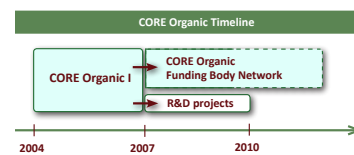


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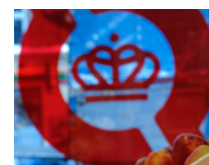
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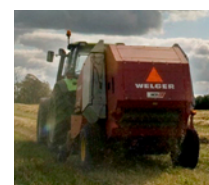
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CORE Organic ERA-net proposal is formulated

By Niels Halberg, Director of ICROFS

Proposal for a second CORE Organic ERA-NET has been formulated, a FAO side event in Rome has raised the profile of organic agriculture and TP Organics wants you to take part in the Strategic Research Agenda.

This issue of *ICROFS news* has more articles than usual. The reason is the lucky situation that many scientists have been very willing to disseminate their research. This is of course fortunate for ICROFS and for our readers, and thus we hope for a continued future interest.

Towards efficient and lasting collaboration: Funding Body Network

The partners of the CORE Organic ERA-NET formed the CORE Organic "Funding Body Network" in 2007 in order to monitor and evaluate the eight CORE Organic pilot projects, to broaden the collaboration and to pursue efforts towards a long-term collaboration in organic research.

Since then, the Funding Body Network has continued to work towards these objectives, with the monitoring of pilot projects, the development of a strategy and the further enlargement of the network to 22 partners, with some additional countries considering joining.

In 2008-2009, the 22 countries have formulated a proposal for a second CORE Organic ERA-NET under the 7th Framework Programme, with the aim to carry out a second phase of transnational calls to give momen-

tum to a flow of transnational calls and projects in the long term, and to develop a framework for a strategic research agenda securing the long-term collaboration.

See the timeline illustration below and visit the ICROFS webpage:

www.icrofs.org/coreorganic



FAO side event raised the profile of organic agriculture in Rome

A collective effort at the UN headquarters, Rome, successfully raised the profile of organic agriculture.

Supported by the Danish Ministry of Agriculture, ICROFS arranged a "side-event" on organic agriculture, climate change and environment in FAO, Rome. ICROFS planned the event together with IFOAM and FAO, the UN Food and Agriculture Organisation.

The side-event was held on April 22nd occasioned by a meeting in the FAO Committee on Agriculture, COAG in Rome.

After the side-event, COAG met to discuss future approaches on agriculture. On April 25, COAG adopted its Report, and under the agenda item on agriculture and the environment, the Report mentions organics twice.

At the COAG meeting, the committee stressed that:

"an ecosystem approach be adopted in agricultural management in order to achieve sustainable agriculture, including integrated pest manage-

Your input to *ICROFS news*

ICROFS listen to our readers's response with pleasure, as we are here for you! Therefore, any responses are more than welcome, be it about the new format, suggestions to improvements, changes, content and more.

Contact us at: simon.rebsdorf@icrofs.org

ment, organic agriculture and other traditional and indigenous coping strategies that promote agroecosystem diversification and soil carbon sequestration.

Several Committee members noted the need for capacity building in new approaches and incentives to producers. The Committee endorsed the proposal that public and private investments be made in agroecological research, at both national and international levels."

[COAG/2009/REP para. 4]

Find more information and all the presentations on the ICROFS webpage.

Can you handle the media?

ICROFS would like to know if researchers reading *ICROFS news* and the Danish counterpart, *ICROFS nyt*, need a course on media handling and collaboration.



Once in a while certain research results find their way to the daily news media. Yet sometimes the sources of information – the researcher/expert – feels misquoted or misunderstood in the news stories.

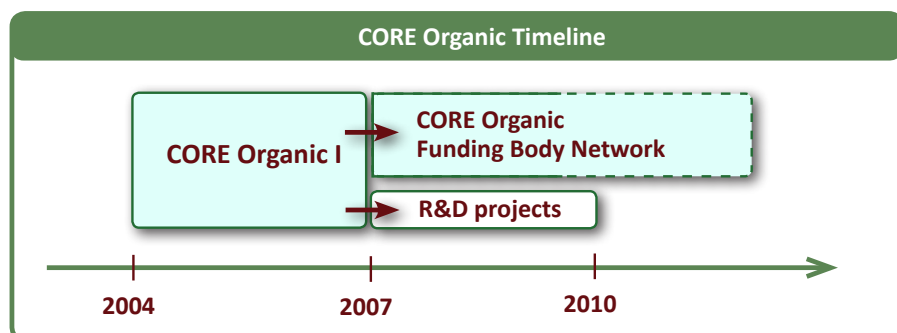
Understanding the professional conditions and the news criteria of journalism might pave the way for a better and more fruitful collaboration with the speedy news media.

ICROFS collaborates with the press in an ongoing effort of improving communication between research and the media. Through coordination of research in many earlier and current research programs.

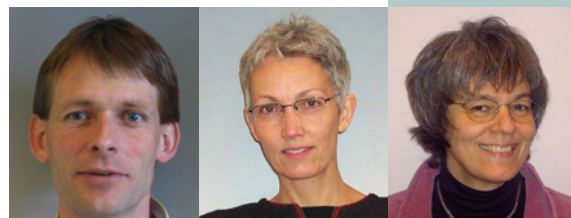
With this, the ICROFS Secretariat requests your opinion on the idea of taking a course for researchers on media collaboration and handling.

Interested? If you are interested in participating, or if you have any ideas in connection with a course on media handling, please e-mail ICROFS:

Simon.Rebsdorf@icrofs.org.



