



Activity report

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Dear reader

Is there any alternative to an organic Switzerland?

When they want to sell food, advertising agencies almost invariably resort to images of unspoiled nature, butterflies in colourful wildflower meadows and happy, free-range animals. The products are always pure, natural, residue-free and delicious. But hand on heart: which form of farming actually lives up to these shrewdly-selected marketing images? Conventional farming? Or integrated production? No, not even organic agriculture can fulfil such high expectations – but at least it comes close.

From the viewpoint of the advertisers' images and the public's expectations, at least, organic has long been the standard form of agriculture in Switzerland. So why not take the next step and convert the whole of Switzerland to the organic way?

The market will not cope, argue the voices of caution. Swiss citizens already spend an annual 165 francs per head on organic products, making them world-champion organic consumers. But at the moment, there is little sign of this demand climbing any higher.

At the beginning of the 1990s, the Swiss Federal Office for Agriculture carried through a reform of its system: away from subsidizing the quantity of production and towards payments for ecological services. The levels of payment set back then for integrated production and organic agriculture have resulted in a situation today where integrated production takes place on 85 percent of farms and organic on 11 percent, leaving the fewest of the few to farm conventionally. The Swiss Confederation spends around 2.5 billion francs per year on direct payments, investing another 1.5 billion in production and marketing, and in improving sector fundamentals. Have we already got the best possible value from all this money for the environment and animal welfare? Organic agriculture works consistently for environmental protection and does not introduce any chemical pesticides or fertilizers into the environment. It preserves the integrity of the soil and conserves biodiversity. It consistently practises closed cycle management, which yields massive savings – particularly on petroleum for fertilizers. It also practises respectful management of farm animals. Organic farming is the form of agriculture that is best accepted by society. Its value to the economy and the excellence of its products have been documented scientifically on many occasions. The means for large-scale conversion are available in the national agricultural budget. – No, there is no alternative to an organic Switzerland!

Dr. Otto Stich,

President of the Foundation Council of FiBL Switzerland



Chronology of a fruitful partnership between research and practice

In the early summer of 2004, the Foundation Council and management launched a debate on the future of FiBL. This included the development of the 'three rings' model of research: the largest, outermost ring stands for on-farm research, which takes place on organic farms all over Switzerland. Depending on the experimental questions, every year 200 to 300 farm managers assist FiBL by taking part in studies. The middle ring corresponds to farms or fields which are exclusively used for research. These include FiBL's own mixed farm in Frick, the FiBL vineyard, and the DOK trial in Therwil. The inner circle represents pure research, which makes use of state-of-the-art growth rooms, biological models



in the laboratory and high-tech analytics. FiBL's modest ten-year-old laboratory can no longer keep pace with developments in this field. The Foundation Council and management therefore decided to plan a new laboratory and office building. It took two years before the detailed planning for the project was completed in May 2006 and the costs of 4.5 million francs were known. On 13 July, the first sod was turned by Otto Stich (President of the Foundation Council), Regina Fuhrer (President of Bio Suisse), Christian Butscher (President of the biodynamic producers' association Demeter), Markus Arbenz (Director of Bio Suisse) and myself. Unlike the state research institutes, a small non-profit foundation like FiBL cannot call upon parliamentary backing in the form of generous building loans. Nor do we have the economic clout of the chemical research sector. The one-off investment must therefore be financed by means of a major public appeal. My heartfelt thanks, therefore, to the numerous sponsors and patrons who support FiBL financially!

In November 2004, FiBL and the Canton of Aargau agreed upon the transfer of the state winery in Frick (with its four hectare vineyard, previously managed on integrated principles) to FiBL for research purposes. In May 2005 the FiBL winery presented itself to the public with a new wine label and appealing wines (still in conversion to organic production in 2005). Viticultural research has been intensified ever since, not just in Frick but on various other working farms. For example, a new project is studying the influence of bio-dynamic preparations on soil fertility, the physiology of the vine and the quality of the wines. We would like to get to the bottom of the experience of top vintners in Switzerland and abroad, who produce wines of extraordinary quality, redolent with character and terroir, thanks to bio-dynamic production techniques.

In December 2004 the Swiss Ornithological Institute brought up various weak points of organic farming practice in discussion with FiBL. They raised the issue that organic cereal production with its mechanical weed control (harrowing) gave too little consideration to ground-breeding bird species (e.g. sky larks). Or that in the Engadine, the whinchat was under pressure due to the early cutting of meadows, even on organic farms. This dialogue has led to close cooperation, with several regional projects

now under way which quite deliberately encourage birds and other wild animals on organic farms.

Organic agriculture is more than nature and environmental conservation. For consumers, flavoursome and healthy food are just as important. Since 2004, food quality research at FiBL has been expanded by recruiting a microbiologist, a nutritional physiologist and a food technologist. March 2006 saw the publication of FiBL Dossier no. 4 on the quality and safety of organic products, which was greeted with huge interest internationally.

The last three years have been very successful for FiBL in terms of new EU research projects. The EU brings together consortia of renowned institutes to tackle research themes of European significance. Thanks to bilateral treaties between Switzerland and the EU, as of January 2004 FiBL can participate not just in the role of a partner but as an overall coordinator, which we are already doing in two cases. In total, there 15 large research projects running in the year 2006 in which FiBL is a partner or a coordinator. In October 2005, Switzerland was swept – out of the blue – by criticism of organic milk. This was prompted by a study at the University of Berne on the health status of dairy cattle on integrated and organic farms in the Canton of Berne. Even the tabloid press took up the issue, with headlines asking why higher prices should be paid for organic milk if it could claim to be neither better nor healthier. Luckily, FiBL was always ready to respond to critical questions with facts, figures and innovative projects. For instance, in its Pro-Q project, FiBL is addressing the fundamentals of udder health problems in dairy cows. It developed a comprehensive preventive health strategy for dairy cows which relies on complementary medicine in case of problems, thus reducing the use of antibiotics (to zero in certain instances). This led to better milk quality from 2000 to 3000 cows on the first 100 pilot farms. After three years, the leading farms on the project are producing certified milk of excellent quality. Further studies in the European QLIF project in England, Wales, Denmark and Sweden, for which FiBL is the academic coordinator, reinforce the positive findings in relation to the quality of organic milk.

The present activity report includes extracts from the diverse activities of the three FiBL institutes in Switzerland, Germany and Austria from mid-2004 to mid-2006, with a view to offering our readers a host of examples of the exciting work we do. We hope you enjoy it!

*Dr. Urs Niggli,
Director of FiBL Switzerland*

Research and services with practitioners' interests at heart

Organic agriculture in Germany is faced with major challenges. The development of new groups of customers, for instance, as organic products are increasingly stocked even by discounters, is currently generating major growth in the German organic sector. On the other hand, it is virtually impossible to meet the rising demand from domestic production alone: the globalization of the organic market exposes our farmers to competition from regions where the production cost base is far lower. In addition to the high costs they face – for labour and energy, for example – German organic farmers also have to deal with an onerous level of bureaucracy, with a rising burden of paperwork required to prove compliance with ever more stringent regulations. Moreover, new European rules on organic agriculture which do not in any way meet the requirements of practical farming are threatening to cause new hardships. And finally, the prospect of genetically modified crops being grown on a large scale poses difficult problems for organic farmers as well as the processors and traders of their products.



These are equally pressing challenges for FiBL Germany, given its close cooperation with the actors and organizations of the organic food sector. The projects presented in this annual report show how FiBL is working to solve current problems: by means of the traceability project named "Organic face-to-face", for instance, which shows consumers the face of the organic producer who made the particular product they purchased – usually a local farmer attached to one of the producer organizations – and so renders these foods less substitutable; or by means of the practitioners' handbook on keeping organic products free from genetic engineering, which gives practical guidance to organic producers, processors and traders on avoiding contamination with genetically modified organisms. Another extremely important strand of work is the list of permitted inputs, the basis on which the producers' associations authorize their members to use certain organic crop treatment products and fertilizers. All in all, these are examples of FiBL's leading role in the sector, as a research institute focused on practical applications and as a service provider in tune with the needs of its clients in organic agriculture.

If all those who care about organic agriculture can concert their efforts in this way, then the challenges we face in the next few months and years will not prove insurmountable!

*Dr. Felix Prinz zu Löwenstein,
Board member, FiBL Germany*

Five years of FiBL Germany – a gratifying milestone

It has been five years since the FiBL Germany team took up its work in the autumn of 2001. This early anniversary prompts us to take stock of progress so far – and the results are resoundingly positive. We have succeeded in establishing FiBL Germany and building a reputation in Germany as a research institute with strong ties to agricultural practice, and as a knowledge-based service provider.

The growing interest in organic agriculture, and the agricultural rethink following the BSE scandal paved the way for an excellent start. The spotlight was first and foremost on the setting up and maintenance of the central Internet portal www.oekolandbau.de; but other projects like the seed database at www.organicX-seeds.de and the publication of the permitted inputs list have reached a very wide audience, raising FiBL Germany's profile significantly.

The fact that this profile could be established on a sound financial basis is particularly gratifying, in that FiBL Germany had no initial endowment from public funds. Through the commitment and competence of our staff, it has been possible to finance our work completely via projects. Thus FiBL Germany with its current staff of eleven has become a permanent fixture in Germany's organic food sector.

In order to maintain FiBL Germany's influence in future and enable it to grow, we must continue to address the challenges facing the organic food sector and help to work on solutions to the problems that exist. For example, take the area of marketing: although the organic market is booming in Germany right now, German farmers are not reaping enough of the benefits, because demand is often being met with products imported from abroad. In 'Organic face-to-face' (www.bio-mit-gesicht.de) we developed a concept which aids better communication of the high quality and safety of products from German producer associations. The system aims to reduce the substitutability of products and to create a competitive advantage for the participating farmers. Another example is agro-genetic engineering, the proliferation of which would pose a massive threat to the organic food sector. As a response to this challenge we, together with the German Federation of the Organic Food Sector and the Öko-Institut (Institute for Applied Ecology), have produced a practitioners' handbook on GM-free production ("Bioprodukte ohne Gentechnik", www.bioXgen.de) as a ready-reference work for farmers and processing companies on how to avoid GM-contamination.

