briefly) show how. With slides.

10.30-11.00 Refreshments

11.00 - 12.30 Thursday 19th January

WORKSHOPS 4

A4/H4: Non-inversion tillage for arable and field-scale vegetable crops

This session reports on results from projects that are evaluating non-inversion tillage (NIT) in field-scale crop production, with input from farmers engaged in these projects (organized by IOTA, Organic Arable, OGA).

David Wilson (Duchy Home Farm): Practical experience of NIT using the Eco Dyn: desperation, achievements and ideas for the future.

The session focuses on two and a half seasons' use of non-inversion tillage at Duchy Home Farm. The Ecodyn cultivator drill has been used as part of a three-year ORC trial comparing a plough-based system with non-inversion tillage. The machine has also been used on the farm outside the trials to establish a variety of crops.

Chair: Mark Measures (IOTA)

Thomas Döring (ORC): A review of ongoing European research into reduced tillage in organic agriculture

Through reduced inputs and other measures, organic farming typically contributes to improved resource use efficiency and biodiversity conservation in comparison to non-organic systems. However, rising energy costs provide a strong incentive to look for further improvements regarding energy use efficiency. A high proportion of energy used on farms is spent on mouldboard ploughing, which is currently the predominant practice on organic farms. While ploughing is seen as a useful tool, in particular for weed control, it can have negative effects on a range of soil parameters and its high energy demand is not only economically costly, but also associated with greenhouse gas emissions. Reduced tillage (RT) can help improve the efficiency of arable production by reducing energy use and improving soil health. However, RT is difficult to employ on organic farms where, in the absence of herbicides, the plough is typically relied upon for adequate weed control. In addition, nutrient mineralization under RT can be slower than under ploughed conditions, thereby compromising crop yield potential. To solve these agronomic problems trials investigating RT on organic farms are currently being conducted in several European countries. This presentation gives an overview of results found in some of these trials, with a focus on long-term trials as well as an update on UK research initiatives.

Derk van Balen (Wageningen University): Practice and research into NIT field veg and arable cropping in the Netherlands

Non inversion tillage (NIT) and conservation agriculture are quite new in the Netherlands. It started about 15 years ago in the southern hills as an erosion prevention measure. It is adapted by organic farmers as a method to preserve and improve soil quality. These organic farmers worked with Controlled Traffic Farming (CTF) systems and wondered why they still ploughed the soil. But the experience with NIT in lifted and small seeded crops (potato, carrot, onion) on clay soils in a sea climate is very limited. The BASIS project started autumn 2008 and consists of 5

parcels of 2,5 hectare each. Three of these parcels are rotating in a 6 year organic crop rotation (potato-grass/clover-cabbage-spring wheat-carrot-springwheat/faba bean). The other two rotate in a conventional system. We use CTF with 3.15m tracks. Three cultivation methods are tested: 25 cm ploughing (ST); non-inversion tillage with subsoiling (T); non-inversion tillage without subsoiling (M). These treatments have four replicates and one third of each parcel is designed for testing machinery and subtrials (e.g. cover crops). We keep the T and M fields green or covered during winter. The first results show almost no differences in yield of cereal crops, but quite some difference in carrot and cabbage yields. Besides yield, several soil physical, chemical and biological properties are measured and analyzed.

D4: Lean or fat? Making money from milk

There are many different ways to run a successful dairy farm. Two of the speakers run unusual dairy businesses and present their model and ideas, some of which challenge accepted norms. The second part focuses on information farmers might be able to access when re-thinking their business. (Organized with support from OMSCo)

Chair: Susanne Padel (ORC)

David Finlay (Rainton Farm 'Cream o'Galloway'): Lean farming.

What connects the Japanese post-war recovery and suckling dairy cows? In the context of climate change, resource depletion, food insecurity, healthy diets, developing antibiotic resistance, biodiversity loss and declining animal and social welfare standards, is not the dairy industry's headlong rush towards greater intensification actually making all these things worse? We are told over and over by industry leaders, consultants and many agricultural scientists that this is the price we must pay for the production of adequate, affordable food – especially now, in times of financial austerity. Yet the fact is, these intensive systems are complex, wasteful and high cost. Their main beneficiaries appear to be those proponents mentioned above rather than farmers who are being caught in a vicious cost price squeeze caused primarily by resource depletion. Time for a fundamental rethink! We are about to implement an innovative, counter intuitive, dairy based food production system which is small scale yet, we believe, addresses to a large degree the issues mentioned above at competitive (even non organic!) prices, while releasing a substantial amount of food back into the human food chain.

