FiBL Switzerland in brief

The Research Institute of Organic Agriculture (FiBL) was founded in 1973 and has been based in Frick since 1997. It is one of the world's leading research centres for organic farming. FiBL operates a vineyard which produces its own wine, a fruit-growing area, a farm with farm shop and a restaurant, all of which are run on organic lines. FiBL employs 125 staff. It works closely with those involved with practical applications of organic agriculture. Research and advisory projects are being carried out on more than 200 organic farms all over Switzerland.

Fruit, wine, vegetables and potatoes are the main subjects of crop research at FiBL. Trials are conducted on resisting pests and diseases by promoting beneficial organisms, applying direct control measures, and improving cropping techniques. One division of the institute is dedicated to the quality of organic products and the processing involved. Another key emphasis is on measures to increase soil fertility. Veterinarians are engaged in research into udder health and parasites; they optimize husbandry, feeding and pasture regimes and test homeopathic remedies and plant preparations. The socio-economics division analyses business problems at organic farms, pricing of organic goods and cost recovery levels, agricultural support measures and marketing issues. FiBL is a sought-after partner in European Union research projects.

In conjunction with its research FiBL operates an advisory service, so that results can quickly have an impact on practice. Alongside the provision of advice to individual farms and to groups, the most important advisory channels are courses, the monthly journal "bioaktuell", the website www.bioaktuell.ch and FiBL's data sheets. The international cooperation division organizes tailor-made projects for market development, certification and applied research in developing countries.

FiBL set up the independent institutes FiBL Germany (2001) and FiBL Austria (2004). It also co-founded the Bioinstitut in the Czech Republic (2004) and the Institut fir biologesch Landwirtschaft an Agrarkultur Luxemburg (IBLA, 2007).

Contact: urs.niggli@fibl.org

Income and expenditure 2007 und 2006		
(in Swiss francs)	**2007**	**2006**
Income		
Research projects	5 226 304.65	5 258 499.26
Service mandate for Swiss federal agencies	4 800 000.00	5 000 000.00
Advisory service and training	1 033 481.62	1 300 412.20
Communication (periodicals, data sheets, Internet)	870 911.96	878 108.47
International cooperation	3 275 258.89	2 737 819.26
Pilot farm	56 193.70	57 043.62
Catering, housekeeping	450 466.45	424 038.85
Donations, miscellaneous income	427 084.97	413 427.06
Total income	16 139 702.24	16 069 348.72
Expenditure		
Personnel expenses	9 857 708.95	9 689 311.45
Material expenses		
Experimental/trial material, laboratory, analytics, projects	4 375 045.14	3 970 014.47
Premises, office supplies, other administrative, information technology, advertising	1 193 678.36	1 205 856.68
Financial result	196 407.28	122 815.49
Depreciation	650 279.30	1 238 156.95
Total expenditure	16 273 119.03	16 226 155.04
Non-recurring income/expenditure	136 409.99	200 979.61
Net profit for the year	2 993.20	44 173.29

Development in FiBL Switzerland's finances in 2006 and 2007

In 2006 and 2007 FiBL carried out research, advisory, information and development projects to the value of 16 million Swiss francs per year. As a non-profit-making foundation we are committed to high ethical standards. We seek to live up to these standards, without being swayed by possible economic, political or social advantages.

Our work focuses on innovation in sustainable agriculture, species-appropriate livestock management and healthy nutrition. Our success in this work is due to the support of many donors, as the impressive list on pages 48/49 shows.

In 2006 the Swiss Federal Veterinary Office announced that it was withdrawing its annual grant for research into health prevention for farm animals. This affects important research in the areas of antibiotic-free milk production and the natural control of gastrointestinal parasites in cattle, sheep, pigs and poultry. In 2007 FiBL was short of 200,000 francs for this work; in 2008 the deficit will be 500,000 francs. In view of the significance of these issues for ecology and healthy nutrition, the decision of the Veterinary Office is hard to understand. By contrast, cooperation with the Swiss Federal Office for Agriculture (BLW) remains unflagging.

It is encouraging to note that "ethical buying" is growing in importance. The many brands on the shop shelves bear testimony to this, and it has made FiBL's work more attractive. An excellent model is the Coop sustainability fund, which makes considerable sums available to FiBL for the development of organic agriculture and species-appropriate animal management. Research is also funded by other companies such as Migros and the manufacturers of natural remedies HISCIA and Weleda.

Through its many international contacts, FiBL in involved in a large number of development cooperation projects (SECO, DEZA), and EU research, too, now provides FiBL with important research mandates. In the period covered by this report we were involved in 17 EU projects.