Nitrogen management on large organic dairy farms



By Jørgen Eriksen, Margrethe Askegaard, and Karen Søegaard, Department of Agroecology and Environment, University of Aarhus, Tjele, Denmark

Further reading

You can read more on the website of the DARCOF III research project, OrgGrass:

www.orggrass.elr.dk/uk

Large dairy herds need much grassland near the farm. Utilisation and losses of nitrogen in such grass-intensive crop rotations can be controlled by management.

In grassland, grazing days or fertiliser input can be reduced, and following grassland cultivation, a barley whole crop for silage undersown with Italian ryegrass can reduce leaching to a minimum.

Historically, a large part of organic milk has been produced on smaller farms with maximum integration of animal husbandry and plant production through grazing of the entire crop rotation. An increased proportion of grass-clover in combination with an ongoing structural development in the size of dairy farms lead to

high grassland frequencies near the farms as uniform grazing of all cropped land becomes inexpedient due to long distance to the milking facilities.

Focus on management strategies

This development has got implications. A concentration of grazed grassland near the farm creates loss of fertility furthest from the farm and accumulation of nutrients near the farm, to an extent that may increase losses of e.g. nitrogen if not efficiently utilized. This is especially important in areas with sandy soils and

high winter rainfall where a large proportion of organic dairy farms are located in Denmark. However, a longer duration of grasslands may also provide an opportunity to control nutrient losses due to less frequent grassland cultivation.

The theme of an ongoing ICROFS project is grass-clover leys as an integrated part of organic dairy farms. The focus is on management strategies with the purpose of overcoming the above-stipulated shortcomings by manipulating grassland frequency and grazing intensity.

Two crop rotations

Two crop rotations have been established on loamy sand soil in an existing organic grass-arable sy-

stem at Research Centre Foulum: One represents close to the farm buildings (barley/grass-clover, 4 years of grass-clover and barley whole crop/catch crop) and another represents further away (barley/grass-clover, 2 years of grass-clover, barley/catch crop, maize/catch crop and lupin/catch crop). In all grass-clover leys five grassland treatments have been made varying in nutrient load and grassland management (table).

Nitrate leaching

Two years of data shows that nitrate leaching (figure) in the crop rotation close to the farm was mainly in the grasslands. In both crop rotations the barley wholecrop undersown with Italian ryegrass was very efficient in accumulating N following spring ploughed grassland and therefore leaching losses at this place in the crop rotations were at a very low level. Distant from the farm leaching losses following maize and lupin were considerable, despite both crops were followed by a catch crop. Maize was undersown with a ryegrass/winter rape mixture and lupin was followed by winter rye. Nitrate losses in grasslands depended on both grazing and manure treatment. Highest leaching was found following the grazing regime with manure application, and a drop was observed when avoiding the manure application. Also a drop was observed when removing spring cut before start of grazing. In cut grassland manure application did not influence nitrate leaching.

- 1 Grazing (heifers) regime with cattle manure application in spring, 100 kg total-N/ha
- 2 Grazing regime without manure application
- 3 Spring cut followed by grazing. Cattle manure application in spring, 100 kg total-N/ha
- 4 Cutting with cattle manure appl. (200 kg total-N/ha, ½ in spring and ½ after spring cut)
- 5 Cutting regime without manure application

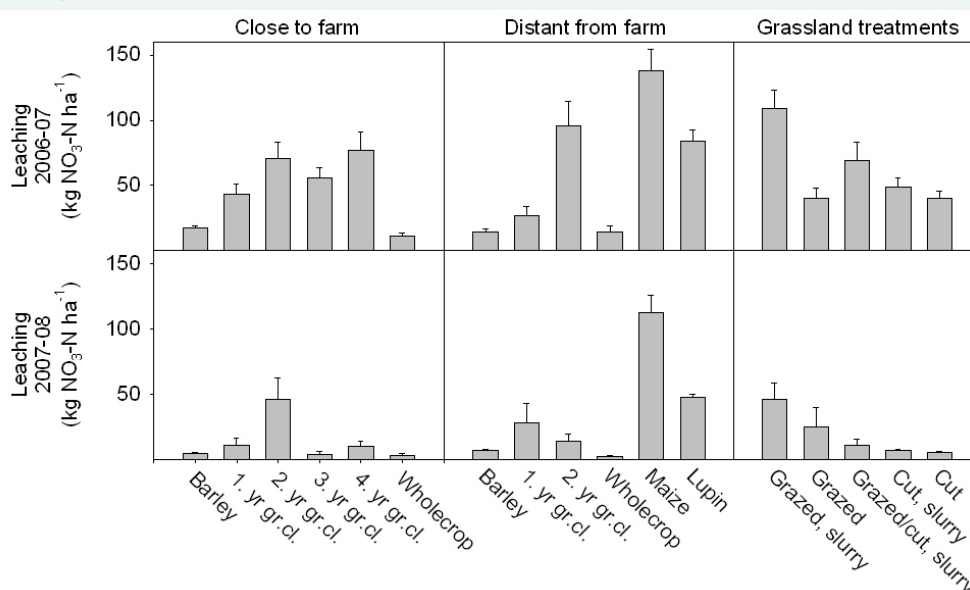


Table above: Grassland management treatments. Figure below: Annual nitrate leaching in two winters (2006/07 and 2007/08). Left and center: Individual crops in the two crop rotations, average of grassland regimes. Right: Grassland regimes, average of grassland age and crop rotation. Error bars: \pm SE.