In the founding phase of FiBL Germany, Germany's then Minister of Agriculture, Renate Künast, developed the vision that twenty percent of farmers in Germany would be farming organically by the year 2010. Even if this target was perhaps somewhat overoptimistic, we hold fast to the vision that we could see a percentage in double figures by the time of our tenth anniversary.

*Dr. Robert Hermanowski,
Director of FiBL Germany*

Knowledge transfer as important as research

It is a declared policy objective of the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management (the "Ministry of Life") to promote organic agriculture in order to safeguard and extend Austria's position as Europe's leading country for organic food. The Organic Farming Action Programme devised for this purpose puts special emphasis on cooperation among all the actors in the organic sector.

Comprehensive knowledge transfer between research and practice, taking in all the "intermediate levels" (school-based initial vocational training, advisory and extension work, etc.) is especially relevant. Putting the available knowledge into practice is just as important as generating new knowledge through research.

FiBL has therefore made this one of its priorities.

A good example of FiBL's activities is its work in the field of animal health. Even internationally, holistic concepts for prophylaxis and treatment are still only at an embryonic stage. FiBL is trying to make good the deficit by means of active support and knowledge transfer to vets, consultants and organic farming practitioners. Given the special responsibility of organic agriculture for ethically and ecologically sound food production, and the increasing significance of food quality and food safety, this is an area of strategic importance.

*Ao. Univ. Prof. Dr. Werner Zollitsch,
Board member, FiBL Austria*

FiBL Austria 2004 to 2006

Since FiBL Austria was founded in May 2004, we have worked in close contact with organic practitioners to advance organic agriculture in Austria. We have meanwhile grown into a small but effective institute with a team of five staff. At our headquarters in Vienna, we can work side by side with BIO AUSTRIA.

Since the inception of FiBL Austria, cooperation with the Austrian institutions working in organic farming has always been enormously important. The chambers of agriculture, the Raumberg-Gumpenstein Research and Education Centre for Agriculture, the universities for crop and soil sciences and veterinary medicine, and BIO AUSTRIA have all been dependable partners during our two-year start-up phase.

The current focuses of our work are animal health, risk research and comparative quality research in relation to genetic engineering, and knowledge transfer on arable production and nature conservation.

*Dr. Elisabeth Stöger,
Chairwoman FiBL Austria*



“We aim to remain the organic leader of the new EU states”

The Bioinstitut in the Czech Republic was founded in November 2004 by Czech organic producers' association Pro-Bio, Olomouc University and FiBL. Since then it has been active largely in the fields of training and advisory work. An interview with its Director, Jiří Urban.

Within organic agriculture, the Czech Republic is seen as the leading country among the new EU Member States. What is the Bioinstitut's role in this?

Jiří Urban: After the Czech Republic's accession to the European Union in May 2004, the government very quickly produced a national action plan for organic farming. The Bioinstitut is now involved in implementing this. We coordinate the work of the participating organizations. The problem is that there is no financial support for the action plan as yet. We are now in the process of developing financing proposals for the ministries, however.

And the Bioinstitut itself? What is its financial situation?

Urban: The Bioinstitut finances itself by means of projects. Currently there are three members of staff working the equivalent of 1.5 full-time posts. Until now there has been a large volume of work and very few people to do it, since there was no money for additional staff. Now we have had various

projects approved we will be able to recruit; in total, six people will be sharing three new full-time posts.

What are these projects, specifically?

Urban: In the next two years, the Czech organic producers' association Pro-Bio will be setting up two new centres for advisory work, training and knowledge transfer in organic agriculture. Their work will include supporting 36 additional information offices in agricultural colleges, conservation offices or similar existing establishments. The input of the Bioinstitut consists of training and advisory services. Furthermore, we are working with ten other research institutes on Olomouc University's "Landscape Project" on the themes of landscape planning, environmental protection and biodiversity. The main focus of the Bioinstitut's work is on organic agriculture.

We are preparing what are known as farm management plans. This involves analysing the actual status of a farm and making suggestions for improving its management as well as pointing out possible financing options. We integrate all this into a plan for conversion to organic agriculture. We are also working jointly with FiBL Switzerland and FiBL Austria on a project promoting biodiversity and nature conservation.



Jiří Urban



The average organic farm in the Czech Republic is in a mountain region, where 90 percent of its approx. 200 ha is grassland, and is stocked with suckler cows, a few sheep and horses.



So the Bioinstitut is on course for success?

Urban: Yes. So far we have been doing a great deal of work which was not funded, simply to raise our profile. This is now paying off. With our new members of staff, we will be able to make even better progress with organic agriculture in the Czech Republic. – After all, we aim to remain the organic leader of the new EU member states.

Interview: na

Contact: jiri.urban@pro-bio.cz

Internet: <http://www.bioinstitut.cz>; <http://www.pro-bio.cz>



Soil and plants

New long-term trial on soil cultivation, fertilizer use, and biodynamic preparations

The new long-term trial is at its mid-term stage: It has been running since 2002 at FiBL in Frick and compares tillage production with and without ploughing as well as the impact of manure compost and of the biodynamic preparations. The trial will conclude in 2011. It recently delivered initial, in part quite surprising results.

Does reduced soil cultivation work in organic farming? The long-term trial at Frick combines the factors biodynamic preparations, soil cultivation with and without ploughing, and use of manure compost or slurry in a full factorial design (eight treatments with four replicates each, i.e. a total of 32 plots, 12 x 12 m in size each). The FiBL experts and external project partners from, amongst others, the Research Institute at the Goetheanum and from Agroscope FAL Reckenholz were surprised at a number of results from the initial years of the trial. They had not expected that wheat from plots which had only been treated with biodynamic preparations in the trial year contained less fusarium toxins and was distinguishable from non-treated wheat samples through picture forming methods. The results on soil fertility are also very significant: Soil tests carried out in 2005 showed that compared to ploughing, reduced tillage resulted in a statistically significant increase in the humus content of 7 percent (+0.16 percentage points C_{org}) at 0-10 cm depths in a mere two years (see Fig.). In the reduced tillage soils, the microbial biomass was elevated by 28% and there was a trend towards higher colonization of roots with symbiotic fungi.

Good results can be obtained with reduced soil cultivation

Yields responded positively or negatively, depending on crop type. For example, in the first year the winter wheat yield under reduced tillage was 16% lower than in the ploughed plots (reduced: 5.1 t wheat/ha; 15% humidity). The following intercrop, an oat/berseem clover mix, showed no notable difference while sunflowers even gave a 5% higher yield in the reduced tillage plots (reduced: 3.6 t seeds/ha; 8% moisture).



Reduced tillage does not necessarily imply reduced yields: Sunflowers produced a 5% higher yield, presumably because they are able to utilize nitrogen mineralized late in the year.

Deep-rooted weeds could become a problem

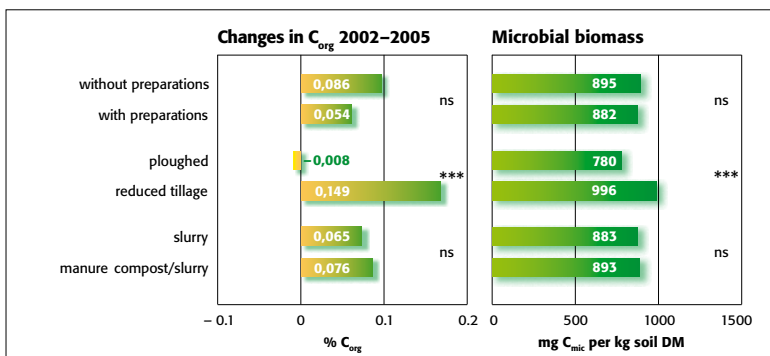
In the first year of the trial the weed population differed little between the two soil cultivation methods but in the third year there were clear differences under spelt wheat. At 16 percent, the cover value for weeds at the spelt's flowering stage was twice as high in the reduced tillage plots than in the ploughed plots. Project manager Alfred Berner expects that the differences between the two cultivation strategies will become even more pronounced in the next trial period.

mb

Contact: alfred.berner@fibl.org und paul.maeder@fibl.org

Funding: Dutch Biodynamic Association, Driebergen; Stiftung zur Pflege von Mensch, Mitwelt und Erde, Münsingen; Sampo Verein für Anthroposophische Forschung und Kunst, Dornach; Software AG Stiftung und Evidenzgesellschaft, Darmstadt; Swiss Federal Office for Agriculture (BLW), Berne.

We are grateful to the advising members of the steering group: Rainer Sax and Daniel Böhler, Jürg Hädrich, Nikolai Fuchs, Manfred Klett, Hartmut Spiess and Bernhard Streit. We are particularly indebted to the Research Institute at the Goetheanum and to Agroscope FAL Reckenholz for the analyses they carried out.



