

# IFOAM EU Group

*International Federation of Organic Agriculture Movements - EU Regional Group*

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## Future research priorities of Organic Agriculture

Policy paper of the IFOAM EU Group ▪ September 2004

### 1. Introduction

This policy paper presents the main research priorities for organic farming agreed by the IFOAM EU Group. It identifies the main clusters both in a table format and with a more detailed explanation of the individual priorities. The paper was discussed at the board meeting of 13th March 2004, amended by additional input from national farmers' associations and various research institutes from all EU members, revised with a prioritisation exercise at the board meeting of 26th June in Lednice (Czech Rep) and finally was reviewed and approved at the board meeting in Bonn the 3rd September.

### 2. Main priorities

The **high priority** for research given by all the IFOAM-EU Group members is on **organic plant production**, especially the topic on "**soil health and link with plant health in organic and low input farming systems**". The **environmental links** of "**organic farming and the biodiversity**", and the aspects about **quality, health and food security**, regarding "**food processing technology for organic foods in order to support innovation on SME**", also have a high research priority for all the IFOAM-EU Group members.

For the IFOAM EU organisations from old member states another priority is **socio-economic aspects** on the topic "**development of attitudes of relevant societal groups and actors towards to organic farming and the consequences for future actions**". Another further priority on environment aspects is the topic "**organic (and low input) farming and climate change**". Also the main priority in livestock production is especially the topics "**improving husbandry systems which respect to animal welfare**" and "**combining regionality, food origin and organic farming in European agriculture**".

For the IFOAM EU organisations from new EU Member States, a secondary priority is the **environment aspects**, on the topic "**organic and low input farming and nutrient losses and recycling**". Research on plant production is also important particularly "**support and facilitate the innovation in the field of novel pesticides suited for organic farming**".

Other priorities of IFOAM EU organisations from old member states is in the **livestock production aspects**, particularly in the topic "**improving animal health, product quality and performance of organic farming an low input livestock systems by breeding**" and also in socio-economic aspects in the topic "**enhancing the health promoting properties of organic food and optimising its organoleptics quality parameters and food quality – actual dietary behaviour - health and public health costs**". Finally, further research priority from the organisations of the new EU members is the socio-economics aspects,

particularly the topic ***"psychological and sociological attitudes of consumers and different market actors to deal with organic food"***.

**Table 1. General research priorities of IFOAM EU per main clusters and topics (September 2004)**

<b>1. RESEARCH IDEAS ADDRESSING ORGANIC PLANT PRODUCTION</b>	<i>Priority</i>
Soil health and link with plant health in organic and low input farming systems	***
Supporting and facilitating the innovation in the field of novel pesticides suited for organic farming	**
Improving the quality, the ecological, technical and economic performance of organic and low-input crop production systems by breeding	**
Prevention and control of pests and diseases in Mediterranean organic agriculture	**
Co-existence and organic farming	*
Developing efficient and economically sound systems of agro-forestry and permaculture under temperate climate conditions	*
<b>2. RESEARCH IDEAS ADDRESSING LIVESTOCK PRODUCTION</b>	
Improving husbandry systems which respect to animal welfare	***
Improving animal health, product quality and performance of organic and low input livestock systems by breeding	**
Comparing and optimising the immune system, the stress tolerance/stress recovery and problems with zoonoses under different environments and under different production/rearing systems	**
Innovation in the field of alternative or complementary medication/veterinary treatments in organic livestock systems	**
Sustainable organic dairy production free of antibiotics	*
Need for and alternatives to synthetic vitamins in organic animal husbandry	*
<b>3. RESEARCH IDEAS ADDRESSING SOCIO-ECONOMIC TOPICS</b>	
Development of attitudes of different relevant societal groups and actors towards organic agriculture and consequences for future actions	***
Combining “regionality”, food-origin and organic farming in European agriculture	**
Psychological and sociological attitudes of consumers and different market actors in dealing with organic food	**
Socio-economic analysis of different forms of co-operation between farms	**
Organic farming and requirements of the Green Box (WTO)	**
Consolidated data on consumer behaviours with regard to organic food (European consumer panel)	*
<b>4 QUALITY, HEALTH AND FOOD SECURITY</b>	
Food processing technology for organic foods in order to support innovation of SME.	***
Enhancing health promoting properties of organic food and optimising its organoleptic quality parameters.	**
Food quality – actual dietary behaviour – health – public health costs.	**
Reducing costs of different standard setting and certification schemes for organic food.	**
Food security and organic food	*
<b>5 ENVIRONMENT</b>	
Organic/low input farming and biodiversity	***
Organic/low input farming and nutrient losses and recycling	**
Organic/low input farming and climate change	***

