

CORE Organic Country Report



Report on Organic Food and Farming in Finland

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1 History

Traces of the first form of organic agriculture, Natural Agriculture of the Life Reform Movement, can also be found in Finland in the 1910s. First experiments with biodynamic farming were carried out and the first farm was started in 1927. The Finnish Biodynamic Society was founded in 1946. Biochemist and Professor A.I. Virtanen can, however, be considered as the pioneer of organic farming of Finland. During the 1930s, Virtanen developed the AIV-System, a cultivation method that included crop rotation with intensive red clover leys and pastures and bread grains. Silage was made of clover based leys using a new method, where the idea was to decrease the acidity of the clover silage rapidly to under pH 4 with mineral acids in order to preserve the silage properly. Professor Virtanen was awarded with the Nobel Prize of chemistry in 1945 for this ingenious method, on which the silage making in northern conditions is still founded. At his time, Professor Virtanen was known as one of the world's leading biochemists and especially as researcher of biological nitrogen fixation.

The interest in research on organic farming grew in the beginning of the 1980s. In 1980, an extensive seven-year-project started in cooperation between several institutions investigating the possibility to improve the efficiency of nitrogen fixation and utilisation of nitrogen fertilisers and cow manure. Two extensive comparative projects began in 1982: (1) conventional and organic cropping systems at Suitia, University of Helsinki and (2) self-sufficient crop rotation and cropping system by the Agricultural Research Centre of Finland at its regional research stations.

In September 1985, the Partala Centre for Rural Development for research on organic farming was founded in Juva. The University of Helsinki, Juva municipality and some other organisations belonged to this Partala association, as it is called nowadays. Partala experimental farm was integrated into the MTT Agricultural Research Centre of Finland in 1990. MTT Partala and Karila in nearby town Mikkeli were joined together in 1996 to the MTT Research Station of Ecological Production. Partala research station and later MTT/Ecological Production has coordinated research on Organic Food and Farming in Finland since 1990. It has launched three research programmes, which have covered the whole organic sector from soil issues to food processing and markets, as well as social issues. Professor Artur Granstedt from Sweden was nominated as professor for organic farming research in Partala for 5 years in 1993, and he influenced strongly the research programmes of Organic Food and Farming at that time.

MTT Ecological Production established 'The Finnish Research Network on Organic Agri-Food Systems' (ReNOAF), together with other stakeholders in 2000 and has coordinated this network ever since. Funding directed especially for research programmes on Organic Food and Farming (OF&F) was addressed for the first time in Finland in 2003, when the Ministry of Agriculture and Forestry launched its first research programme on Organic Food and Farming, based on the priorities prepared in the ReNOAF. National research seminars were also organised by MTT Ecological Production.

The Partala Research Station will be closed down in September 2006. The lands of the Partala Research Station will remain under organic farming research, but all personnel will move to the Mikkeli Research Station to work in close connection with the Ruralia Institute of the University of Helsinki. The reason for this decision was to improve efficiency by having a better critical mass of researchers by putting more people to work together and by concentrating the resources.

At the University of Helsinki, the Mikkeli Institute for Rural Research and Training (Ruralia Institute Mikkeli Unit), a neighbour of MTT Ecological Production, got started in 1988. Organic production has been one of its priorities from the very beginning. It has concentrated on further training and development activities. It has, for example, educated all advisors and teachers for organic farming since 1991. Developing activities have covered the processing and marketing of food, plant protection and animal welfare. In 2000, the only academic educational programme for Organic Food and Farming was started there. This Eco Studies – project (see Chapter 9) has been under way at the Ruralia Institute Mikkeli Unit of the University of Helsinki since 2001. The project consists of scientific

research and university level study entities. Studies in the organic agri-food systems study programme are available for university students and through the Open University for all who are interested in the field. It provides opportunities to join the European and Nordic study programmes, too.

Organic production, marketing and consumption of organic products are also studied in Finland at the other departments of the MTT Agrifood Research and University of Helsinki, the University of Joensuu, the National Consumer Research Centre, the VTT Technical Research Centre, the National Veterinary and Food Research Institute and the Work Efficiency Institute.

Milestones in Finnish Organic Food and Farming research

- 1910 First experiments in Organic Food and Farming
- 1985 Partala Centre for Rural Development for research on organic farming established
- 1988 Mikkeli Institute for Rural Research and Training got started
- 1990 Partala integrated into the Agricultural Research Centre of Finland MTT
- 1991 Research Programme on Organic Production of the Agricultural Research Centre of Finland started, running 1992-1995
- 1993 Professor Artur Granstedt was nominated a professor for organic farming research in Partala for five years
- 1994 Updating of the Research Programme for 1995-1997
- 1997 Research Programme on Organic Food and Farming 1998- 2002
- 2000 The Finnish Research Network on Organic Agri-Food Systems established
- 2000 Eco Studies – project, the only academic educational programme for Organic Food and Farming started
- 2003 Research Programme on Organic Food and Farming of the Ministry of Agriculture and Forestry started
- 2004 Professorship for animal welfare established by the Department of Clinical Veterinary Medicine and the Ruralia Institute of Helsinki University
- 2005 Professorship for ecological plant production established by MTT Mikkeli and Ruralia Institute of Helsinki University