*Long-term trial in Frick: Changes in humus content, measured as organic carbon C_{org} between autumn 2002 and spring 2005, and microbial biomass in spring 2005 at 0-10cm soil depth. ns=not significant; *** = highly significant*

FiBL research shows: Organic farming is good for our climate

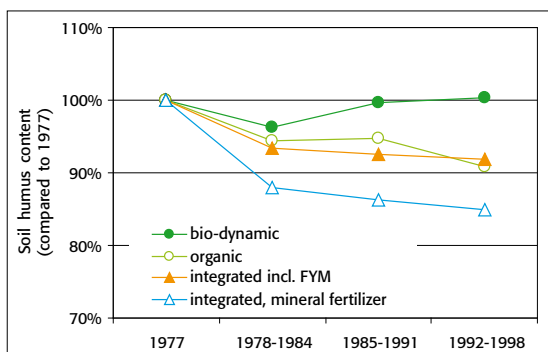
Agriculture plays an important role in what's happening to the world's climate. It is one of the factors responsible for humus decomposition and the emission of carbon dioxide and trace gases into the atmosphere. The techniques employed in organic farming contribute to humus formation and can thus have a climate-stabilizing effect

Soils are the largest terrestrial carbon pool but through agricultural land use large quantities of humus are mineralized. Across large regions this process has weakened or destroyed an important factor in soil fertility. Since humus can also sequester atmospheric carbon (carbon sequestration), sustainable farming which maintains the humus or even helps increase humus content is also of climatic importance: Humus management can help to mitigate global warming.

Organic techniques contribute to humus formation

“The production techniques used in organic farming can make a certain contribution to climate protection” states the soil scientist Andreas Fließbach, “as in organic farming the targeted use of fertilizers from on-farm production, such as farmyard manure or slurry, in combination with a constant vegetative soil cover and a varied crop rotation, contribute to humus formation.” Refraining from the use of mineral nitrogen fertilizers and pesticides also entails a significant reduction in the use of non-renewable fossil energy sources and thus a reduction in the emission of climate-relevant trace gases.

“In the long-term DOK trial we were able to show that the methods using farm-generated fertilizers yielded higher humus contents than the method employing exclusively mineral fertilizer. Interestingly, the bio-dynamic method, which involves the use of composted farmyard manure, is the only method in the DOK trial showing stable humus contents” explains Andreas Fließbach. After 21 years the soils in this variant had a 20 percent higher humus content than the variant relying exclusively on mineral fertilizer.



In the DOK trial the bio-dynamic method was able to maintain the humus content at its original level, despite the fact that on account of losses due to composting the quantity of fertilizers applied was approximately 20% lower than in the other methods.



Humus management is very important: The picture on the left shows a DOK trial plot where exclusively mineral fertilizer has been applied and where the humus content is low. The picture on the right shows a bio-dynamic trial plot with a relatively high humus content. Both pictures were taken after heavy rain and clearly highlight the differences in the degree of surface siltation.

Reduced soil cultivation also benefits the climate

In its new long-term trial at Frick, FiBL has shown that reduced soil cultivation has a positive impact on humus content. Reduced soil cultivation is only cautiously being introduced into organic farming, especially because of weed problems, but it offers interesting perspectives in terms of soil conservation, humus accumulation and enhancement of soil fertility. Only two years into the trial at Frick, the method using reduced soil cultivation is already showing a slightly higher humus content (plus 0.15%) in the top 10 cm. Over the coming years research will show whether this is a long-term and stable trend or not.

“The two long-term trials provide us with an excellent research infrastructure which we can also use to study the medium and long-term impacts of soil cultivation measures” says soil scientist Paul Mäder. “The DOK trial has already allowed us to provide much evidence for the superiority of organic farming and we are delighted that with our latest results we can also contribute to the climate debate.”

The positive effects of organic farming have not only been demonstrated under our local conditions. A long-term study carried out by the Rodale Institute in the US as well as many comparative studies support the FiBL results. af

Contact: andreas.fliessbach@fibl.org

Funding: Swiss Federal Office of Agriculture FOAG, Berne

The DOK trial (D = bio-Dynamic, O = organic, K = non-organic) has been running since 1978 and is managed jointly by FiBL and Agroscope Reckenholz-Täniken (Swiss Federal Research Station for Agroecology and Agriculture).

Promoting mycorrhizal fungi with compost and green manure

Mycorrhizal fungi are of great benefit to the plants whose roots they colonize. They support the uptake of nutrients and can even protect the plants from diseases. Can mycorrhizal fungi be promoted through green manures or compost applications? FiBL researcher Anja Vieweger reports on her project.

Mycorrhizal fungi which enter plant roots with their filament-like hyphae can significantly increase the nutrient uptake of their host plants and can protect them from soil-borne diseases. Moreover, they can have a positive effect on soil aggregation and thus contribute to protection from soil erosion.

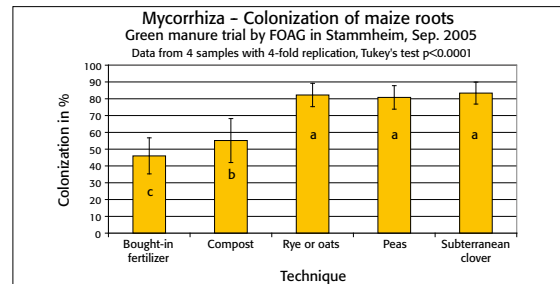
On two commercial farms, FiBL has studied the impact of green manures, winter green covers and undersown crops on nitrogen dynamics and on the yields of follow-on crop over a two-year period. In the first year the main crop was leeks, in the second year it was white cabbage. In the final year the development of maize and the colonization of the maize roots with mycorrhizal fungi was recorded.

FiBL studied the following five techniques:

- › Bought-in organic fertilizer: without green cover, fallow during the winter months
- › Compost: applied to each main crop, fallow during the winter months
- › Rye: sown during the winter months
- › Winter peas: sown during the winter months
- › Subterranean clover: sown in between the rows of the main crop

Best colonization in the green cover variants

The best colonization of roots was found in the variants with green covers of rye, peas, and subterranean clover respectively. Colonization exceeded 80% in these variants. The variant using compost applications showed approximately 55% colonization. The least colonization, 45%, was observed in the variant using bought-in organic fertilizer. “Apparently the mycorrhizal fungi found more roots of potential host plants in the green cover variants and were thus able to take up more assimilates”, Anja Vieweger ex-



Colonization of maize roots with mycorrhizal fungi. Variants with different letters show significant differences.

plains. Especially in the winter months the conditions in the fallow field that received bought-in organic fertilizer were unfavourable for the survival of the fungi. In contrast, the soil carrying a vegetative cover offered a suitable environment with living plant roots. In the cabbage main crop the green manure of subterranean clover was able to function as an intermediate host for the mycorrhizal fungi as cabbages are “non-hosts”, i.e. they are not colonized.

Green manure also gives higher yields

The research has shown that green manures not only conserve significant amounts of nitrogen over the winter months but that they also strongly support biogenic soil stabilization through roots and symbiotic fungi. The fact that the variant using subterranean clover also produced a 30% higher yield is most interesting for commercial farming. However, some questions regarding green manure still need to be answered. For example, the optimum quantities to be sown and the best time for sowing remain to be determined. *av*

Contact: martin.koller@fibl.org and paul.maeder@fibl.org

Funding: Federal Office for Agriculture, FOAG, Berne



In order to determine the percentage of maize roots colonized with mycorrhizal fungi, root samples from the maize plants were taken in mid-August 2005 with a soil corer to a depth of 20 cm. The root samples were washed, and the roots dyed. The root parts were then counted out at 40-fold magnification under a magnifying glass.

New ways towards healthy seed

Organic farming strives to use only seed propagated under organic conditions – exclusively, if possible. It is of utmost importance to have access to healthy, high-quality organic seed. FiBL Germany and FiBL Switzerland are both working on this topic.

“It is almost impossible to make up for patchy crop stands resulting from a lack of seed health during the growing season, especially not with the means available to organic farming” says Klaus-Peter Wilbois. With the support of the German Federal Organic Farming Scheme he coordinates a joint project at FiBL Germany which is seeking improved ways of guaranteeing the health of organic seed. The project involves researchers from the German Federal Biological Research Centre for Agriculture and Forestry (BBA), the Institute for Biodynamic Research (IBDF) and Darzau Cereal Breeding Research as well as the organic associations Naturland, Bioland, and Demeter.

At FiBL Switzerland the topic is being dealt with in the context of another project under the guidance of Hans-Jakob Schaerer in cooperation with the organic seed producer Sativa and specialists from Swiss Federal Research Institutes. These activities are funded by the Coop Naturaplan Fund.

Try out new ways, improve tried and tested ones

Organic farming currently has only limited direct options for seed treatment at its disposal beside preventive measures such as cleaning, cultivar selection and well-timed sowing. Known treatments are, for example, seed treatment with hot or warm water. Tillecur® mustard extract is also very effective against the most important seed-borne cereal disease, i.e. common bunt of wheat. Other possibilities such as the application of plant extracts, natural substances or micro-organisms are understudied. As an example of a new approach to common bunt sanitation, project leader Dr. Wilbois mentions a brushing machine which is able to simply brush the pathogen's spores off the kernels and achieves good results at a high processing speed.

“Our aim is to find new means and procedures which we will initially subject to careful testing in the laboratory and in the field. Those strategies that prove successful we

wish to make available and safely applicable for practitioners. It is equally important to broaden the range of possible applications for known, successful measures and to make them more accessible to the practitioners” Dr. Wilbois explains.

FiBL Switzerland also engages in the testing of substances and methods. “We also offer support in difficult cases” Hans-Jakob Schaerer explains. “For example, there have been problems on farms with downy mildew on Lamb's lettuce. Our methods allowed us to determine which seed was diseased and which was not. Where necessary, the farms received new seed or otherwise they could sow the seed without having to worry.”



Pre-testing a range of seed treatments suitable for organic farming for the treatment of seed-borne diseases in greenhouses.

Guides for practitioners

FiBL Germany is now working on guides for seed producers and farmers which detail the known preventative measures for maintaining seed health.

Amongst other information the guides will also contain threshold values for disease incidences, the crossing of which will indicate a need to treat the seed. The guides for practitioners are to be published in two editions: one for arable crops and one for vegetable crops. *kpw*

Contact: klauspeter.wilbois@fibl.org; hans-jakob.schaerer@fibl.org

Funding: German Ministry of Consumer Protection, Food and Agriculture (BMELV), Bonn, and Coop Naturaplan Fund, Basel



Project staff member Klaus Wilbois with field bean seeds – healthy seed is an essential precondition for a healthy crop stand.