You, dear donors and patrons, have kept faith with FiBL, some for as much as 35 years. We respond to the trust you place in us with a commitment: we endeavour to use your donations as efficiently as possible and in the ways that you would wish. We are most grateful for each and every donation which helps to further the cause of organic agriculture, the environment and respect for life.

Martin Ott und Urs Niggli

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For further information, see also page 72.

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Endoparasites in ruminants

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Stolz Hanna
M Sc
Consumer and market research


Stolze Matthias
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MSc ETH
Food safety


Kretzschmar-Rüger Ursula, Food engineer
Processing of organic foods


Oehen Bernadette
MAS ETH
Freedom from genetic engineering


Seidel Katrin
Dipl. oec. troph.
Food safety, nutrition


Wyss Gabriela
Dr. sc. nat.
Head of division: Food quality

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Allemann Marianne
Experimental farm staff


Allemann Pius
Master farm manager

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Bär Markus
Balmer Oliver
Bayer Erika
Bieber Anna
Eisenring Tobias
Gloor Marianne
Götschi Sabine
Guerrero-Zimmermann Michael
Hildermann Isabell
Jäckel Jennifer
Kaiser Franziska
Kraus Noëmy
Louw-Prevost Martina
Schmid Heinz
Seidel Kathrin
Staehli Pamela
van der Meer Markus
Werne Steffen

Staff departures
Bolliger Conradin
Gloor Marianne
Guarino Maria
Guerrero-Zimmermann Michael
Heil Fritz
Hertzberg Hubertus
Hirt Helen
Holzherr Philipp
Kerbage Laurent
König Zeltner Cornelia
Kraus Noëmy
Larbi Mohamed
Majewsky Vera
Moser Samuel
Nowack Heimgartner Karin
Portmann Katrin
Richter Toralf
Schlatter Christian
Vieweger Anja
Zimmermann Maria

Trainees
Bargetzi Laura
Baumann Denise
Berger Nicole
Bieber Anna
De Reise Silva Cide Cil
Egger Regula
Gelman Bagaria Pablo-Enrique
Géneau Céline
Hothum Kathi
Huber Fabienne
Jancaryova Danica
Kaiser Franziska
Moesch Michèle
Morales Bernardos Inés
Müller Michael
Pasche Aline
Perret Jean-Luc
Pino Lucas Silvia
Seidel Kathrin
Thut Stefan
van der Meer Markus
Weber Felix
Werne Steffen
Winter Remo

Student guests
Bendani Zoubir
Buess René
Capponi Sergio
Erhard-Bucher Gertrud
Farag Mohamed
Huber Franz
Kamm Brigitte
Monzeglio Ursula
Schmid Yvonne
Schneider Hélène
Schüpfer Rudolf
Singer Bernhard

Students producing diploma theses
Bantleon Georg
Beermann Marina
Dittrich Priska
Hammelehle Andreas
Kilchsperger Rahel
Korte Nicola
Leimgruber Andrea
Lirsch Katharina
Meier Jsabel
Penzkofer Magdalena
Probst Johanna
Schied Johannes
Wagner Salomé
Welwarsky Yvonne
Willareth Martin

Visitors
Agarwal Pavan
Cornish Peter
Lang Andreas
Schaack Diana
Stoerrle Maria
Oyama Toshio
Zaferiou Rigas

Community service
Eigenmann Christian

Soil science

Efficiency of cropping systems

The natural resources available for producing food, such as fertile soil, biological diversity, water and fertilizer nutrients are becoming increasingly scarce. At the same time agriculture needs to become more independent of non-renewable fossil energy, which is used in the form of synthetic nitrogen fertilizers and fuels. By comparing different cropping systems for their resource use efficiency, we can make a crucial contribution to the further development of agriculture. Thanks to three long-term field trials and targeted studies on individual farms, FiBL is uniquely placed to carry out this type of research. Of special interest to us is the diversity of microorganism communities in the soil and their function in building up and mineralizing organic matter (humus). This is highly topical in view of climate change, because soils are capable of removing carbon from the atmosphere.

Strategies to optimize yields

The major challenge of the future is to produce more high-quality foods, applying methods which place much less pressure on the environment and use natural resources with care. Organic farming provides an ideal starting point for this, as it is already sustainable and the quality is high; only its productivity needs slight improvement. Our research concentrates on crop rotation, the improvement of animal-soil-plant nutrient cycles, adaptive reduced tillage, the application of beneficial soil bacteria and root symbiotic fungi (mycorrhiza), along with various preparations that have a catalytic impact on soil processes. The emphasis is on arable farming and horticulture.

