Strategic Research Agenda

and

Implementation Action Plan

Czech Technology Platform for Organic Agriculture

Olomouc, September 2009

A. Strategic Research Agenda

Vision for Organic Agriculture Research Agenda to 2025

Organic agriculture and organic food production is an important innovative contributor to the sustainable development of society. Over the past 20 years the ecological agriculture system in the Czech Republic has extended to almost 10% of the acreage of agricultural land, secured the income of hundreds of farms especially in marginal areas, has created many job opportunities, improved living conditions for farm animals, and last but not least has contributed to the protection of the environment and helped in the development of rural areas. Innovation plays a major role in shifting agriculture and food production in general towards long-term sustainability and quality.
The potential for innovation on the basis of ecological knowledge is enormous, as is the impact of this innovation on public benefit, services and markets. However, the current level of spending on research and dissemination of knowledge does not adequately reflect this potential.
It is therefore in the common interest to invest in research in organic agriculture and organic food production in order to improve and further develop the system itself and the whole organic food chain. One way of accelerating innovation is Technology Platforms (TP), which focus on identifying research priorities in a given sector, improving the vertical cooperation between science, applied research, advisory services, farmers, processing companies and, consequently, trade and consumers.
"The Czech Technology Platform for Organic Agriculture" (CTPOA) is based on the vision and strategy of the European Technology Platform "TP Organics", aimed at sustainable food production systems and creating public benefit, founded in 2008 by the IFOAM EU Group in Brussels.
The background of The European Technology Platform TP Organics, the Strategic Research Agenda and the Implementation Action Plan CTPOA is based on the Action Plan for organic food and organic agriculture, adopted in 2004, and respects Council Regulation No. 834/2007 on organic production and marking of agricultural products, which came into force on 1. 1. 2009. It aims to map out the necessary research at all levels within a time horizon of 15 years, identify milestones, overcome barriers to development, and define priorities for technological development and make proposals for the deployment and utilisation of new technologies.

The research program for organic food and organic agriculture to 2025 includes the following challenges and trends in agriculture and the food supply chain:
• increasing demand for high quality food with added value;
• stable food production and availability;
• dependence of agriculture and food supply on non-renewable energy resources, especially on fossil fuels;
• exploitation of natural resources and destruction of regulatory, cultural and ecosystem services;
• depopulation of rural areas, industrialization and alienation of food chains;
• preservation of landscape, biodiversity and soil fertility;
• ethical and cultural aspects including care for the quality of human life, but also that of livestock.
Some of the goals of scientific research in organic agriculture and organic food production are: to ensure lower cost of organic food production, increase revenues, improve external and internal quality and organoleptic characteristics of produce, prevent food safety risks and

achieve significant reductions in spending in the area of the environment, its protection and social costs.

Priorities of the Czech Technology Platform for Organic Agriculture

The research and innovation priorities are

1. Economically viable organic agriculture as part of the rural economy
2. Production based on ecological principles and respect for the environment
3. Organic foods to improve the quality of life and health

Priority 1
Economically viable organic agriculture as part of the rural economy

1.1 Vision for 2025

Organic agriculture as a model of multifunctional agriculture, processing products with higher added value and agricultural tourism will become an important driving force in strengthening rural economies. Dialogue between urban and rural populations will improve significantly and partnerships between consumers and producers will strengthen. The diversified regional economy will attract residents, improve their quality of life and ensure that the environmental, economic and social development of rural areas is sustainable.