2 Overview of organic farming in Finland

Organic farming started in Finland already in the 1910s, but organic acreage was very small until the early 1990s, when the Ministry of Agriculture and Forestry first started subsidizing farmers for conversion to organic farming. Today 7% of the Finnish arable area is certified organic area, which totals 148,000 hectares. It is noteworthy that this is all arable land and almost 40% is under cereals. This results in a relatively high production of organic cereals in Finland, especially oats. Finland is the largest source of organic oats in Europe. In 2004, the average organic area (including conversion area) per farm was 33.2 hectares. The average size of organic farms is thus five percent larger than the average size of all farms in Finland.

About 45% of the organic farms practice animal production. Therefore, it is quite surprising that there were only 386 farms with certified organic animal production in 2004. There are two main reasons for this: converting the animals to organic production is not a prerequisite for the conversion or for receiving production aids for organic farming, and the market for organic animal products is still quite undeveloped. In 2005, a new payment scheme for organic animal farms was introduced, which led to a clear increase in the number of organic animal farms.

In 2004, 47% of the certified animal farms had dairy cows, 40% beef cattle, 12% sheep or goats, 14% poultry and 4% pigs. Egg production is increasing rapidly at the moment, while there is still very little pork production.

In 1990, the first dairy started to process organic milk, and in 2005, four dairies were processing organic milk. The product range includes low fat milk, cheese, yoghurt, cream and - also popular - traditional Finnish sour milk products. Organic meat markets have been the most difficult to establish. Price premiums are low and even the supply has been very small so far.

The organic food market is relatively well-developed, representing a Western European average level where the market share of organic food is estimated at about 1.5%. Most of the organic food is sold through mainstream supermarkets.

2.1 Organisation

2.1.1 MTT Agrifood Research Finland

MTT Agrifood Research Finland is the largest research institute in Finland and one of the largest institutes in the Nordic countries, carrying out agricultural and food research, plus economic and environmental research related to agriculture. MTT Agrifood Research Finland is an expert body operating under the Finnish Ministry of Agriculture and Forestry. It produces and disseminates scientific research information, as well as develops and promotes the transfer of new technology for the agriculture and food sector as a whole.

Ecological Production Research Unit

Research on organic production at the **Ecological Production Research Unit**¹ focuses on nutrient economy and production techniques. Research on local food and the recycling of nutrients promotes the sustainability of food economy. The research topics include nutrient management with a focus from soil ecology to the field scale, farm and food system levels, cultivation techniques for arable and horticultural crops, legume based grassland farming, environmental effects and marketing of Organic Food and Farming.

Agricultural Engineering Research Unit

The Agricultural Engineering Research Unit² deals with the technology of organic farming. Typical fields of research are the replacement of environment, stressing technologies by environment supporting and appropriate technologies. Emphasis is laid on support of practical farming by development and adoption of technology according the objectives of organic farming principles. Tests and verification are carried out through the application of new technology on the organic fields of the Agricultural Engineering Research Farm “Kourla”. In animal production, both new buildings and adoption of old production buildings are studied to meet the needs of animal welfare and landscape architecture, in accordance with organic farming principles.

¹ MTT Agrifood Research Finland, Ecological Production, Arja Nykänen, FIN - 50600 Mikkeli
<http://www.mtt.fi/english/research/environment/ecological.html>

² MTT Agrifood Research Finland, Agricultural Engineering Research, Dr. Winfried Schäfer, FIN - 03400 Vihti, .
<http://www.mtt.fi/english/research/technology/mat.html>

Animal Nutrition

Animal Nutrition Research³ is focused on the use of grass as ruminant feed, grass silage, supplementary feeding and nutritional physiology of both ruminants and monogastrics. The study of animal behaviour and the production environment is on the increase as well.

Swine Research

Swine Research⁴ focuses on the nutrition, feeding and management of pigs. The nutritional value of different types of feeds and study of the nutritional requirements of pigs at different stages of production is evaluated. The Unit also investigates the effects of nutrition and feeding on gut health and meat quality of pigs and studies how management influences the performance, as well as behaviour of pigs. Pig nutrition research supports the development of pig breeding methods.

Economic Research

Economic Research⁵ produces and disseminates scientific economic research related to organic farming, commodity markets, corresponding agricultural and environmental policies. Organic farming has been studied by employing the farm accountancy data from the Finnish FADN network. Learning effects related to the adoption of organic farming technology have been investigated. Studies have given insight into technical efficiency and environmental friendliness of the organic farming strategy compared to conventional farming. For comparison of eco-efficiency, variables capturing both positive and negative environmental impacts of farming practices, such as indicators for biodiversity and excessive nutrient surplus, have been used. Furthermore, an environmental economic modelling tool, entitled *Regional Agro-Economic Model* (RegAE), has been developed for examining the links between economy and the environment in organic production. Implications for agri-environmental policies adopted have been identified. On commodity markets, interaction and functionality of the food chain have been investigated with a special emphasis on municipal decision makers' and consumers' understandings of and attitudes to organic food. Quality and responsibility issues, as well as alternative food chains such as local and organic foods have been studied.