Organic labelling systems and consumer confidence



By Carsten Daugbjerg, Professor, and Kim Mannemar Sønderkov, Assistant Professor, Department of Political Science, University of Aarhus, Denmark

A research analysis suggests that a state certification and labelling system creates confidence in organic labelling systems and consequently green consumerism. Danish consumers have higher levels of confidence in the labelling system than consumers in countries where the state plays a minor role in labelling and certification.

Organic consumption is an example of the way in which the market can be used to contribute to greening production and consumption.

Green consumption is often associated with higher consumer prices and therefore consumers must have trust in producers when they claim that a good is produced in an environmentally friendly way. Unless the transaction between the producer and consumer is face-to-face and the production methods are transparent for the consumer, green

consumption requires an institutional set-up which can guarantee to consumers that producers are complying with certain environmental production standards. The organic food sectors provides valuable experiences from which governments may benefit when designing green certification and labelling systems.

Four investigated countries

In 2008, we undertook a survey on consumer confidence in organic labelling systems in four countries: the United

States, United Kingdom, Sweden and Denmark. These countries were selected with care because they operate different certification and labelling systems.

The US certification and labelling system relies on private certifiers, but these must be accredited by the US Department of Agriculture. By March 2005 56 domestic and 41 foreign certifiers were accredited and 64 had applied for accreditation.

In the UK, the state also sets the organic standards

and leaves certification and labelling to private bodies. The Soil Association is by far the most important certification body in the UK, certifying over 80% of all organic food being sold in the UK.

In Sweden organic certification and labelling is delegated to the private association KRAV which is state accredited. Organic farmers are not required to be KRAV certified to receive government subsidies for organic farming but to market produce as organic through commercial sales channels KRAV certification is needed.

Finally, in Denmark, the state operates the certification and labelling system (the Ø-label). The state label is the sole national organic label and only state-certified farms are allowed to market organically labelled products and receive state support.

State and private labels are trusted differently

A key question is thus whether the institutional set-up of certification and labelling systems influences consumer confidence. Do consumers have more confidence in a state operated system, like the Danish system, compared to various systems operated by private bodies?

Further reading

You can read more on the website of the DARCOF III research project, COP:

www.cop.elr.dk/uk

ICROFS is involved in the EU project CERTCOST on improving the organic food certification system in Europe:

www.certcost.org



| | "You can trust that products marketed as organic actually are organic in the majority of the cases" | |
|----------------|---|-----------------------------------|
| Country | Completely or partly agree (%) | Completely or partly disagree (%) |
| United States | 54.4 | 22.4 |
| United Kingdom | 54.4 | 20.4 |
| Sweden | 58.4 | 21.6 |
| Denmark | 81.6 | 10.0 |
| N = 3,858 | | |

Table: The share is significantly higher/lower in Denmark compared to the other countries in both columns ($P < 0.001$). No significant differences is found between the other countries ($0.37 < P \leq 1.00$). Source: COP survey.

The table above sheds light on this issue. Column 1 shows the share in each country who fully or partly agrees that products marketed as organic actually are organic (on a 5 point scale). Column 2 reports the share who completely or partly disagrees in the statement.

Clearly, the Danes have higher levels of confidence in the labelling system. 4 out of 5 Danes express confidence while the shares in the other countries are less than 3 out of 5. Likewise, the share expressing low confidence is 10% in Denmark while it is about twice as high in the other countries.

Reasons for higher Danish trust in organic labels

This finding triggers a new question: can a state certification and labelling system successfully be applied elsewhere?

To answer this question we need to establish what explains this difference? Does a state certification and labelling system by itself produce more consumer confidence than privately operated system, or do other factors explain the difference?

Possible explanations

Several factors other than the labelling system could potentially contribute to explain this difference. It could be, for example, that Danes are more gullible,

optimistic or trusting than citizens in the other countries.

Several studies show that Danes are among the most trusting people in the world, having high levels of trust in other people and, more importantly, in institutions like the courts and the government. This may have

a significant effect on the comparatively high level of confidence in the Danish organic state label.

General trust in institutions

Our survey confirms that Danes indeed have high levels of trust in institutions in general and that this

contributes to explaining confidence in the labelling system. Therefore, the high confidence in the Danish labelling system is not just an effect of the existence of a state labelling system, but also an effect of a high level of confidence in government institutions.

Nevertheless, our analysis shows that Danes still have an extraordinary high level of confidence in the labelling system after taking their level of general institutional trust into account—as well as other factors that might explain trust in the labelling system (e.g. environmental values, income, and level of education).

This means that state certification and labelling by itself have an impact on consumer confidence, but not as significant as a first glance at the above table might lead one to think.

Hence, whether state certification and labelling can be successfully applied universally is ambiguous. Our analysis suggests that a state certification and labelling system raises consumer confidence and thus creates green consumerism. On the other hand, the analysis also shows that this effect will be much greater if the model is applied in countries where the citizens trust the institutions in general.



Photo: Organic Denmark

Organic farmers can gain from Green House Gas trade

By Gert Tinggaard Svendsen, Professor,
Department of Political Sciences, University of Aarhus



Farmers may earn money from participating in the ongoing greenhouse gas (GHG) trade system under the Kyoto agreement.

Farmers do not trade greenhouse gases (GHG) under the Kyoto agreement. This is a puzzle as agricultural land use contributes to 12% of global GHG emissions. In Denmark, the GHG contribution is even higher, namely 18%. Thus, while the debate on GHG has mainly focused on the energy, industrial and transportation sectors and household behaviour, there has been limited attention paid to the significant potential to limit GHG emissions in the agricultural sector. The farming sector mainly emits methane and nitrous oxide besides carbon dioxide.

