

RESEARCH TOPIC REVIEW: Advisory Tools for Use in Organic Farming

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Scope and Objective of the Research Topic Review

- to identify relevant research and development,
- identify the tools developed,
- draw on farm and advisory experience of using advisory tools,
- summarise the tools available for advisors with a brief description of the tool and its use.

1. Environment

Energy use, Carbon and emissions auditing

There are a wide range of tools available for reviewing energy use, carbon and emissions.

1.1.1 Energy audit

CALU produced an energy audit which is mainly directed towards farmers. It aims to help farmers reduce their energy use and signposts them to people which can advise them further.

It allows the user to conduct a farm energy audit by answering very simple questions and helps them identify key elements of energy costs. In addition it helps prioritise cost-effective options that can reduce business costs and carbon emissions.

It is downloadable free of charge from the CALU website:

<http://www.calu.bangor.ac.uk/Technical%20leaflets/Energyauditmanual.pdf>

1.1.2 Carbon Accounting for Land Managers (CALM)

CALM is a web-based greenhouse gas calculator for farmers and land managers. It has been produced by the Country Land and Business Association (CLA) working closely with Savills, supported by the East of England Development Agency (EEDA) and with additional support from the Crown Estate.

It measures the emissions and carbon sequestration and that arise from a land management business. Measurements include both direct emissions of farm activities (e.g. livestock emissions) and indirect emissions (e.g. feed and fertiliser inputs). Furthermore, it calculates the carbon balance.

It aims to identify areas within the business where it is possible to reduce emissions or improve carbon sequestration and offers guidance on what practical steps can be taken. It is possible to save data, enabling the user to track progress annually and recalculate their carbon balance if and when farming systems change.

The calculator is available online. It is possible to download a report with results <http://calm.circlesquared.com/> or http://www.cla.org.uk/Policy_Work/CALM_Calculator/

1.1.3 **SAVEFuel and Refuel**

These are two pieces of Software are being developed by SAC. The software aims to help farmers and growers lower their energy bills, reduce their carbon footprint and identify opportunities for the generation of renewable energy on their farms.

SAVEFuel quantifies existing farm energy use and compares it with benchmarks and targets. Potential savings are identified and ranked by cost/benefit with an outline plan for implementation. REFuel assesses the potential for on-farm production of renewable energy, looking at options for producing energy from renewable sources such as wind, hydro, solar heat, photovoltaics, energy crops and animal wastes. SAVEFuel will in future become available for farmers and growers but REFuel will only be available to SAC advisors.

1.1.4 **MEASURES model**

The Ammonia emission module MEASURES (Multiple Environmental from Agricultural Systems) was developed by Rothamsted Research (BBSRC) and Silsoe Research Institute (BBSRC). It aims to help farmers and other stakeholders achieve multiple environmental objectives in a cost-effective way, and to demonstrate the impact on the environment of current farming practice and alternative approaches.

The model has been improved within the following project: 'Quantifying uncertainty in the MEASURES framework.'

http://www.defra.gov.uk/science/project_data/DocumentLibrary/ES0107/ES0107_3638_FRP.doc

1.1.5 **Other current research projects and reviews:**

Energy and Emissions Benchmarking

The Organic Research Centre (Elm farm) has developed a comprehensive whole farm benchmarking tool (EASI) specifically developed for advisers working with Organic Farming. Uniquely it provides analysis and recommendations on embodied and direct energy use and emissions, sequestration, energy generation and impact of changes on farm biodiversity. Further details available from mark@organicadvice.org.uk

Nitrogen and methane emissions

A study of the scope for the application of research in animal genomics and breeding to reduce nitrogen and methane emissions from livestock based food chains was conducted by Genesis Faraday Partnership for DEFRA in 2007 and 2008. It assessed breeding and genetics tools and on ability to reduce nitrogen and methane emissions from livestock systems.

The report should be available soon.

Ref.

http://www2.defra.gov.uk/research/project_data/More.asp?I=AC0204&SCOPE=0&M=PSA&V=EP%3A030A

Another study which is being conducted for DEFRA by the Centre of Ecology and Hydrology aims to predict future emissions as affected by changes in agricultural activity and practice. It further aims to develop and assess local strategies to protect SSSIs and other sites of conservation interest. *The update should be available in April 2008.*

Ref.

http://www2.defra.gov.uk/research/project_data/More.asp?I=AC0109&SCOPE=0&M=PSA&V=EP%3A030A

Ammonia emissions

A DEFRA funded project was commissioned to revise and update the inventory of ammonia emissions from UK agriculture, for 2005 and 2006. *The update should be available in April 2008.*

Ref.

http://www2.defra.gov.uk/research/project_data/More.asp?I=AC0102&SCOPE=0&M=PSA&V=EP%3A030A

Another DEFRA funded project was commissioned to assess the effectiveness of ammonia mitigation strategies being employed on commercial farms and to provide data for ammonia loss models being developed under separate projects. A number of models are evaluated.