1.2 General rationale

Strengthening of local economies will be an important trend in European agriculture and food production.
Regionally produced raw materials with specific properties will increase the diversity of food, while linking traditional diversity with the latest, groundbreaking technology. Food production with the added value of local food prepared according to traditional recipes and foods with a geographical designation of origin will create jobs and ensure economic development in rural areas while contributing to the increased attractiveness of these areas. Small farms and farms of medium size, as well as producers of food located in less favourable climatic zones or locally specific disadvantaged areas or those in remote regions will be able to realize sales of local production, increasing local economic value. Local food produced in a sustainably sound method will become an important part of culinary culture and contribute to the healthy diet of the population while developing trade in agricultural commodities. New forms of cooperation will create more direct relationships with customers and become the basis for the implementation of equitable distribution of values of production – a consumer chain from the perspective of both customers and producers. Organic agriculture will play a vital role in disseminating the principles of a healthy lifestyle and responsibilities, for example through demonstration farms; the role of the farmer in the promotion of sustainable life will be shown (recycling of nutrients, improving the environment, etc.). Farmers will be perceived by the public as bearers of authentic local produce. The positive attitude of consumers towards local economies will be strengthened as a contrast to the globalized approach to production and consumption of food.
Organic agricultureis a highly knowledge-based form of agriculture - including both advanced modern technology, and also knowledge of the original - with an emphasis on the farmer’s ability to make spontaneous decisions.

Organic agriculture as a model of multifunctional agriculture will continue to motivate and inspire conventional agriculture and other sectors to raise standards of management for the benefit of society.
Farmers producing organic food particularly excel in the use of direct sales channels, such as yard sales, local farm markets, shops selling local produce or home delivery of organic produce. The importance of the Internet marketing is on the rise – on-line stores are becoming a successful form of sale, allowing organic farmers to communicate with customers in remote areas. All these forms of marketing can play an important role in bridging the gap between the agricultural and non-agricultural population.

1.3 Examples of research topics

1.3.1 The positive influence of organic agriculture in terms of ethics and values

Further development of ecological principles and the dissemination of fundamental ethical values.
Development of methodology for the evaluation of food and agricultural systems in relation to the basic principles of organic agriculture(health, ecology, fairness and care).
Establishing procedures for operational interpretation of ethical values and principles in the creation of rules in the legal framework.

1.3.2 Strengthening cooperation between partners

Methods for improving communication and sharing values in remote and global food chains on the basis of negotiation between equal partners.
Creating space for dialogue between all stakeholders such as consumers, producers, processors and others involved in the food supply chain.

Development of models for new forms of economic and social cooperation, such as CSA - *Community Supported Agriculture*, home-delivery of local organic food, regional food webs, community-supported local food processing units, etc.

Developing approaches for successful integration of the population (farmers, industry, consumers and society) in research programs based on participation and action research methodology.
Active involvement of farmers in regional development programs (e.g. Leader, ecotourism).

1.3.3 Market

Knowledge of the functioning and development of markets for organic produce, including innovation related to market development (particularly for commodities for which markets are undeveloped).
Potential and implications of regionalization and localization of food systems, including assessment of differences in various types of food and the extent to which the needs of consumers are met throughout the season.
Evaluation of the social and economic consequences of various models for a fair market.
Initial costs and level of internalization of various types and intensities of regionalised and global food chains. Documentation of social and economic impact on a local and regional level.
Development of localized production and renewable energy in rural areas, including an

assessment of sustainability of technology, and social, economic and environmental impacts.

1.3.4 Transfer of information and education

Innovative forms of education through communication and cooperation within the global network of parties involved in regionalised and local food chains.
Improved methods for knowledge transfer and exchange of best practice. Training the next generation.
Development of innovative forms of information transfer (personal advice through the media, etc.) within the framework of organic farming.
Management development: exchange of knowledge and expertise in combining agriculture and food systems.

1.3.5 Economic and business aspects of organic agriculture and its role in regional development

Building a system for analyzing the economic status of organic enterprises as a means of increasing the business potential of farmers in organic agriculture (OA).
Business potential in OA in promoting rural development. Evaluation of social sustainability, quality of work and life factors involved in supply chains.
Reducing the cost of organic food in regional, national, European and international food chains.
Development of appropriate indicators and procedures for evaluating the success of OA systems as well as certification for evaluation of the production of public benefit (improving the environment, improving animal welfare, etc.).

Priority 2
Production based on ecological principles and respect for the environment

2.1 Vision for 2025

With appropriately adjusted instruments organic agriculture and organic farmers access to the countryside can co-partner on the protection of individual components of the environment and on enhancement of biodiversity at all levels. With its approaches to the actual agro-ecosystem as well as to the entire countryside this long-term sustainable agricultural system will make the living environment more attractive for local residents and for tourism.