Plant Protection Research

Plant Protection Research⁶ concentrates on harmful diseases, pests and weeds in organic production. National weed surveys have been made both in spring cereals and on pea plantations. Biology and control of perennial weeds (e.g. *Cirsium arvense*, *Sonchus arvensis*, *Elymus repens*) have been studied to meet the requirements of organic production, too. Potato late blight (*Phytophthora infestans*) as the most serious potato disease has been studied with the aim of controlling this with cultivation strategies and bio-control. The severity, prevalence and possible ways for bio-control of pathogens affecting red clover, such as *Fusarium* and *Sclerotinia* have also been studied. The risk of pea moth (*Cydia nigricana*) infestation has been evaluated by modelling field survey data.

³ MTT Agrifood Research Finland, Animal Nutrition Research, Dr. Marketta Rinne, FIN - 31600 Jokioinen, <http://www.mtt.fi/english/research/animprod/animnutrition.html>

⁴ MTT Agrifood Research Finland, Swine Research, Kirsi Partanen, FIN - 05840 Hyvinkää <http://www.mtt.fi/english/research/animprod/pigs.html>

⁵ MTT Agrifood Research Finland, Economic Research, Dr. Anni Huhtala, FIN-00410 Helsinki, <http://www.mtt.fi/english/research/economic/economic.html>

⁶ MTT Agrifood Research Finland, Plant protection Research, Dr. Jukka Salonen, FIN - 31600 Jokioinen, <http://www.mtt.fi/english/research/plants/plantprot.html>

2.1.2 University of Helsinki

Ruralia Institute in Mikkeli

The main focus of the Ruralia Institute in Mikkeli⁷ is to give education and courses at the university level. This teaching is strongly supported by the research activities of the Unit. Priorities in the research strategy of the unit are: 1) Sustainability discourses, sustainability as a methodological challenge, 2) sustainable food systems, 3) learning citizen-consumers and 4) welfare of production animals.

Department of Animal Science at the Faculty of Agriculture and Forestry

The Department of Animal Science at the Faculty of Agriculture and Forestry⁸ focuses on animal breeding and animal nutrition research. The field of animal nutrition covers research from feed production and nutrition physiology to composition and quality of animal products. Animal welfare and environmental issues have connections to the nutrition research strategy. Research related to organic animal production has been carried out in several research projects.

Section for Animal Hygiene at the Faculty of Veterinary Medicine

The Section for Animal Hygiene at the Faculty of Veterinary Medicine⁹ has been working with issues related to farm animal ethology and welfare since the 1980s. The research field has grown rapidly since the mid-1990s, resulting e.g. in the establishment of the Research Centre for Animal Welfare, which is a multidisciplinary research group with members from different departments and faculties at the University of Helsinki. The group focuses on issues like ontogeny, environmental enrichment, rest and sleep, as well as challenges in modern production systems. As animal welfare is a central value in organic animal husbandry, many of the projects relate directly or indirectly to organic animal production. The focus on organic farming grew in 2004, when a new 4-year professorship was established at the Department of Clinical Veterinary Medicine, in cooperation with the Ruralia Institute in Mikkeli (part of the University of Helsinki). This professorship is on animal welfare, with special focus on organic animal production and with farm animal ethology as a central scientific theme.

Some of the activities of the Faculty of Veterinary Medicine take place on the Saari estate⁹ located in Mäntsälä. The rural environment of the Saari Unit is ideally suited to practical instruction on food animals. The Unit interacts closely with the surrounding community and provides it with the latest scientific information. Research conducted at the Unit focuses on food animals. The largest research group is studying mastitis, while the research group examining the reproduction and longevity of pigs has obtained more external funding than any of the other groups. Other topics of research include the respiratory diseases and limb disorders of ruminants, as well as other infectious diseases. In addition, smaller, active research groups are studying equine and cattle reproduction and sperm. The Unit also studies the health of animals in organic production.