Ecotoxicological assessment of biological and chemical pressures on soils

Soil fertility has always been the basis of organic agriculture, and today it is a main focus of the global debate on sustainability. Over the past 20 years FiBL has built up a high level of methodological and technical expertise with respect to the biological, physical and chemical issues surrounding soil fertility. In the framework of a risk assessment system we are exploring the effects of conventional and genetically modified organisms on soil fertility. We are also investigating regionally and temporally specific indicators of pesticide contamination of the soil, and are developing methods to produce food safely on sites damaged by previous land uses.

Seed and environment

The Swiss Organic Farming Ordinance and the EU Regulation on organic production stipulate that organic seeds and vegetative propagating material must be used in organic crop farming. As the seed markets are not yet fully established and there are still numerous exemptions, FiBL is coordinating the supply of organic seeds by maintaining an Internet database. Of increasing importance in the sustainability debate is the question of whether plant breeding for low-input and sustainable systems should set different priorities in terms of objectives. The many small breeders engaged in this area are not capable of solving these research questions on their own. As cereals are a key crop in organic farming, we are clarifying the essential elements of the interaction between genetics (plants) and environment (site factors such as soil and climate, as well as cropping intensity). How the plant root and soil interact under reduced tillage conditions is of special interest to us.

Horticultural production methods

Problem-solving and innovation in the value chain of organic fruit

Fruit production has always been a technology-intensive industry requiring a great deal of auxiliary input. Despite this – or perhaps because of it – all-natural quality is in high demand. Already 11 % of the stone fruit sold by market leader Coop is organic, and they consider 20 % to be a realistic figure. The market for cherries, plums, pears, berries, grapes and nostalgic fruit varieties still holds untapped potential. The main obstacle facing the expansion of fruit cultivation is currently a lack of varieties which are economically viable for organic production. It is also vital that we reconsider our present methods of cultivation (plantations on dwarfing rootstock well suited to mechanization) and develop more natural fruit orchards with a greater capacity for self-regulation (up to and including agroforestry systems).
Our research projects concentrate on testing numerous new varieties and also old ones grown under organic conditions, improving yield security and economic viability with preventive and natural practices, carefully examining any weak points in transportability and shelf life, and optimizing the quality of the fruit in terms of content, taste and nutritional value.

Optimizing production and quality in organic viticulture and vinification

Organic wines are currently experiencing a positive change of image among consumers. In Europe biodynamic wines in particular are considered some of the highest quality wines available. Swiss organic production competes with good-quality, affordable wines from abroad. Top quality, specialty products and the reduction of production costs are possible strategies to cope with this situation. Organic production today is based on heritage varieties which are susceptible to disease and need a great deal of pest management. This is far from ideal, both from an ecological and an economic point of view. Fungus-resistant varieties (PIWIs) are an elegant solution, but their proportion on organic vineyards today is only 10%. Our research projects concentrate on questions surrounding the PIWI varieties: monitoring their suitability for cultivation, resistance and wine quality, adapting vinification to the new varieties and supporting their market introduction. The further development of an organic crop protection regime for traditional European varie-

ties is constantly being advanced (new preparations, improved computerized forecast models). Furthermore, we are investigating the question of low-sulphite and sulphite-free organic wines and, in field and cellar trials, are analysing the question of whether and why organic – and in particular biodynamic – viticulture leads to a distinctive terroir quality.

Optimizing production systems and quality formation in organic vegetable and ornamental plant production

Growing organic vegetables and ornamentals is usually highly specialized and therefore prone to problems. The high expectations of the market as regards product appearance and quality require extensive research and development. Entirely new methods of cultivation must even be developed for certain crops such as green asparagus. On largely livestock-free vegetable farms, the level of self-sufficiency with nutrients is very limited. In theory green manuring with clovers could bring some improvement, but in practical terms there are still too many knowledge gaps. Organic seeds continue to be in short supply; enhanced development of organic seed dressing and ongoing testing of organic varieties are the most efficient methods of dealing with this problem. Consumers of organic vegetables expect great visual and sensory diversity (of nostalgic varieties, too); they want them to taste good, have a long shelf-life and promote their health. Organic vegetable growers can only satisfy such high expectations if they have the support of research. In addition to vegetables, we also address production and marketing matters concerning herbs and ornamentals.