Buyer and seller can earn money from GHG trade

A main flexible mechanism in the Kyoto Protocol is emissions trading. It means that trade of GHG credits can take place between firms in different countries. The ownership of one credit gives the right to emit 1 ton of CO₂ equivalents per year. Once the permit has been used to show compliance in a given year, it will be withdrawn from the market. Every new year means that the permits will be reissued.

The duration of the compliance period has so far been limited to one year in the market to ensure liquidity in the market. The longer the compliance period, the less

liquidity can be expected in the marketplace, which could create uncertainty and higher transaction costs concerning the GHG market price. As long as the credits have not been used to show compliance, they stay in circulation, and all permits are identical no matter what year they have been issued.

A potential for cheap GHG reductions

A German power plant, for example, may buy GHG credits from a Danish farmer if it is cheaper for the latter to reduce GHG than it is for the German firm. Firms will then respond to this price and will reduce or increase their individual GHG emissions until all

their individual marginal reduction costs are equal to the GHG price.

This system means that both buyer and seller can earn money from GHG trade. It has been calculated, that total gains from free GHG trade among countries may reduce the reduction costs by around 40 per cent compared to the situation without trade, because GHG reduction now can take place in the cheapest firm where the 'low-hanging fruits' are.

Maybe a higher potential for organic farmers

There seems to be a huge potential for relatively cheap GHG reductions in agricultural ecosystems. For





The Kyoto agreement

The Kyoto agreement was signed in Japan 1997 and sets an emission ceiling for a group of six greenhouse gases (GHG), namely: carbon dioxide (CO₂); methane (CH₄) and nitrous oxide (N₂O). Also included are three types of chlorofluorocarbons (CFCs), namely: hydrofluorocarbons (HFCs); perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆).

example, the Intergovernmental Panel on Climate Change (IPCC) and others have suggested a range of measures such as improved cropland management (including nutrient management, tillage/residue management and water management), improved grazing land management (e.g. grazing intensity, nutrient management) and the restoration of degraded soils. Also sink enhancement (carbon sequestration), low energy production facilities, biofuels (also for own use) and the minimization of transportation distance are important options.

Research conducted over the last decade also indicates that organic farming production methods may have an even higher potential to reduce GHG emissions than conventional farming.

This difference in emissions is to a large extent caused by the non-use of chemical fertilizers. When emission reduction is measured per hectare, the reduction potential seems very impressive (Fliessbach 2007) estimates that GHG emissions from organic farming systems are 35-37% less per hectare compared to organic

farming, but when emission reduction is measured on the basis of production output, emissions reductions are significantly lower as a result of lower yields in organic farming.

Nevertheless organic farming still has significant potential for GHG emissions in the arable sector, while the potential is more modest in the livestock sector and negative for vegetables (Halberg 2008).

Furthermore, based upon Danish data Dalgaard et al. (2002 & 2003) find that the extent to which emissions decrease depends on the way in which livestock production is adjusted to lower crop yields.

If livestock production is upheld at pre-conversion level and fodder is imported to compensate for lower crops yields, the decrease in GHG emissions are significantly lower compared with a situation in which livestock production is adjusted to lower crop yield.

In summary, farmers as a group may gain significant benefits from GHG trade. Politically, the participation of farmers could be one extra important tool for the European Union. As it is, the EU is facing a big challenge

under the Kyoto Protocol in its ambitious efforts to achieve 8% GHG reduction from 1990-2012 and 20% from 1990-2012.

Future challenges

The crucial next step, however, is to further develop and establish adequate monitoring techniques for documenting GHG reductions from farmers. If this challenge can be addressed adequately, the future role of farmers in climate policy may become a hot issue during the next climate

meeting in Copenhagen, Denmark 2009 (COP-15). If so, farmers could then earn money from joining the ongoing GHG trading system. Furthermore, the US would be more likely to rejoin the Kyoto agreement. The US has up till now strongly advocated land-use practices as the missing link in climate negotiations.

Further reading:

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Svendsen, G.T. (2009) 'Why should farmers participate in the EU ETS?' Working paper.



Certified Organic Agriculture: Policy Instrument for Sustainable Development?

By Henrik Egelyng, Ph.D., Senior Project Researcher, Danish Institute for International Studies

Further reading

You can read more on the website of the DARCOF III research project, GlobalOrg: www.globalorg.elr.dk/uk

Certified Organic Agriculture (COA) is conquering the world as a perceived proxy for sustainability. The great challenge is whether it is really transformative. Institutional requirements include green GDPs and societies taxing bads instead of goods. Ignoring these requirements may leave COA as a brand with monetary value, but limited macro level sustainability impact. Research along this line of inquiry is pursued in the DARCOF III-project GLOBALORG.

Certified Organic Agriculture (COA) can be viewed as an institutional vehicle for environmental sustainability and is indeed conquering the world as a perceived proxy for sustainable development. Carrying the organic market, a global movement of environmentally educated consumers and producers use their purses and skills to pursue "fixing" institutional deficiencies in policy regimes at various levels. In terms of progress towards sustainability, the great challenge is whether this social movement can really transform the pattern of incentives governing nationwide choices of agricultural production methods and move agriculture towards a truly macro level environmentally sustainable multifunctional system. If not, COA may end up as a mere brand-name, inviting questions about the extent to which it is really serving sustainability goals.