It concluded that there were very large differences between models used in the estimates of total emission from two study farms, giving ranges of 3379 – 7099 and 9298 – 30336 kg NH₃ per year for the dairy and pig farms, respectively. They concluded that further research should aim at producing robust, process-based models for predicting farm-specific whole farm NH₃ emissions and reported that a number of additional parameters should be included.

Ref.

<http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=9636>

1.1.6 Additional information

Environmental audit:

Envirowise conduct FastTrack environmental audits. FastTrack visits are on-site waste reviews. Small to medium sized enterprise (SME) can apply for a free and confidential FastTrack environmental audit. The audit aims to help businesses be more efficient and save money. An application form will ask for information needed to approve your request for a visit. This includes some financial information, current waste levels and the name of your waste minimisation champion. More information is available from 0800 585794, or

www.envirowise.gov.uk/envirowisev3.nsf/key/FTVisitRequest

FREE assistance to reduce packaging design wastDesigntrack offers a free confidential site visit by a specialist design consultant that focuses on reducing the whole life environmental impact of a specific product. For more information contact the Environment and Energy Helpline on 0800 585794.

Environmental management

This section includes environmental benchmarking tools and energy use measurement tools.

1.1.7 Energy efficiency and energy generation on farm - a guide

The guide addresses a number of aspects related to energy efficiency on farm and energy generation on farm. It aims to point farmers and advisors in the right direction for the substantial resource of

technical and financial support available. It provides details for organisations providing funding, advice and information.

Further information and a download of the guide can be found at:

http://www.calu.bangor.ac.uk/energybk_en.pdf

1.1.8 Environmental Management for Agriculture (EMA)

The (EMA) is a computer software package that provides a comprehensive set of tools, information and assessment routines designed to help the farming industry improve its environmental performance.

EMA has been developed by the Agriculture and the Environment Research Unit (AERU) at the University of Hertfordshire. Its development has been funded by the Department of Food and Rural Affairs (DEFRA), Scottish Executive Rural Affairs Department (SEERAD), the Milk Development Council (MDC) and the Horticultural Development Council (HDC).

It aims to help develop a more sustainable agriculture. It includes an environmental auditing system that provides feedback on performance and also decision support tools and a number of management planning tools. The audit covers the following areas: fertilizer and livestock wastes, pesticides, soil sustainability, livestock management, fruit husbandry and energy efficiency, water efficiency and conservation.

The audit is freely available from the following website

http://sitem.herts.ac.uk/aeru/ema/home/ema_audit.htm

1.1.9 LEAF audit

The LEAF Audit is suggested to help farmers assess their whole farm business performance and environmental health check. The tool has the form of an questionnaire. It provides the farmer the opportunity to benchmark themselves against other LEAF farmers and signposts farmers to organisations which can help them with particular issues, and also signposts them to information resources.

To access the LEAF audit you have to subscribe. The tool is available from:

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

1.1.10 Fit4future web-based tool

The Fit for the future tool was developed by Sue Fowler at Organic Centre Wales (OCW). The tool is directed at farmers and aims to help farmers think about whether they and their farm are 'Fit for the Future'? The tool has the form of an online quiz. It provides the farmer the with to opportunity to benchmark themselves against other farmers. It also signposts farmers to organisation which can help them with particular issues, and to information resources publicly available.

The Fit for the future tool covers a wide range of topics such as environmental management but it also addresses social issues, cooperation, animal health and welfare and other areas.

The tool is free available from: <http://www.fit4future.org.uk/>

1.1.11 Other current research projects and reviews:

Direct energy use in agriculture: opportunities for reducing fossil fuel inputs. The aim of this DEFRA funded project was to quantify direct energy use in agriculture providing a breakdown by sector and fuel type and to recommend technologies that offer the best opportunities for reducing the current dependence of the agricultural sector on fossil fuels.

The report should be available soon.

Ref.

http://www2.defra.gov.uk/research/project_data/More.asp?I=AC0401&SCOPE=0&M=PSA&V=EP%3A030A

Farm level environmental indicators. The aim of this international project was to critically assess current experiences with Input/Output Accounting systems. This report provides an overview of the strengths and weaknesses of a wide range of IOA systems in a number of European countries. British systems assessed include Environmental Management for Agriculture, Assured Produce, Tesco Natures Choice, Ncycle Model, Nitrate Sensitive Areas Scheme, MANNER and others.

One of the conclusions was that there seems to be a potential for the development of the use of IOA systems to facilitate voluntary improvement in environmental performance on topics that are not already strongly regulated by mandatory regulation.