(\*\*\*) High priority; (\*\*) Secondary priority; (\*) Third priority

**Table 2. Research priorities of IFOAM-EU for old and new EU members (September 2004)**

<b>1. RESEARCH IDEAS ADDRESSING ORGANIC PLANT PRODUCTION</b>	<i>Old ME</i>	<i>New ME</i>
Soil health and link with plant health in organic and low input farming systems	***	***
Supporting and facilitating the innovation in the field of novel pesticides suited for organic farming	*	**
Improving the quality, the ecological, technical and economic performance of organic and low-input crop production systems by breeding	*	*
Prevention and control of pests and diseases in Mediterranean organic agriculture	**	
Co-existence and organic farming	*	
<b>2. RESEARCH IDEAS ADDRESSING LIVESTOCK PRODUCTION</b>		
Improving husbandry systems which respect to animal welfare	***	**
Improving animal health, product quality and performance of organic and low input livestock systems by breeding	**	**
Comparing and optimising the immune system, the stress tolerance/stress recovery and problems with zoonoses under different environments and under different production/rearing systems	**	*
Innovation in the field of alternative or complementary medication/veterinary treatments in organic livestock systems	**	*
Sustainable organic dairy production free of antibiotics	**	
Need for and alternatives to synthetic vitamins in organic animal husbandry	*	
<b>3. RESEARCH IDEAS ADDRESSING SOCIO-ECONOMIC TOPICS</b>		
Development of attitudes of different relevant societal groups and actors towards organic agriculture and consequences for future actions	***	**
Combining “regionality”, food-origin and organic farming in European agriculture	***	*
Psychological and sociological attitudes of consumers and different market actors in dealing with organic food		***
Socio-economic analysis of different forms of co-operation between farms	**	*
Organic farming and requirements of the Green Box (WTO)	**	*
Consolidated data on consumer behaviours with regard to organic food (European consumer panel)		*
<b>4 QUALITY, HEALTH AND FOOD SECURITY</b>		
Food processing technology for organic foods in order to support innovation of SME.	**	***
Enhancing health promoting properties of organic food and optimising its organoleptic quality parameters.	**	*
Food quality – actual dietary behaviour – health – public health costs.	**	*
Reducing costs of different standard setting and certification schemes for organic food.	**	*
Food security and organic food	*	*
<b>5 ENVIRONMENT</b>		
Organic/low input farming and biodiversity	***	***
Organic/low input farming and nutrient losses and recycling	**	***
Organic/low input farming and climate change	***	*

(\*\*\*) High priority; (\*\*) Secondary priority; (\*) Third priority

### 3. Short description of the topics per cluster

#### CLUSTER 1. RESEARCH IDEAS ADDRESSING ORGANIC PLANT PRODUCTION

##### Topic 1.1 Soil health and link with plant health in organic and low input farming systems

Research should look at the potential of good soil management and cultivation systems (rotations, green-manuring, use of high-quality compost, etc.) in minimising plant health problems in particular with soil-born diseases in organic and low-input farming systems. Novel technologies in improving the health status of plants, e.g. with specific extracts of compost or soil with disease suppressive abilities, should be investigated and tested in different climatic regions. Participatory *on-farm* research and specific extension/dissemination activities are essential.