⁷ Helsinki University, Ruralia Institute, Mikkeli Unit Dr. Jouni Kujala, Lönnrotinkatu 3-5, FIN - 50100 Mikkeli Finland, www.mtkk.helsinki.fi/english/eng_index.htm

⁸ Helsinki University, Faculty of Agriculture and Forestry, Department of Animal Science, Dr Aila Vanhatalo, FIN-00014 University of Helsinki, www.animal.helsinki.fi/english/index.html

⁹ Helsinki University, Faculty of Veterinary medicine, Kristiina Dredge, Saari unit, Pohjoinen pikatie 800, FIN-04920 Saarentaus, <http://www.vetmed.helsinki.fi/saari/english/index.htm>

Department of Food and Environmental Hygiene, University of Helsinki (HU/DFEH) and Department of Risk Assessment at the National Veterinary and Food Research Institute (EELA/DRA)

There are two institutes in Finland doing research on food safety and pathogens: The Department of Food and Environmental Hygiene, University of Helsinki (HU/DFEH)¹⁰ and the Department of Risk Assessment at the National Veterinary and Food Research Institute (EELA/DRA)¹¹. HU/DFEH has special expertise in molecular biological detection and characterization methods and in understanding the epidemiology and contamination routes of psychrotrophic food-borne pathogens. EELA/DRA has special expertise in modelling of food production chain from farm to table and scientific risk assessment.

2.1.3 University of Joensuu

The Karelian Institute

The Karelian Institute is a research unit of the University of Joensuu¹². The Institute consists of three departments: Ecology, Humanities and Social Sciences. Research on organic production has been carried out in the Department of Social Sciences. The focus has been in empirical studies on organic farmers' motivation and decision-making, and the process of rapid expansion of organic production (institutionalisation, professionalisation, conventionalisation). Presently, the social meanings and development of organic production as a part of the greening food system and the actor networks around this process are studied. Organic production is seen as a tool for rural policy.

2.1.4 National Consumer Research Centre

The food studies at the National Consumer Research Centre¹³ produce information on the views and expectations of consumers concerning food, food production and the food chain. The objective is to enhance the understanding of consumers' practices related to food purchasing, food preparation, eating and food economy in general. In addition, the studies focus on the views and interpretations of consumers concerning food safety as well as liability, quality and reliability of the actors in the food chain. The approach of the research group is multidisciplinary and consumer-oriented. In the case of organic food, the focus is on consumers' understandings and conceptualisations of organic food.

2.1.5 VTT Technical Research Centre of Finland

VTT Technical Research Centre of Finland¹⁴ is a contract research organisation involved in numerous international assignments. VTT provides a wide range of technology and applied research services for its clients. The core technological competences of the 'Food Biotechnology' - knowledge centre at VTT are food structure engineering, processing technologies for healthier

¹⁰ Helsinki University, Faculty of Veterinary medicine, Department of Food and Environmental Hygiene, hannu.korkeala@helsinki.fi, riitta.maijala@helsinki.fi, Agnes Sjöbergin katu 2, FIN - 00014 University of Helsinki http://www.vetmed.helsinki.fi/english/research_food.htm

¹¹ The National Veterinary and Food Research Institute of Finland EELA, Department of Risk Assessment, Dr. Vesa Myllys, Mustialankatu 3, FIN-00790 Helsinki, www.eela.fi/en/index.html

¹² University of Joensuu, Karelian Institute, Department of Social Sciences, Dr. Eeva Kuusela, P.O.Box 111, FIN - 80101 Joensuu, <http://www.joensuu.fi/ktl/index.php?profili=24>

¹³ National Consumer Research Centre, Dr. Johanna Mäkelä, P.O.Box 5, FIN - 00531 Helsinki, <http://www.kuluttajatutkimuskeskus.fi/?l=en>

¹⁴ VTT Technical Research Centre of Finland, Biotechnology, Anne Arvola, P.O.Box 1000, FIN - 02044 VTT, Finland, <http://www.vtt.fi/services/cluster4/index.jsp>

products, beneficial microbes in foods and food processes, as well as consumer science and food choices. The most important customer segment is the food industry. Research and development is carried out in joint interdisciplinary projects with industry and universities or in confidential contract work with industrial customers. Organic food related research at VTT is part of wider interest in understanding factors and mechanisms behind consumers' food choices. These factors include consumer beliefs, attitudes and perceived sensory quality.

2.1.6 Work Efficiency Institute (TTS Institute)

The Agricultural Department of the TTS Institute¹⁵ concentrates on applied technological research and development of rural industries. The main focus is to combine human labour and technology in rural production in an economically and ecologically sustainable way. While specialising in the organisation of farm work and the development of working methods, economically efficient and ecologically sustainable production, as well as energy saving and occupational safety are also promoted. The studies are carried out in cooperation with domestic or foreign research institutes, related industry, organisations and the business community.

2.1.7 Financing

Most of the funding for organic farming research has been supported by the Finnish Ministry of Agriculture and Forestry either through the budgets of its research institutes (mainly MTT Agrifood Research Finland) or through financing research projects from its non-committed research budget. The Academy of Finland and Tekes - the National Technology Agency - have also supported research on organic farming, but only in a small number of projects. In recent years, the cooperation between these major players has developed in terms of joint programmes and consultations in the project selection phase.

2.1.8 Coordination and planning of the research

In 2001, Finnish researchers in the field of organic farming set up a network, the Finnish Research Network on Organic Agri-Food Systems (ReNOAF)¹⁶. The aim is to promote the interaction between researchers, establish the research topics for research programmes in Finland and to have joint research projects. The work is voluntary and there is no separate financing for it. The communication in ReNOAF operates via an e-mail list and meetings of theme groups (society and environment, products and markets, plant production, animal production, soil science).