Ref. <http://ec.europa.eu/environment/agriculture/pdf/inputoutput.pdf>

Environmental Life-Cycle Assessment. The aim of this DEFRA funded project is to further development and deliver the Defra Life-Cycle Inventory and a Life Cycle Assessment. *The report should be available end 2009.*

Ref.

http://www2.defra.gov.uk/research/project_data/More.asp?I=IS0222&SCOPE=0&M=PSA&V=EP%3A030A

Quality and Environmental Benchmarking. The aim of this DEFRA funded project was to identify farm-system quality benchmarks that provide output-based indicators of the overall efficiency of the organic farming system that can be readily used by the farmer or adviser to guide management and resource use. *The report should be available soon.*

Ref.

http://www2.defra.gov.uk/research/Project_data/More.asp?I=OF0348&M=KW&V=Q&Lvl=3&Cat1=13546&Cat2=13953&Cat3=13975&Cat4=&Cat5=

1.1.12 Additional information

Envirowise support businesses to reduce energy, water and waste providing free waste audits and information to SMEs. Call the helpline 0800 585794.

<http://www.envirowise.gov.uk/page.aspx?o=166083>

See also www.est.org.uk for details of alternative energy production for farmers including wind turbines and solar technology.

FEC Services Ltd is one of the UK consultancies providing advice on the application of energy based techniques in business. For more information please see <http://www.fecservices.co.uk/>

Water

There are a number of tools available to help farmers and advisors reduce the water used in agriculture.

1.1.13 Water wise on the farm

The Guide is part of a series of free water efficiency publications from the Environment Agency. It helps farmers and land manager identify their water use, explains how to develop a water management plan and outlines a number of water efficiency measures.

The guide is available free of charge from the following website http://www.environment-agency.gov.uk/commondata/acrobat/waterwise_2006_1407627.pdf

1.1.14 Water audit toolkit

In 2006, a scoping study carried out by ADAS the potential impact of the EU Water Framework Directive was identified as a reason why growers may have to provide greater justification for water abstraction in the future. Based on the findings from this previous Defra Funded study, a Water audit toolkit focussing on the provision of practical advice to farmers and growers was produced.

A PDF version of the advice booklet “Irrigation Best Practice: A Water Management Toolkit for Field Crop Growers” and all the CD toolkit files can be accessed via the UK Irrigation Association website at <http://www.ukia.org/defra.htm>

1.1.15 Soil Association Water Management plan

The Soil Association has developed draft Standards for Water Management in a project funded by WWF and includes all aspects of water management: Soil Water, Surface Water, Biodiversity, Pollution, Abstraction, Re-use, Irrigation, Washing, Processing and Stock watering. The Standards and associated Water Management Plan procedure is not published but does inform the development of the SA water management guidelines.

1.1.15 Other current research projects and reviews

Environmental Footprint and Sustainability of Horticulture. The aim of this DEFRA funded project was to improve understanding of the environmental effects of horticulture and its relationship with the social and economic impact of the horticultural industry and to compare the results with other agriculture sectors.

The report demonstrates environmental footprints for twelve commodities on a per hectare, per year basis and look at a range of sustainability indicators (ecological footprint, toxicity and quantity of pesticides used, global warming potential, eutrophication and acidification potential, water, labour).

Ref. http://randd.defra.gov.uk/Document.aspx?Document=WQ0101_6747_FRP.doc

Water use in Agriculture. This DEFRA funded study aims to establish the extent of water use in agriculture and horticulture.

It concludes that distribution of irrigation use corresponds with the areas of high insolation and least summer rainfall. It estimates the total on-farm use of abstracted water to be in excess of 300 million cubic metres a year. It suggests that of this irrigation water, 75 M m³ is used on the potato crop, and a further 34 M m³ on field vegetables.

Ref.

http://www.defra.gov.uk/science/project_data/DocumentLibrary/WU0102/WU0102_4274_FRP.doc

1.1.16 Additional information

Envirowise support businesses to reduce water including guidance for the Food and Drink industry on how to minimise water waste. Call the helpline 0800 585794 for more information or visit: <http://www.envirowise.gov.uk/page.aspx?o=117553>

Farm Waste Management plan. Organic Farmers and Growers have produced a control manual for dealing with farm waste.

<http://www.organicfarmers.org.uk/licensees/controlmanual/pdf/%20CM%206%20Records%20-%20Producers/RS10.pdf>

Farm biodiversity and conservation plan. Organic Farmers and Growers have produced a control manual for setting up a conservation plan.

<http://www.organicfarmers.org.uk/licensees/controlmanual/pdf/%20CM%206%20Records%20-%20Producers/RS%20%201.pdf>

Business management and planning (including conversion planning)

Conversion planning

Conversion to organic farming involves many aspects of the farm business including identifying suitable crop rotations, stocking, soil and manure management and a consideration of the capital requirements and potential profitability. Conversion planning can help farmers to assess the technical and financial feasibility of the conversion.