##### Topic 1.2 Supporting and facilitating the innovation in the field of novel pesticides suited for organic farming

Innovation in the field of pesticides for organic farming is still poor because potential markets (organic land area for different crops) are very small. There is a need in helping SME to develop novel products, equipment, software and diagnostic tools e.g. in combination with CRAFT projects. In addition, registration procedures in most EU countries represent a severe obstacle and are very inconsistent from country to country. Scientific and technical innovation has to come from a joint effort of universities, independent research groups and small bio-control enterprises, supported by the EU. A range of novel products and techniques are needed which will replace old pesticide practices in organic farming (copper, sulphur, nicotine, rotenone). Preventive management practices and the stabilising effect of biodiversity (functional biodiversity) should be considered when developing and screening novel compounds and techniques.

##### Topic 1.3 Improving the quality, the ecological, technical and economic performance of organic and low-input crop production systems by breeding

Comparison of different breeding concepts/approaches (molecular, holistic, participatory) regarding how fast, efficient, effective, environmentally friendly and safe they are in reaching breeding aims is especially needed for organic farming and low input agriculture. The main breeding aims of such systems should be a high nutritional value, excellent sensory (organoleptic) quality, the stability (not the absolute amount) of yield, field tolerance to pests and diseases (in addition to or instead of mono- or multi-genetic resistance), the adaptation of N-demand of crops to the N-supply of organic soils in the context of different organic and low input management practices, good competition on root, shoot and leaf levels and finally, crops better adapted to stressful environments and low input conditions. A case study approach with selected annual crops (a cereal, one or more vegetables) should be chosen and the consortium should consist of scientific institutes, participatory breeders and SME.

##### Topic 1.4 Prevention and control of pests and diseases in Mediterranean organic agriculture

Many organic farming methods, developed to prevent and control pests and diseases, work best under temperate climate conditions. Mediterranean production systems are completely different, in particular the pressure of pests and diseases is much higher. The concepts of habitat management (functional biodiversity), the potentials of intra-varietal diversity in crops and the complementary intervention by biological and mechanical techniques have to be studied and adapted. The Mediterranean region has a unique potential in providing high quality organic food Europe-wide but will in the future face strong competition from fast growing organic production in other regions with favourable growing conditions (Australia, India, China, South America). To maintain the competitiveness of European agriculture special target-oriented research projects have to develop better and innovative techniques and strategies for the main crops to control the relevant pest and

disease problems. Participatory on-farm research and specific extension/dissemination activities are essential.

### **Topic 1.5 Co-existence and organic farming**

There is an ongoing discussion about the coexistence of organic farming and GMO crops: Is this a strong threat or a tolerable option for European organic farming? What are the economic implications of co-existence to the entire organic sector? Risk analysis should be the basic approach to clarify a number of problems in such a project along the whole supply chain of selected commodities, specifically: the contamination risk for processed and unprocessed organic products, the effectiveness of preventive measures of the GMO "users" with respect to organic farming requirements, the liability issue and the economic risks for the organic farming sector (farmers, processors, retailers). Furthermore, focus should also be led to the question of social tensions between GMO and non-GMO farmers and regions.

## **CLUSTER 2. RESEARCH IDEAS ADDRESSING LIVESTOCK PRODUCTION**

### **Topic 2.1 Improving husbandry systems which respect to animal welfare**

Special attention should be given to minimise land use, to reduce ammonia losses and greenhouse gases and to increase food safety (zoonoses etc.). Different low and high input systems should be compared in order to make optimum use of partially contradictory aims (animal welfare, environment, economy, food safety). Sustainable and ethologically sound strategies for free range systems should be developed and tested in a case study approach for beef, pigs and poultry. Special emphasis should be given to the feeding regime in order to have maximum synergies between outdoor feed intake and feed supplement.

### **Topic 2.2 Improving animal health, product quality and performance of organic and low input livestock systems by breeding**

The focus of an integrated project should be on cattle, poultry and pigs. Different breeding concepts (molecular, holistic, participatory) should be analysed, regarding how fast, efficient, effective, animal-appropriate, ethical and safe they are in reaching breeding aims especially needed for organic farming and low input rearing. The main breeding aims of such systems are a good health condition, well adapted to stressful environments and low input conditions (good tolerance as well as fast recovery from environmental and management changes), high nutritional value and excellent sensory (organoleptic) quality of the products. Indicators should be developed which are tested in different breeding programmes in different macro-climatic regions.

