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## **The contribution of research to the development of organic farming in Europe**

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### **ABSTRACT**

On national as well as on EU level, research funds should be directed substantially towards organic farming in order to improve the economic and ecological performance of organic farming. The impact of research funds is very high in this field of food production, because, as yet, the potential of organic farming has been scarcely tapped by research.

Integrating organic farming research into conventional research structures means disintegrating organic farming itself. Therefore, special attention should be given to how research activities are organised. National or regional centres of competence (hubs) are needed in order to provide and maintain an appropriate quality of research. These hubs can be organised as real or virtual centres.

Evaluation procedures for most national and EU research funds do not consider adequately the unique approach and methodology of organic farming research.

### **INTRODUCTION**

Organic farming research developed in 4 phases: i) Pioneer farmers and scientists, ii) pioneer private research institutes, iii) organic farming chairs at universities and, finally, iv) organic farming projects and institutes at state research institutions (Figure 1). Today, organic agriculture has become fully accepted within agriculture and food research.

Figure 1: Development of organic farming research in a historical perspective



The legacy of the pioneers has lain heavy on organic farming researchers. Both biodynamic and organic approaches implicitly disapproved of conventional researchers, of their concepts, their methods and their priorities. The aspiration to be different on all levels at the same time has made organic farming research a difficult undertaking.

In this paper I would like to concentrate on the following questions:

- How crucial is research for organic farming?
- What approaches are appropriate for organic farming research?
- What are the best ways to organise organic farming research?

## HOW CRUCIAL IS RESEARCH FOR ORGANIC FARMING?

Several recent review papers have dealt with the needs and priorities of research activities in organic farming (Niggli & Willer 2000, Padel 1999, Willer & Zerger 1999, Wynen 1998, Hoesek 1997). Because agricultural research neglected organic farming for decades, presentations of research needs turn out to be long lists of top priority.

Organic farmers face the same problems as conventional farmers. 'Unfortunately', however, organic farming takes a more integrative – and therefore more time consuming – approach to resolving them. Considerably less private-sector research support, such as that provided by pesticide and seed companies, is allocated to organic farming.

Niggli & Lockeretz (1996) evaluated research activities since the 1<sup>st</sup> International Scientific Conference of IFOAM in 1977, the debut of organic farming research. Since 1977, the scarcely funded research activities have improved the performance of organic farming considerably and the progress made in each area can be linked to a single or very few research projects. By extrapolating this excellent input-output ratio one can surmise that research might be the crucial factor driving organic farming quickly and substantially forward. It is pure nonsense to discuss the productivity and economic and ecological performance of organic farming before stimulating its potential by strengthening and reassessing national and EU research activities.

To judge future research priorities properly, the following questions have to be considered:

- What impedes the fast growth of organic conversion – locally, regionally and globally – most? Focus: Production techniques, economic optimisation strategies.
- What could endanger the market success of organic food? Focus: Quality, food safety.

- What is needed for the long-term and sustainable progress of organic farming?  
Focus: Ethics, animal welfare, genetic resources, landscape and biodiversity, social issues.

The research priorities vary considerably from question 1 to 3. Unfortunately, the limited funds have prevented organic farming from seriously working on the issues which guarantee a long term perspective of organic farming.

## **WHAT APPROACHES ARE APPROPRIATE FOR ORGANIC FARMING RESEARCH?**

Lockeretz (2000) proposed to the organic community to use the terms “holistic” and “system approach” extremely sparingly when describing their research activities. He could not find any clear, systematic distinction between research on organic and conventional systems, based on an analysis of 12 volumes of the *American Journal of Alternative Agriculture* and on several conference proceedings of IFOAM. He also missed examples of transdisciplinary or participatory research work where farmers or other stakeholders took part in the study.

How does one optimize a whole system? It is not easy to put holistic approaches into action and to develop appropriate research concepts and methods. Therefore, the procedures in organic farming research do not differ greatly from the common practice in agricultural research: Divide the farm into separate problems, study them, improve them, and put them back into the system. (The "system" may be a crop rotation, a farm unit or a even a whole region.) Finally, look at how the system works under the organic farming requirements. Is the last step all that distinguishes organic from mainstream research?

Disciplinary studies including classical research designs and methods will continue to dominate organic research work. Moreover, a shift from merely descriptive research to experimental analysis of parts of the organic production system is urgently needed to enhance performance. Many of the really big problems of organic farming – such as a number of plant diseases for which only copper or sulphur or in many cases no treatments are possible, numerous plant pests in horticultural crops in Mediterranean countries, internal and external microorganisms, flies and parasites which pester free range animals – can best be resolved by disciplinary research. Therefore, we should abstain from criticizing conventional researchers who become involved in organic farming.

Nevertheless, some methodological standards might be helpful to develop organic farming further:

### **Look at problems and their solutions from different perspectives**

Examples: I) An epidemiological study on a leaf-borne plant disease might arrive at useless results if no interactions with tillage, quality and amount of manure, soil structure, soil microorganism populations, plant density etc. are known. II) Feeding studies with dairy cows looking only into milk yield and quality must consider impacts on

claw or udder health and on the general constitution of the animals as well as possible interactions between the diet and grassland ecology.