1.1.17 Orgplan

OrgPlan/EMAPlan is a computer programme for farmers and advisors supporting whole farm planning, particularly of organic conversion to organic farming and changes to organic management. It was developed and tested by Institute of Rural Studies and Elm Farm Research Centre through a series of DEFRA funded projects. ([OF0159](#), [OF0331](#), etc).

The program allows the evaluation of a planning scenario over several years in terms of financial and technical feasibility under management, allowing the farmer to make an informed choice about conversion on a specific farm. Based on field sizes and stock numbers of a particular farm, it supports the planning of a crop rotation and cropping plan, and calculates a whole farm gross margin, forage and farm gate nutrient budget using the standard OrgPlan database. By entering further farm specific data or modifying the standard assumptions detailed cash flow and profit and loss forecast over several years can be produced.

OrgPlan/EMAPlan consists of two parts:

1) **EMAPlan:** The planning module was released as part of the EMA 2004 software. The EMA software is available FREE to everyone who purchases a subscription to the EMA Online Library programme, which can be purchased from <http://www.adlib.ac.uk/adlib/signup.asp>

2) **OrgPlan 2007 database:** This contains data from the *Organic Farm Management Handbook* and other sources for a number of organic, in-conversion and conventional data.

An update for the OrgPlan data based on the 2007 edition of the *Organic Farm Management Handbook* is available for £20 from Organic Centre Wales. Please email: orgplan@aber.ac.uk

Other research projects and reviews

The EU project '*Overcoming barriers to conversion to organic farming in the European Union through markets for conversion products*' addresses a number of constraints and opportunities of conversion to organic production.

The results are available from:

http://ec.europa.eu/research/agriculture/projects/qirt_1999_31112_en.htm

And a few case studies used to illustrate these issues are available from:

http://orgprints.org/8442/01/grey_Conversion_farm_case_studies.pdf

And:

[A multi-country case study of the process of conversion to organic farming in the EU](#)

A DEFRA funded research project looked specifically at all aspects involved in conversion from conventional to organic dairy production.

The aim of the research was to monitor the physical, environmental and financial implications of conversion to organic milk production on a research farm and ten commercial farms in southwest England and Wales, in order to provide policy makers and farmers with more information about the consequences of conversion.

Results are available from <http://orgprints.org/6789/>

A DEFRA funded research project looked at conversion to organic field vegetable production.

The aim of the research was to collect and evaluate agronomic and economic data from farms undergoing conversion to organic field vegetable production. As part of this process, eleven farms were monitored.

Results are available from <http://orgprints.org/9915/> and <http://orgprints.org/8301/>

1.1.18 Additional information

Organic Centre Wales annually collects financial data as part of a benchmarking project. This provides organic producers with information on financial issues and gross margins. For more information please look at www.organic.aber.ac.uk. The results are included in the *Organic Farm Management Handbook* mentioned earlier. This handbook is available for £20 from Organic Centre Wales. Please email: orgplan@aber.ac.uk

Crop planning

Crop planning includes: developing crop rotations, planning acquiring seed, propagating and acquiring machinery appropriate for crop production.

1.1.19 NDICEA

The program NDICEA nitrogen planner presents an integrated assessment on the question of nitrogen availability for your crops. It claims to be more than a simple nitrogen budgeting for each crop: crop demand on one side, and expected availability out of artificial fertilizers and manures, crop residues, green manures and soil on the other side. <http://www.ndicea.nl/indexen.php>

1.1.20 Other current research projects and reviews

Designing crop rotation. In this publication by the German Saxonian Research institute an overview is provided on pre crop effects. http://orgprints.org/10469/01/FRUCHTFE_Englisch.pdf

Impact of global warming on organic production. In this research publication by Topp, C F E, Doyle C D, the impact of global warming on milk and forage production are simulated. They address both the effects on dry matter yield of grass and grass/white clover swards *and* the effects on milk yields and grazing management of dairy herds. Results can be obtained in *Agricultural Systems* 52, 213-270.

A DEFRA funded project looked at planning organic dairy systems. The main objective of the project was to gain better understanding of the production characteristics of dairy cows under organic management.

It provides lactation curves, information on milk yield characteristics of organic cows and information about the effect of organic management on the production of cows with different genetic potential. Based on the results a herd simulation model was developed that characterises production profiles in organic dairy herds. More information is available from www2.defra.gov.uk/research/Project_data/projects.asp?M=KWS&V=Milk

Soils

Soil Nutrient Budgeting.

1.1.21 Crop Recommendations

The industry standard is: 'Fertiliser Recommendations for Agricultural and Horticultural Crops,' (RB209) published on behalf of DEFRA by The Stationery Office (ISBN 0112430589).