In other respects, the organisation and coordination of organic agri-food research is embedded in the regular planning process of the research organisations involved.

Along with this new Research Programme, the ReNOAF is an organ coordinating and developing the national organic agri-food research of high quality. One important aim is to have extensive communication between research and interest groups. This takes place via research seminars, workshops, research education and a research project database. In the network, there is close interaction between organic and conventional agri-food research, which benefits the whole research field. This is an example to be extended to the whole field of Finnish agri-food research as well as international research.

¹⁵ TTS Institute, anna-maija.kirkkari@tts.fi, P.O.Box 28, FIN-00211 Helsinki, Finland, www.tts.fi/uk/index.html;

¹⁶ Finnish Research Network on Organic Agri-Food Systems (ReNOAF), c/o MTT Agrifood Research Finland, Ecological Production, Arja Nykänen, FIN-51900 Juva, <http://www.agronet.fi/luotu/eng/contact.htm>

2.1.9 Main stakeholder organisations

The most important stakeholder organisations¹⁷ in Organic Food and Farming are: Luomuliitto – Finnish Association for Organic Farming, Pro Agria - Rural Advisory Centre (national and local ones), the Plant Production Inspection Centre (KTTK, supervises organic agricultural production), Finnish Consumer Association, Finnish Ministry of Agriculture and Forestry, Ministry of the Environment, Ministry of the Interior, Ministry of Trade and Industry, Finnish Environment Institute, Regional Environment Centres, companies operating in the whole food chain, regional food chain actors and municipal officials.

3 Research programmes

The first research programme on Organic Food and Farming in Finland was launched in 1991. This programme was called ‘Research Programme on Organic Production of the Agricultural Research Centre of Finland 1992-1995’ (updated for 1995-1997). Research topics were prioritised by a questionnaire sent to actors in the food chain. The most important topics concerned plant production (composting, biological nitrogen fixation and soil), animal husbandry (feeding as well as behaviour of animals and production environments). Economic research was involved in all studies. Financing came from the MTT’s own budget. The second programme was called ‘Research Programme on Organic Food and Farming 1998-2002’ and it also included a ‘Research Programme on Agricultural Engineering in Organic Farming’. This programme was a result of expert group discussions. Research topics of this programme were aimed to cover the entire food chain. There was no special financing for this programme.

At the moment, there is a research programme funded by the Finnish Ministry of Agriculture and Forestry 2003-2006. In 2001, the Ministry appointed a specific working group to prepare a proposal for a comprehensive Research Programme for Organic Food and Farming. As a result, a three-year-programme in this field was launched in October 2002. The programme consists of 15 projects on different themes covering the whole food chain (Table 1). Projects are organised under the following priority areas for research: quality and risks of organic food, consumer oriented product development, maintenance of soil fertility, safe recycling of organic waste, improved production of seeds, improved production of organic milk and meat, animal welfare and organic farming, local food systems, and role of organic farming in multifunctional and pluriactive agriculture.

¹⁷ For the addresses of these stakeholder organisations please check the address database of www.organic-europe.net

Table 1: Projects under the programme of Ministry of Agriculture and Forestry (MMM-FI) 2003-2005)

No	Project name
1	Red clover efficiently into organically produced milk
2	Quality beef with efficient suckler cow production
3	Organic egg production: management of animal welfare and food safety
4	Emerging food-borne pathogens (EHEC) in primary production
5	Risk assessment on food safety risks in organic pork production: pathogenic <i>Yersinia</i> and <i>Listeria monocytogenes</i>
6	Development of meat-bone meal as organic fertilizer
7	Waste composts in organic crop production – Future risks and possibilities
8	On-farm soil quality assessment
9	Control of potato late blight by caraway oil in organic farming
10	Disease management in organic seed potato production
11	Specialisation of organic farms through cooperation
12	Local food system: impacts and learning challenges
13	Consumers, decision makers and local or organic food. Possibilities of SMEs
14	Frontiers of organic and conventional farming technologies – Environmental efficiency, productivity and learning
15	Interaction between actors of organic demand-supply chain

Table 2. The financial expenditure on the Organic Food and Farming Research Programme of the Ministry of Agriculture and Forestry (MMM-FI) per research topic (Euro)

	Projects	2003	2004	2005
Farming systems	2,11	164 370	368 630	222 500
Animal husbandry	1,2,3	396 350	814 990	616 500
Crop production	1,6,9,10	320 600	372 960	287 000
Soil	1,7,8,	155 300	264 960	236 300
Environmental aspects	14	70 000	111 000	70 000
Food systems	3,4,5,12,15	386 080	671 160	598 000
Values, standards, certification	13	121 500	204 200	198 000
Information management				
Total		1 614 200	2 807 900	2 228 300

4 Financing

The first two research programmes on Organic Food and Farming were financed by different financing bodies and the projects competed for money with research projects concerning conventional farming. The main financer for agricultural research in Finland has been the Ministry of Agriculture and Forestry. The Academy of Finland, Ministry of Environment and Tekes - the National Technology Agency - have also supported research on organic farming, but only in a small number of projects.