Institutional requirements for sustainable development include phasing out the long outdated use of the monetary growth indice, Gross Domestic Product (GDP), as indicator of progress. Political systems pursuing a modern metering of overall suc-



cess, use multidimensional indicators of development, such as the green GDP, System of Environmental and Economic Accounting (SEEA), Green Development Index (GDI), and Environmental Sustainability Index (ESI). Similarly, tax ministries wishing to facilitate sustainable development are busy replacing the old fashioned monetary income tax revenue base, with a system of Ecotaxation: taxing energy, use of non-renewable resources and pollution, instead of taxing

labour. In the absence of such "ecological institutions" to govern agriculture at the macro level, COA is likely to remain a concept of limited sustainability value. This article report on how the DARCOF III-project GLOBALORG has pursued this theory based line of inquiry and reflects how GLOBALORG has tried to get the same message across to policy-makers at the international and national level(s).

Measuring Sustainable Agriculture

In the absence of change towards national institutional environments using sustainability indicators to guide and evaluate national policies, COA will continue to face unfair competition from environmental free-riders, who are cost shifting instead of paying the full cost of the resource use and pollution following from their consumption and production. Therefore, an important step is to quantify and document what neoclassical economics refer to as positive and negative "externalities" of agricultural production. We believe a major "milestone" for the development of COA in Europe was achieved when the OECD published a series of statistics documenting the environmental service functions and multifunctional benefits of organic agriculture. Therefore, we deem research using Life Cycle Analysis and similar methods to quantify the environmental footprints of agriculture, as essential for the global future of COA.

Such research, form part of the institutional environment in which agriculture develops along a more or less environmentally sustainable pathway (1).

A huge body of literature identifies potentials for societies to harvest "double dividends", actively through introduction of "economic instruments" such as green taxes. From the point of view of public policy, the challenge is how to design the "magic of the market" to ensure all pipers call the tune of the environment. Policy-makers generally like the worlds nations to be able to benefit from the strengths of market forces, without accompanying costs of blind and unregulated markets running wild and producing only havoc, as it happens where "the market" governs the world, and nobody governs "the market". Now, an increasing number of people is beginning to understand that in order to provide development, instead of merely (positive or negative) monetary growth, markets need a particular framing of incentive structures and enforceable controls, to nurture only the kind of companies and markets that makes consumers and producers part of a pathway of sustainable development. Markets are only as intelligent as public policies make them, and the case of COA is a highly important arena providing crucial lessons of policy learning in this respect. Other ecologically modernizing industries, such as biodegradables or

those (e.g. Photovoltaics) in the renewable energy sector, do the same. In a developing country context one theoretical generalization emerging from our research is that without an active state able to perform certain roles, including capacities to conceive, enforce and implement public policies, a merely “market driven” COA may not be able to distribute environmental and social benefits broadly enough to really serve sustainable development.

AFRICA - the development question

COA has become a new field for international studies (2), representing “Globalisation Options” for the South. Globalisation (with a c) can be defined as a matter of capacity to cope with or benefit from globalisation (3). A global research programme for organic farming has been proposed (4) and is emerging with ISOFAR and initiatives such as the Organic Research Centres Alliance (ORCA).

Meanwhile, global agriculture remains at a crossroad and questions remain on how far/how many societies will draw the full policy implications of agriculture as a multifunctional economic activity (5). Given conducive conditions, COA offers a development pathway and livelihood strategy, not least for Africa (6). A major potential exist for development agencies, including the Danish International Development Assistance and the Danish Commission for Africa, to act through policies, strategies and programmes based on the latest knowledge available.

In addition to publishing peer reviewed articles in international journals and presenting at international (Boston 2006, Montpellier 2007, Modena 2008 and Geneva 2008) as well as national conferences in Odense (2006) and Copenhagen (2007 and 2008), including a workshop “Organic Agriculture for Sustainable Development, GLOBALORG contributed directly to



Drying up Kenyan organic coffee. Photo by the author.

raising multilateral and bilateral donor awareness. For instance, GLOBALORG acted discussant to the World Bank presenting its World Development Report for 2008, at a Conference on Rural Economic Development in Eigtveds Pakhus Copenhagen, in April 2008). GLOBALORG also worked through the IAASTD and through a study pointing to local innovation capacities of smallholders using de facto organic methods (7). As far as bilateral donor awareness is concerned, GLOBALORG presented input to the “Africa Strategy” of the Danish Ministry of foreign affairs, and to the so-called “Danish Development Days”, held in Eigtveds Pakhus, Copenhagen, June 2007, and through broadcasting to the general public (8).

Concluding thoughts

Studied as any other ecological modernization industry, COA is part of the wave of new sunrise industries wrecking “creative destruction” on sundown industries - the prime example being producers of eco-efficient cars displacing conventional producers of gasoline guzzling Chryslers and Hummers. The imperative of mitigating climate change is likely to accelerate the pace by which COA emerge as a new global standard for agriculture. The same imperative, however, may well challenge COA on at least two fronts. The first is to demonstrate in quantitative terms that COA is

indeed eco-efficient, energy efficient and low carbon, - which may prove generally easier in Africa and Brazil than in Europe and the USA. As for the second front, the onus is as much on society at large, to demonstrate a willingness to remove the economic and institutional distortions currently discouraging the majority of farmers from adopting COA.

Ideally speaking, a genuine EcoTax reform represent a policy option to take agriculture even beyond market driven organic certification, into a system of eco-efficient and low carbon agro-ecological production, environmentally and socially sustainable for a region or nation on the whole, rather than a network of patches of micro level “certified” plots, within a sea of mainstream agricultural energy waste and pollution. Global consumers have been able to see and react to the governance

failures, including resource (over)use and pollution of the mainstream food and fibre markets more directly and faster than voters have, partly because there is more of a world market than world governance. Ironically, the successful emergence of global organic agriculture may not be able to transform global agriculture towards sustainability. The current set of rules of the game relying on environmental market labels only result in dispersed farms serving an elite of educated global consumers paying voluntary price premiums. This system de-facto taxes the environmental consciousness of educated individuals, instead of taxing all polluters and resource users. For COA to gain optimum possibilities for contributing to overall national policy goals, EcoTax reform at national and global levels may prove indispensable.