1.1.22 PLANET

A software development of this is PLANET (Planning Land Applications of Nutrients for Efficiency and the environment). It aims to provide farmers and advisers with a convenient way of obtaining RB209 recommendations for arable, horticultural or grassland crops in each field, each year, taking account of the crop nutrient requirement as well as the nutrients supplied from organic manures, soil and fertilisers.

It allows the user to develop a nutrient and manure application plan for a group of fields covering the use of nitrogen (N), phosphate (P₂O₅), potash (K₂O), magnesium (as MgO), sulphur (as SO₃), sodium (as Na₂O) and lime. The plan can be modified during the season and actual applications recorded. Field histories and recommendations can be printed off.

Version 2 of the PLANET standalone software is currently under development and is expected to be ready for release in 2008. Version 2 will contain the following additional calculation modules and improvements:

Organic Manures Inventory and Storage Requirements – calculation of monthly quantities and nutrient content of slurries, solids and dirty water on a farm. Calculation of the minimum slurry storage requirement as required for compliance with the proposed NVZ Action Programme measures. Organic Manure Storage Capacity – calculation of the storage capacity of existing slurry and solids stores based on store dimensions. Whole-Farm Livestock Manure N Loading – calculation of the current whole-farm loading as required for compliance with the proposed NVZ Action Programme measures.

It is available free of charge with full information on www.planet4farmers.co.uk or by phoning ADAS on 08456 023864.

PLANET is relatively easy to use but can be time-consuming to enter field and crop data. However last year's field records together with other information are used to generate next years RB209 recommendations. It is a valuable tool for larger, cropping and conventional farms. The current version has not generated wide use on organic grassland farms. The new version with additional modules will be more useful.

Nitrogen Budgeting

1.1.23 NDICEA

This computer model calculates nitrogen availability for the crop. It has been developed, tested and used during more than ten years by the [Louis Bolk Instituut](http://www.louisbolk.nl), Netherlands. It is more than simple nitrogen budgeting for each crop but balances crop demand with expected nitrogen availability of manures, crop residues, green manures and soil. It calculates:

- The release of nitrogen as a result of the mineralization of the different types of organic matter in the soil is calculated, depending on soil type, temperature and rainfall,
- Losses due to leaching and denitrification are calculated,
- During the growing season, the resulting net available nitrogen is compared with the crop demand in time steps of one week.

Further information and a software download can be found at: <http://www.ndicea.nl/indexen.php>

The software is easy to use but a detailed evaluation of the program used under UK conditions on organic farms has not been carried out.

Other research projects and reviews

1.1.24 Whole Farm Nutrient Budget

A report presented at the UK Organic Research 2002 Conference. (pp. 153-156) looked at whole-farm budgets for N, P and K for the organic dairy farm at Trawsgoed in mid-Wales. The data was used to assess the potential value of budgets as a management tool for optimising nutrient use.

It was concluded that whilst most of the information needed is available on commercial farms an important limitation is the difficulty of estimating N fixation and that insufficient information is available for use in managing nutrient flows on a field scale.

Ref. <http://orgprints.org/8387/>

1.1.25 'Fertility Building Crops' model

This has been developed in Scotland as a planning tool to provide organic farmers with information about how much nitrogen will be available in the soil at different stages following the ley phase of the rotation. It predicts the likely crop yields under this level of nitrogen supply and provides an estimate of how much nitrogen will be lost by leaching and denitrification so that if necessary the grower can examine the effects of modifying the rotation to improve the efficiency of nitrogen use and minimize losses.

It is claimed that the model is easy to use and requires only the sort of information that is readily available to commercial growers.

Although it appears to provide realistic simulations of a range of crop rotations and conditions, it has not yet been fully validated.

Ref. <http://orgprints.org/10249>

1.1.26 Phosphorus and Potassium management.

The aim of this DEFRA funded project was to assist in the formulation of improved advisory guidelines for organic farming systems based on a sound understanding of the dynamics of P and K.

It was concluded that the complex interactions between nutrient cycles in organic farming systems means that the process based simulation model of P and K turnover was necessarily very simplified. The data collected in this project was not long-term enough to allow a full evaluation of all the factors which influence P and K off take, particularly the impact of crop establishment and management practices.

Ref.

<http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=9066>

Currently Org Plan offers the only readily-available whole farm nutrient balance budgeting tool.

Further information is available in the following IOTA PACA Res Research Reviews:

- (1) Nutrient budgeting,
- (2) Chemical soil analysis and soil mineral management,
- (3) Role, analysis and management of soil life and organic matter in soil health, crop nutrition and productivity.

Manure Management

The aim of manure management is to plan the spreading of manures to make optimum use of nutrients they contain and to minimise pollution.