Phytopathology

Improving potato production techniques

Organic quality potatoes are an important market commodity and a high value crop for growers. Although considerable progress has been made in terms of plant protection (from various foliar and tuber pathogens and pests such as Phytophtora infestans, Rhizoctonia, wireworms), yields are highly variable from year to year and the percentage of non-marketable produce is exceptionally high, which in turn reduces profitability. Our applied research projects focus on the questions of which new cultivars and heirloom or exotic varieties are suited for organic production, how fertilization, plant protection, and crop rotation can be optimized, and how substantial improvements in quality can be achieved.

Fundamentals of soil-plant-disease interaction

Plant health also depends on soil fertility, specifically soil structure (air and water balance), nutrient levels, and microbiological activity. Disease-reducing soil properties can be weakened as well as enhanced by cultivation techniques. Soil preparation, fertilization, and use of good quality compost are priorities. The goal of our research projects is to gain a better understanding of these interactions in field crop, vegetable, fruit, and grape production so that they can also be applied to organic production. Furthermore, stable agricultural systems, which are highly adaptable to the hazards of climate change, are of fundamental interest to us. We are especially interested in "clover soil fatigue," i.e. the effect of pathogens that proliferate in crop rotations with many legumes. Good legume growth is a key factor in the productivity of sustainable cropping systems.

Testing and developing fungicides and resistance inducers compatible with organic standards for fruit, grapes, vegetables and potatoes

Various plant protection products and plant tonics are approved for organic crop production. These products may be of botanical (e.g., fennel oil) or mineral (e.g., argillaceous earths) origin. The requirements for the products are becoming more stringent: on one hand increased efficacy is being demanded for existing products and on the other hand the requirements regarding ecotoxicity and human toxicity are increasing. Along with the testing and development of novel natural products and organisms, finding alternatives to copper-based fungicides is of the highest priority.
Recent research has shown that crops possess a number of defence mechanisms, which can be activated to varying degrees and which are collectively known as resistance induction. The systematic use of these natural defence mechanisms may be of great benefit to organic production.

Plant protection: Strategies and epidemiologies for fruit, grapes, vegetables and potatoes

Plant diseases cause considerable losses in yield and quality in organic production. Organic production relies on preventative measures more than any other agricultural production method. Such measures include the use of healthy seed, hygiene measures, resistant cultivars, cultivar mixes, cultural practices (such as pre-sprouting potatoes) and optimum soil fertility. Direct control measures are a last resort. These consist of special fungicides, biocontrol organisms and elicitors (resistance inducers). Plant protection products require optimum application techniques and timing, especially when efficacy is only partial. The use of warning systems as decision aids in timing applications is on the rise. These warning systems are based on the analysis of weather data. The use of such warning systems can substantially improve pest and disease control in organic production as well.

Seed quality and breeding

Healthy seed and vegetative propagating material is of paramount importance for organic production. Seed must be true to variety, must not be contaminated with genetically modified organisms (GMOs), must have a high germination percentage and vigour, and must be disease-free. Along with the compulsory use of organically grown seed, there must be methods in place that enable (i) the early detection of quality-related problems, (ii) acceptable levels of seed production in the field, and (iii) seed treatment in line with organic standards.
This project will promote the production of high quality, healthy vegetable seed. For a few key crops, we are searching for organically appropriate methods and products to treat seed for seed-borne pathogens.

Evaluating auxiliary inputs and technologies for organic production

The use of auxiliary inputs such as plant protection products, fertilizers, disinfectants and products to control veterinary pests is regulated in various bodies of public legislation (Switzerland, EU, United Nations Food and Agriculture Organization FAO) and private-sector standards (Bio Suisse, International Federation of Organic Agriculture Movements IFOAM). A formal approval process confirming compliance with organic standards, however, is lacking in Switzerland as well as in the rest of the world. With its list of approved auxiliary inputs (Hilfsstoffliste), FiBL has established a standard for scientific testing and approval since 1996. Today there are comparable procedures in place in Germany, Austria and the United States. The strict and transparent regulation of auxiliary inputs is an important tool in gaining consumer trust. International standardization of the regulations and criteria for approval of new products is thus of paramount importance.

Organic agriculture is an innovative food production system. Great strides are being made in technology, with strict attention to social, ethical and ecological criteria as well. We will use simple criteria to evaluate new animal breeding, plant breeding, food processing and food packaging technologies (e.g., nanotechnology) thoroughly. Our expertise should help not only the organic production sector but other groups in society as well in making a judgment.