2.2 General rationale

Protecting the environment is a much-discussed problem associated with intensive forms of farming. Many of them adversely affect not only the environs, but have significant negative effects on species richness and diversity of the landscape. New and modern methods of organic agriculture should not only ensure sufficient quantity of quality produce, but their priority should also be the protection of soil quality, which is the foundation of agricultural production and life on Earth. It is also very important not to damage water resources and to care about diversity at all levels, from genetic to ecosystem. The aspect of landscape aesthetics can not be ignored either. It is appreciated not only by people living within a particular landscape, due to its attractiveness it is also becoming a popular destination for short and long-term recreation for the urban population. All the environmental effects of organic agriculture have their impact in the economic sphere because, in the spirit of economics of the environment, they minimise the cost to society incurred in remedial action. Environmentally friendly approaches to agriculture are not only about non-productional functions of multifunctional agriculture, but have a direct impact on the actual agroecosystem

(eg the cycle of elements, functional biodiversity in plant protection). In its environmental approach to agricultural management organic agriculture may be a benefit in addressing current issues such as loss of biodiversity, poor soil quality and pollution of natural resources. A number of measures now being implemented across the board on agricultural land or in livestock breeding have long been the norm in the organic agriculture.

2.3 Examples of topics for research

2.3.1 Development of new systems with regard to both production and non-productive functions

Development of systems for a changing climate (climate extremes).

Ecological approaches in locally adapted agricultural systems.

Development of new technologies and products for weed-killing and plant protection (biological protection, pesticides on plant-based substances, etc.).

Development of technologies related to proposed sustainable management and its control (automation, sensors in crop and livestock farming, GPS and information technology).

2.3.2 Optimization of agro-ecosystem and care for land

Improved care for soil organic matter, and research on soil microorganisms in making nutrients and plant protection.

Making available and receiving macro and microelements in a different way of farming.

Increased recycling of nutrients and organic matter in different production systems. Development of technologies minimising soil degradation.

Research in functional diversity of soil biota.

2.3.3 Organic agriculture in the protection of biodiversity and landscape

Evaluation of environmental impacts of organic agriculture on farmland.

Proposing quality indicators of the agricultural system with the aim of protecting the environment.

Research into the effects of biodiversity and ecosystem services in agricultural production.

Proposals for specific functional forms of biodiversity management.

Study of gene resources for organic agriculture(with emphasis on breeding crops for resistance).

A system of evaluating externalities of agricultural production (assessment of effects of the agricultural system on the components of the environment and the countryside).

Priority 3
Organic foods to improve the quality of life and health

3.1 Vision for 2025

By 2025 the population will have healthier and more balanced nutrition. Preferences in food and quality are changing. Fresh, balanced foods will become the basic trend and processing technology will be producing food with minimal changes in terms of the standard of quality. Specific taste and its regional variations will be valued more highly than man-made food.

3.2 General rationale

Changes in eating habits fuelled by various economic, social, and communal factors create a demand for semi-finished and finished foodstuffs, a simplified and unbalanced diet, fast food restaurants and cheap meals in schools, nurseries and canteens. Knowledge of how to produce and prepare quality food is disappearing, and there is a general lack of awareness of food. Child obesity is one of the most serious health challenges of the 21st century. Furthermore, other nutrition-related illnesses, such as cardiovascular disease, diabetes, tooth decay and food allergies affect the physical and mental abilities of consumers.

The health of individuals and society depends, among other things, on both the quantity and quality of food received, the composition of our diet and the way food is processed and prepared. A higher quality of life is inevitably linked to the increased demand for food and other goods of the highest standard. Consumer awareness of nutrition will rise in the future, increasing the demands put on safety and origin of food.

Eating organic food is considered to be part of a healthy lifestyle. This is also due to the fact that organic food production is well covered by law and certified by transnational and national standards. Organic foods do not contain artificial flavours with addictive potential and, in processing, no technology is used to disrupt the body's perception of satiation. Consumption of foods of plant origin is an important part of the organic lifestyle. Consumers who, for the benefit of a healthy lifestyle, reduce their consumption of meat, may indirectly reduce the environmental and welfare problems associated with high intensity livestock breeding.