1.1.27 Templates

Plans in template form are available from DEFRA:

http://www.defra.gov.uk/corporate/regulat/forms/agri_env/nvz/manureplan.pdf

or from the Welsh Assembly Govt:

http://new.wales.gov.uk/topics/environmentcountryside/farmingandcountryside/farming/agri_env_schemes/tircynnalscheme/manuremanagementplan/?lang=en

IOTA has developed a draft Manure Management Plan template for organic farming, contact mark@organicadvice.org.uk for further details.

1.1.28 MANNER

A decision support system that can be used to accurately predict the fertiliser nitrogen value of organic manures on a field specific basis. Is MANNER. This software can be used either:

- in advance of applying manure to check the likely effect of a spreading policy, or
- to assess the actual fertiliser N value of a spread manure using manure application details and weather data.

Full information is available on <http://www.adas.co.uk/manner/frameset.html>

MANNER is available free on disk or CD-Rom. Tel ADAS on 08456 023864.

MANNER is easy and quick to use and a valuable tool for both farmers and consultants.

1.1.29 Other Information

In addition to nitrogen, organic manures are valuable sources of other major plant nutrients (phosphate, potash, magnesium and sulphur) and organic matter. Further guidance is given in the following leaflet:

Managing Livestock Manures Booklet 4: Managing Manure on Organic Farms.

Available free of charge from ADAS Gleadthorpe Research Centre (tel: 01623 844 331).

There is a section on using manures and slurries in www.gardenorganic.org.uk

Soil Management Plan

Farmers and Growers must complete a simple farm level review of soil management as part of cross-compliance obligations using a format and guidance provided by DEFRA or WAG.

More detailed Soil Management Plans need to be completed for Entry Level (ELS) and Organic Entry Level (OELS) of the Environmental Stewardship scheme.

1.1.30 Templates

Templates are available from:

<http://www.defra.gov.uk/erdp/pdfs/es/guidance/es-soil-management-plan.pdf>

Similarly under the Welsh Assembly Tir Cynal environment scheme applicants also need to complete a plan. Details are available on:

http://new.wales.gov.uk/topics/environmentcountryside/farmingandcountryside/farming/agri_env_schemes/tircynnalscheme/soilnutrientmanagementplan/?lang=en

2. ANIMAL HUSBANDRY

There is a wide choice of software tools available from commercial companies developed to help conventional farms and rural businesses to effectively manage their business records. Some are orientated to organic farming eg.

www.bordersoftware.com/FarmIT

and most can be adapted for use on organic farms. Some examples are given below:

www.farmplan.co.uk

www.livestockdatasystems.co.uk

www.shearwell.co.uk

www.agridata.co.uk

The range is designed to help users meet legislative, cross compliance and performance management requirements. It is beyond the scope of this review to compare the range of software available.

Health Planning

It is a requirement to have a Health Plan in place to satisfy Organic Standards and other Farm Assurance requirements. It lays out preventive husbandry strategies and is an invaluable management tool.

A good article on the importance of health and welfare planning is available on the SAC website:

www.sac.ac.uk/mainrep/pdfs/animalorganicplans.pdf

Guides to developing Health Plans on organic livestock units are normally available from the Certification Body or from Farm Assurance bodies e.g: Soil Association provides Health Plan guidance notes to applicants, OF&G provides technical notes and a Health Plan record sheet available on: http://www.organicfarmers.org.uk/licensees/farmersandgrowers/technical_leaflets/index.php

http://www.fabbl.co.uk/templates/template_5_animal_health_plan.doc

The second edition of the Compendium of Animal Health and Welfare in organic Farming is due to be soon launched on www.organicvet.co.uk/

It is an invaluable and user friendly source of information on the description of the majority of farm animal disease and their treatment under organic management.

NADIS is disease surveillance and forecasting scheme which also provides technical information. Not specifically organic but making moves to link up with the Compendium of Animal Health to provide organic specific management advice.

www.nadis.org.uk

The new Farm Health Planning project is a free web-based initiative aimed at dairy farms, launched by Holstein UK, CIS and the CDI in association with Defra. This CIS Health Plan template records health and disease incidence and provides a pro active approach to health management of livestock.

www.thecis.co.uk

Other Sources of Information

The Welsh Assembly Government has produced an “Animal Health Plan.”

