2001 Consultation of organic farming research priorities in the UK

Carried out by Organic Centre Wales, Institute of Rural Studies, University of Wales, Aberystwyth on behalf of MAFF organic farming unit and UKROFS

Collated by Susanne Padel, Jane Powell and Nic Lampkin

Total of 62 responses received, of which 24 from farmers, 12 from researchers and research organisations and 26 from organic producers and other farming organisations

Information on ongoing research was derived from the MAFF 2001 organic farming research review, SERAD listing of organic farming projects and MAFF project OFO171, Review of current European research on organic farming.

1 General points: priorities, funding and research organisation

- Ensure programmes and projects integrated at highest level (IOR)
- Needs of processors should be taken into account when drawing up priorities for research (Hassett, Billingtons)
- Failure to mention SERAD-funded research in assessment of current position (Toby Willison, Christine Watson, SAC)
- Need a local approach to research as conditions may vary widely around the country (McMaster, Ulster Farmers Union)
- Better understanding of problems relating to poor soil structure and more effective advice (IOR)
- need to address regional and national variations; need systems-based research, and for that research to be monitored for longer than 3 years, as organic production systems require longer to establish. It is particularly important to look at least at the course of one rotation, which on average could be anywhere from four to seven years, or even longer (Laure Barrington, Soil Association)
- Many developments initiated in the name of organic research could have great benefit to conventional agriculture, and should therefore merit expenditure beyond the relative size of the sector (Tom Latter, farmer)
- Relevance of conventional systems R&D to organic production (Chris Pollock, IGER
- Research targets should build on previous work and be precisely expressed (Edwards Jones, UW Bangor)

2 Dissemination and technology transfer

Farmer groups and participative methods

- More effort should be put into communicating the results of research to farmers, involving a participative approach (Morris & Oreszczyn, OU)
- Funding for farmers' self-help groups (Cormack & Keatinge, ADAS)
- Farmer-led research workshops on specific themes to aid technology dissemination (IOR)
- Establish farmer groups to offer their systems as a group benchmark for a particular interest area (Dan Powell, Gaia Professional)
- On-going monitoring of progress through seminars, workshops and exchange of individuals producers within the group (Dan Powell, Gaia Professional)
- Nominate progressive technologies/knowledge on key demonstration/monitor farms (Dan Powell, Gaia Professional)
- Increased use of technology transfer methods to producers, region-wide basis, on-farm projects (John Davies, NFU Wales)
- Need for continuity of advice, particularly with one advisor covering both OCIS visits (Dilwyn Jenkins, farmer)
- Hold farmers' workshops on home-saved and organic seed (IOR)

Printed media

- Farmers's manuals are needed to make research available in user-friendly form, e.g. 'Field Crop Ecology and Pest, Disease and Weed Management', concentrating on benefits of biodiversity, and a 'Pest Management Manual for Organic Farmers'. These could be linked to web-based information (IOR)
- Need to make sure that the results and conclusions of research are disseminated to farmers direct from *the researchers* (to avoid bias being introduced by interested 3rd parties) in a way that the farmers can understand, for example through a newsletter (Gillian Morgan, farmer)
- Publication of progress through the agricultural press and peer reviewed papers (Dan Powell, Gaia Professional)
- Technical and advisory material for producers, advisors and vets (VEERU)
- Create a dedicated network of demonstration farms, with representatives from all organic farming systems (IOR)

Electronic media

- Internet/helpline accessible database for research results and articles and sharing of advice and practical experience (Ab de Bree, National Trust)
- Develop computer software for different farming and management systems, e.g. conversion planning, nutrient budgets, herd-health plans.

MAFF funded projects

OFO159 Conversion to Organic Production software (COP) (01/09/99 - 30/11/00. Cost: £79k)

OFO162 Organic animal health, welfare & husbandry: assess existing knowledge & production of advisory resource compendia (01/10/98 - 31/03/00. Cost: £97)

OF0160 Organic farming research database (01/08/99 - 28/02/02. Cost: £21k)

European work

Projects with some relevance to the topics mentioned above are currently under way in Austria, Finland, Germany, Norway, Sweden, Switzerland.

3 Research methodology

- Adopt participative methods of research, involving farmers in the process and using the results of on-farm research (Morris & Oreszczyn, OU; Haines, NRI; IOR)
- Develop methodologies and statistical analyses suitable for research into the food chain and farming systems (IOR)
- Bring organic farming research into a framework of the farming systems approach, where the decision-making capacity of the farming household and all farm enterprises are considered together (Haines, NRI)

European work

A series of workshop with relevance to the topics mentioned above has been organised by the FAO, ongoing work in Denmark

4 Whole farm systems

- Describe organic farming systems in UK, identifying problems and constraints (IOR)
- Better understanding of which farms are suitable for organic conversion, on the basis of agronomy, pest management possibilities and farmer coping strategies, in order to minimize unsuccessful conversions (Haines, NRI)
- Impacts of specific R&D on overall systems (Philipps & Pearce, EFRC)
- How are farmers adapting their practices to changes, or perceived changes, in climate, and how this might affect the adoption of new organic crops (Haines, NRI; (McMaster, Ulster Farmers Union)
- Benefits of multi-enterprise (mixed farming) systems in terms of soil nutrition, biodiversity, pest and disease levels, weed control and economic factors (Laure Barrington, Soil Association)
- Understand and take advantage of natural systems and thus avoid the use of synthetic chemical inputs so as to enhance the integrity of organic food (Tom Latter, farmer)
- Feasibility of integrating vegetable production with livestock enterprises (Roger Hitchings, OAS Organic Horticulture Advisor)

- Inter-farm linkages for more closed organic systems (Cormack & Keatinge, ADAS)
- Introduce alternative farming or cropping systems, e.g. agroforestry, mixed croppings, community supported agriculture (IOR)
- Improve energy efficiency of organic farms by reducing energy inputs and energy losses (through soil inversion) and using local food distribution systems (IOR)
- Need to develop systems capable of handling human waste (Morley, British Tomato Growers' Association; Goff)
- Potential contribution of permaculture and bio-dynamic approaches and community/creative farms to development of organic agriculture (Peter Lawler, farmer)
- Investigate potential for woodlands and agroforestry on organic farms (IOR)
- Use of woodland in livestock systems and development of use and marketing of forestry products (Laure Barrington, Soil Association)

MAFF funded projects
OF0182 Energy use in organic farming systems (01/09/99 - 31/03/00. Cost: £17k)
SERAD funded projects
ERM001/97 Review of the organic farming sector in Scotland and evaluation of the organic aid scheme (1/12/97-29/02/00)
SAC/093/95 Key factors in sustainable ley farming systems: quantifying the effects of crop rotation, vegetation management; and animal health status on nitrogen and energy flow (1/04/95 - 31/03/2000)
SAC/257/00 Resource use in organic farming (1/04/2000 - 31/03/2003)
European work
Some work with relevance to the above mentioned topics currently under way in Denmark, Finland, Germany, Netherlands, Sweden and Switzerland.