Key problems in the production of organic transplants

Since the introduction of the organicXseeds.com database for organic transplants, careful checks are in place to ensure that organic holdings use organically produced transplants for top-fruit, soft-fruit, and vines. In cooperation with organic tree nurseries, FiBL is addressing key problems in this difficult field in order to ensure that the organic transplants meet the necessary quality criteria.

Over the past years FiBL has been able to develop solutions for organic fruit producers in the areas of rootstock and cultivar selection, fertilizers and soil fertility, weed control, thinning and quality optimization, and even in marketing.

“This broad range of issues forces us to focus on the key problems in each part of the production chain”, says Franco Weibel who coordinates this research area at FiBL. “Moreover, we try to involve growers and market partners in all projects from the very beginning.” At present, one of the priorities is support for tree nurseries in the production of organic transplants. Since 2002, organic fruit and wine producers must use organically grown trees and vines. However, due to the restrictions in organic farming, the production of organic transplants matching the qual-

ity of their non-organic counterparts is a highly skilled activity.

In cooperation with the tree nurseries the project team has defined the key problems. Customers are dissatisfied with visual quality characteristics in particular. The trees are too small, the stems too thin and not enough side shoots are formed. Moreover, aphid and mite problems as well as leaf diseases can lead to supply bottlenecks or loss of quality. The control of competition from weeds also causes major problems.

Packaging individual measures into a system

Thanks to support from the Coop Naturaplan Fund, Franco Weibel and his colleagues Francisco Suter and Jean-Luc Tschabold were able to carry out trials at two innovative tree nurseries. Numerous fertilizer tests showed that higher fertilizer use alone does not yield quality improvements. However, preparations from N-fixing bacteria, for example, have contributed to good quality of the trees despite restrained fertilizer use. The annual legumes *Medicago rigidula* and *M. polymorpha* (Medic or Bur clover species) proved useful as ground covers. Due to good germination and cover they can compete well with indigenous weeds, improve the soil surface's load capacity and are also an interesting ground cover on account of their nitrogen fixing properties. Numerous mechanical means and substances were tested to encourage the formation of side shoots. At present the only effective and organically acceptable method is the repeated topping of the central leader. “We were able to make good progress with workable solutions in all areas”, says Franco Weibel, “but we still don't have a satisfactory solution to the problem of insufficient side shoot formation.” At this point, the most promising individual solutions are to be combined into a systemic solution. The project team is also counting on the growing body of experience amongst the commercial holdings which have already made essential contributions to previous solutions. ta

Contact: francisco.suter@fibl.org; franco.weibel@fibl.org; jean-luc.tschabold@fibl.org.

Funding: Coop Naturaplan Fund, Basel



Organically produced transplants, such as the vines shown here, often do not satisfy visual quality criteria. Franco Weibel (right), Francisco Suter and Jean-Luc Tschabold (not in the photo) are testing solutions directly in the tree nurseries.

Potato production: Progress in small steps

Year after year those who grow organic potatoes are threatened with having their work come to naught due to potato blight: Will it hit? Will my field be spared this year? A major EU project tried to optimize growing systems and find varieties suitable for organic farming. Bernhard Speiser reports.



*Left: The large-scale trial clearly shows the differences between varieties: Agria has already died back while the foliage of Naturella is still healthy.
Right: Detailed view.*



Potato blight is a particularly dreaded disease in organic farming as there are hardly any direct means of fighting it. The disease is wind-borne and does not stop at the borders. "The logical conclusion was to look for organic solutions in a pan-European context" explains Bernhard Speiser, a potato specialist at FiBL. Thirteen partners from seven countries contributed their expert knowledge to the EU research project termed «Blight-MOP» (2001 to 2005). The project was conducted in three phases:

- Initially the status-quo of organic potato production in the participating countries was determined: Extent of production, yields, production techniques and ways of dealing with potato blight.
- Subsequently specialists compiled a catalogue of possible individual measures such as the use of non-susceptible varieties and variety mixes, optimized planting times, planting distances and plot layouts, pre-germination, fertilizer use, position in the crop rotation, irrigation, destruction of foliage, and a variety of preparations from composts, plants, minerals, and micro-organisms.
- Finally, these individual measures were integrated into growing systems of selected holdings and tested.

Research with a tractor and a saucepan

Susceptibility to disease, yield, and quality are all highly dependent on the individual variety. "In the first two years of the project we tested new varieties, some which are especially useful for organic production" explains Dr. Speiser. But only a variety that looks well and tastes good will be successful in the marketplace. Therefore, FiBL tested the acceptance of these varieties by carrying out consumer surveys and organizing tasting panels.

Thanks to good coordination with the Agroscope research stations in Changins and Reckenholz, the Swiss Potato Commission Swisspatat and the major trade partners it

was possible to quickly include a number of varieties on the Swiss list of potato varieties. The major Swiss retailer Coop carried out test sales at an early stage where the mealy variety Naturella did particularly well.

Small steps for growers

In the third phase of the project new varieties, variety mixes, different types of fertilizers, alternative plant protection products and new application techniques were tested on more than one hectare of land on the Rheinau Estate in the Canton of Zürich. Smaller trials were carried out in the Cantons of Aargau, Zürich, Bern and Waadt. It became evident that the production systems must be optimized individually for each holding. This calls for intensive dialogue between researchers, advisors, and farm managers. In order to support that process, FiBL published the "Organic potatoes" information leaflet in 2004. Has the Blight-MOP project found the solution to potato blight? "We did not develop one single method of getting rid of the problem once and for all. But we have highlighted a set of measures which, combined individually for each holding, brings us closer to a solution step by step. It's not spectacular, but it's sustainable." *bs*

Contact: bernhard.speiser@fibl.org

Funding: European Commission and State Secretariat for Education and Research (SER), Berne

Induced resistance: Magic potion not yet sufficiently palatable

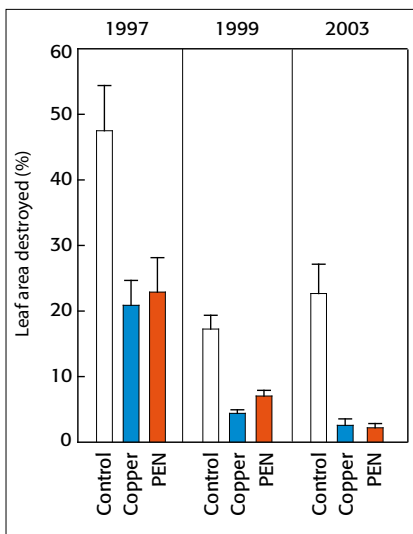
FiBL was able to show that the "PEN" fungal extract induces a strengthening of the defences of crop plants and thus gives them improved protection from diseases. However, the substance also has undesirable side effects. Therefore FiBL researcher Barbara Thürig is trying to find the actual active substance.

Since 1997 FiBL in Frick and its project partners have been studying an aqueous extract of the mycelium (the vegetative part of a fungus) of *Penicillium chrysogenum* (PEN). If this extract is sprayed onto a plant's leaves it can increase the plant's resistance to diseases – this is termed induced resistance. The source material (mycelium) for the production of PEN is produced at an industrial scale and is included in the FiBL "List of approved auxiliary inputs" as a fertilizer suitable for organic regimes.

PEN can suppress diseases ...

In a first project phase FiBL was able to show that PEN is remarkably effective in controlling diseases of grape vines (powdery mildew and downy mildew), tomatoes (blight), apples (scab), and onions (downy mildew). In particular, the use of PEN significantly increased the resistance of grape vines to *Plasmopara viticola* (downy mildew, "Pero"). "Depending on the disease pressure in the individual years it was possible to reduce disease incidence by 52 to 90 percent", explains Barbara Thürig. Thus PEN was equally effective as copper, the use of which has become very restricted in organic farming.

What is remarkable is that mostly resistance is induced not only to one particular disease but the plants' defences are strengthened overall. For example, the treatment with PEN of *Arabidopsis*, which was used as a model, led to increased resistance to all four disease agents tested, including a bacterium and a downy mildew.



Reduction of infestation of grape vine with *Plasmopara viticola* due to PEN resistance inductor and copper (fungicide) respectively, in the field in three years of research. Control = Infestation with no treatment

... but has negative side effects

However, research has shown that while PEN induces excellent resistance, it can, under certain conditions, also be toxic: necrotic spots develop on leaves and fruit, resulting in a loss of quality. PEN is a raw extract containing numerous different substances. Apart from the desirable substances which induce resistance there are also those which are toxic to the plant. In order to develop methods for separating the toxic from the resistance-inducing components, the resistance-inducing substance must be known.



Under the magnifying glass: Evaluating downy mildew incidence on *Arabidopsis*.

Imminent breakthrough?

Barbara Thürig is trying to track down this substance. In her dissertation she has already been able to show that the resistance-inducing substance is a protein exuded by the fungus *Penicillium chrysogenum*. It has not, however, been possible to identify this protein yet. Therefore further research is needed in order to develop PEN, or rather the resistance inductor it contains, into a practical option. Lucius Tamm, FiBL expert on plant diseases, hopes that FiBL will soon make great progress on this issue: "If we are successful we will have solved many problems in organic plant protection." *hw*

Contact: barbara.thuerig@fibl.org; lucius.tamm@fibl.org

Funding: Sandoz GmbH in Kundl (Austria)

Compost can provide more than fertility

Composts and compost extracts can suppress plant diseases. Mohamed Larbi has shown that the effects are remarkable. However, a workable application is still a long way off.

The fact that composts and compost extracts have disease-suppressing properties is nothing new. Recently it was discovered at FiBL that not only manure composts but also those made from green waste can have such effects. Mohamed Larbi has written a dissertation on this topic with funding from the University of Neuchâtel, the Federal Scholarship Commission for Foreign Students (ESKAS), and FiBL.