At the same time with the Organic Food and Farming Research Programme of the Ministry of Agriculture and Forestry (MMM-FI), there are some other projects under way as well. The total annual

expenditure on Organic Food and Farming research in Finland according to research topic is presented in table 3.

Table 3. Annual budgets (in Euro) of Organic Food and Farming research in Finland from 2000 onward, according to research topics

	2000	2001	2002	2003	2004	2005
Farming systems	393 907	240 481	327 679	351 408	469 909	222 500
Animal husbandry	198 142	373 213	254 809	545 927	919 757	616 500
Crop production	843 112	1 340 428	1 749 921	1 647 173	1 118 520	342 000
Soil	81 328	125 125	0	155 300	264 964	236 300
Environmental aspects	102 459	383 515	431 614	440 254	362 266	70 000
Food systems	117 670	168 657	228 104	538 422	915 933	598 000
Values, standards, certification	0	0	0	180 242	205 533	368 000
Information management	0	0	0	0	0	0
	1 736 618	2 631 419	2 992 127	3 858 726	4 256 881	2 453 300

Most of the Organic Food and Farming research in Finland, about 70-95 %, is carried out at the MTT Agrifood Research Finland. The rest is done at the universities (mainly the University of Helsinki) and other institutes. The distribution of funds used in Organic Food and Farming research according to the institutes in different years is presented in figure 1.

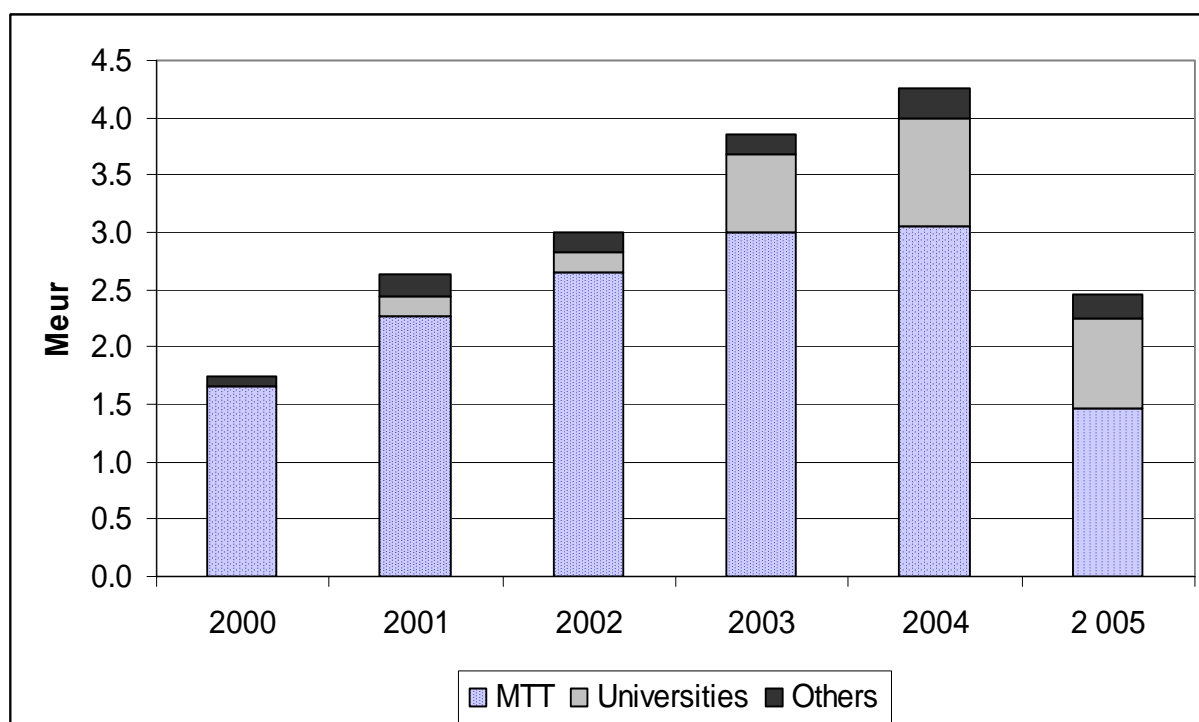


Figure 1. The amount of Organic Food and Farming research funds (million EUR) in Finland from 2000 according to institutes

The maintenance and financing of research facilities takes place through the institutes' own budget money. The actual research activities with the related facilities are financed through research projects, which are mainly financed by external money.

5 Research facilities

In Finland, the main research facilities for research in Organic Food and Farming concern organic plant production – research fields and leaching fields with different crop rotations and farming practices. One cattle building is used for organic animal production research. One mass spectrometer is available for ¹⁵N-measurements. Fistulated cows can be used for research on organic production as well.