Entomology

Nature conservation and farming

There are numerous studies substantiating the positive effects of organic agriculture on animal and plant species diversity. Organic agriculture is thus especially well suited to the development of viable, diverse cultural landscapes. Nevertheless, it is evident that organic farmers could make even greater improvements in nature conservation: flora and fauna can benefit greatly from suitably adapted cultural practices and systematic assessment of landscape structures. We plan to evaluate the workability of these different methods on pilot farms and in pilot regions. An additional priority of this project cluster is the provision of consultancy services to farmers. Nature conservation should become an enterprise that is also economically profitable. In collaboration with the Schweizerische Vogelwarte bird observatory and Bio Suisse, FiBL is striving to preserve intact, diverse ecosystems and promote biodiversity.

Biodiversity for the farmer's benefit

When deployed intelligently, biodiversity can also be of direct benefit to the farmer: pest populations can be reduced by systematic promotion of predatory and parasitic beneficials through carefully selected companion plantings within and around the crops. These promotion measures must be adapted to the crop and to the pest complex. Moreover, they must be technically and economically feasible. Thanks to basic and applied research, strategies for functional biodiversity are being developed for various crops.

Beneficials for pest control

Nearly every pest is known to have a beneficial as a natural enemy. These beneficials may be fungi, viruses, bacteria, predatory or parasitic insects or arachnids. There are some very efficient beneficials for some pests, and these are being used effectively on a commercial scale. The use of these beneficial organisms enables reduction in the use of standard pesticides. Through systematic research and development, we hope to discover additional beneficials and test them against pests in various crops. The goal is to collaborate with industry and get new products approved and on the market.

Protecting plants from pests

Direct plant protection measures are frequently used as a last resort in organic production due to the limited selection of approved products available to organic farmers. In order to ensure profitable production and high quality of certain crops, however, these products are important. Selective and effective plant protection methods in line with organic standards are being developed in collaboration with industry partners. Novel insecticides, physical controls, pheromones and plant tonics are thus priorities for research.

Animal health

Complementary and alternative medicine for animals

Animals in organic operations are usually treated with orthodox veterinary measures when they get diseases. There is much interest, however, in alternative or complementary treatment methods. The gap between their widespread use and the lack of scientific proof of their activity and efficacy, however, creates a need for basic research, which must be conducted in controlled systems under laboratory conditions. Testing such medications under field conditions is also essential. Hence the goal of this module is to demonstrate the activity of potentized substances on biological systems in the laboratory and to test the efficacy of residue-free, natural medications on diseased animals. Up-to-date recommendations will be based on practical experience and backed up by controlled, scientific methods. Emphasis will be on field studies to assess the applicability of the experimentally tested protocols.

Epidemiology and development of preventative strategies for animal health

The health of farm animals is influenced by many factors. These include the environment, feeding, husbandry, social behaviour in the herd/flock, and management and care provided by humans. The scientific analysis of all of these factors and their effect on animal health will provide valuable information for both consultancy and practical applications. In these analyses, we will determine which factors contribute to health in farm animal herds/flocks (epidemiology). FiBL's „pro-Q" pilot farm network with over 150 dairy operations will serve as a database and foundation for such analyses. The goal is the elaboration of factor catalogues that focus specifically on the unique situations and conditions of organic production. The results of the epidemiological research will build on these catalogues and serve as the foundation for holistic, practice-oriented animal health programmes designed to prevent animal diseases. The rudiments of such animal health programmes are already in place in the area of udder health and they will be further developed to include other disease complexes and animal species.

Animal health and quality

The knowledge gained is being implemented in herd/flock health management systems. Farmers who sign up to such management systems benefit from comprehensive, holistic animal health consultancy. This involves close cooperation between the farmers and extension services and veterinarians. The special feature of the systems is that they combine animal welfare, disease prevention and complementary medicine with a high quality of milk and meat. The management programmes are applicable to different production systems (organic, IP, conventional), different problem areas (udder health, fertility) and different animal species. Special emphasis is also placed on the profitability and sustainability of livestock management.

Veterinary parasitology

Analysing the parasite infestation situation in animals in organic operations

Organic operations face greater parasite problems, as on one hand the animals come into contact more often with parasites due to the compulsory access to pastures and runs, and on the other hand because prophylactic medication is not allowed. A targeted implementation of antiparasite treatments is possible with the help of a situation analysis on the farm level. Considerable reduction in the number of treatments can often be achieved this way, without compromising the health of the animals.