5 Soils and soil fertility

- Review of soil analysis techniques and protocols in order to develop a more reliable monitoring of soil fertility levels and soil quality under organic management, including trace element levels and biological activity and their interpretation for farmers (John Davies, NFU Wales; Tom Latter, farmer; Jonathan Williams, farmer; Gillian Morgan, farmer; Dan Powell, Gaia Professional; Ball, SAC; IOR)
- Effects of rotation and manuring on soil biodiversity and nutrient supply (Watson, SAC)
- Improve understanding of roots and factors influencing their development including consideration of below-ground interactions in rotation design (IOR)
- Methods for restoring/converting degraded (contaminated/run down) land (Philipps & Pearce, EFRC)
- Effects of organic methods on soil and phylloplane microbiology, with implications for soil fertility and disease control (Haines, NRI)

MAFF funded projects
OF0164 Understanding soil fertility in organically farmed systems (01/04/99 - 31/03/02. Cost: £311k)
European work
Ongoing work with relevance to the above mentioned topics in AT, BE, DK, FI, FR, DE, NL, NO, SE, CH.

Soil microbiology

- Effect of biodynamic preparations on soil microbial ecology (Watson, SAC; Anderson, Demeter)
- Integrate research in soil microbiology and ecology into organic farming research, particularly in relation to the fine-tuning of the organic component of soils to the cropping system, including the impact of microbial activity on soil fertility (IOR); linkages between soil health and biodiversity (Laure Barrington., Soil Association; Philipps & Pearce, EFRC

MAFF funded projects
OF0117T Earthworm populations in conventional/organic arable-based systems and their contribution to soil fertility (01/07/95 - 30/06/98. Cost: £127k)

Effects of cultivation

- Effects of soil cultivation on N mineralization (Watson, SAC)
- Used of reduced tillage techniques (Ball, SAC); develop cultivation practices which will minimize damage to soil structure and fauna (IOR)

MAFF funded projects
OF0118T Optimisation of nitrogen mineralisation from winter cover crops and utilisation by subsequent crops (01/08/95 - 30/06/99. Cost: £220k)

Manures and compost

- Effects of manure and composts on fate of nutrients and trace elements (Watson, SAC)
- The role of composting in the management of wastes; quality and biosafety (Morris & Oreszczyn, OU)
- Use of compost and compost teas to manipulate soil microbiology and control disease (Cormack & Keatinge, ADAS; Anderson, Demeter; Segger, OFF; A. Evans, grower)
- Optimise composting of waste products, from the farm or brought in from outside, e.g. municipal and industrial wastes (IOR)
- The fate of DNA in composting: the ability of the composting system to neutralize GMO materials (Morley, British Tomato Growers' Association; Anderson, Demeter)
- Use of compost to supply plant nutrients, reduce CO2 emissions, reduce leaching and to clean soils previously abused prior to conversion to organic farming (Peter Segger, Organic Farm Foods), in particular as part of an holistic system, not simply an input (Anne Evans, grower)
- Composting techniques in upland and higher rainfall areas (Laure Barrington, Soil Association; Ab de Bree, National Trust; Philipps & Pearce, EFRC)
- Cheap and effective manure storage to preserve nutrients and avoid pollution (Tim Bevan, National Botanic Gardens; IOR)
- Efficiency of different crops in utilising farm-derived slurry and FYM including practical constraints and evaluation of on-farm tests to determine nutrient contents of materials (Weller et al., IGER)
- The re-cycling of compostible domestic waste and sewage sludge in organic systems (Tom Latter, farmer) and production of acceptable composts from waste/by-products of organic production (Philipps & Pearce, EFRC)

MAFF funded projects
OF0161 The environmental implications of manure use in organic farming systems (01/08/98 - 30/11/99. Cost: £59k)
OF0187 Efficient use of animal manures within an upland organic system (01/04/99 - 31/03/01. Cost: £39k)
European work
Ongoing work with relevance to the above mentioned topics in AT, BE, FR, FI, DE, ES, SE, CH

Fertility-building crops and green manures

- Fertility-building crops (winter cover crops and also short and medium term green manures, including grass/clover leys): species and variety choice, management, effects on soil fertility (IOR)
- Nutrient release from incorporated green manures and supplementary fertilisers in Welsh context (Philipps & Pearce, EFRC)
- Crops for fertility building (John Davies, NFU Wales)
- Green manures for integrated management of nutrients, insects, disease and weeds (IOR); development of novel green manures (Roger Hitchings, OAS Organic Horticulture Advisor)

MAFF funded projects
OF0173 Clover:cereal bi-cropping for organic farms (01/01/99 - 31/12/01. Cost: £251k)

Nutrients

- Simple nutrient balance calculation methodology (Cormack & Keatinge, ADAS)
- The development of reliable data for nutrient budgeting (Tom Latter, farmer)
- Better data on N fixation by legumes (Cormack & Keatinge, ADAS; Watson, SAC)
- Effect of cropping sequence on nutrient availability in stockless systems (Watson, SAC)

- Effect of cropping sequence on root development and arbuscular mycorrhizal fungi (Watson, SAC)
- Improve understanding of mycorrhizal and other plant/microbe associations and importance in nutrient uptake and disease control (IOR)
- Assess appropriateness of permitted nutrient inputs (e.g. rock phosphate) and characterize their impact on the soil (IOR)

MAFF funded projects

OF0118T Optimisation of nitrogen mineralisation from winter cover crops and utilisation by subsequent crops (01/08/95 - 30/06/99. Cost: £220k)

OF0197 Modelling manure NPK flows in organic farming systems to minimise nitrate leaching, NH3 volatilization and NO2 emissions (01/09/00 - 31/03/01. Cost: £64k)

OF0180 Influence of level of self-sufficiency on the nutrient budgets of an organic dairy farm (01/10/98 - 30/09/02. Cost: £208k)

OFO159 Conversion to Organic Production software (COP) (01/09/99 - 30/11/00. Cost: £79k)

OF0178 Improving N use and performance of arable crops on organic farms using an expert group approach (01/01/99 - 31/12/01. Cost: £90k)

European work

Ongoing work with relevance to the above mentioned topics in DK, FI, FR, NL, NO, SE

P and K

- Effect of potassium chloride on germination and plant and soil life (Anderson, Demeter)
- Use of naturally mined magnesia-kanite as remedial treatment for damaged soils (Anderson, Demeter)
- Reassessment of what should be the most appropriate levels of and source of supplementary potash in organic systems (John Davies, NFU Wales; Tom Latter, farmer; Gillian Morgan, farmer; Weller et al., IGER)
- Phosphate nutrition: use of plant extracts to improve P availability, and use of P sources in compost management or directly on the soil (Anderson, Demeter)