Brian Goodenough (Eling Estate, Berkshire): My farm business - producing milk solids at low cost

Eling Farm Dairy has undergone quite a few changes since a new dairy was built on a green field site in 2001, though always operating a grazing based system. Over the last two seasons we have settled down to spring calving, a cheese contract and once a day milking. In the last 12 months we have had 20.44 inches of rain – not quite the right place for a forage based business. Or is it? Increasing the area of lucerne, which has not been hampered by drought, has provided an insurance policy. To work within the challenges imposed by the risk of drought, I have realised that the only way forward is measuring and recording and monitoring. This already includes soil testing using the Albrecht and Reams system, and grass measuring with the plate meter. This spring we are going to add Brix readings which will give us a sugar reading and overall health of the plants. Grazing management is the key to plant growth and cow performance. With a better, more consistent diet I would expect milk solids to go up and health status to improve. Recording and monitoring production and health will be important to establish whether this is the case.

James Hanks (Pan-Livestock) and Kathryn Rowland (Kingshay): Information to highlight your herd's strengths and weaknesses.

Pan-Livestock: How do farmers and their technical advisers know they are focusing on the priority areas of their individual herds? A recent analysis of milk recording data from 112 herds supplying OMSCo provides a description of performance and, in particular, the wide variation currently achieved by commercial organic dairy herds. This talk will highlight the differences between farms and describes how this information is being used to help technical advisers and farmers tackle areas of greatest need. Records are essential to a business, particularly when it comes to making significant management decisions. There are many options available to dairy producers to monitor herd performance. By regularly assessing trends, any problems that may arise can be highlighted before they become too much of an issue. In this session we discuss the importance and benefits of accurate records, while focusing on up to date analyses and trends of organic herds.

Kingshay: There are several Key Performance Indicators that can highlight strengths and weaknesses. One way of easily recording herd performance on a monthly basis is using Margin over Purchased Feed costings, enabling easy comparisons to other similar herds. Good feed efficiency is vital in all organic systems and boosting milk from forage is a key route to better profits. Home produced forage crops cost less per tonne of dry matter than bought-in feeds and with good nutritional quality they will result in a lower cost per litre of milk produced. Other recording options include management accounts. Quarterly financial data can be analysed and compared to others. Although this can take more time to complete, it can highlight realistic areas where potential cost savings can be achieved.

M4: Reconciling prices and costs of production – can we make ends meet?

Higher costs of production and low premiums are putting beef and sheep producers in a squeeze and leading to leakage of organic animals to conventional markets, increasingly resulting in shortages of organic stock when they are really needed. This session reviews the trends in prices and costs of production and asks do we need premium prices for beef and sheep and what role the different parts of the supply chain (farmers, distributors, processors and retailers) can play in addressing the problem? (Organized with Graig Producers)

Chair: Sue Fowler (OCW)

Nic Lampkin (ORC): Costs of producing organic beef & lamb and opportunities for reducing costs

As price differentials between organic and non-organic beef and lamb have come under pressure, the issue of costs of production has become more relevant. It remains the case, unfortunately, that there is still very limited actual data on costs of production of beef and lamb – in part a reflection of the very wide range of production systems found in the UK. This presentation reviews the

evidence from England, Wales and Scotland that does exist, and highlights that although fertiliser and other costs per hectare may be reduced in organic systems, the costs per kg of meat produced are often higher than non-organic because of lower stocking rates and longer finishing periods. For the same reason, similar fixed costs per hectare also end up as higher costs per kg. However, there are also very wide variations in performance, indicating that for some producers, significant opportunities to reduce costs may exist. In some cases, these may be more important than attempting to increase the price obtained. The presentation considers what actions should be undertaken to improve the quality of the evidence available, and in particular whether the levy companies could play a greater role in helping collect and collate relevant data.

Bob Kennard (Graig Producers): Price trends and the role of producer marketing groups

Is it a reality or a perception that organic lamb and beef producers need a premium? Prices appear to be currently high in the conventional sector, due to strong export demand resulting from a weak £. However, once inflation is stripped away, are prices so good, especially with high organic input costs? To what extent has a variable and unpredictable organic premium, together with a lag between live weight market prices and deadweight organic prices, resulted in some farmers voting with their livestock, and selling organic stock without an organic premium through livestock markets? This is especially so of lambs, but with beef there appears to be a major organic leakage into the conventional stores market. Either way, how important is a premium in keeping livestock within the organic system? Are we in danger of frightening the consumer away from organic red meat due to price? If so, what are the levels of organic premium being charged along the supply chain, and are they justified? How do producers negotiate a premium?