Direct and indirect mechanisms

The results show that both composts from green wastes and extracts thereof have a very interesting potential for the protection of plants from soil-borne and leaf-borne diseases – in grapevine, infestation with downy mildew was reduced by 70%.

“In my dissertation I have also looked at the effect mechanism of extracts of composts from green wastes” Mohamed Larbi says. “Interestingly, the control of downy mildew in grapevine was based on a direct effect. The control of apple scab however was not due to a direct effect but may be based on induced resistance, i.e. on the activation of the plants’ own defences.” These findings are very important when it comes to optimizing the quality and application of the extracts.

Combined use of composts and compost extracts

Moreover, it was shown that the combined application of composts to the soils (to control soil-borne diseases) and compost extracts to the leaves (to control leaf-borne diseases) can significantly reduce disease pressure on the plants. So far these results have only been obtained in the lab but follow-up research now aims to demonstrate that the composts and compost extracts are effective in the field and find out how they work. Moreover, research will

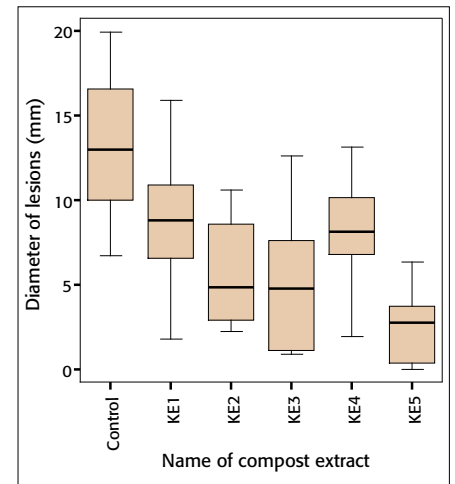
be carried out to see how the disease-suppressing potential of the composts and compost extracts can be improved and stabilized. One possible way may be the admixture of selected micro-organisms to the composts and extracts.

“Another important result of our research was that the composting process plays a very important role”, says composting expert Jacques Fuchs. “The management of the composting process is even more important than the source material. The correct compost quality is decisive in suppressing certain diseases.”

In other projects, financed by, amongst others, the Swiss Federal Offices for the Environment and for Agriculture, Jacques Fuchs has already compiled much knowledge about optimum composting. An important foundation for the optimization of composts and compost extracts with a view to disease suppression has been laid. *hw*

Contact: jacques.fuchs@fibl.org

Funding: University of Neuchâtel, Federal Scholarship Commission for Foreign Students (ESKAS) and contributions from FiBL supporters and patrons.



Impact of different compost extracts (KE1 to KE5; control = water) on the development of downy mildew of grapevine, pathogen: Plasmopara viticola.



Mohamed Larbi carrying out his research work: Transplanting seedlings, treating plants with compost from green waste, and analysing the effects in the laboratory (from left to right).

Diversity blossoms on organic farms – wildlife-friendly organic farming

With a new project FiBL will help to ensure that nature conservation measures become more firmly entrenched on organic farms and are extended by means of schemes covering all aspects of the farm's activities. Cornerstones of the project are the improvement of knowledge transfer by advising on farming practice, and education of the general public.

There are in Switzerland around 40,000 animal and 3,000 plant species. Many of these species are found on agricultural land. Modern farming methods, though, have the reputation of driving out animal and plant species. Near-natural forms of cultivation, through which valuable areas are conserved, therefore play an increasingly important part in preserving natural diversity for the future. Many studies worldwide provide evidence of the positive impact of organic agriculture on the species diversity of plants and animals.

Research, advice and PR for more nature conservation

Experience from a number of precursor projects has shown that organic farms have significant potential for promoting biological diversity, and that they can benefit from this diversity, for example through improved pest control (functional biodiversity).

With the Wildlife-Friendly Organic Farming project FiBL is hoping to anchor species diversity and the idea of nature conservation yet more strongly in organic farming. The project aims to take account not only of agroecology and nature conservation issues but also of operational and economic considerations. The quality of ecological compensation measures performed by farmers and the interplay of such measures are also due to be improved. Working in close cooperation with the Swiss ornithological institute Schweizerische Vogelwarte, the project team plans to develop practical farming methods that are beneficial to wildlife. FiBL is working with Agrofutura on project implementation and for the provision of advice.

The project's logo was created by FiBL's graphic designer Claudia Kirchgraber. An eye-catching logo is an important element of the project's public relations work.



One of the tasks of the research part of the project is to test the effect of wildflower strips along field edges. Wildflower strips provide food and cover for birds and insects and thus play a part in biological pest control.

ing examples» these model farms can urge other farmers on to greater ecological achievement», believes Pfiffner. «Of course that depends to a large extent on whether we are successful in developing ecologically innovative and economically interesting farming concepts», he adds. Right from the start the project is working not only to incorporate the insights gained into farming practice, but also to heighten the awareness of the population for this type of nature conservation. Regular PR work serves to bring the activities and outcomes of the project to popular attention and to create the basis for a greater appreciation of the contribution made by organic farms to nature conservation.

The project is not to be limited only to Switzerland. There is provision for cooperation with our partner institutes FiBL Austria, FiBL Germany and the Organic Institute in the Czech Republic. *na*

Contact: lukas.pfiffner@fibl.org

Funding: Sonnenwiese Stiftung, Vaduz ; Stiftung Soliva, Chur; Fondation-Sur-La-Croix, Basel

Cherry fruit fly: New approaches to an old problem

*Cherry trees on standard rootstock are of major ecological and cultural value – they support ecological diversity and are characteristic elements of the cultural landscape. Organic cherry production is however very difficult due to the cherry fruit fly *Rhagoletis cerasi*. Claudia Daniel is testing a number of different approaches to this problem.*

The cherry fruit fly is actually quite pretty with its striped wings and its yellow dorsal shield. But this fruit fly is the reason that stops many conventional cherry producers from converting to organic production. Insect specialist Claudia Daniel is working on this important pest species for her Ph.D. at FiBL. “A single female can lay eggs in as many as 400 cherries; the eggs then develop into the very unpopular larvae” says Daniel. She is testing numerous methods and strategies to control cherry fruit flies. “Faced with this kind of reproductive capacity we have to tackle the fruit fly at a number of different stages of its reproductive cycle”, the researcher explains.

Perfectly timed fly cycle

The fly cycle begins in mid May when the young flies emerge from the soil where they overwintered as pupae. Their hatching time is well timed to coincide with the ripening of the cherries, as it occurs when the cherries change colour from green to yellow. The female flies lay eggs singly in cherries. The larvae hatch after six to ten days and begin their three to four week long development inside the fruit. At harvest time they exit the cherry and drop to the ground to pupate. As early as 1930 a parasitic wasp, *Phygadeuon wiesmanni*, was discovered at Wädenswil which parasitizes the pupae of the cherry fruit fly. However, the parasite is much more susceptible to low temperatures than the cherry fruit fly; its efficient use is only possible by way of mass releases of bred parasites. It is difficult to breed these parasites in the lab. So far Claudia Daniel's attempts at breeding them have been unsuccessful.

Success with fungi?

Claudia Daniel is also testing whether natural pathogens such as fungi could be used to keep the cherry fruit fly in check. Her results from lab tests with natural pathogens have been promising. Siegfried Keller of Agroscope Reckenholz-Tänikon isolated these entomopathogenic

(damaging to insects) fungi in extensive field collections in Swiss tillage soils and made them available for the experiments. A further approach is to catch the emerging flies with fine mesh nets spread out under the trees as they hatch. While this method works, it is so labour and cost intensive that it is only feasible for hobby growers. Chickens kept under the trees are also able to reduce the occurrence of the flies.

However, even if only a few flies survive, the damage threshold of two percent of damaged cherries is reached very quickly. Once the flies have hatched, another possible control method are yellow sticky traps. The traps' effectiveness has been improved through attractants but success is limited. “Farmers would have to put up to ten yellow sticky traps in each tree and not only that, but these would have to be high in the top of the trees where the flies prefer to dwell”, Claudia Daniel explains. This type of effort is often too great for the farmers as it would coincide with other peak work loads. Which is the most promising approach? Claudia Daniel clearly stakes her bets on the entomopathogenic fungi. They would have to be

combined with a projection model which can predict the exact hatching time of the fruit fly. The fungi are already being used to successfully control the related Mediterranean fruit fly and olive fruit fly says Claudia Daniel. “Why should this method not work for our cherry fruit fly as well?” She is confident that it will. ta

Contact: claudia.daniel@fibl.org

Funding: Federal Office for Agriculture FOAG, Berne

Under laboratory conditions, Claudia Daniel's results are highly promising.



At what cost “GMO-free”?

Many consumers do not want GMOs in their food. This is a good reason for Swiss food producers and processors not to use these products. But at what cost? FiBL analysed the additional costs along the supply chain that are associated with avoiding GMOs for Swiss grocery retailer Migros.

Migros commissioned FiBL's GMO specialist Bernadette Oehen and economist Matthias Stolze to calculate the additional costs incurred by the company that are associated with purchasing and processing the GMO-free foods their customers want. The Swiss grocery retailer depends on international supply chains for soy, maize and rapeseed products, for example, and for food additives.

The case of maize

Because available calculations from other countries do not translate well to Switzerland, the FiBL project team did their own calculations with Migros. “Our first question was what the costs for Migros would be were GMO maize to be grown in Switzerland. We chose maize cultivation because maize is used for a wide range of products and because there are GMO varieties that can be grown in Switzerland,” states Oehen.

If GMO maize were to be cultivated in Switzerland in the future, Migros maize products would be affected in very different ways. The vast majority of Swiss maize is used for feed. So it is not retailed directly, but instead reaches consumers

indirectly, as dairy products, meat or eggs. Since Migros also requires that all animal products that are produced in Switzerland are GMO-free, there could be additional costs here, as well. With imported feedstuffs, the additional costs associated with avoiding GMO products could be quite high, as illustrated by studies from other countries. But what about feed maize that is produced in Switzerland?