Hovi, Malla and Vaarst, Mette, Eds. (2002) Positive health: preventive measures and alternative strategies (5th NAHWOA Workshop). Proceedings of NAHWOA: Network for Animal Health and Welfare in Organic Agriculture, Røddinge, Denmark, 11-13 November 2001. <http://www.veeru.reading.ac.uk/organic/proc/FinalProceedingsDenmark.pdf> or www.orgprints.org/877

M. Hovi, A. Sundrum. (2002) Discussion report: Health planning and management in organic livestock systems www.orgprints.org/877

MacNaoidhe F.S. (2002) *Pasture management and composition as a means of minimizing mineral disorders in organic livestock* www.orgprints.org/877

D. Gray, M. Hovi (2002) *Animal health plans for organic farms: the UK experience* www.orgprints.org/877

M. Vaarst, E. Noe, T.B. Nissen, T. Stjernholm, C. Sørensen, P.S. Enemark, S.M. Thamsborg, T.W. Bennedsgaard, T. Kristensen, H.J. Andersen, C. Enevoldsen (2002) *Development of health advisory service in Danish organic dairy herds - presentation of an action research project* www.orgprints.org/877

2.1.1 Parasite Control

Grazing Management. Grazing management should be based on a consideration of animal risk and pasture contamination. The strategy should aim to provide clean pasture for susceptible animals and should involve grazing of susceptible animals together alternately with immune animals of the same species or with other host species.

Ref: Strategies for parasite control The 5th NAHWOA Workshop, Reading, 11-13, November, 2001

Cattle. An attempt to control nematode infections in the first grazing season has been made in the Netherlands by developing a flow chart based on intended grazing management. It is designed to produce optimal recommendations on the safe side of risk.

Strategies for internal parasite control in organic cattle. M. Eysker. Ref: <http://www.veeru.reading.ac.uk/organic/proc/FinalProceedingsDenmark.pdf>

The main problem using the flow chart on organic farms is that most recommendations imply prophylactic anthelmintic treatments. The flow chart should highlight possible bottlenecks in nematode control and, when feasible, suggest ways of coping with these. Flow charts can be a practical aid to parasite management but do not include factors like breeding, feeding, stocking rates, pasture biodiversity. This paper discusses strategies and is a useful reference but it is not an advisory tool.

Sheep. To help farmers in the control of parasites in lamb production, diagnostic data sheets for typical management strategies have been produced. These are presented with recommendations on how to manage the system in order to avoid losses from parasite infections.

Ref: Parasitism in organic sheep farming Bouilholand Mage reported in above workshop.

It is suggested that despite the use of the above, routine faecal egg counting would still be necessary.

Faecal Egg Counting. Faecal Egg Counting (FEC) is a diagnostic technique, which calculates the number of internal parasite eggs per gram (EPG) of faeces. A strong relationship exists between the number of eggs per gram and the parasite status of the animal tested. and fine tuning your grazing management. A study at the University of Aberdeen (www.abdn.ac.uk/organic/organic_15e.php) concluded:-

The [FECPAK](#) provides a straightforward and user-friendly method for the farmer to monitor roundworm infestations in his/her stock. This provides the farmer with a useful additional tool for managing stock health and gaining a better understanding of the peaks and cycles of nematode infestations.

In practice, faecal sampling and testing takes time particularly as duplicates (of mob samples) give better accuracy of egg counts, and frequency of sampling provides a trend, important for assistance with decision-making. The farm user must therefore accept the idea of faecal monitoring as a routine job, the speed of which will improve with practice.

As [FECPAK](#) has been developed and tested in New Zealand, there is a need for further information relevant to the use of [FECPAK](#) under UK conditions. The prevalence of different roundworm species in different regions of the UK and the significance of the low egg counts of different species in comparison to their infestation could usefully be addressed to further develop our understanding of roundworms and their effects. It would also be useful to have UK cost/benefit data in order to promote the system in an objective manner.

The Soil Association Technical guide on roundworms in organic sheep is a comprehensive outline of management options in organic husbandry

2.1.2 Lameness, Mastitis, Fertility

Farmers use a variety of tools and recording systems for the incidence of disease, fertility and mastitis. It is beyond the scope of this review to compare the variety of recording packages and systems available. Some very effective computerised systems do exist, such as InterherdTM, which can provide detailed information on a number of herd measures, including mastitis. These rely on the farmer subscription to a recording programme such as the National Milk recording scheme which provides management information on individual cow's performance in terms of milk parameters, including individual cow cell counts, yield and fertility.

A simple and effective tool is **Body Condition Scoring** - a management technique that can be used routinely by farmers and stockmen to assess the body reserves of individual cows

Ref. www.defra.gov.uk/animalh/welfare/farmed/cattle/booklets/pb6492.pdf

2.1.3 Benchmarking

Specialists at the Scottish Agriculture Colleges have developed several benchmarking formats for cattle and sheep designed to be filled in from farmers' records. The figures provide comparative data for the farm enterprise against targets and suggest advice for improving current performance.

These include:

- Suckler herd fertility and calving pattern,
- Suckler herd age structure and reasons for culling,
- Scanning to sale/retention benchmarking for sheep enterprises,
- Losses at lambing.

Welfare benchmarking and herd health plans on organic dairy farm was studied by the Duchy College Organic Studies Centre. The main focus was on the identification of strengths and weaknesses using a benchmarking league table of organic farms and how improvements could be made.