Further reading and references

{}-parentheses refer to Organic Eprints publication

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2. *Organic Agriculture: A New Field of International Development Policy* {12508}
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4. *Towards a Global Research Programme for Organic Farming* {15401}
5. *Options for Enabling Policies and Regulatory Environments* {14752}.
6. *Afrika: Fremtidens Økologiske Kontinent* {14814}.
7. *Supporting local innovation for rural development* {11304}.
8. DR Miljømagasinet, www.diis.dk/sw31249.asp and www.dr.dk/P1/klimaogmiljoe/Udsendelser/2008/04/02083606.htm

No effect of cropping system on the greenhouse gas N_2O



By Mette S. Carter, scientist, Risø National Laboratory for Sustainable Energy, Technical University of Denmark, Roskilde, Denmark; and Ngonidzashe Chirinda, Ph.D. student, Dept. of Agroecology and Environment, University of Aarhus, Tjele, Denmark

Organic farming is comparable to conventional in terms of field emissions of the strong greenhouse gas nitrous oxide (N_2O). Our study points to the need for increased yields in organic farming as measure to reduced emissions per unit of produce.

In general, organic farming is regarded as a production system with low environmental impact but it may not be the case when it comes to emissions of nitrous oxide (N_2O) from organically managed soils.

Nitrous oxide is a strong greenhouse gas, which is produced by bacteria in the soil during periods of high nitrogen (N) availability, for instance following fertilization.

Currently, N_2O emissions from agricultural soils account for about 8 % of the Danish release of greenhouse gases to the atmosphere.

Crop production in organic farming to a large extent

relies on N supply via the long-term decomposition of plant residue, manure and soil organic matter, which needs to be balanced by the crop N demand in order to avoid N_2O losses.

This is in contrast to the targeted short-term fertility management used in conventional farming, where N is introduced with mineral fertilizer when needed for plant growth.

The consequences for the N_2O fluxes of these two very different fertility management strategies have been more or less unclear.

Evaluating N_2O emissions

The objective of this study was to evaluate whether N_2O emissions from crop-

ping systems are affected by:

- 1) organic versus conventional farming practises,
- 2) use of grass-clover ley in the rotation as whole-year green manure and
- 3) use of catch crops.

Nitrous oxide fluxes were measured in winter wheat field plots that belonged to four different long-term crop rotation systems at Research Centre Foulum and Flakkebjerg in Denmark, and monitoring took place every second week from September 2007 to September 2008 using static chambers (Fig. 2).

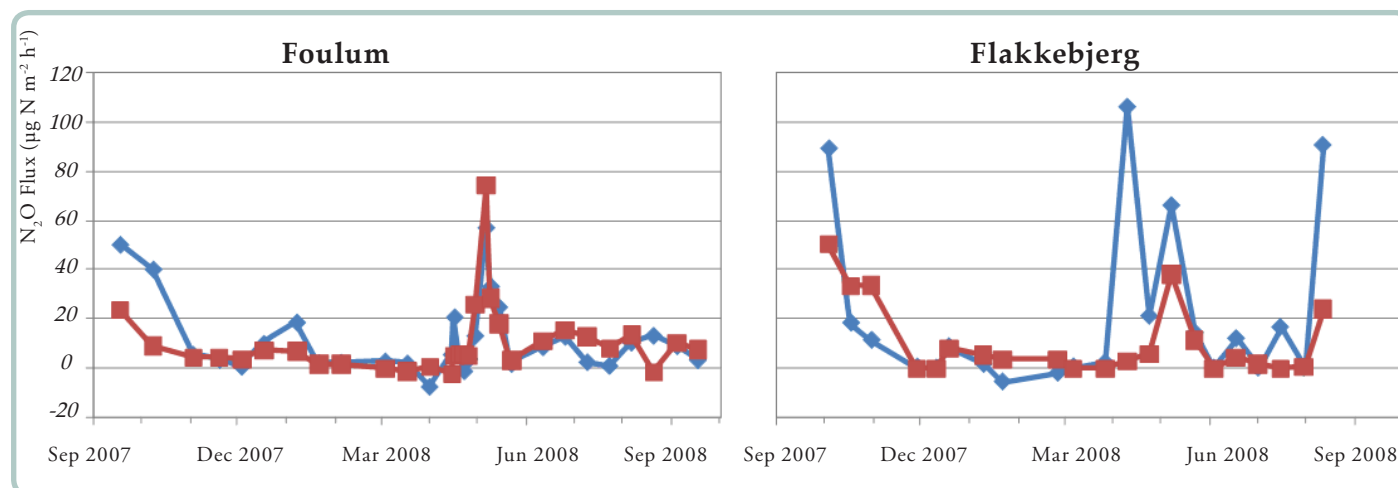
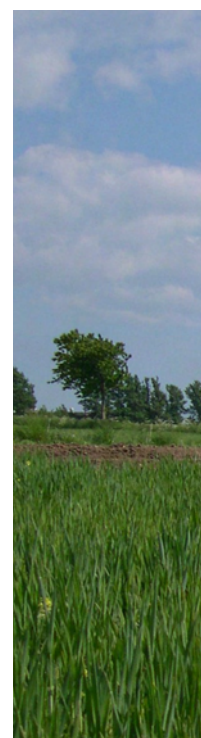


Figure 1: Fluxes of N_2O in organically and conventionally managed winter wheat at Foulum and Flakkebjerg.