MAFF funded research project

OF0114 Optimisation of phosphorus and potassium management within organic farming systems (01/01/98 - 31/12/00. MAFF Cost: £150k, Non-MAFF Cost: £12k)

6 Cropping systems and crops

Seed production, variety choice and plant breeding

Seed production

- Improve production of organic seed (IOR)
- Issues relating to production and development of organic seed research at all levels, particularly collating data from the field (Anne Evans, Grower, Philipps & Pearce, EFRC) (NB MAFF-funded project at HRI only partly addresses issue)
- Evaluate and develop organically acceptable seed store hygiene methods (IOR)
- Factors affecting organic seed viability and vigour (Watson, SAC)
- Develop appropriate Seed Certification regulations for organic seed, with consideration to acceptable levels for seed-borne disease admixture and vigour, especially in vegetable crops (IOR)
- Methods for producing disease-free seed (Cormack & Keatinge, ADAS); especially treatment of cereal seed (Shaw-Porter, UKASTA); evaluate and develop organically acceptable seed treatments (IOR); Organic seed health and control of seed-borne disease (Philipps & Pearce, EFRC)
- Health of seed potatoes and ware crops (Watson, SAC)

MAFF funded projects

OF0154 Production of organic seed for the organic sector (04/01/99 - 03/01/00. Cost: £20k)

OF0166 Economic and agronomic feasibility of organic vegetable seed production in the UK, and subsequent seed quality (01/03/99 - 31/08/03. MAFF Cost: £230k, Non-MAFF Cost: £27k)

European work

Ongoing work with relevance to the above mentioned topics in AT, FI, NL. NO, SE

Varietal choice

- Short-term variety trials and longer-term breeding programmes to develop crop varieties suited to organic production in particular regions (Philipps & Pearce, EFRC; IGER; McMaster, Ulster Farmers Union; IOR)
- Cereal varieties suited to organic production in Wales (Stuart Taylor, farmer)
- Suitable species and varieties for grassland, forage and arable systems, including recommended varieties list (Ab de Bree, National Trust)
- Suitable lettuce varieties for west Wales (low light), esp. for mid and late season (Anne Evans, grower)

MAFF funded project
OF0142 Varieties of field vegetables and potatoes for organic production and marketing (01/04/97 - 31/03/01. Cost: £124k)
European work
Ongoing work with relevance to the above mentioned topics in AT, FI, SE, FR, DE, NO, CH

Breeding

- Breeding objectives to include wider health and acclimatisation issues led by whole farm ecology considerations (Bernard Jarman, Biodynamic Agricultural Association)
- Development of perennial cereal and grain legume crops (Tom Latter, farmer)
- Dedicated breeding programmes for vegetables coupled to conservation of genetic resources (IOR)
- Breeding programmes for UK organic crops, especially cereals, potatoes, pulses, taking into account root traits as well as above-ground characteristics (Watson, SAC), with a strong regional bias (IOR)
- Cereal selection for increased straw yield (John Davies, NFU Wales; Tom Latter, farmer)
- Breeding of suitable forage varieties for organic systems (Cormack & Keatinge, ADAS)

MAFF funded project
OF0178 Improving N use and performance of arable crops on organic farms using an expert group approach (01/01/99 - 31/12/01. Cost: £90k)
European work
Ongoing work with relevance to the above mentioned topics in DE, NO, CH

Weed population dynamics and control strategies

- Review existing weed/seed bank levels on organic farms, grassland and field vegetable systems to identify key areas that need control (Dan Powell, Gaia Professional)
- Investigate beneficial and harmful effects of weeds by looking at weed-microbe-crop interactions (IOR)
- Potential of weed flora to increase biodiversity (IOR)
- Population dynamics of annual and perennial weeds in organic rotations that include cereals (Watson, SAC); ecological principles that determine shift in weed species during conversion to an organic system (Haines, NRI)

Control methods

- Mechanical control methods for perennial and grassland weeds, eg. crimping and bruising of creeping thistle and bracken (Anderson, Demeter; Cormack & Keatinge, ADAS; Frost, ADAS)
- Biological control of weeds (Cormack & Keatinge, ADAS)
- Allelopathic weed control properties of cover crops and fertility building crops (IOR); (Philipps & Pearce, EFRC)
- Biodegradable mulches as an alternative to plastic (IOR)
- Effects of weed control machinery on weeds, the soil and crop growth (IOR)
- Development of row-crop machinery that will cover large areas quickly (Cormack & Keatinge, ADAS);
- Review and comparison of available technologies, both cultural and mechanical (Dan Powell, Gaia Professional; Laure Barrington, Soil Association)

MAFF funded project
OF0177 Growth and competition model for organic weed control (01/04/99 - 31/03/02. Cost: £58k)
European work
Ongoing work with relevance to the above mentioned topics in AT, Be, DK, FI, FR, DE, NL, NO, SE

Particular weeds and systems

- Control of creeping thistle and docks (John Davies, NFU Wales) and weed control in permanent pasture (Tim Bevan, National Botanic Gardens), including developing integrated approaches based on existing knowledge (Philipps & Pearce, EFRC)
- Weed control in cereals (Clyde and Helen Parker, farmers (in conversion); Laure Barrington, Soil Association)
- Control methods for annual grasses (IOR)
- Develop and assess economically weed control methods for large-scale organic arable and vegetable production (Watson, SAC; Haines, NRI), such as use of tillage, cover crops, competitive cultivars (Haines, NRI)
- Biology and management of perennial weeds across all systems (Cormack & Keatinge, ADAS; Watson, SAC; IOR)
- Develop integrated weed management strategies for arable and horticultural systems (IOR)

Pest and disease population dynamics and control strategies

- Importance of biodiversity for management of pests and diseases in crops (IOR)
- Rationalize recommendations on development of hedges in relation to their value as reservoirs of pathogens, pests and beneficial species (IOR)
- Management and mechanical control measures designed to minimise problems arising in agricultural and horticultural crops, to include rotation, composting methods, and use of approved inputs (Laure Barrington, Soil Association); Integrated management systems for troublesome pests and diseases (Watson, SAC)
- National systems to avoid use of synthetic chemical inputs (John Davies, NFU Wales)
- Biological control of pests and diseases (Cormack & Keatinge, ADAS; Morley, British Tomato Growers' Association); integrated management (IOR)

Maff funded project

OF0168 Development of disease control strategies for organically grown field vegetables (DOVE) (01/01/99

OF0181 Companion cropping for organic field vegetables (01/01/99 - 31/12/01. MAFF Cost: £220k, Non-MAFF Cost: £50k)