Farmers who grow maize for silage would have to pay somewhat more for seed. Cross-pollination in the field would be a minor issue, in terms of the numbers, with farm-produced silage maize. The entire plant is harvested,

not just the cob, which reduces the percentage of GMOs, if any. It is a different story with maize kernels used for feed. Mixing can happen anywhere along the supply chain, from farm to collection depot to feed mill. There are costs associated with preventing this mixing. However, if the law is followed to the letter, farmers who do not want to work with GMOs can assume that they would be able to split these expenses with farmers who cultivate GMOs or could even pass the costs on to them entirely. It remains to be seen if it really would be possible to pass on these expenses.

The situation is similar for sweet corn, and specialties like Swiss polenta and “Ribbel”. But there is the additional issue that, from consumers’ point of view, these are sensitive products. It would probably be worthwhile to avoid GMO farming altogether in the areas under these crops.

Additional costs are low for processed products

In further calculations, Oehen and Stolze scrutinized the costs associated with avoiding genetically modified organisms in the making of bread and chocolate. They considered both domestic production and imported goods. It turned out that in both cases there are additional costs, but they are not so relevant that they would have to be passed on to the end product, and thus to the consumer. Even though the GMO-free soy lecithin used in the chocolate is three times as expensive, it would only make the chocolate 0.1 percent more expensive, since soy lecithin only makes up 0.5 percent.

Right now, in 2006, grocery retailers have mastered supply chain separation for maize and soy products; the logistics infrastructure is in place. “The costs for this were incurred five to six years ago when the entire quality assurance system had to be built from the ground up. It would be a completely different situation if a GMO product were to be grown in Switzerland. Then the logistics would have to be set up so the two types of products could safely coexist, which would be very expensive for food processors and retailers,” asserts Oehen. bo/ta

Contact: bernadette.oehen@fibl.org; matthias.stolze@fibl.org

Funding: Migros-Genossenschaftsbund, Zurich



Bernadette Oehen has been studying the economic and ecological impact of genetically modified plants for several years.

Inquiry and delight

FiBL has its own wine-growing estate since 2004 when it took over the state winery in Aargau (Aargauische Staatstrotte) which had maintained the vineyards there for almost 40 years. Viticulture has always been an important topic in FiBL's research and with this estate the institute now has a research facility at its disposal where the issues can be addressed directly in Frick.

Numerous research activities commenced shortly after FiBL took over the estate, says vintner Andreas Tuchschnid. "Most of the work is concerned with the replacement of copper in viticulture and with grape cultivars that are resistant to both powdery and downy mildew."

Research in vineyard and winery

FiBL is carrying out viticultural research on the following issues and more:

- › How well do copper-free organic plant protection strategies work? In two vineyards, one with Blue Burgundy grapes and one with Riesling-Sylvaner, there is a copper-free variant in addition to the normal organic management programme.
- › How well do the fungus-resistant cultivars perform? In the "Top Ten Trial" the agronomic characteristics of the ten most promising fungus-resistant grapevine cultivars are being tested. Not only the resistance to fungal attacks are of concern here but also the quality of the wine produced from them.
- › Bentonite is an alternative to copper. Does its use impact on the taste of the wine? A FiBL trial using a bentonite preparation is being carried out in France. The wines are produced and tested at the FiBL estate by way of microvinification, i.e. in small tanks or glass carboys.
- › As yet, organic farming does not have any treatment for gray mold. FiBL is carrying out "defoliation trials" to test how the removal of leaves around the grapes can limit gray mold infections.
- › How do new grapevine cultivars and selections react to not being sprayed? 50 different cultivars are grown and tested in the cultivar collection.
- › How do biodynamic methods effect soils, grapes, and wine? In 2003 Demeter growers initiated a cooperative trial involving four holdings in the cantons of Neuenburg, Waadt and Aargau. FiBL, in close cooperation

Profile of FiBL vineyard

Climate: 350 m a.s.l., 900 mm precipitation, low risk of hail, little late frost

Size: Frick 2.5 ha, Hornussen 0.3 ha, Elfingen (ca. 5 km south-east of Frick) 1.2 ha

Main cultivars: Blue Burgundy (54%), Riesling x Sylvaner (12%), Chardonnay (5%), fungus-resistant cultivar (14%), others (15%).

More than 20 cultivars are vinified and direct-marketed.

Winery: Total capacity 50,000 litres, 14 small tanks of 100 litres each; various glass carboys for microvinification.



Vintner Andreas Tuchschnid at work: Microvinification is a tricky process, but indispensable to test wines from trial plots.

with the vintners, assesses the effects of biodynamic methods, and the use of the biodynamic preparations in particular. In many ways, including methodology, the FiBL researchers have to break new ground in this work.

Expansion of international research cooperation

"FiBL has been carrying out research in this field for many years. With its own estate it can now address many issues directly in its own yard", explains FiBL scientist Franco Weibel. "We expect that with our trials we will make good progress on the way to the further development of organic wine production. Moreover, with the research possibilities that the estate has opened up for us we have become an interesting partner for competent viticulture institutes. For example, the EU project ORWINE which commenced in 2006 deals intensively with vinification techniques and the quality of organic wines. We have much to contribute on that front." hw

Contact: andreas.tuchschnid@fibl.org; franco.weibel@fibl.org

Internet: www.weingut.fibl.org

Organic apples home to diverse microflora

Little is known about naturally occurring microflora on food – or about what roles they might play. FiBL suspects that different, and perhaps more beneficial, populations of microorganisms develop on organic foods than on conventionally grown foods.

It certainly seems plausible to assume that the populations of microorganisms that develop on the surfaces of organic apples would be different than those on conventionally grown apples.

For biologist José Granado, analysing the microorganisms on organic products is relevant for two reasons. On the one hand, critics of organic agriculture have repeatedly claimed that organic products become colonized by harmful microorganisms because chemical/synthetic pesticides are not used. On the other hand, in earlier tests FiBL was able to prove that organic apples regularly have higher concentrations of desirable secondary constituents such as polyphenols. The assumption is that this is related to microorganism populations, but this has not been able to be proved yet.

Apples are not germ-free: Biologist José Granado analyses and compares the various “fungus cocktails” on and under apple peels.



Uncharted territory for research

After another preliminary study showed that apples grown in different ways really did have different microflora, FiBL ventured into this uncharted territory, supported by the Coop Naturaplan Fund. Granado counted and isolated the molds and yeasts on Golden Delicious apples that came from five integrated and five organic orchards with comparable operations. He categorized and assigned the fungi based on appearance (morphologically) and molecular biology using PCR (polymerase chain reaction). Granado also tested the apples for detectable levels of the undesirable *E. coli* bacterium, a “hygiene marker.” There were microorganisms on all of the tested apples, but the *E. coli* bacteria were not detected on either the organic or integrated apples. The lack of *E. coli* bacteria and the relatively low microbial count indicate that both organic and integrated apples are completely hygienic. Organic apples were more frequently colonized with diverse mold populations than the conventional apples were. The total mold count was significantly higher on the surface, and notably also under the peel, of the organic apples. The spectrum of yeasts on the apple surface also differed.

2,000 fungal strains isolated

“We know very little about the significance of these differences, but one hypothesis is that the negative characteristics of individual micro-organisms, for example those of putrefactive agents, can be better controlled naturally by the presence of the diverse fungal community on organic apples,” states Granado. He calls the collection of more than 2,000 isolated fungal strains a real treasure trove and research should be done on their roles. “Beneficial organisms” are a particularly interesting subset of the collection. Fungi that suppress other, less-welcome and harmful fungi can be defined as beneficial organisms. Ideally these beneficial organisms have other properties that add value and, for example, are able to initiate the synthesis of polyphenols relevant to health. ta

Contact: jose.granado@fibl.org

Funding: Coop Naturaplan Fund, Basel

Working together for credibility

Organic products contain on average 500 times less pesticide residue than non-organic ones. Yet even the smallest residue traces can now be detected by modern methods, and harm the credibility of organic produce. Bio Suisse, Coop, other trading companies and FiBL are therefore engaged in close cooperation on quality assurance issues.

A large number of studies have confirmed that pesticide residues are found much more rarely in organic products than in conventional ones, and if they are present at all they are found in much smaller quantities. But even minimal residues present an image problem for organic farming.

These residues may be the result of spray drift from neighbouring land that is farmed conventionally. Other possible causes are contaminated soil from earlier conventional

insecticide DDT, dieldrin is an organochlorine pesticide (OCP) and thus does not break down even after decades in the soil.

Cucurbitaceous vegetables are particularly at risk: cucumbers, courgettes and pumpkins take up persistent pesticide contaminants from the soil more readily than other plants and transfer them to their fruit.

Only soil analysis can create certainty

In an initial campaign Bio Suisse, Coop and FiBL investigated the growing conditions of the 15 most important cucumber producers in Switzerland. The reassuring verdict was that there was no universal problem. In those places where problems were identified, cucumbers are now no longer grown. The land on which organic cucumbers are now grown has been tested.

The second campaign involved testing 46 plots of land belonging to small-scale producers of cucurbitaceous vegetables. All but three of the plots were given the all clear. It was recommended that cucurbitaceous vegetables should not be grown on the three seriously contaminated plots. Gabriela Wyss and her colleagues are also developing concrete methods of making contaminated soils usable again. According to Gabriela Wyss, this is necessary because it is not feasible to simply take greenhouses out of production.