Partala experimental farm

The fields of Partala experimental farm¹⁸ with an area of 28 hectares (owned by the MTT Agrifood Research Finland) have been under organic farming since 1985. Nowadays they are under crop rotation of organic dairy farming consisting of 2-year-old clover based leys, pulse crops and vetch based green fodder. The soil type is moraine soil and the nutrient status is quite diverse. The farm is situated in Eastern Finland (62° N 27° E). The annual rainfall is about 650 mm, average temperature 3.5°C, growing season 190 days and effective temperature sum 1250°C. There is also a two hectare spatial field, where lots of chemical, physical and biological parameters, as well as quality and quantity of clover based ley have been determined on 105 plots to determine the variability of these parameters spatially. Nutrient leaching data have also been collected from certain plots.

Karila experimental station

The fields of Karila experimental station¹⁹ (owned by the MTT Agrifood Research Finland) have been partly under organic farming since 1995 (four hectares) and partly since 2001 (5.5 hectares). Nowadays they are under crop rotation of organic dairy farming consisting of 2-year-old clover based leys, pulse crops and vetch based green fodder. Soil type is fine sand. The station is situated in eastern Finland (61° N 27° E). The annual rainfall is about 650 mm, average temperature 3.1°C (growing season 12.6°C), growing season about 160 days and effective temperature sum 1200°C.

Stockless organic farm, Kourla

The Organic Research Farm Kourla²⁰ (owned by the MTT Agrifood Research Finland) is situated in southern Finland (60° N 24° E). The fields of 20 hectares have been under organic farming since 1994. The main soil type is clay soil and crop rotation consists of clover based leys, vetches, cereals and oil seed hemp. The farm is further developed as a model for stockless organic farming. Planning and book keeping is launched using different programmes. Records of soil fertility are regularly made. The plots are offered to other units for experiments. Detailed research projects are planned yearly.

Muuruvesi College and Organic Farm

Muuruvesi Organic Farm (owned by the Savo Vocational College) is situated in Eastern Finland (63° N 28° E). The fields of Muuruvesi farm have been under organic farming partly since 1988 and the whole farm since 1995. The arable area is 145 hectares and the soil type is mainly silt, containing 3-6% organic matter. The crop rotation consists of silage, pasture, hay, oats, barley and peas. The farm has had organic milk production since 1998. There are 60 cows and average milk yield is 9500 kg/year. A new cowshed was built in 2001 and now it is possible to make feeding experiments with cows in 2-3 groups.

¹⁸ <http://orgprints.org/5566/>

¹⁹ <http://orgprints.org/5576/>

²⁰ <http://orgprints.org/5637/>

There is also 3000 m² of greenhouse are in the organic production of tomatoes and cucumber and some pepper, honeydew melon and aubergine.

Toholampi leaching field

Toholampi leaching field (owned by the MTT Agrifood Research Finland) is situated in Western Finland (63° N 24° E). The field consists of 16 plots of 0.16 hectares each. The soil type is fine sand, with five % organic C in the plough layer. There has been an experimental setup with organic and conventional crop rotations since 1997. Plots are sub-drained and water is collected separately from each plot to the observation building, where the volume of water is measured and flow-weighted water samples for analyses are taken manually. Surface water is also collected and measured.

Yöni leaching field

Yöni leaching field (owned by the MTT Agrifood Research Finland) is situated in south-western Finland (60° N 23° E). The soil type of the field is clay, with four percent of organic C in the plough layer. There are six plots, 0.5 hectares each. Two plots have been under organic farming since 1993, two plots are under conventional farming and two plots are under natural grassland. The volume of the water from drainage pipes of each plot is measured automatically and flow-weighted water samples are taken by hand. Surface runoff is conducted to the same measurement system so that the runoff represents the total runoff from the plots. There are four other plots under organic and four plots under conventional farming, but the drainage system does not allow the measurement of runoff from these plots.

6 Initiation of research and stakeholder engagement

The main funding body for agricultural research in Finland, the Ministry of Agriculture and Forestry (MMM-FI), follows a long-term planning process, which produces information about the information needs of the Ministry. MMM-FI has set up a consultative body -the Advisory Board for Agri-Food Research- which consists of 12 experts representing different stakeholder groups (rural extension, policy, industries, research...) to find out the information needs of the society. The Advisory Board presents initiatives to the Ministry as regards to relevant research themes and fields. As a result, MMM-FI makes an open invitation in June for new research projects and, after an evaluation procedure, the decisions are made in March of the following year.

In Finland, new research programmes or priority lists of topics on Organic Food and Farming are initiated mainly via the Finnish Research Network on Organic Agri-Food Systems (ReNOAF). The network consists of researchers and other stakeholders who are interested in Organic Food and Farming research. Different methods have been used to define the research priorities. The most common ones have been meetings and discussions within the network and by hearing other stakeholders. Some enquiries as well as e-mail discussions have also been used. Financers have been invited to discussions to get them involved in the financing of Organic Food and Farming research.