SERAD funded project

SCR/535/99 Impacts of a conventional and an organic crop insecticide spray treatment on the life history traits of two spot ladybirds (1/08/99 - 31/01/2002)

European work

Ongoing work with relevance to the above mentioned topics in AT, DK, FI, DE, NL, NO, SE

Soil microbiology and disease suppression

- Effects of organic methods on soil and phylloplane microbiology, with implications for soil fertility and disease control (Haines, NRI)
- Potential of compost to suppress disease (Watson, SAC)
- Strategic research investigating the relationships between soil borne disease and soil health (Laure Barrington, Soil Association)
- Potential of soil microorganisms, e.g. mycorrhizal fungi, in disease control (Watson, SAC; IOR)
- Investigate relationship between pest and disease control, soil organic matter and the use of composts and green manures. Can compost teas be designed for pest and disease control on s specific crops? (IOR)
- Use of compost and compost extracts/teas for control of soil-borne diseases (Peter Segger, Organic Farm Foods; Anne Evans, Grower; Cormack & Keatinge, ADAS; Anderson, Demeter

European work

Ongoing work with relevance to the above mentioned topics in AT, SE, CH, DE

Varieties/crop mixtures and rotations

- Use of variety and species mixtures to increase overall resistance within the crop (IOR)
- Specific varietal choice for organic systems regarding disease resistance (Laure Barrington, Soil Association)
- Specific focus on intercropping, bi-cropping and crop/varietal mixtures in Welsh context for pest and disease control (Philipps & Pearce, EFRC)

- Effect of crop rotations on weed, pest and disease incidence in stockless systems (Watson, SAC)
- Trap crops for pest control (Cormack & Keatinge, ADAS)

Pesticides

- Investigation of biostimulants and biocides: customer acceptance, the regulatory framework, screening, testing and risks (IOR)
- Item 3, under Pest and Disease Control, 'identify and address the barriers to be overcome to register with the PSD substances on the EC list' should be deleted as it is not a research topic and possibly unethical (Edwards Jones, UW Bangor)

MAFF funded projects

OFO179 Desk study to apply knowledge developed for conventional horticulture to control of pests in organic vegetables (01/04/99 - 31/03/02. Cost: 89k)

OF0188 Studies on exploiting semiochemicals for pest management in organic farming systems (01/11/99 - 31/01/00. Cost: £20k)

European work

Ongoing work with relevance to the above mentioned topics in FI, SE

Specific pests and diseases

- Red clover nematode (John Davies, NFU Wales; Tom Latter, farmer)
- Potato blight control (John Davies, NFU Wales; Tom Latter, farmer; Laure Barrington, Soil Association;) without copper-based treatments (Frost, ADAS)
- Carrot fly (John Davies, NFU Wales)
- Seed-borne disease in cereals (John Davies, NFU Wales; Tom Latter, farmer)
- Control of leatherjackets and slugs in grassland (Watson, SAC; Frost, ADAS)

MAFF funded projects

OFO137 Organic Farming: Biological control using Nematodes for Slug Control (01/09/96 - 31/03/99. Cost: £82k

OF0158 Integrated control of slug damage (01/09/98 - 31/03/02. Cost: £263k)

OFO167 A study to develop alternative strategies for the control of potato blight in organically grown crops (01/01/00 - 31/12/03. MAFF Cost: £149k, Non-MAFF Cost: £23k)

SERAD funded projects

SCR/359/92 Quantifying the benefits of genetic resistance to late blights and other diseases of the potato in pesticide-free (organic) farming systems (1/04/92-31/03/94)

European work

EU research project on control strategies for potato blight without copper

Clover pests in SE, slug control in CH, cereals diseases in AT, DK, DE, NL, SE

Particular cropping systems and crops

- Do mulch-based systems developed elsewhere have a role in the UK, particularly on sandy soils? (IOR)
- How do mulch, compost and manure systems compare in terms of crop production and environmental impact? (IOR)
- Companion cropping – commercially practical systems (Cormack & Keatinge, ADAS)
- Testing sustainability of stockless arable systems (Tom Latter, farmer), including companion bi-cropping systems to reduce reliance on fallowing (Cormack & Keatinge, ADAS)
- Development of fully plant-based organic systems (Morley, British Tomato Growers' Association)

MAFF funded projects

OF0143 A study of the advantages and disadvantages of break crops for organic rotations (01/10/98 - 30/09/02. £120k

OF0145 Testing the sustainability of stockless arable organic farming on a fertile soil (01/04/98 - 31/03/01. Cost: £541k)

European work

Ongoing work with relevance to the above mentioned topics in FR, DE, SE

Particular crops and systems

- Develop organic horticulture systems (IOR)
- Sustainable systems of top and soft fruit production (Cormack & Keatinge, ADAS; Watson, SAC); organic apple production, especially disease resistance (Frost, ADAS); consider novel orchard designs, and agroforestry (IOR)
- Feasibility studies for novel food and fibre crops (Watson, SAC; IOR)
- Develop systems for producing ornamentals organically (IOR)
- Effect of novel crops (fibres, medicinal crops, flowers) on soil fertility (IOR)
- Mixed cropping systems of protein and cereal crops (John Davies, NFU Wales; Tom Latter, farmer)
- Organic maize growing (Clyde & Helen Parker, farmers)
- Inclusion of fibre and biomass energy crops in rotations (John Davies, NFU Wales; Tom Latter, farmer)
- Role of permanent grassland and potential for long-term swards with mixed species, to reduce need for cultivations, reseeding etc. associated with rotations (Weller et al., IGER)

MAFF funded projects

OF0145 Testing the sustainability of stockless arable organic farming on a fertile soil (01/04/98 - 31/03/01. Cost: £541k)

European work

Ongoing work with relevance to the above mentioned topics in AT, DE, CH, NL, NO, SE, CH

Protected cropping and plant raising

- Crop rotations for protected environments: economics, crop sequence, duration, alternatives to traditional rotations (Morley, British Tomato Growers' Association; IOR)
- Use of coloured covers/filters for disease control (IOR)
- Soil ecology and nutrient dynamics in glasshouse systems, including the use of composts, the impact on soil structure and biology of high fertility, development of an index to compare rates of mineralization in different soils and composts (Morley, British Tomato Growers Association); develop nutrient management regimes for glasshouse crops, focussing on composts and green manures (IOR)
- Adapt protocols for organic transplant production to crops not so far produced organically (IOR)
- Transplanted crops: effects of plant raising conditions on plant performance in the field, e.g. relationship between nutrient levels and bolting in leek transplants (IOR)
- Production of organic transplants and performance of organically raised transplants (NB previous MAFF-funded work needs further development)
- Develop new growing media using by-products from organic production (IOR)
- Alternatives to animal/fish based nutrient sources for supplementary feeding of organically raised transplants, which may be unacceptable to consumers: plant-based and novel animal sources (e.g. wool)? (IOR)