Controlling endoparasites in ruminants

Grazing animals are infected with worm parasites that need to be controlled for economical as well as animal welfare reasons. The current standard practice on both organic and conventional operations is to de-worm the animals with synthetic antihelminthics. Their use is not without problems (resistance, effect on soil organisms), however. In past years, diverse non-drug procedures (e.g., pasture management, bioactive forages, selection of resistant animals) have been developed and their efficacy has been confirmed. The goal for the coming years is to implement these strategies and in particular to exploit their additive effects. Special attention shall be paid to the profitability of new control strategies of this nature. These methods promise great strides for all livestock producers, regardless of production method and herd size.

Controlling endoparasites in nonruminants

Worm parasites and coccidia are one of the worst health problems in poultry, swine and rabbit production. In rabbit production, for example, the economic losses are enormous, and all producers struggle with major problems. Preventative approaches in nonruminants are less sophisticated and also less effective than in ruminants and horses. For these reasons, alternative treatments (such as phytotherapy) supplement preventative measures in these animal species.

Controlling ectoparasites

Problems with insect and mite parasites are likely to increase in the future, as global warming creates more favourable living conditions for these pests. As a consequence, their importance as vectors of diseases (e.g., bluetongue) and as problems in animal protection and hygiene will also increase. Certain preventative measures against ectoparasites are known, but they are frequently insufficient to reduce infestations in farm animals to tolerable levels. The chemical-synthetic products still in widespread use therefore need to be replaced as quickly as possible with improved preventative measures and more effective natural products.

Animal breeding, livestock husbandry

Animal welfare and environmental performance

Today's society vehemently demands species-appropriate and environmentally-appropriate milk, meat and egg production. Organic production is playing an exemplary role in this area. Workable and ethically acceptable livestock management strategies are undergoing continuous development and new, environmentally sound livestock management systems are being researched and tested. Corresponding research and assessment methods are being developed and applied.

Special priorities for research in this area include the transport and slaughter of farm animals, as well as reduction of stress and losses in meat quality. Additionally, we are conducting new research on rabbits, as they are a very interesting niche. Feeding, feed supplements, species-appropriate management programmes, prevention and treatment of coccidiosis, and meat quality are priorities.

The results have important implications in terms of practical applications as well as development of new methods and

insights in the areas of animal behaviour, species-appropriate livestock management, and human-animal relationships.

Sustainable animal breeding

In terms of breeding goals, the priorities of organic agriculture are different than those of traditional agriculture: the health and fertility of the animals as well as product quality are at the top of the list. It is therefore necessary to develop breeding strategies that give priority to the pursuit of these goals. Furthermore, research is needed to determine which breeding animals fulfil these goals. Traditional breeding strategies do not always employ techniques that are compatible with the concepts and goals of ecological agriculture. As a consequence, there is a need for ongoing discussion of ethical aspects in connection with breeding strategies and reproduction techniques in organic production, as well as for the elaboration and communication of appropriate recommendations.

Food quality and safety

Food quality and health

The quality of organic products, particularly in terms of their nutritional and physiological benefits and their positive or negative effects on health, is a constantly recurring theme in the media and in public debate. Organic foods do indeed differ in many quality-related respects from those produced by other systems. FiBL is interested in particular in the verifiable connections between the chosen method of cultivation and the resulting quality of the food produced, and in the impact of cultivation method on the well-being and health of consumers. Organic quality research explores this multi-disciplinary area by means of feeding and intervention studies on both animals and people. As part of this work, FiBL devises and scientifically validates integrated quality assessment methods. The impact of microflora on product quality is also studied by appropriate methods.

Food safety

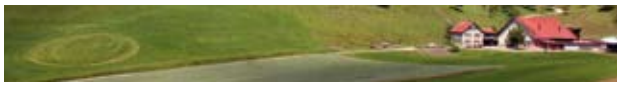
The market for organic products is growing extraordinarily fast, trade flows are becoming more and more international and in many places there are bottlenecks in the procurement of raw materials produced to organic standards. In consequence the demands on the quality assurance of organic products are increasing. There is also a growing incentive for farmers who do not take the stringency of organic standards too seriously to seek a foothold in this lucrative market. Even with one of the best quality assurance systems of the entire food industry, the organic sector is not immune to malpractice; there is room for improvement throughout the production, processing and transport chain. By means of targeted courses, projects, advisory work and publications we function as an information platform and support those involved in organic agriculture (producers, processors, monitoring and certification bodies and food inspection) in their efforts to safeguard organic production along the entire supply chain. FiBL has now acquired a large amount of data in the form of information, analysis and case studies.