In Finland, no special evaluation of research methodologies used in Organic Food and Farming research has been applied.

7 Selection criteria and evaluation procedures

The main funding body for agricultural research in Finland is the Ministry of Agriculture and Forestry (MMM-FI), the evaluation criteria of this are described below.

Projects funded by MMM-FI are evaluated on the basis of the following criteria:

- Scientific excellence, innovativeness (projects must be of high scientific quality and demonstrate innovative hypothesis, methodology or technology)
- Partnership and resources (projects must demonstrate efficient value-added, cooperation of researchers and the partners and institutes must be able to carry out the project)
- Relevance (projects must fall within the pre-set areas of research, they must produce know-how and/or technology solving a relevant need either in policy preparation or in the development of agriculture)

Each proposal is evaluated by at least three experts. Formerly, the experts were selected amongst the members of the Advisory Board and MMM-FI staff, but in recent years, the number of external experts has been increasing. International evaluation is under consideration and has been piloted in the ongoing research programme of Organic Food and Farming.

The Advisory Board prepares a proposal for a short-list of projects to be funded, to the Ministry. The short list is balanced between different programmes and programme areas. Very often, the number of excellent projects is far beyond the available funding and cuts to the budgets must be made. The Ministry makes the final funding decision, but usually it follows the recommendation of the Board quite closely.

The follow-up of ongoing projects is based on the work of steering groups. These groups are nominated from representatives of interest groups, users of results, and co-financers of the project. The steering group meets the researchers twice a year and it has to give a positive assessment each year to keep the project going. Self-evaluation of the research project has to be included in the final report. Funding is usually based on ex-post payments made once or twice a year.

In Finland, there are no special evaluation criteria for Organic Food and Farming research. The evaluation is based on the normal evaluation procedure, including the balancing of different topics defined in the research programmes.

8 Utilisation of research

Farmers can utilize the research results through advisory bodies, research seminars and articles published in professional journals. On-farm research and participatory research are one way to disseminate research results. Advisory services utilise research through seminars and direct contacts with researchers. Other stakeholders utilise the research via direct contacts with researchers. Research priorities are discussed and formulated together with all stakeholders.

9 Scientific education and research schools

Extensive teaching in Organic Food and Farming is available at the University of Helsinki, while the University of Joensuu offers some individual courses about the topic. Besides study modules in Organic Food and Farming, the University of Helsinki offers degree programmes (BSc, MSc) in Agroecology, which is closely related to Organic Food and Farming. Other Finnish universities offer studies, which may support studies in Organic Food and Farming, mainly courses in environmental

issues and sustainable development. Some postgraduate studies for PhD students are also being planned.

The University of Helsinki offers courses for basic studies (25 credits) and intermediate studies (35 credits) in Organic Food and Farming. Advanced studies are also being planned. The studies are organised by the University of Helsinki, Ruralia Institute in Mikkeli. The studies meet the study requirements of the Faculty of Agriculture and Forestry, where the responsible department is the Department of Applied Biology.

The education offers qualifications for critical examination and sustainable development of Organic Food and Farming and prepares students to work specifically in jobs related to the organic food chain. Basic studies give a general view to organic production and underlying principles, while intermediate studies deepen the understanding of current issues in organic production.

In the academic year 2005 – 2006, there are altogether 17 courses, which discuss sustainable development and principles of Organic Food and Farming, primary production (production systems, plants, animals), food production (food, food chains, manufacture, social and economic issues), quality, food systems and case studies. Within these courses, students also have the opportunity to take basic and intermediate literature exams, do practical training, for example, in a research group and carry out projects of their own.

These multidisciplinary studies are meant for all university students regardless of the subject in which they are majoring. Half of the studies (mainly intermediate studies) are also offered for foreign students in English.

Teaching is closely connected to the ongoing research on Organic Food and Farming at the University of Helsinki Ruralia Institute and elsewhere. Teaching applies progressive inquiry and communal learning. Intensive teaching periods, expert lectures, group work, visits to farms and enterprises, e-learning and independent study periods are essential parts of the courses. Several courses are run completely on the Internet.

Teaching and planning staff cooperates with the European Network EONAT²¹ and the Nordic network AGROASIS (Nordic School of Agroecology/Ecological agriculture)²² in order to develop the studies and promote student and teacher exchange.

²¹ European Network of Organic Agriculture Teachers[0] ENOAT, www.umb.no/?viewID=7187

²² Bachelor of Science degree, Specialisation in Ecological Agriculture, Ruralia Institute, FiN-50100 Mikkeli, http://www.mtkk.helsinki.fi/ecostudies/english_studies.htm or –courses (BSc) in the European Common this is not the same as the agroasis, it is a specialised degree in OF, should this not be mentioned in the text ?It does not say to be the same as AGROASIS, but they cooperate with AGROASIS. I hope it can remain as it is.

10 Literature

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