MAFF funded projects

OF0144 Overwinter transplant production for extended season organic cropping (01/12/97 - 31/03/01. Cost: £121k)

European work

Ongoing work with relevance to the above mentioned topics in FI, NL

7 Livestock and livestock systems

- Linking of upland and lowland farms with speciality systems due to climatic/production constraints (Laure Barrington, Soil Association)

Breeding

- Breed suitability for organic systems, especially of dairy cows, pigs, poultry (Cormack & Keatinge, ADAS; Watson, SAC; McMaster, Ulster Farmers Union; VEERU) with focus on relationship between disease resistance and commercial traits (VEERU); using indigenous breeds and crosses (Philipps & Pearce, EFRC)
- Develop customized selection indices for organic stock (Watson, SAC)
- Breeds and stock selection for parasite resistance (Mick & Lizzie Shaw, farmers)

- Develop breeding programme for organic livestock, especially for efficiency of forage conversion, positive health and fertility, with strong regional bias (IOR; Watson, SAC)
- Include welfare-relevant traits in selection indices for organic stock (Watson, SAC)
- Are breeds that are suited to an organic system likely to be more prone to stress during transport and at the abattoir? (Avizienius, RSPCA)
- Will high genetic merit dairy cows adjust to a high-forage diet without suffering energy deficiency? (Avizienius, RSPCA)

MAFF funded projects
OF0153 Effect of breed suitability, system design and management on welfare & performance in traditional & organic poultrymeat (01/10/98 - 30/09/02. Cost: £288k)
SERAD funded projects
NCR Breeding strategies for organic dairy cattle (- 03/2003)
European work
Ongoing work with relevance to the above mentioned topics in AT, SE, CH

Animal welfare and housing

- Role of stockmanship in organic production (Cormack & Keatinge, ADAS)
- Relationship between disease and welfare (Frost, ADAS)
- Survey of recent converters and converting farms in order to identify and monitor emerging health, welfare and production constraints (VEERU)
- Development of welfare friendly production systems including husbandry and housing (VEERU); ensuring optimum balance between production and welfare (Philipps & Pearce, EFRC); optimum stocking rates for this (IOR); development of methods for objective assessment of welfare in organic systems (Cormack & Keatinge, ADAS; IOR; VEERU)
- Housing needs of upland farming systems, moving away from tethering and resultant need to erect modern structures - cost implications to the farming business and possible implications to the landscape in sensitive areas (Emyr Williams, Snowdonia NPA)
- Quantifying and valuing animal welfare, environmental, public health and rural development benefits (Peter Lawler, farmer; Laure Barrington, Soil Association)

MAFF funded projects
OF0162 Organic animal health, welfare & husbandry: assess existing knowledge & production of advisory resource compendia (01/10/98 - 31/03/00. Cost: £97)
OF0172 Animal health and welfare in organic livestock systems: Identification of constraints and priorities (01/10/98 - 31/03/99. Cost: £27k)
European projects
Ongoing work with relevance to the above mentioned topics in AT, DK, DE, SE, CH
NAHWOA European Network for animal health and welfare in organic farming systems

Species-specific welfare and housing issues (see also Pigs and Poultry)

- Suitability of different housing systems for cattle, especially in N Ireland where straw is scarce (McMaster, Ulster Farmers Union)
- Effects of indoor housing and food restriction on finishing pigs (Cormack & Keatinge, ADAS)
- Effect of new UKROFS poultry standards on bird welfare (Avizienius, RSPCA)
- Improving the environment for poultry, to prevent destructive behaviour (Jones, Roslin)
- Investigate problems associated with outdoor rearing of poultry (predation etc; David Speckman, UK egg producers
- Use of free range methods: establish what proportion of commercial flocks venture out the sheds and why (Jones, Roslin)
- Optimum colony size for organic poultry (Cormack & Keatinge, ADAS)
- Review status of animal health and welfare on organic farms and compare these to conventional averages of disease incidence to identify key areas that are in need of development (Dan Powell, Gaia Professional)

MAFF funded projects
OF0162 Organic animal health, welfare & husbandry: assess existing knowledge & production of advisory resource compendia (01/10/98 - 31/03/00. Cost: £97)
OF0172 Animal health and welfare in organic livestock systems: Identification of constraints and priorities (01/10/98 - 31/03/99. Cost: £27k)
OF0169 Optimising production systems for organic pig production (01/04/99 - 31/03/02. MAFF Cost: £300k, Non-MAFF Cost: £30k)
OFO163 Optimising the synergism between organic poultry production and whole farm rotations, including home-grown protein (08/02/99 - 31/03/02. Cost: £90k)
European projects
Ongoing work with relevance to the above mentioned topics in AT, DK, DE, CH

Animal health

Alternative treatments

- Properly supervised trials to establish the efficacy of homeopathy, herbal medicines, natural products and other alternative treatments (Goff; Avizienius, RSPCA; IOR; Watson, SAC) for diseases in poultry (David Speckman, UK egg producers; John Davies, NFU Wales; Clyde & Helen Parker, farmers; Jonathan Williams, farmer)
- UKROFS approved list of accepted drug and treatment methods (John Davies, NFU Wales); producer recommendations on the use of alternative treatments (VEERU)
- Further development of alternative approaches for internal parasite control considering the implications for breeding, biological control and the use of novel plants and plant extracts(VEERU)
- Testing of plant extracts for internal parasite control (VEERU)

Control strategies

- Ongoing monitoring of the use of alternative and established control strategies on organic farms (VEERU)
- Development of health plan protocols for converting farms (VEERU)
- Establish a pilot health strategy for the key areas on nominated units and evaluate progress from base line data collected from initial review (Dan Powell, Gaia Professional)
- Development of management practices for control of diseases, including husbandry techniques and minimal use of allowable veterinary inputs (Laure Barrington, Soil Association)

European projects
Ongoing work with relevance to the above mentioned topics in AT
NAHWOA European Network for animal health and welfare in organic farming systems

Particular health issues: Dairy

- Control of mastitis in dairy cows without using antibiotics (Watson, SAC; Goff; VEERU)
- Perception and importance of somatic cell count control strategies on organic dairy farms (VEERU)
- Dairy cow fertility: does it improve under organic management, and is it affected by minerals in the feed (Goff)
- Mastitis and cell count control without dry cow therapy (Stuart Taylor, farmer) including identification of pathogens and potential to reduce cell counts through alternative remedies (Weller et al., IGER)
- Prevention and control of digital dermatitis in dairy cattle (Laure Barrington, Soil Association)