Innovation is particularly needed in relation to the processing and storage of foodstuffs and their packaging. Innovative technologies will be developed, such as a sensitive method for physical processing to preserve sensory properties and the high nutritional and health quality of products. Additional and auxiliary substances for processing will be reduced, modified or replaced in accordance with the standards of environmental quality. New manufacturing technology will ensure the competitiveness of organic food and will be especially attractive for small and medium-sized enterprises.

The variability of range and quality of organic food can be additionally increased by using non-traditional crops, old and regional varieties on organic farms. Many of these products require an adaptation of knowledge of their production, processing, packaging, transportation and handling.

Eating organic food will become an essential part of modern food culture and lifestyle. It will be part of the changes that dramatically improve quality of life and health of consumers. This position will also contribute to a reduction in the cost of health care. The culture of organic food has the potential to become a driving force for a sustainable, natural and healthy lifestyle.

3.3 Examples of topics for research

3.3.1 Indicators of quality and authenticity of organic food

Defining basic terms associated with the perception of organic food and health (e.g. food quality, authenticity, naturalness, integrity, intactness, vitality, durability).
Improving the system of indicators for high-quality organic food (e.g. freshness, naturalness, structure and taste).
Development and validation of testing methodology for indicators of quality organic food.
Specific features of the old landraces and old varieties and breeds.
Development and validation methodology to ensure the authenticity of organic food.

3.3.2 The influence of quality of genotype, environment and technological processes

Improved quality of food, which is more in line with the principles of organic production systems and systems of crop and livestock production with low input (through breeding and agriculture techniques).
The links between organic agriculture practices and food quality indicators.
Innovative or modified technologies to ensure the quality of organic food during production, transport and storage.
Innovative or modified technology to ensure the quality of organic food processing and packaging (aimed at a sensitive method for physical processing as well as alternatives to additional and auxiliary substances for processing).
Quality of the entire food chain and risk analysis of the critical control points in organic production. Application of modern diagnostic tools in combination with the certification process.
Inclusion of animal welfare ratings in the certification scheme.

3.3.3 The relationship between quality of bio-production and the environment

The ecological footprints of foods from different production systems, different processing technologies and various food chains.
Climate change and consumption of organic food.
The effect of regional production on quality of organic products and the environment.
Biodiversity in terms of quality organic produce and agro-ecosystem.

3.3.4 The effect of quality organic produce on health and consumer satisfaction

Diet, consumer preference and purchasing behaviour in different socio-economic conditions.
Perception of quality indicators by the organic food consumer.
Links between eating habits, diet, feeling of well-being and health and organic production systems.
Links between food and cultural heritage.
Finding links between consumption of organic food and health.

B. Implementation Action Plan

Priorities identified in the Strategic Research Agenda will be gradually developed in research topics in order of importance and taking into account the weaknesses of organic agriculture in the CR and gaps in knowledge.

Long-term goal of an implementation plan:
to build an integrated knowledge system in organic agriculture based mainly on research and dissemination of information (e.g. using consultants).

Medium-term goal of the implementation plan:
to cover key issues lacking in knowledge of organic agriculture in the CR through research and transfer of information.

1. Activities, action, implementation and outputs (for all priorities)

1.1 Overview of activities common to all research priorities

1.1.1 Regularly defined content-focus of research in the CR

Activities and steps: regular (at least annually), identification of desired topics for research.

Implementation and outputs: regular working meetings of leading farmers, research workers in the chosen field and consultants, with the aim of identifying and discussing topics for research.

The output will be a list of topics for research that will serve to focus research more effectively in the following period (emphasis on identifying future priorities), this will serve:

- to improve the accuracy of ongoing research projects;
- to prepare proposals for medium-term research priorities in national research agencies;
- to plan international research (seek partners, etc.);
- to build a long-term knowledge system, covering the key issues in organic farming.