Figure 2: Chamber used to measure N_2O fluxes in the winter wheat crop

No long-term effect of grass-clover or catch crops

Grass-clover ley is used as a whole-year green manure in the crop rotation, and thereby provides an alternative source of N through biological nitrogen fixation. However, mineralization of the N-rich residues after ploughing down of the grass-clover ley could lead to increased N_2O emissions from the following crops.

In our study the grass-clover ley was followed by a potato crop in 2006 before the winter wheat crop was sown in 2007. In the winter wheat crop we could not detect any differences in N_2O emissions between cropping systems with and without grass-clover in the rotation. Thus, any potential residual effect of grass-clover on the N_2O fluxes may have

disappeared within the first year after ploughing down of the ley. Neither did the presence of catch crops in the cropping system seem to affect the N_2O losses from the system.

Comparable N_2O emissions from organic and conventional systems

High N_2O emissions occurred in the autumn of 2007 following harvest of the preceding potato crop (Fig. 1). The main source was mineralization of N from potato crop residues and soil organic matter, a process that was probably stimulated by the intensive soil disturbance during harvest.

As seen in many other studies, a peak in the N_2O emission occurred after the fertilization in spring (Fig. 2). The conventionally managed systems received

mineral fertilizer at a rate of 170 kg N per ha, whereas the organic systems were fertilized with pig slurry at about 100 kg N per ha; thus the N supply was 40 % lower in the organic system. At Foulum, the N_2O losses from the organic and conventional systems were similar, but at Flakkebjerg during spring the emissions tended to be higher from the conventional system.

Thus, measured on an area basis the organically and conventionally managed systems gave rise to comparable amounts of N_2O despite the lower N-input to the organic system.

However, at both sites the yield of winter wheat in the organic system was about half of the yield in the conventional system, and therefore the picture changed somewhat when we calculate the N_2O emission

related to crop yield. In this case the N_2O loss associated with the production of 1 tons of organic winter wheat was similar or higher than for the conventional wheat.

No clear effects of management

The crop rotations investigated did not show clear effects of several management options on N_2O emissions, and we therefore recognise that it may be difficult to improve this aspect of sustainability in organic farming systems. However, to reduce the N_2O losses related to crop yield we advise organic farming to aim at increasing crop yields without an increase in the N-input.



Economics, Policy, and Organic Agriculture

By Jan Holm Ingemann, Associate Professor, Aalborg University

In the last couple of decades, several social scientists have claimed that organic agriculture is a phenomenon so special, that special methods and theories are needed to explain the existence and subsequent evolution. It's crucial to examine the claim prior to policy recommendations. In the COP project, we have thus done so from the point of view of economic science.

Is organic agriculture special in an economic sense? The question can be divided into at least two sub-questions concerning agriculture in general and organic agriculture in particular:

- Is *agriculture* special? I.e. does agriculture fundamentally differ from other productive activities in society and hence imply special addressing concerning policies?
- Is *organic* agriculture special? I.e. are there any reasons to expect organic agents (including consumers) to act and react based on different mechanisms than agents related to agriculture in general?

Is agriculture special?

In the history of economic thought the answer has most often been affirmative. The affirmative answer was the key to the evolution of a special branch of economics under the headline "agricultural economics". Roughly speaking, the contributions in agricultural economics until the 1960s underlined two major characteristics:



Photo: Organic Denmark

- Agricultural production is special due to the obvious biological dependencies (including land as a necessary productive factor)

for instance implying a long time-lag between the production decisions and the productive output. This implies a risk of what seems to

be absurd responses to market signals (so-called pervert market reactions).

- Agriculturalists (farmers) are special agents first of all because they consider farming a way of living. The family is attached to the land/the place and the family labor force is rather fixed. This implies that the agriculturists do not react as capitalists aiming at optimizing pecuniary outcome but rather as agents optimizing family welfare.

Hence, focus was on special reactions from farmers (output reactions other than expected from general economics). Policy considerations among theorists were somehow limited; until around 1930 neoclassical economists in general had the same attitude towards social economy as meteorologists towards the weather: you can register how it evolves but you can't do anything to change it. However, the crisis of the early 1930s drew attention to policy considerations connected to crisis management. General macro policy considerations



Photo: Organic Denmark

did then influence agricultural economics and thus economic theoretical analysis of agricultural policy; but these considerations did only address the question of how to construct policies to counteract negative influence from general business cycles.

From the 1960s most economists conceptualized the agricultural problems (farmers realizing themselves in an increasing incomes squeeze) as temporary and caused by protectionism and outdated ways of production in the farming sector. Hence adequate policy would imply more effective (liberalized) markets and/or governmental programs giving incentives to technological innovations and modernization (i.e. industrialization) of farms. In other words, focus was only on the supply side and agricultural policy was subsequently only seen as a question of making supply side able to maximize quantity produced. In this line agricultural policies should be designed to assist farmers in switching to industrial technology and maximize output.

Satiety and the treadmill

However, a few agricultural economists contested the

mainstream analysis and pointed out that demand-side should be included in the analysis too. This inclusion did reveal that the farmers' incomes problems couldn't be seen as temporary only. The argumentation was linked to satiety: In the rich part of the world consumers were unable to eat more; besides, the increase of population was almost zero. Linked to the limits of the human capacity to digest the implication was that effective demand was almost stable. An increase in output would then lead to a dramatic decrease in prices. It was also demonstrated that the provision of subsidies to farmers would increase agricultural output (by means of industrial technology) and hence further decrease market prices. The subsequent social trap was labeled as "the agricultural treadmill".