MAFF funded projects
OF0124T An investigation of the incidence, treatment strategies & financial implications of mastitis in organic & conventionally managed UK dairy herds (01/07/96 - 30/06/99. Cost: £148k)
European projects
Ongoing work with relevance to the above mentioned topics in DK, DE

Particular health issues: Poultry

- Poultry hatcheries and pullets: how best to manage these stages of growth under an organic system (Avizienius, RSPCA)
- Strategies to reduce feather-pecking in poultry (Cormack & Keatinge, ADAS; Jones, Roslin)

Particular health issues: Sheep

- Footrot control approaches including breeding (Mick & Lizzie Shaw, farmers; Laure Barrington, Soil Association)
- Evaluation of "Strike Out" traps to control fly strike on extensive, large sheep flocks (Tim Bevan, National Botanic Garden)

Particular health issues: Parasites

- Ectoparasite control in ruminants, pigs and poultry (Cormack & Keatinge, ADAS; Frost, ADAS)
- Endoparasite control in pigs and poultry (Cormack & Keatinge, ADAS)
- Livestock parasite control in ruminants, especially roundworm , liverfluke and sheep scab (John Davies, NFU Wales; Tom Latter, farmer; Clyde & Helen Parker, farmers; John Thomas, Farmer; Mick & Lizzie Shaw, farmers; Laure Barrington, Soil Association; Ab de Bree, National Trust; Tim Bevan, National Botanic Gardens)
- Linkages between soil trace element levels, trace element supplementation and parasite levels (David Jones, farmer)
- Information about worm species and what levels should be of concern as well as sampling methods both on farm and in the laboratory (Gillian Morgan, farmer)

MAFF funded projects

OF0185 Control of internal parasites in organic livestock without the use of pharmaceutical anthelminthics (01/01/00 - 31/12/03. MAFF Cost: £559k, Non-MAFF Cost: £155k)

European projects

New EU research project on internal parasite control strategies approved

Pig & poultry systems (see also rest of livestock section)

- More whole systems research, especially integration of pigs and poultry into farm rotations (Cormack & Keatinge, ADAS)
- Implications of extending lactation length in organic pig production (Cormack & Keatinge, ADAS)
- Effects of indoor housing and food restriction on finishing pigs (Cormack & Keatinge, ADAS)
- Protein and amino acid nutrition, especially poultry and pigs (Cormack & Keatinge, ADAS)
- Availability of organic pullets, post Dec 2003 (Williams, British Egg Industry Council)
- Develop alternative livestock enterprises, such as (a) integrating poultry with horticulture and agroforestry, (b) veal production, (c) freshwater pond fish.
- Use of forages for breeding pigs and fattening stock (Cormack & Keatinge, ADAS)
- Organic pig production and sources of nutrients within livestock system (John Davies, NFU Wales)
- Rearing organic table poultry to the standard and conformation now expected by supermarket customers, on a natural diet produced locally (ie in Wales, oats, barley and dairy) including analysis of feeds, costs and breed suitability (Carol Ferguson, farmer)
- Potential for integrating poultry and horticultural systems (Philipps & Pearce, EFRC)

MAFF funded projects

OF0153 Effect of breed suitability, system design and management on welfare & performance in traditional & organic poultrymeat (01/10/98 - 30/09/02. Cost: £288k)

OF0163 Optimising the synergism between organic poultry production and whole farm rotations, including home-grown protein (08/02/99 - 31/03/02. Cost: £90k)

OF0169 Optimising production systems for organic pig production (01/04/99 - 31/03/02. MAFF Cost: £300k, Non-MAFF Cost: £30k)

OF0192 Workshop and desk study to appraise technical difficulties associated with organic pullet rearing (01/04/00 - 30/11/00. Cost: £30k)

European projects

Ongoing work with relevance to the above mentioned topics in AT, DK, DE, FI, SE, CH

Animal nutrition

Forage production and utilisation

- Control of perennial weeds in grassland (Cormack & Keatinge, ADAS; Frost, ADAS)
- Optimising clover/legume management in organic leys (Cormack & Keatinge, ADAS)
- Pasture improvement/maintaining clover-based swards on upland farms (Frost, ADAS)
- Alternatives to silage making, which use less energy and benefit wildlife by allowing seed production, such as haylage (IOR)
- Utilization of pasture by organic poultry (Cormack & Keatinge, ADAS)
- Management of arable silage mixtures: best combinations, place in rotation, improving clamp fermentations (Goff)
- Optimum use of forages, including maize (Cormack & Keatinge, ADAS)
- Use of forages for breeding pigs and fattening stock (Cormack & Keatinge, ADAS)
- Strategic grazing systems for sheep and free-ranging pigs, exploiting natural immune status (Watson, SAC)

European projects
Ongoing work with relevance to the above mentioned topics in AT, FI

Nutritional quality of forage

- Strategic supplementation to sheep and pigs to bolster immunity at times of nutrient scarcity (Watson, SAC)
- Develop species mixtures for grassland (grasses, clovers, herbs) that will ensure adequate nutrition (IOR)
- Mixed forage diets: best combinations and most appropriate supplementation (Goff)
- Agronomic and nutritional benefits of forage herbs (Watson, SAC)
- Impact of high-forage diets on body fat losses in early lactation and potential for metabolic disorders, and role of modern grass and clover varieties in overcoming these (Weller et al., IGER); effect on milk composition (Cormack and Keatinge, ADAS)
- Interaction between (cow) diet and milk quality in dairy production, including effect of high-forage diets, different sward types and the change from conserved to fresh forages (Weller et al., IGER)
- Extent of quality/quantity losses in conserved forages and options to reduce them, including environmental implications (Weller et al., IGER)
- Review analysis methods for silage quality to determine actual nutritional value for organic systems (Jonathan Williams, farmer)

Other issues of animal nutrition in organic systems

- Implications of GM feeds on organic/animal production (Cormack & Keatinge, ADAS)
- Improving supply of organic feeds
- Improving availability of organic UK-grown concentrates (Goff)
- Crimped grain as an animal feedstuff (Strzelecki, Kelvin Cave Ltd)
- Ensure a sufficient supply of organically grown ration, by trialling alternative crops such as soya, lupin and maize, and improving the production of existing crops (IOR); develop reliable systems for organic pulse production for animal feed (Watson, SAC)
- Availability of organic feedstuffs, especially protein sources, for poultry post-Aug 2005 (Williams, British Egg Industry Council)
- Development of crops/cropping systems to reduce reliance on conventional feed inputs (Philipps & Pearce, EFRC) including potential of different cereal species (Weller et al., IGER) and alternative forages for ruminant diets and their appropriateness for growing in Welsh climate and soil types (Laure Barrington, Soil Association; Weller et al., IGER)
- Mineral and trace element nutrition (Cormack & Keatinge, ADAS; IOR; Jonathan Williams, Farmer); especially in uplands (Frost, ADAS); including assessment of nutritional deficiencies, critical assessment of the need for supplementation (Anderson, Demeter) and the development of alternative approaches to supplementation (VEERU)
- Protein and amino acid nutrition, especially poultry and pigs (Cormack & Keatinge, ADAS)
- How to ensure organic diets are nutritionally adequate in terms of nutrition, given that synthetic amino acids and other supplements are banned; are there other feed sources that could be considered (Avizienius, RSPCA; Lanning, Lloyd Maunder Ltd; Nelson, UKASTA)