To find out how things interact, interdisciplinary projects and interdisciplinary research teams are essential.

### **Use pilot farms at a very early stage of research**

Experimental research work must be placed within the context of pilot farms or must be complemented by on-farm trials at a very early stage. Farm managers should become integrated in the project actively e.g. as research engineer or research adviser. The same goes for other stakeholders of research (veterinarians, processors, nature conservationists etc.).

### **Re-scale continually the focus of research work in the same project**

Many organic research projects suffer from the circumstance that, while they characterise the outcomes of processes, they are unable – both qualitatively and quantitatively – to weigh the causes and interactions among causative factors. This is exemplified by the DOC Trial in Switzerland, which has demonstrated phenomenal differences in soil fertility and plant quality as outcomes of the ‘conventional’, ‘integrated’, ‘organic’ and ‘bio-dynamic’ management systems, but is unable to explain the differences in terms of specific factors. While within conventional research, in contrast, cause-effect relations in sub-systems can be analysed exactly and thus also controlled targetedly, their effects in complex systems nonetheless remain beyond the grasp of the highly specialised researcher. Care therefore needs to be taken in research projects to form project teams able to continually re-scale their focus from microcosms to macrocosms (e.g. cell, plant, field, farm, region, market, policy).

### **Use stakeholder panels**

Working with pilot farms is only one way to practise transdisciplinary or participatory research. Discussing research processes and results among panels is another way to understand what farmers, consumers, nature conservationists, processors etc. expect.

### **Consider and decide on long term impacts**

In the context of organic farming, short term research projects are highly questionable. Misleading conclusions and unexpected side-effects are very frequent in such projects. Similarly, long term impacts on economy, ecology, health and social welfare need to be considered (this point is closely connected to the above-mentioned need to continually re-scale the research focus).

### **Learn to consider frameworks other than scientific ones**

Organic farming and food processing rely not only on natural science, but also operate within individual, social, ethical and philosophical frameworks. Researchers should be enabled to deal with these aspects.

These procedures make research projects expensive and more demanding to manage. Unfortunately, one result of this is that project proposals often do not match the criteria of research funding, especially in the EU frameworks. Without a major change of evaluation procedures, organic farming research will gradually become ‘conventional’.

## **WHAT ARE THE BEST WAYS TO ORGANISE ORGANIC FARMING RESEARCH?**

Further progress in organic farming cannot be obtained by improving or changing 'vertically' single parts of the landscape, the farm or the individual production technique without regard to the horizontal interactions and the fragility of agro-ecological systems. Therefore, organising organic farming research within the currently completely segregated agricultural research structures is not appropriate – indeed, such an approach may even be lethal to organic farming. The prerequisite to strengthening research in this field is to have strong and efficient core structures or schemes (national or regional hubs) which support specialists in complex research programmes. These hubs can be organised as a leading institution, as a permanent forum of researchers or as a strongly facilitating secretariat.

European examples of national schemes for organic farming research:

### **Denmark: Danish Research Centre for Organic Farming (DARCOF)**

Research institute "without walls", research secretariat which co-ordinates projects carried out at conventional research institutes (universities, state centres, private institutes) financed by an R&D programme of the ministry. Board decides on priorities and strategic approach, international peer review of projects.

### **The Netherlands: Louis Bolk Institute guarantees genuine 'organic quality'**

Researchers of the private pioneer institute Louis Bolk are involved as external experts in all organic farming research projects of conventional institutes in Holland in order to ensure an 'organic thinking' in these projects. Some of the projects are carried out directly at Louis Bolk Institute.

### **Switzerland: From FiBL to a wider network for organic farming research**

Most of the research in organic farming in Switzerland has been done at the private pioneer institute FiBL for 28 years. Research projects cover all disciplines. Projects are often multidisciplinary. Extension and advisory work is under the same roof as research. The work of FiBL has been so successful that the federal Research Institute for Agroecology and Farming (focus on arable crops and grassland) FAL will be converted to organic farming and will form a research network with FiBL including projects and researchers at all federal research institutes.

### **United Kingdom: The Colloquium of Organic Researchers (COR)**

A loose platform of committed organic farming researchers from private institutes, universities and state R&D dedicated to discussing methodological issues, co-ordinating the setting of priorities and inducing concerted projects.

### **Germany: Research initiative of organic farming researchers (FiOEL)**

The federal government will launch a very ambitious R&D programme in the years 2002 and 2003 (35 million €) in order to initiate a strong growth of organic farming. To ensure organic farming quality in the research projects a permanent platform of the COR type is planned to establish, run and co-ordinated by a professional secretariat with two scientific staff (project in application).

An international society of organic farming researchers, linked with IFOAM, will probably be proposed at the 14<sup>th</sup> International Scientific IFOAM Conference in Victoria in 2002.

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