Isabel Hilber and Lea Vogt are therefore investigating whether OCPs can be captured by mixing activated carbon into the soil. Initial results indicate that the addition of activated carbon significantly reduces the availability of dieldrin in the soil. *ta*

Contact: gabriela.wyss@fibl.org

Funding: Bio Suisse, Basel; COST 859; Federal Office for Agriculture FOAG, Berne

Organic products can only be as good as the environment in which they are produced: Lea Vogt prepares cucumber samples for residue analysis.



Can activated carbon help counteract pesticide residues in the soil? Lea Vogt (left) and Isabel Hilber are looking for answers.

farming and inadequate separation during transport, storage, processing and sale. Very occasionally prohibited pesticides have been used and have led to residues being detected.

If complaints are made they are usually dealt with by Gabriela Wyss and Karin Nowack. The two experts have access to a comprehensive database in which all known incidents to date are recorded. According to Gabriela Wyss, inadequate separation is the most important cause of residues. "As part of an EU project we have therefore identified possible risks and weaknesses for various product chains and we can quickly offer solutions when problems arise."

Dieldrin poses problems for pumpkins

Gabriela Wyss is currently concentrating on persistent contaminants, and specifically on dieldrin. This broad-spectrum insecticide was used extensively in the 1960s to control a wide range of pests including wireworms, potato beetles and codling moths. At the beginning of the 1970s its licence for use in Switzerland was revoked and it was later withdrawn from the market. Like the well-known



Livestock



Healthy ruminants: Bringing knowledge into the cowshed

Organic farming does not have access to the full range of options available for managing illness in veterinary medicine. Rigorous preventive measures and recognition of signs and symptoms can compensate for the shortage of treatment options. Many questions arise in this regard – and one project run by FiBL Austria has set about providing answers.

“No-one has ever examined my livestock so closely”, says one farmer involved in the “Ruminant Health in Organic Farming” project. This project, initiated by FiBL Austria and the organization Bio Austria, is funded by the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management (known as the Ministry of Life). “We regularly visit 25 organic holdings where there are herd diseases affecting cattle, sheep and goats”, reports veterinarian Elisabeth

Stöger. “When we visit a holding, we first of all look at the available data, for example milk records, reports from the abattoir or records of medicines administered. Then we take a close look in the cowshed, and if possible inspect every animal.”

Close inspection of the animals makes farmers more aware of signs that are relevant in terms of livestock health. They learn to recognize symptoms earlier and take steps to counteract problems in good time. Elisabeth Stöger uses the experience she has gained from working on the pro-Q project run by FiBL Switzerland, in which systematic monitoring is used as a means of improving herd health. The primary focus of her work, however, is providing information.

Information for farmers

On organic farms, as on conventional farms, livestock health begins with the basics: housing, feeding and breeding. The relevant knowledge, however, needs to be made available and extended constantly. The questions that need to be answered are often quite simple ones: how much milk does a two-week-old calf need? What does the milking machine have to do with the cell count? How do you prevent footrot in sheep flocks?

Livestock health

In order to make this knowledge available in a practical and efficient way, Elisabeth Stöger runs around 50 courses for farmers over the winter months. Together with the Raumberg-Gumpenstein Agricultural Research and Education Centre, FiBL Austria also provides a telephone hotline and a website dealing with livestock health issues.

Involving veterinarians

The relationship between farm vet and farmer should be one of mutual trust. This provides the best guarantee that information will be shared and agreed measures implemented. Elisabeth Stöger has found that not all vets in Austria are adequately informed about the special requirements relating to veterinary treatment of livestock on organic farms. She has therefore devised a presenta-



Herd monitoring is an important element of the Ruminant Health project. Elisabeth Stöger pays regular visits to organic farms and gives advice to farmers.

tion for vets on the subject of treating animals on organic farms.

In liaison with the Austrian Animal Health Service, she also makes this information available in the form of lectures to practising veterinarians. This provides a forum for intensive discussion on legal issues such as withdrawal periods, frequency of treatments, or record-keeping, and for finding ways of implementing regulations in practice. The project will run until the end of 2007. By that time, as much knowledge as possible will have been translated into practice on the participating holdings. es

Contact: elisabeth.stoeger@fibl.org

Funding: Ministry of Agriculture, Forestry, Environment and Water Management, Vienna

Udder health to improve at farm level

Continuous improvements in udder health can be achieved by means of comprehensive herd monitoring and interventions using complementary medicine, thereby also minimizing the use of pharmaceutical drugs. This has been demonstrated by the “pro-Q” project, funded by the Coop Naturaplan Fund. The pro-Q approach is now coming to fruition internationally.

Development of resistance, environmental pollution, risk of residues in foods: the problems associated with the use of antibiotics in animal husbandry are well known. The “pro-Q” project is aimed at maintaining the health of cattle herds primarily by preventive measures and improvements in management. In just two years, out of a total of 19 herds infected with the pathogen *Staphylococcus aureus*, herd health has been improved in 14 cases and completely restored in 5 cases. The number of cases of clinical mastitis treated with antibiotics fell by 50 per cent during the same period. The best news of all for the participating farms is that the pro-Q approach also pays off in economic terms: milk quality is higher, production losses due to mastitis are reduced, withdrawal times following drug administration are shorter, and veterinary and culling costs are reduced.

Using the experience in an EU project

“The success of the pro-Q project on Swiss organic farms has aroused the interest of the partners we are working with on the EU project QLIF (Quality Low Input Food)”, says FiBL veterinarian Peter Klocke. The pro-Q approach is now being introduced and tested in Italian and Dutch milk production units. There have been indications of interest from Germany, too, and FiBL Austria is currently carrying out a project that is very similar in nature.

By developing an extension tool, pro-Q aims to show farmers, among other things, the impact that technical and hygiene factors during the milking procedure can have on udder health and milk quality. To do this, the project team has surveyed and evaluated a whole array of factors on 30 organic farms, such as the nature of the milking technique and the cleanliness of the animals.

The results were rather surprising: the only factor that correlated clearly with udder health was teat cleanliness. “We must look at each farm individually; schematic approaches do not work”, concludes Klocke. A separate strategy must be devised for each farm depending on its situation at the outset. Herds with poor udder health must first of all be restored to health. In such cases, the use of antibiotics may temporarily increase.

Recommendations for drying off

As well as being used to treat udder inflammations, antibiotics are also widely used to help cease lactation in cows prior to calving. Prophylactic use of antibiotic therapy for drying off cows in this way is prohibited in organic production. In recent years, a bismuth-based non-antibiotic teat seal has been developed, arousing great hopes among organic farmers. The substance, which resembles chewing gum, is inserted into the teat canal, forming a physical barrier to microorganisms. Peter Klocke and his colleagues have compared the effectiveness of the teat seal with homeopathic methods and have arrived at some clear recommendations: in healthy herds, you can do without antibiotics for drying off and there is absolutely no problem. The physical teat seal should be used only where environmental pathogens affecting the udder, especially between milkings, become a problem throughout the herd. Otherwise, homeopathic remedies are the most effective solution. *ta*

Contact: peter.klocke@fibl.org; fritz.heil@fibl.org

Funding: Coop Naturaplan Fund, Basel; European Commission and the Swiss State Secretariat for Education and Research (SER), Berne



FiBL veterinarian Ariane Mäschi assessing udder health on a pro-Q farm.

Using mistletoe to combat skin tumours

Equine sarcoid, a type of skin tumour widespread among horses, is neither painful nor life-threatening for the affected animals. The tumours are troublesome, however, and also present an aesthetic problem for some owners. Customary methods of treatment have so far had little effect. Initial trials using mistletoe preparations are promising.

You will rarely find veterinarian Ophélie Clottu at FiBL headquarters in Frick. Her workplace is in the stables and the fields where horses graze between Geneva and Frick. In a joint project with the Swiss national stud farm in Avenches and the University of Berne, Clottu is examining the effectiveness of the mistletoe preparation ISCADOR® against equine sarcoid, a type of skin tumour widespread among horses.

Mistletoe preparations have been used since the 1920s as a cancer remedy for humans. In recent years, veterinarians have been reporting on its effectiveness in treating tumours in small animals and horses. In earlier studies, FiBL veterinarian Ulrike Biegel described instances where mistletoe was used successfully to treat malignant tumours. For ethical reasons, however, Biegel deliberately decided against the use of placebo controls. As a result, it was unclear whether the improvement was due to some form of spontaneous remission or whether it was indeed attributable to the mistletoe treatment.

3600 injections administered

Ophélie Clottu has now set about filling this gap with her doctoral thesis. "Although equine sarcoid is unpleasant for the animals affected, it is not life-threatening", explains horse-lover Clottu. She thinks it is therefore ethically sound to conduct a double blind placebo-controlled trial based on this skin tumour. "Our objective is to test the mistletoe preparation both in the primary treatment of sarcoid and as prophylaxis to prevent tumour recurrence following surgical excision", says Clottu.

Treatment follows a fixed pattern, lasting 15 weeks per animal, and the veterinarian does not know whether she is administering mistletoe or an injection of placebo. Clottu administers a small amount of pine mistletoe extract or placebo to each animal three times weekly by subcutaneous injection in the chest area. In her study, she is treating a total of 80 horses. When the study has been concluded she will have administered 3600 injections.



Relaxed relationship between veterinarian and horses: each horse receives a total of 45 injections from Ophélie Clottu during the 15-week course of treatment.

"I always take plenty of time with the horses and make sure I stay calm", says Clottu in response to the question of how she has managed so far never to get kicked or bitten by a horse. When she appears with her injections, the horses show absolutely no sign of fear, merely curiosity. The animals are distributed over a wide area between Geneva and Frick. Clottu will be able to conclude the whole trial in autumn 2006. Results relating to the treatment of 10 animals outside the study are already very promising: in the case of four of the animals, the sarcoid was completely cured and in another four cases, tumour growth was halted; in only two of the horses was no improvement reported.