- Use of herbs and other plant species, and their contribution to trace element and vitamin needs in monogastric and ruminant nutrition (Laure Barrington, Soil Association)
- Improving energy/protein ratios in ruminant diets and protein utilisation by including high-sugar grasses and/or energy feed/fodder supplements (Weller et al., IGER)
- Effect of organic production on nutrient supply from feeds (Cormack & Keatinge, ADAS)
- Energy supply of high genetic merit dairy cows in high-forage diets (Avizienius, RSPCA)
- Investigation into animal nutrition and suitability of feeds for animal requirements in organic systems (Laure Barrington, Soil Association)

MAFF funded projects
OF0163 Optimising the synergism between organic poultry production and whole farm rotations, including home grown protein (08/02/99 - 31/03/02. Cost: £90k)

8 Food quality and safety

- Optimise quality of organic meat and milk, including processing (Cormack & Keatinge, ADAS)
- Definitive studies on the quality and safety of organic food (Cormack & Keatinge, ADAS, Watson, SAC; Morley, British Tomato Growers' Association; Bower, Farm and Food Society; Anderson, Demeter; IOR); assess safety using HACCP methods (Haines, NRI); value of primary nutrients and secondary metabolites in organic food (Peter Segger, Organic Farm Foods; Philipps & Pearce, EFRC); assessment of vital quality in organic food (Peter Segger, Organic Farm Foods; effects of processing on food quality (IOR)
- Research methodologies for food quality assessments (COR); development of quality testing methods to include other (complementary) and less mainstream techniques including Sensitive Crystallisation, Chromatography, whole plant observation and taste testing (Bernard Jarman, Biodynamic Agricultural Association)

Specific effects of production system on quality

- How important is development of secondary metabolites in organic vs. non-organic crops with respect to (a) crop production and (b) nutrition? (IOR; Peter Segger, OFF)
- Quantify relative pathogen load and zoonotic risk in organic and conventional livestock (Cormack & Keatinge, ADAS)
- Can the use of variety and species mixtures enhance product quality relative to monocultures? (IOR)
- Investigate how the quality of primary products is influenced by the production system, or by factors within it. Using this approach systems would be evaluated by food quality assessment as well as by agronomic and economic parameters (IOR)
- Effect of high forage diet on milk composition (Cormack & Keatinge, ADAS)
- Relationship between intake of organic food and health of humans and animals (IOR)

European projects
Ongoing work with relevance to the above mentioned topics in AT, DK, FI, CH

9 Processing and storage

Post harvest biology

- Fumigation of premises and machinery without using methyl bromide (Hassett, Billingtons)
- Alternatives to chlorine-based products for washing fruit and vegetables (Hassett, Billingtons)
- Assess economic feasibility of various methods of improving shelf life of organic produce, eg by high CO2 or vacuum packing (Haines, NRI)
- Health of seed potatoes and ware crops (Watson, SAC)
- Develop alternatives to organophosphate insecticides for use in grain stores (Haines, NRI)

MAFF funded projects
OF0156 Shelf life of organic vegetables (01/06/98 - 31/05/01. Cost: £67k)
OF0176 Integrated grain storage - technology transfer for organic farming (01/04/99 - 31/03/01. Cost: £34k)

Processing

- Marketing and processing for small horticultural producers (Roger Hitchings, OAS Organic Horticulture Advisor)
- Co-ordinated approach to processing needs within a region (e.g. Wales), linked to conventional processing plants (John Davies, NFU Wales; Carol Ferguson, farmer) also to permit development of direct marketing initiatives (Garnons-Williams, farmer)

European projects
Ongoing work with relevance to the above mentioned topics in AT, DK, FI, CH

10 Marketing

Public attitudes

- Understanding consumer motivation to buy 'animal-friendly' and organic products at a premium; relationship between food allergies and decision to buy organic (Makatouni & Harper, Reading University)
- Role of food scares in boosting organic sales: what will happen if there are no more food scares, or there is a scare due to a contaminant in organic food? (Haines, NRI)

Marketing infrastructure

- Effect on the organic industry of its fragmented supply base, with mainly small and medium enterprises; effect of the fragmentation of the certification bodies (Haines, NRI); development of a single Welsh Organic Certification Authority to co-operate with existing organisations (John Davies, NFU Wales; Tom Latter, farmer)
- How to involve livestock markets in developing the marketing process (Martin, Livestock Auctioneers Association)
- Integration of upland and lowland organic livestock production; stratification of production and marketing of organic livestock (Frost, ADAS)
- Integration of producers and supermarkets (McMaster, Ulster Farmers Union)
- Comparison of marketing strategies, e.g. retail, wholesale, box schemes, internet, processing, farmers' markets. This could be done by questionnaires, interviews and case studies (IOR)

Regional and local marketing

- Identify crop varieties and livestock breeds to be developed as leading branded regional organic products (Frost, ADAS)
- Develop markets for regional products; develop public sector markets on a regional basis, including for example schools and hospitals (IOR)
- Continued development of local marketing initiatives, e.g. box schemes and farmers' markets (IOR; Mike Carpenter, farmer), particularly for livestock (Philipps & Pearce, EFRC); Development of co-operative marketing of Welsh organic produce (John Thomas, farmer); also supply and added value (Bob Jeffries, Triodos Bank; Laure Barrington, Soil Association)
- Develop market for organic wool (IOR)
- Marketing strategies to ensure Welsh prominence in the marketplace (Laure Barrington, Soil Association)

European projects
Ongoing work with relevance to the above mentioned topics in FI, DE, SE, CH
EU funded research project on Organic Marketing Initiatives and Rural Development (OMIaRD, 01/01/01-31/12/03)

11 Economics and rural development

Farm-level economics

- Development of economically sustainable models (John Davies, NFU Wales) and optimal size and enterprise mix to provide employment and reasonable return (Garnons-Williams, farmer);

demonstrate importance of diversification and provide inspiration for survival (Laure Barrington, Soil Association)
- Financial costs of converting different farm types (Bob Jeffries, Triodos Bank) and level of support needed to encourage conversion (Hilary Miller, CCW)
- Financial monitoring and modelling of conversion, especially arable and horticulture (Cormack & Keatinge, ADAS)
- Continued monitoring of holdings to assess profitability and model responses to changes in prices and subsidies (IOR)
- Economics of various organic production sytems (Bob Jeffries, Triodos Bank)
- Economic analysis of different fertility management methods; partial budget and gross margin analysis for different farming systems (Haines, NRI)
- Systematic collection of price information to monitor trends (IOR)
- Labour for organic farms - availability, training, feasibility of an organic job centre or labour pool (Anne Evans, Grower)