### **Topic 2.3 Comparing and optimising the immune system, the stress tolerance/stress recovery and problems with zoonoses under different environments and under different production/rearing systems**

In organic and low input rearing systems, the prevention of diseases and parasites is the major factor in securing livestock health. The production system strongly influences the health status of livestock both positive and negative. Interactions between production system/method (e.g. intensity, housing, free range rhythm), the environment and breeds occur as well. In an integrated project, strategies to optimise the health status should be developed which are tested in different case study regions with cattle, poultry, pigs and sheep/goats. Immune system, stress tolerance, stress recovery should be studied as well as potential problems with major zoonoses and the microbial ecology of the involved organisms. Participatory on-farm research and specific extension and dissemination activities are essential.

**Topic 2.4 Innovation in the field of alternative or complementary medication/veterinary treatments in organic livestock systems**

Innovation in the field of alternative or complementary medication/veterinary treatments for organic farming is still poor because potential markets are very small. There is a need in helping SME to develop novel products, equipment, software and diagnostic tools e.g. in combination with CRAFT projects. In addition, registration procedures in most EU countries represent a severe obstacle and are very inconsistent from country to country. Scientific and technical innovation needs to come from a joint effort of universities and independent research groups and specialised enterprises, supported by the EU. A range of novel medications and veterinary treatments such as phytotherapy and homeopathy can be expected which will replace (or complement) synthetic allelopathic medicaments in organic livestock systems. The project should gather necessary toxicological data through facilitating the preparation of the registration. The efficiency of the products should be tested in combination with optimising the preventive measures. Participatory on-farm research and specific extension/dissemination activities are essential.

**Topic 2.5 Sustainable organic dairy production free of antibiotics**

Mastitis is still the major health problem of cows in European organic dairy production. It causes severe economic losses by low yields and marketing restrictions because of residues of antibiotics. Organic milk produced under the USDA regulation is free of antibiotics mainly because dairy cows suffering from mastitis are removed from production by slaughtering. For a sustainable and cost efficient dairy production, novel and holistic concepts of mastitis prevention and mastitis control have to be developed. Prevention strategies by optimising milking technology, feeding regime, housing and free ranging regime as well as animal-farmer relationship is one approach to follow, alternative medication and complementary therapies are another.

**Topic 2.6 Need for and alternatives to synthetic vitamins in organic animal husbandry**

In EU Regulation 2092/91, the use of synthetic vitamins is restricted to non-ruminants and not allowed for ruminants. In a number of countries, farmers observe insufficient vitamin supply with cattle, sheep or goats. An analysis in different countries should analyse if and under which conditions such problems occur and with which strategies these problems can be solved. Alternatives for the use of synthetic vitamins must be developed for both ruminants and non-ruminants. Special emphasis should be given to reducing dependency on farm-external sources. Feeding experiments need to be conducted with different regimes, preferably in an on-farm context. Dissemination activities to farmers, advisors and veterinarians are essential as well as recommendations for any adaptation of EU Regulation 2092/91.

**CLUSTER 3 RESEARCH IDEAS ADDRESSING SOCIO-ECONOMIC TOPICS****Topic 3.1 Development of attitudes of different relevant societal groups and actors towards organic agriculture and consequences for future actions**

The attitudes and aspirations towards organic agriculture have strongly changed in the last decades. There is no sociological study existing which compares this development. An analysis of the main actor groups such as farmers, researchers, traders and consumers in different European countries would allow us to see the driving forces of this development and to draw conclusions about which institutional framework conditions are relevant and could be improved. An important issue is how the image of organic farming in society has developed, compared to conventional farming. The knowledge about the relevance of these attitudes of the different actor groups in different phases and of the development of organic farming in different countries can help in future design of specific action plans for organic agriculture, in particular in accession countries.