Whilst the approach proved valuable, a number of participants suggested that breed, calving pattern, herd size, housing and other system differences made benchmarking between farms less useful than it might at first appear. Instead they considered that year on year within farm comparison was the more useful measure to determine where progress had been made.

<http://orgprints.org/10776/>

A welfare assessment system has been developed in Denmark for commercial organic egg production based on indicators of behaviour, health and management. This advisory tool uses flock health indicators including variations in live weight, mortality, food and water consumption and autopsies. as well as stress indicators such as feather pecking and cannibalism.

It is not known how widely it has been adopted in Denmark although the basis of this advisory tool should be applicable to UK organic production.

<http://orgprints.org/5724/>

2.1.4 Vaccination Strategy

Although this will feature as part of the Health Plan risk assessment for vaccine use and immunisation policies is often difficult at farm level. While each farm situation is unique and the local veterinary knowledge is invaluable in determining vaccination needs on an individual farm, it may be useful to have additional support in taking vaccine use decisions and in making such decisions transparent to the certification bodies and the consumers. The Scottish Agricultural College and the University of Reading have designed an electronic, web-based decision support tool **DeSTVAC**– a decision support tool for vaccine use on cattle and sheep farms

Ref. <http://www.veeru.reading.ac.uk/organic/proc/FinalProceedingsDenmark.pdf>-
<http://www.sac.ac.uk/consultancy/veterinary/services/organiclivestock/>

DeSTVAC is aimed at both veterinarians and farmers and can be used:

- To help vets and farmers to come to considered decisions on vaccine use in sheep flocks and cattle herds in regard to 24 different diseases;
- To make decisions on vaccine use more transparent (both for the farmer and the organic certification bodies), based on consideration of farm specific risk factors and potential risk management measures;

- To analyse current farm situation in terms of absence or presence of risk factors for a particular disease;
- To assist in deciding what level of protection is already in place and in planning what further measures to implement in order to reduce the risk of a particular disease on a farm;
- To produce and print out reports that detail the steps that have been taken to control disease risk on a farm and to highlight the remaining risks. This report can then be used as part of the farm's health plan to justify either use or non-use of vaccines.

Feed Rationing

2.1.5 Software Packages

There are several commercial software packages used widely in the UK for conventional livestock rationing. They are used mostly for dairy cow rations and for least cost formulation of pig and poultry diets. Typical examples are:

www.rumnut.com

www.ultramix.co.uk

www.sac.ac.uk/consultancy/livestock/dairyservices

www.dietcheck.co.uk

They can be used for organic rations as the user can input the analysis of home grown forage and add to the data base to include organic concentrates.

A problem with using such rationing software for organic livestock is that the animal's requirements are from conventional production and usually take no account of breed, stocking and pasture biodiversity. They are valuable in evaluating nutrient balance in housed livestock and especially pigs, poultry and higher producing dairy herds.

2.1.6 Grazing

The above software is not easy to use in a grazing situation where grass supply is variable. Grass height using a ruler or sward stick has long been used as a basis for assessing grass availability. Measuring the height of existing forage is an easy method but is less reliable because it does not take stand density into account. A more accurate method uses a falling plate meter which measures the height of forage while it is depressed with a weighted plate. Plate meters are available for purchase but instructions for making a home made one is available on the web.

Software developed in New Zealand uses information on grass supply and predicted growth for grazing rotation planning and feed budgeting. The system is a simulation program that takes the input variables of a rotationally grazed grassland farm and dynamically the results by matching paddocks to preset grazing policies.

Ref: - <http://www.grazingrotation.co.nz/>

This program has potential for use by in organic milk production for spring calving herds using little concentrate feed. However it needs adapting and developing for use under UK conditions.

Feed/Forage Analyses

Fundamental to the planning of balanced rations is knowledge of the nutrient content of home grown forage.

Testing is available from independent consultants and is usually offered as a service by the feed supplier.

There are also several independent laboratories in the UK which offer this service. It is important that the testing laboratory is a member of the Forage Analytical Assurance Group. FAA is the quality control governing body for the laboratories that analyse forages in the UK.

Further information on <http://www.faagroup.co.uk>

The website lists all the members. Examples of independent laboratories are:-

NRM Ltd, Coopers Bridge, Braziers Lane, Bracknell, Berks, RG42 6NS.
Tel. 01344 886338

Eurofins Laboratories Ltd. Woodthorne, Wergs Rd. Wolverhampton WV6 8TQ Tel. 01902 743222
info@eurofins.co.uk

Bioparametrics Ltd., Peter Wilson Building, West Mains Rd., Edinburgh EH9 3JG.

Sciantec Analytical Services Ltd, Stockbridge Technology Centre, Cawood, Selby, North Yorkshire, YO8 3TZ

The above laboratories offer a full range of analytical services including soil, mineral, trace element, water and manure analyses.