Processing

Of course it is not only fresh products but also processed organic products – in economically significant quantities – that consumers put on their plates. The organic concept therefore needs to be developed and established in the longer term in the processing sector as well as at the level of raw materials. Strategies are needed for environmentally friendly and sustainable processing methods, recipes and packaging. As well as resource-saving processing methods, aspects such as sensory quality, the minimal use of additives, freshness and authenticity are important quality criteria. FiBL is addressing these issues in relation to processing and working with partners from research, monitoring and industry to develop solutions and improvements. Building on experience gained in research projects and a broad skills network, FiBL is able to offer problem-oriented advice in the areas of processing and marketing and to organize conferences on matters of special interest.

Evaluating new technologies

New technologies can open up large-scale opportunities, but they may also entail great risks. We are engaged in the evaluation and pre-emptive avoidance of the risks of new technologies in organic food production. At the core of our activities is the assessment of genetic engineering and its application in the context of sustainable food production. We support the actors of the organic food sector with information and advice. We also carry out research into relevant issues affecting the production of food without genetically modified organisms (GMOs); these include the costs of coexistence, seed purity, and the monitoring of GMOs in the environment. Recently, nanotechnology has also joined the agenda; for organic products it could have potential in the areas of resource-saving processing and quality-conserving packaging. Against these prospects must be set concerns about the impact of nanoparticles on health and the environment.



Socio-economics

Policy impact assessment

Using the CH-FARMIS sector model it is possible to analyse the impacts of different parameters of agricultural policy on organic farming in Switzerland (income, farm organization, product range, relative excellence of organic agriculture). Because ecological indicators are integrated into CH-FARMIS, the system can be used to evaluate the cost-effectiveness of sustainable farming systems in providing environmental services.

The future of farming

The farmers of the future need core competencies in business skills and sustainable management. In this cluster we create the necessary scientific foundation. Relevant subject areas are: the role and importance of cooperation, secondary sources of income, non-food diversification and new technologies.

Consumer behaviour

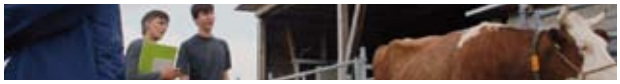
Quantitative methods of consumer research are used to study the behaviour and confidence of consumers who only occasionally buy organic products. One area of this work involves the arguments – other than the organic argument – used by producers to portray their corporate social responsibility; the communicative impact of these arguments on consumers is investigated and improved.

Agriculture and society

In order to draw up principles which will guide political actors in ensuring the sustainable use and development of rural areas, it is first necessary to analyse the present and future social environment. FiBL therefore studies what society requires of the various functions of sustainable agriculture in Switzerland.

Efficient certification systems

Organic certification is a relevant cost factor for actors involved in organic value chains. FiBL identifies approaches to efficient certification systems.



Extension

Advisory work

Advisory services for organic agriculture in Switzerland are now well developed. FiBL has operated an extension service since 1977, and since 1985 services operated by the cantonal authorities have offered advice on organic matters. Cooperation and division of tasks between cantonal advisory services and FiBL's extension service is very well organized. While the cantonal offices deal mainly with the conversion to organic methods on farms, FiBL advisors focus on special areas and bring their knowledge to bear country-wide.
Agricultural policy and the market require farming families to display initiative and be confident in decision-making. Advisory work may therefore address issues ranging from purely technical production questions to whole-farm optimization and new business ventures. The high volume of regulation in organic agriculture increases and complicates the need for advisory services. The principal methods used are telephone information, visits to individual farms and group advice sessions for farmers, processors and traders on technical aspects of production and socio-economic issues.

Training

In collaboration with FiBL's research arm, the advisory service offers an attractive course programme. Some courses shed light on the latest research results; others cover new trends in agricultural policy, the markets, quality assurance or niche products. Working with Bio Suisse and Demeter, FiBL also addresses the training needs of the young generation and has set up a training course leading to the qualification of "farmer with federal certificate of competence specializing in organic agriculture". FiBL is involved in teaching at various agricultural colleges, the universities of agriculture and the Zurich Swiss Federal Institute of Technology (ETH).

Projects

FiBL's extension workers speed up the transfer of knowledge from research to practice (and vice versa) through the institute's own demonstration trials and highly practice-oriented surveys and experiments. These on-farm trials are methodologically very simple, but they help to accelerate innovation. Priority areas are animal feeding, herd/flock management, arable farming, specialty crops and marketing. We work very closely with organic advisors in the cantons and there is an intensive exchange of experience.