O4: Legumes: multi-species and multi-functional

This session reports on current work with legume mixtures in the LegLINK and other projects and explores applications beyond fertility building and ground cover. These include greater use of home-grown legumes in monogastric diets and even as part of a ration for fish (organised with SAC).

Chair: Christine Watson (SAC)

Lesley Smith (SAC): Peas and faba beans as home grown alternatives for soybean meal in fattening pig diets

Both UK organic and conventional pig production rely on soybean meal (SBM), which increases concerns about sustainability, security and environmental impact. Alternative, home-grown protein sources such as peas and faba beans may reduce these concerns. The Green Pig consortium carried out a small-scale growth trial to test effects of peas and faba beans on pig performance. Faba beans (var. Fuego, coloured-flowered spring beans) or peas (var. Prophet) were used in grower and finisher pig diets at 75, 150, 225 and 300 g/kg, gradually and completely replacing SBM. Pure methionine was used to correct amino acid deficiency. Grower and finisher pig data combined suggest that using pea or faba bean based diets throughout the fattening phase unlikely affects overall performance. This indicates that peas and faba beans may be used as viable home-grown alternatives to SBM in balanced diets. Since methionine supply is a bigger constraint in organic diets, an organic demonstration trial is underway to show the feasibility of replacing organic SBM with organic pulses.

John Newman (Abbey Home Farm) and Heather McCalman (IBERS):

Developing alternative legume mixtures - farmers' perspectives

White clover is the mainstay of grass leys grown by organic farmers. There are, however, a wide range of herbage legumes available with differing agronomy mixtures which may offer advantages in biodiversity, N release dynamics, productivity and effects on the following crop. Ten farmers from Wales and Cornwall were among 35 nationwide to grow an 'all species mixture (ASM)' (comprising 10 legumes and 4 grasses) alongside their usual ley in their farm rotation. Linked to regional research hubs, where the ASM was grown in plots, the participating farmers observed the two leys types over the duration of the project. These farmers' views are collated and indicate the potential for inclusion of the less common legumes in ley mixes. At Abbey home farm the ASM was grown alongside the farm's usual three year white clover cutting/ grazing ley to build fertility for a following cereal crop. Differences in establishment, canopy height and yield and suitability for Abbey Home Farm are discussed.

12.30 - 14.00 Lunch/networking

14.00-15.30 Thursday 19th January

Making agro-ecology work in practice

Agro-ecological approaches including organic farming have been shown to increase production of food, fuel and fibre in many parts of the world, while reducing the use of non-renewable resources and maintaining producer autonomy and food sovereignty. Miguel Altieri has pioneered

CLOSING PLENARY

this approach and will provide extensive examples of how agro-ecology can work in practice and make a real contribution to global food security.

Chair: Lawrence Woodward (Whole Organic Plus)

Prof. Martin Wolfe (Wakelyns Agroforestry): Introduction to the guest speaker and topic

Prof. Miguel Altieri (University of California, Berkeley): Agro-ecology in practice around the world

The climate, energy and food crises are becoming more severe, agro-exports are on the rise and the use of transgenic, biofuel crops is increasing globally, land grabbing is exploding and hunger intensifying. There are many visions on how to achieve a sustainable agriculture that provides enough food and ecosystem services for present and future generations in an era of climate change, increasing costs of energy, social unrest, financial instability and increasing environmental degradation. The realization of the contribution of indigenous, peasant and small farm agriculture to food security in the midst of scenarios of climate change, economic and energy crisis, led to the concepts of food sovereignty and agro-ecologically-based production systems gaining

much attention in the developing world in the last two decades.

Organic farmers in the North trapped in an input substitution approach and victims of an unequal global food system are starting to think critically about a new agricultural paradigm. New approaches and technologies involving the application of blended modern agricultural science and indigenous knowledge systems and spearheaded by thousands of farmers, NGOs, and some government and academic institutions are proving to enhance food security while conserving agrobiodiversity, soil and water resources throughout hundreds of rural communities in the developing world. Case studies from Cuba, Brazil, Philippines, Africa, Chile and California are presented to demonstrate how the agro-ecological development paradigm, based on the revitalization of small farms which emphasizes diversity, synergy, recycling, offers options to meet present and future food needs. Given the present and predicted near future climate, energy and economic scenarios, agro-ecology has emerged as one of the most robust pathways towards designing biodiverse, productive, and resilient agro-ecosystems available today.

15.30–16.00 Refreshments and close of main conference

16.00–17.00 Post-conference specialist meetings:

Update for advisers on policy and regulation (IOTA)

OGA Committee

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