From these agricultural economists the policy recommendations were the opposite of the mainstream: slow down industrialization of farming and thus the speed of the agricultural treadmill. From such a policy society would benefit due to a decreasing amount of agricultural subsidies and a decreasing depreciation of

environment.

Mainstream and pluralism

Roughly speaking, policy considerations within contemporary agricultural economics consist of two positions:

Mainstream:

Focus on supply side and conceptualizing farmers' incomes squeeze as temporary. Policy means are primarily seen as ways of making farmers more effective and/or making markets work more effective (liberalization).

Pluralistic:

Focus on both supply and demand side and conceptualizing farmers' incomes squeeze in industrial and postindustrial economies as permanent. Policy means are to some degree seen as ways of avoiding pacing the agricultural treadmill and to find alternative ways of agricultural revenue (multi functionality).

Is organic agriculture special?

In an immediate sense the answer is off course affirmative. Organic agriculture implies a certain technology relying more on biological mechanisms - which on the other hand is the original

farming technology! From an economic point of view the question is whether the general lines of function (patterns of reaction among agents, sectoral evolution and development, etc) are special. New research suggests that the organic sector can only be conceptualized and understood in the general social context (time and space). If the organic sector is only analyzed isolated from the context and as something independent of general social context, it will lead to insufficient and in worst case wrong understandings of the sector and thus to inadequate policies.

Further reading

Organic Eprints

[The Global Organic Food Market and Transformation](#)

[The Evolution of Organic Agriculture in Denmark](#)

Internet links

[Economics, Business and Politics website](#)

DARCOF III website

Website for the research project "Comparative Organic Policy (COP):

www.cop.elr.dk/uk

Organisation



TP Organics needs you!

The first draft of a Strategic Research Agenda has been issued by the TP Secretariat.

TP Organics is looking for interested scientists to be part in the strategic research development. This can be done by going to the [TP Organics website](http://TPOrganics.org).

TP Organics is a platform for organic food and farming research which joins the efforts of industry and civil society in defining organic research priorities and defending them vis-à-vis the policy-makers.

The technology platform has an [official website](http://www.tporganics.eu) with information including newsletters, the drafts of the TP Organics' Strategic Research Agenda, the platforms' background, structure, EU members, enterprises, and supporters.

Important: The open electronic consultation will last until May 31st! Give your comments and ideas for future European organic research on the TP Organics website:

www.tporganics.eu.

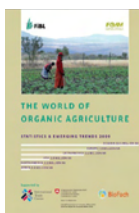
Publications

The world of organic agriculture: Statistics and emerging trends

Helga Willer and Lukas Kilcher from FiBL has edited the annual publication that documents recent developments in global organic agriculture.

The book includes an article by Niels Halberg, Director of ICROFS, and provides comprehensive organic farming statistics that cover surface area under organic management, numbers of farms and specific information about commodities and land use in organic systems. The book also contains information on the global market of the organic sector, the latest developments in organic certification, and insights into current status and emerging trends for organic agriculture by continent.

A summary of this publication is available via the Organic Eprints open access research database (item 15575): www.orgprints.org.



Congresses

NJF seminar: Fostering healthy food systems through organic agriculture - Focus on Nordic-Baltic Region

August 2009

The 422nd seminar of the Nordic Association of Agricultural Scientists is targeted at researchers, policy makers, agrifood businesses, stakeholders and all other interested parties.

The Baltic and Nordic countries share many similarities when it comes to climate and growing conditions; however, they are very different when it comes to markets and structure of agriculture.

At the 422nd seminar of the Nordic Association of Agricultural Scientists, the participants can seek solutions for the challenges the organic food systems face – from farm to fork.

The scientific programme of the conference cover a large range of fields of research involved in organic agriculture, including:

- Soil fertility crop production
- Organic horticulture
- Food quality and health
- Education
- Farming systems/environmental impacts

The seminar is held in Tartu Estonia on August 25-27.

For further information, visit the conference website at:

www.njf.nu



Organic farmers bite back!

17-21 August 2009

[Registration deadline: 31. July, 2009]

In Vaasa, Finland, the XXIII European Society for Rural Sociology congress is held on 17-21 August 2009. The second theme on the conference is concerned with "Re-inventing the rural between the social and the natural." Interested participants can register for the congress at www.esrs2009.fi.



Congresses

International Conference on Organic Agriculture in Scope of Environmental Problems

February 2010

[Early registration deadline: 30. September, 2009]

Invitation and call for papers: The European Mediterranean Conferences Convention invites participants to register for the International Conference on Organic Agriculture in Scope of Environmental Problems.

NGO's from various European countries will participate in the conference as supporters in an event where a large scale of academic people will discuss new trends and advances in today's organic agriculture applications and their effects on other environmental sciences.

The conference is held under the auspices of the local authorities in Famagusta, Cyprus, on 3-7 February 2010. Deadline for early (cheapest) registrations is 30. September 2009.

<http://organic.emccinstitute.org>



Expo – MENOPE: 7th Middle East Natural and Organic Products

7-9. December 2009

The 7th Middle East region's only event for organic and natural products is held on December 7-9, 2009 at Dubai World Trade Centre, Dubai, U.A.E. The event is supported by the International Federation of Organic Agriculture Movements (IFOAM) among other organizations. Interested exhibitors and visitors can find more information about the event at: www.naturalproductme.com.