Communication

Periodicals

FiBL produces a number of periodicals through which it helps organic farmers, processors, advisors, interested consumers, stakeholders and policymakers to remain abreast of developments in organic agriculture. Together with Bio Suisse, FiBL publishes the monthly magazine "bioaktuell" in three languages. There is a long-standing partnership with the journal "Ökologie & Landbau", which appears in Germany, Austria and Switzerland. We produce the journal "Beiträge" for Demeter farmers in Switzerland as well as a newsletter for organic farmers in Zurich and Schaffhausen.

Publications

The FiBL Verlag publishing arm publishes a wide range of materials designed to facilitate the transfer of knowledge from research to advisory work and practice: data sheets, technical reviews, folders, CDs, manuals, conference papers etc. The amount of work put into the educational and graphic quality varies according to the product. As a publisher FiBL attaches high priority to continuity and up-to-date information.

Internet

In addition to its own website, FiBL develops and maintains a number of websites (around 30 in total, see http://www.fibl.org/internet/angebote.php) dealing with FiBL-related activities. These websites are developed jointly with FiBL Germany.

Research communication

As an internationally recognized and experienced institution in organic agricultural research, we make the contents and methods of our accumulated experience available in various networks; we also collate and analyse the experiences of others. The special features of organic agriculture, its systemic approach, its trans-disciplinary research cooperation and its

energetic involvement of actors from the entire "organic chain" make this exchange of experience very fruitful. FiBL is actively involved in websites and literature databases relating to organic research; it takes part in national and international conferences and works on research strategies for the future.

Public awareness

The constantly increasing importance of organic agriculture is accompanied by a growing need for information on the subject and on FiBL. FiBL's awareness-raising work reaches a broad audience. Activities include stands at fairs, an open day, the activity report and wide-ranging media work.

Information hub and statistics on organic agriculture

There is also growth in the need for information on the current state of organic farming in individual counties and worldwide and on current trends and prospects. This information is required in particular by policymakers, associations and market players as a basis for their decisions. For people involved in the media such information is indispensable. FiBL Switzerland processes statistical data on agriculture and on the markets in Switzerland, Europe and internationally. Every year FiBL publishes the book "The World of Organic Agriculture".

Development and cooperation

Sustainable production systems

Crucial to organic farming methods are the promotion of soil fertility and biodiversity and sustainable land use based on locally adapted cultivation techniques. The development of such techniques presents a major challenge for many producers in developing countries. In the tropics and sub-tropics there has as yet been very little research into practical solutions for organic agriculture and the integrated application of its principles.

The priority areas of our projects are the evaluation and development of locally adapted technologies, and exploration of the contribution of organic farming to food security, environmental conservation and sustainable development. The projects focus on practice-oriented on-farm research.

Climate and resources

The tropics and sub-tropics are greatly affected by global warming, in particular because of their greater dependence on irrigation, the soil's lower buffer capacity and frequent lack of access to resource-saving technologies. On the international market, climate-neutral products are playing a more and more important role. People look to agriculture to provide renewable energy and agricultural fuels – which are often labelled, completely inappropriately, as "biofuels". Most of these energy products produce fuel from agricultural crops and compete with food for people. FiBL develops methods, evaluates value chains and researches genuine "biofuels" from the farm.

Market development

The demand for organic products is growing unabated all over the world. Local markets are emerging even in poorer developing countries. The market potential of organic agriculture offers attractive development opportunities for producers and exporters from developing and transition countries. The organic market requires a great deal of attention and specialist knowledge. Anyone who aims to market organic products successfully must develop strategies for quality, regionality and fair trade and have knowledge of the potential of the organic market and of access conditions.

Priorities of the projects in developing countries are the development of value chains and market initiatives, market research, development of regional and international marketing strategies, linking of demand and supply, quality management, and preparation for label recognition and certification.

Certification, standards and agricultural policy

Organic certification is the key to market access, but for small farmers in developing countries it presents a major challenge. International certification procedures are unaffordable for small farmers. Two alternatives are being implemented in various FiBL projects, primarily in eastern Europe and Asia; these involve the setting up of internal monitoring systems and the development of local certification programmes.

Training and extension

Organic agriculture is knowledge-intensive at every stage. Suitably prepared and efficiently distributed information is essential for producers, processors, trading companies, teachers, advisors, researchers and official bodies. FiBL supports training and advisory organizations, research institutions, NGOs and other service providers in developing countries. Activities include collating, editing, distributing and networking specialist knowledge, experience and research results, developing education and advisory tools, materials and documentation such as manuals, data sheets and Internet platforms, developing teaching plans and training teachers, setting up competence centres and advisory services, the direct provision of services such as conversion planning, and the provision of advice on specialist areas of organic farming.