**Topic 3.2 Combining “regionality”, food-origin and organic farming in European agriculture**

In many European countries some consumers associate organic farming with “regionality”. The origin of food is an important buying motive. There are two issues to be explored: a) the ecological and economic impacts of short regional food chains (food miles, efficiency) and b) organic farming's potential to contribute to rural development policy aims. Particularly, the linkage of “regionality” and organic farming has interesting potential to be explored. Besides creating more trust for the consumers the stronger integration of regionality in organic agriculture has a potential to link rural development objectives with sustainability objectives, in particular in regions where the number of organic farmers is relatively high. The socio-economic benefits of integrative concepts of regionality and organic agriculture for rural development, e.g. with the “Bioregions” approach, where new partnerships between organic farmers, local processors, traders, gastronomy, tourism and local communities are built up, should be analysed. The contribution of such initiatives to maintaining the rural population and to the regional economy should be explored. The institutional framework for promoting such approaches needs to be outlined.

**Topic 3.3 Psychological and sociological attitudes of consumers and different market actors in dealing with organic food**

Several consumer studies confirm a positive attitude of many consumers and traders to buy organic food. However the consumption is much lower than could be expected. A similar situation is found in the market place. The reasons why successful marketing concepts of organic food in one supply chain are not taken up more, although economically interesting, should be analysed and the psychological and sociological barriers should be determined. Recommendations on how such barriers can be reduced should be elaborated.

**Topic 3.4 Socio-economic analysis of different forms of co-operation between farms**

Economic constraints result in a similar specialisation of organic farming as already observed in conventional agriculture, although slightly delayed. As a consequence, nutrient cycles are less closed, crop rotations are narrower and soil erosion and soil compaction might increase. A reduced crop and livestock diversity leads to more problems with pests and diseases. It is very necessary to develop new forms of co-operation between farms in order to combine management, diversity and specialisation of production. Agronomic, ecological, economic advantages of and obstacles to different forms of co-operation should be analysed as well as social and psychological aspects and restrictions to farm co-operation.

**Topic 3.5 Organic farming and requirements of the Green Box (WTO)**

Organic farming offers an excellent opportunity to combine multifunctionality with agricultural production. Literature studies show that organic farming can provide ecological goods and services to a greater extent compared with other farming systems. However, these have to be scientifically quantified and qualified under the extreme variation of site and climate conditions throughout Europe. Emphasis should be given to different farm types (low input, high input organic farming, specialised units versus mixed farms etc.). The social benefits of different farming systems should be evaluated as well, including animal welfare aspects. External costs of non-organic agriculture need to be taken into account. To allow policy recommendations to be made the efficiency and public expenditures of different low- and high-input farming methods should be studied in depth and the framework conditions under the WTO requirements should be analysed. An ecosystem service monitoring system/tool with an application for various organic farming systems should be developed.

**Topic 3.6 Consolidated data on consumer behaviours with regard to organic food (European consumer panel)**

In only a few countries consumer panels provide data about consumer behaviour with regard to organic food. However, due to the lack of international standards, these data are often not comparable. On a European level a database in the form of a European Consumer panel should be established which would allow for comparing real consumer behaviour and not only the attitudes in selected countries over several years. Cooperation with specialised marketing firms might be necessary. Based on the analysis of these data, recommendations for market and policy actors can be made.

## **CLUSTER 4 QUALITY, HEALTH AND FOOD SECURITY**

### **Topic 4.1 Food processing technology for organic foods in order to support innovation of SME**

Many consumers in Europe are very sceptical about the use of many additives in organic food processing. However there are interesting innovative minimal processing methods being developed which allow the non-use of a number of additives by using functional properties of ingredients. These approaches should be explored and the acceptance by consumers should be investigated. Furthermore the processing methods should be developed which allow reducing the mechanical impact on food and improving sensorial and nutritional quality parameters. Heat load indicators to monitor such more careful processing methods need to be developed and tested. Recommendations how such indicators and consumer-friendly technologies can be integrated in guidelines and standards should be developed. Innovative SME should be integrated in such projects, e.g. with CRAFT programme.

### **Topic 4.2 Enhancing health promoting properties of organic food and optimising its organoleptic quality parameters**

In the premium price food sector, the consumer expects the products to have an excellent taste, best intrinsic and extrinsic qualities and health benefits. An increasing number of functional or designer foods are introduced into this market sector and compete with organic produce. Other than functional food, organic food gains its quality (both on the health and taste side) by interacting between management technique, soil properties, feedstuff quality, climate, varieties/breeds and human knowledge. This approach to improving food taste and health promoting compounds in food is a very powerful but also a very demanding one. The effect of the individual factors and their combination on taste and quality is not sufficiently known in order to produce a constantly high quality. Research and dissemination in this field would help to let organic food participate in the fast growing market of premium and health foods.