1.1.2 Regular balancing of the desired focus of research with existing capacity

Activities and steps: comparison of desired topics of research with existing capacity in research (are the topics covered by appropriate experts? Is their staffing capacity sufficient? Are current technical capacities sufficient for testing, etc.?).

Implementation and outputs: Following the identification of topics for research the demands for research will be assessed in terms of the existing capacities in research and ways will be considered to supplement the missing capacity (international research, education of young professionals, etc.).

The output will be a proposal to complement the capacity or to secure by other means the research facility which is lacking in the CR.

1.1.3 Integration of research in organic agriculture in the CR

Activities and steps: development of an information-sharing system on the direction of members of CTPOA, creation of teams and production teams and research support (to be reviewed and possibly upgraded once a year).

Implementation and outcomes: this system will be developed in the first year and implementation of its parts will be gradual (over one year at most).

The output will be a functional system for sharing information and building research teams.

1.1.4 Creation of key strategic documents and evaluation of their success in organic agriculture(eg organic agriculture Action Plan)
Activities and action: the development of a system of cooperation in the creation of key strategic documents.
Implementation and outcomes: strategic documents will be developed according to their nature (periodically, or according to need). Evaluation of the results of the adopted strategic documents will be carried out every year, and will lean towards the needs of research. The output will be key strategic documents for organic agriculture and their evaluation.

1.1.5 Strategy of common procedures
Activities and steps: Creation of a common strategy for the fulfilment of research development and advice to members of the OA Platform.
Implementation and outputs: The strategy will be elaborated in detail in 2010, with the provision that it will be realised in the same year. Part of the strategy will be e.g. to balance capacity and coverage of topics in research and consultancy in OA among members of CTPOA and a proposal to address any issues not covered (see sections 1.1.1 and 1.1.2.). The output will be a strategy of cooperation (division of roles, partly formalized procedures of cooperation, etc.) among members (and also non-members) of CTPOA and the beginning of its implementation in 2010.

1.2 Desirable changes in the environment and conditions for R & D and innovation at national and European level so that their growth is encouraged

1.2.1 Adoption of research priorities that reflect the importance of organic agriculture at national and European level (proposed e.g. by CTPOA)

1.2.2 Support for institutional facilities and cooperation in research and consultancy in OA

1.2.3 Support in improving education in organic agriculture in schools of all levels in the CR

1.3 Time-schedule and first expected outputs according to priorities, guidelines and selected research topics (examples)

Priority/Theme	In 1 year	In 5 years	Permanent
(1) Economically viable organic agriculture as part of the rural economy			
Further development of ecological principles and dissemination of fundamental ethical values			x
Creating space for dialogue between all stakeholders such as consumers, producers, processors etc.		x	
Knowledge of the functioning and development of markets for organic produce	x		x
Improving methods for knowledge transfer and exchange of "best practice"		x	
Development of innovative methods of information transfer	x		x
Analysis of economic enterprises in OA	x		x
Indicators for assessing the production of public benefit, certification, etc.		x	
(2) Production based on ecological principles and respect for the environment			
Development of systems for a changing climate (climate extremes)			x
Development of new technologies and products for weed killing and plant protection (biological protection, pesticides, plant-based substances, etc.)			x
Improved care of soil organic matter, research on soil microorganisms in making nutrients and plant protection			x
Development of technologies for minimising degradation of soil		x	
Proposal of quality indicators of the agricultural system with the aim to protect the environment		x	
Proposals for specific functional forms of biodiversity management		x	
Study of gene resources for organic agriculture(with emphasis on breeding crops for resistance)			x
(3) Organic foods to improve the quality of life and health			
Preparation of methodology for testing indicators of quality of organic food			x
Development and validation of methodology to ensure authenticity of organic food			x
Research on innovative technologies to ensure quality of organic food			x
Evaluation of environmental burdens and Bio-processing	x		
Analysis of the impact of regional organic production on quality of produce and environment		x	
Studying consumer perception of quality indicators of organic food	x		
Finding links between the consumption of organic food and health		x	

Note: for permanent tasks, the intention is to start with research and development within the first year and continue on a permanent basis.