MAFF funded projects
OFO125/OFO190, OFO155 Economics of Organic Farming: Economic Modelling (01/07/96 - 30/06/00. Cost: £109k)
OF0159Conversion to Organic Production software (COP) (01/09/99 - 30/11/00. Cost: £79k)
OF0155 Factors affecting profitability of organic farms (01/10/98 - 28/02/99. Cost: £24k)
SERAD funded projects
SAC/262/00 Maintaining a competitive position in the Scottish organic fresh food market 1/04/2000 - 31/03/ 2003)
European projects
Ongoing work with relevance to the above mentioned topics in AT, FI, FR, DE, IT, NO, SE, CH

General support to farmers
- Ways of establishing new entrants/part-time farming activities or community supported agriculture schemes (Bob Jeffries, Triodos Bank)
- The development of an economic support mechanism through supply contracts which relate to both price and volume of product in preference to the current conversion aid (Tom Latter, farmer)

Rural community development
- Community-supported agriculture: methods and benefits to rural communities (O'Kane, UWA); benefits of local organic production/processing (Bob Jeffries, Triodos Bank; Laure Barrington, Soil Association)
- Role of organic farming in rural development (Cormack & Keatinge, ADAS)
- Socio-economic and macroeconomic studies to evaluate costs and benefits of organic farming systems within local and regional context (IOR)

European projects
EU funded project on Organic Marketing Initiatives and Rural Development (OMIaRD, 01/01/01-31/12/03)

12 Policy
- How is organic sector going to broaden its appeal, what is role of non-economic factors in conversion to organic farming? (Haines, NRI)
- Effect of organic production and organic food consumption on local and national government spending (Laure Barrington, Soil Association)

Agri-environment schemes
- Tailoring of Organic Farming Scheme and certification costs to situation of small producers, and assistance identifying local suppliers of feeds, straw etc. (Ian & Una Goddard, farmers)
- Is farming for biodiversity using environmental grants and the organic option a real economic alternative to conventional agriculture (Tim Bevan, National Botanic Garden)
- Identify additional costs incurred by agri-environmental schemes in the context of organic production (Hilary Miller, CCW)

- Review relationship and possible conflicts between organic farming and other agri-environment schemes (Cormack & Keatinge, ADAS; Frost, ADAS) and respective information packs to better co-ordinate/advise farmers (Sally Brown, Pembs NP)
- Monitoring of environmental effects of the Organic Farming Schemes (Danny Ardeshir, ADAS)
- To what extent will subsidies in the organic farming sector promote sustainable farming practices, and what factors will influence this? (Haines, NRI)
- Impact of economic pressures to maximise organic production, in particular through land improvement (Hilary Miller, CCW)
- Develop combined environmental and organic schemes for common land and hill farming communities (Frost, ADAS)

SERAD funded project
ERM001/97 Review of the organic farming sector in Scotland and evaluation of the organic aid scheme (1/12/97-29/02/00)
European projects
EU funded project on organic Farming and the CAP (completed in October 2000)

13 Environment

General impact

- Greenhouse gas emissions from organic systems (Ball, SAC; Watson, SAC)
- Does development of organic matter in the soil have a significant value in terms of carbon sequestration? (IOR)
- Environmental impact of organic diets for ruminants (Cormack & Keatinge, ADAS)
- Identify and quantify environmental benefits; what are main benefits of organic farming and how can they be maximized? (Cormack & Keatinge, ADAS; Haines, NRI; IOR)
- Need to consider systemic aspects of organic farming, such as the closing of the nutrient and carbon cycles involving the consumer, e.g. the integration of waste treatment processes into organic production (Morris & Oreszczyn, OU); organic farming should be as sustainable as possible, and aim to meet as many of society's needs as possible, e.g. fibre and energy production (Tom Latter, farmer)
- Life-cycle assessments of supplementary nutrients permitted by organic standards; development of more scientific basis for selection of materials, and consideration of resource-miles (Watson, SAC)

SERAD funded project
SAC/022/90 Environmental benefits and disbenefits of organic farming system (1/04/90-31/03/95)

Biodiversity and habitats

- Farmland birds (Watson, SAC); especially uplands (Frost, ADAS); comparison of bird populations on organic and conventional farms, contrasting upland and lowland examples (i.e. extending existing BTO, RSPB work to western/upland context) (Hilary Miller, CCW)
- Impacts of crop rotations in organic farming on valuable habitats (Danny Ardeshir, ADAS)
- Effect of organic systems on semi-natural and semi-improved habitats (Emyr Williams, Snowdonia NPA), in particular impacts of soil fertility improvement by slot-seeding clover (Hilary Miller, CCW)
- Guidelines/advice on conversion of common land and fast-track conversion of semi-natural habitats (Sally Brown, Pembs NP)
- Regimes to enhance biodiversity on grassland farms (Tim Bevan, National Botanic Garden)
- Assessment of potential for "grazing rings" to promote both appropriate grazing and organic conversion of conservation sites (Sally Brown, Pembs NP)
- Refinement of farm conservation planning methodology with respect to e.g. organic stocking rates (Hilary Miller, CCW)

MAFF funded projects
OF 0165 Factors influencing biodiversity within organic and conventional systems of arable farming (01/01/99 - 31/03/03. MAFF Cost: £376k, Non-MAFF Cost: £37k)
European projects
Ongoing work with relevance to the above mentioned topics in AT, DK, DE, FI, NL, NO, SE, CH

Farming and the landscape

- Evaluate the impact of organic systems on recreation and access, particularly "green tourism" opportunities, through the potential to market farm-based holidays and the development of integrated walking or other recreational opportunities (Hilary Miller, CCW). (NB The Mynydd y Ffynnon project is starting to examine this issue)
- Landscape benefits of organic farming; extensification versus releasing land from agriculture (Watson, SAC; IOR)
- Investigation into the impacts of organic farming on the conservation of habitats, species and landscapes specifically in the context of regional farming systems (e.g. in Wales) with focus on farms supported under other agri-environmental schemes (Hilary Miller, CCW)
- Landscape impacts of year round production of organic lamb and beef to meet market demand (Hilary Miller, CCW)

European projects
Ongoing work with relevance to the above mentioned topics in AT, DK, DE, FI, CH, NL, SE
EU concerted action on landscape and nature production of organic types of agriculture in the EU