### **Topic 4.3 Food quality – actual dietary behaviour – health – public health costs**

In almost all countries public health costs are rising. The relation between actual dietary behaviour and public costs are often difficult to establish. Furthermore, it would be interesting to know what role high quality food such as food from organic farming and low input farming systems can play in reducing public health costs. There is still a concern that substances used in intensive agriculture and their combinations may have as yet unidentified negative effects on health, especially their possible roles in the increasing incidences of allergies, behavioural disorders and reproductive problems. It is therefore still an urgent need to analyse interactions between different food or feed qualities and health parameters, using all possible approaches such as in vitro models, animal models (e.g. pigs) or dietary studies and cohort epidemiological studies. A special focus should be made on the impact of organic and conventional food diets on improving the human immune system. Interactions between eating patterns, food quality and obesity should also be addressed because there is some evidence that especially tasty and authentic food can reduce obesity. And finally, a huge trend in food quality research is to use complementary methods in order to gain additional information on food quality such as picture-developing methods, biophotons and electro-chemical methods. These methods should be evaluated in relation to analytical methods and in relation to possible health impacts. Recommendations for policy makers and market actors need to be developed. Different disciplines need to be involved such as medicine, economics, nutritional science and social sciences (especially psychology).

**Topic 4.4 Reducing costs of different standard setting and certification schemes for organic food**

Standard setting and certification in organic farming and processing has become a considerable cost factor which makes the organic food industry less competitive. Slight differences in national and private standards and certification schemes impede fast trade in Europe. New problems such as a potential coexistence between GMO and traditional crops or residues of pesticides or other undesired compounds in organic foods, caused by environmental contamination or spray drift, will considerably increase the costs of organic food and its quality assurance system in the future. In an EU-wide study, costs and problems of standard setting and certification should be analysed and recommendations given on how to substantially reduce. More risk-oriented approaches should be compared with the actual inspection and certification systems and the cost-efficiency should be outlined.

**Topic 4.5 Food security and organic food**

An argument against organic farming often mentioned is that this farming method cannot feed the world. There should be a world-wide study to explore the potential of and constraints on organic agriculture in ensuring sustainable food security. The study should focus not only on the yield but look also at other relevant parameters (quality parameters, dry matter content, resource use, distribution issues, human diets in different countries, socio-economic framework conditions etc.). Cooperation with FAO would be desirable.

**CLUSTER 5 ENVIRONMENT****Topic 5.1 Organic/low input farming and biodiversity**

The effectiveness of different farming measures in organic/low input farming to promote genetic and biotic biodiversity in farming systems with different intensities should be evaluated in a case study approach using key indicators. Recommendations to farmers for biodiversity measures for different ecotypes should be developed.

**Topic 5.2 Organic/low input farming and nutrient losses and recycling**

An analysis should be made in different organic and low-input farming systems on nutrient management and the potential to further reduce nutrient losses. A literature review should be done on nutrient budgeting in different farming systems and field studies with regard to nitrogen losses. In a case study approach it should be analysed how to reduce nutrient losses. It should include how to improve the recycling of nutrients coming from households back to the farms. The recommendations to be developed need to be adapted to the regional conditions.

**Topic 5.3 Organic/low input farming and climate change**

The focus of this project should be on the impact of organic/low input farming on greenhouse gas emissions. In particular due to its lower intensity in organic livestock systems and developed farmyard manure handling systems, there is potential to reduce greenhouse gases. In addition, carbon sequestration should be investigated using existing long term comparison trials with arable rotations. In a case study approach, combined with modelling gas emissions of different farming systems, the link between cultivation/livestock systems and climate change should be highlighted and proposals for the further reduction of greenhouse gases should be given. Long term comparison trials in different climate zones throughout Europe should be used as a data source for the modelling.

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