In the case of the younger animals, it is possible that there has been spontaneous remission; in older animals, however, according to Ophélie Clottu, this rarely occurs. Viruses are only one of a variety of factors involved in the pathogenesis of this hereditary disease. The success of this treatment is therefore likely to vary among different horses, says Clottu, to dampen any exaggerated expectations.

ta

Contact: ophelie.clottu@fibl.org; peter.klocke@fibl.org

Funding: Society for Cancer Research (Hiscia), Arlesheim



Following two months of ISCADOR® therapy, the sarcoid tumours on this mare's head, chest and underbelly had disappeared, irrespective of localization and type. Only hairless scars remained.

Breeding sows: Communal living in the pig-shed

Livestock management in organic farming should be as appropriate as possible for the species. In the case of breeding sows, FiBL therefore advocates the use of group housing for farrowing sows and piglets – provided that the organization of the farm is suited to this arrangement.

“We can learn what is appropriate for a species by looking at animals in the wild”, explains Barbara Früh of the FiBL Extension Service. “Female wild boar live in matriarchal groups called sounders. Although a sow will isolate herself to farrow, she returns to the sounder with her piglets after about a week.” In the context of livestock farming, on the other hand, pregnant breeding sows are generally transferred to a farrowing pen a few days before the birth of their piglets, and the piglets are suckled there until weaned. In organic pig keeping, this takes six weeks. After this, the sow is re-integrated into the group, while the piglets are housed together with other piglets.

Group farrowing pens: Reducing stress for the sow and her litter

The FiBL Extension Service recommends that sows should be kept separately, with their piglets, for a period of two weeks following the birth of the litter and then housed together with other sows in multi-suckling group pens. This system offers numerous advantages: the piglets come into contact with other sows' piglets early on, and by the

time they are weaned they have established a stable group. Fighting among sows to establish social rank is reduced or prevented altogether.

In multi-suckling pens, the animals have much more space than in individual pens, which increases the animals' vitality. Weaning stress for the piglets is reduced as the piglet group is already established and the animals are familiar with each other. Weaning, involving a change in feed and separation from the mother, is the most critical phase of piglet production. For this reason, stress levels need to be kept to a minimum.

Multi-suckling pens have some disadvantages as well as advantages. Although they can help to reduce the number of costly farrowing pens, the use of multi-suckling pens involves additional outlay. Moreover, smaller piglets are subject to greater competitive pressure, and divergence in growth rates is frequently observed. In other words, the piglets' weight may vary at the time of sale. As regards the phenomenon of “cross-suckling” that occurs in group housing systems, i.e. where piglets suckle from other sows than their mother, no clear verdict has yet been reached.

Research into group housing systems

So far very little scientific research has been carried out on the subject of group housing during lactation. One research study funded by the German Federal Organic Farming Scheme is examining production indicators and management factors on ten holdings in Switzerland (FiBL), Austria (Veterinary University, Vienna) and Germany (the animal husbandry consultancy firm Beratung artgerechte Tierhaltung). This on-farm study enables various systems to be evaluated while taking into account farm-specific factors.

The objective of the study is to use the findings to draw up guidelines for interested farmers and advisors. These guidelines shall include recommendations relating to management and construction requirements for a successful group housing system. bf

Contact: barbara.frueh@fibl.org

Funding: German Ministry of Consumer Protection, Food and Agriculture (BMELV), Bonn



Barbara Früh of the FiBL Extension Service is studying ten holdings in Switzerland that use group housing systems, examining their production indicators and management factors.

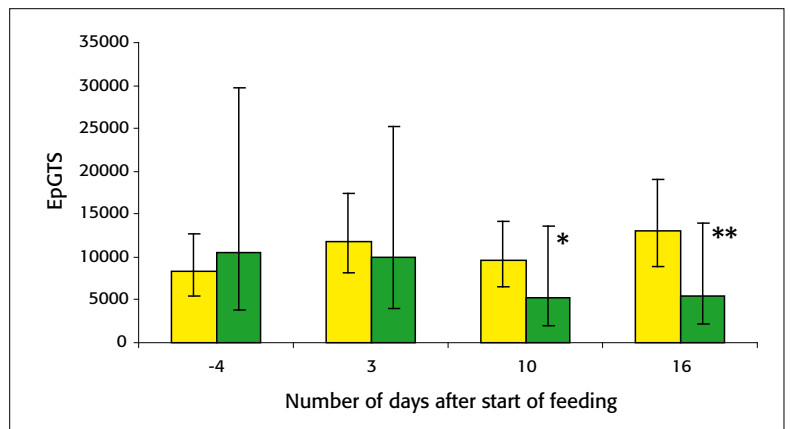
Gastro-intestinal nematodes: A clover species proves effective

Sainfoin is the name of the forage plant that demonstrates activity against gastro-intestinal worms; its condensed tannins appear to act in two different ways simultaneously to combat the parasites. "The control assays are very promising", says Felix Heckendorn, who is writing his doctoral dissertation on this subject.

But first some background: gastro-intestinal worms are widespread among small ruminants, including sheep. It is possible to treat them using synthetically manufactured worming preparations, but there are indications that worms are beginning to develop resistance to these pharmaceutical anthelmintics.

A clover species that goes by the attractive name of sainfoin (*Onobrychis viciifolia*) now offers an elegant solution to the problem of curbing the parasites using natural means; moreover, it is a forage plant and therefore ideally suited to the purpose. In lambs fed with sainfoin hay, nematode egg excretion was reduced by 58 percent compared to the control group (see figure) within 16 days. For the purposes of the experiment, the sheep were infected with a defined quantity of the gastro-intestinal nematode *Haemonchus contortus*, and Heckendorn then measured levels of egg excretion in the faeces. At the end of the experiment, he also examined the abomasum and small intestine of the animals for worms.

"Infestation with *Haemonchus* really takes a lot out of the animals", explains Felix Heckendorn: "The worm attaches itself to the mucosal wall of the abomasum for protection against the stomach acid, which has a pH value of only 1–2, and feeds vigorously on the sheep's blood." In a badly



Comparison of excretion of *Haemonchus* eggs per gram of faecal dry matter (EPGTS) among lambs fed on sainfoin hay (green bar) or control hay (yellow bar). Error bars show a 95 percent confidence interval. Significance of the statistical tests: * $P < 0.05$; ** $P < 0.01$

affected animal, anaemia results, and the animal becomes lethargic. For farmers, there are economic consequences too, as infected animals may take longer to reach their slaughter weight, and the use of pharmaceutical drugs also costs money.

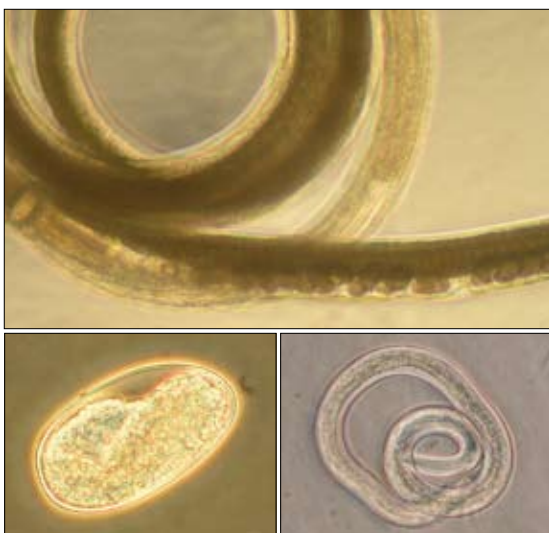
Double action: Weakening the worm, strengthening the host

There are two theories regarding how the condensed tannins work: according to the first, the tannins act directly by binding to protein structures present on the surface of the nematodes' skin. As a result, the biological functions of the parasites are disrupted. The tannins are also thought to act indirectly by enhancing protein availability in the host animal. This has a positive impact on the sheep's immune defences. It is likely that both of these explanations are correct, and a dual action is indeed taking place.

Is sainfoin therefore the universal panacea for gastro-intestinal worms? "The results are certainly encouraging", confirms Felix Heckendorn, and ventures a glimpse into the future: "If this approach is developed further so that it can be put into practice, it undoubtedly has the potential to play an important role in the control of gastro-intestinal worms." mmm

Contact: felix.heckendorn@fibl.org

Funding: Swiss Federal Office for Agriculture (FOAG), Berne; Federal veterinary office (FVO), Berne



Fully grown gastro-intestinal nematodes live in the digestive tract of ruminants. The females (image above, top) produce eggs (image above, lower left) that go through initial larval stages before developing into infectious L3 larvae (image above, lower right). These then emerge from the faecal pellet and are ingested by other grazing animals.

Don't just focus on maximum performance

In cattle breeding there is often still a major gap between aspirations and realities on organic farms. Commissioned by Bio Suisse, Beat Bapst and Anet Spengler implement a number of measures which ease the path to shifting the focus in breeding from milk yield to site-appropriate stock.

Livestock health depends not only on general husbandry, feeding, and care but also, and strongly, on breeding. The organic standards thus require that livestock health is also to be ensured through breeding measures. Based on an analysis carried out in 2004, Anet Spengler and Beat Bapst of the FiBL Animal Breeding and Animal Husbandry Division found that there is often a major gap between aspirations and realities in this regard: Organic farms rarely use other bulls than conventional holdings and too much emphasis is placed on milk yield in selecting bulls. Some organic farmers regret that performance-oriented breeders are often more passionate about breeding than they are enthusiastic about organic farming. The breeders in turn regret the ban on using embryo transfer bulls and criticize the restrictions on bought-in feeds in organic farming. However, the solution is not in easing restrictions but in site-appropriate breeding strategies, especially in relation to milk yield and animal size. The cows' milk yields are often too high compared to the feeding potential on-site, says Anet Spengler. Health problems can result from this imbalance. Bio Suisse has commissioned Anet Spengler and Beat Bapst to strengthen the organic farmers' understanding of site-appropriate organic breeding and to provide support to them. To this end the two researchers have developed a tool that allows breeders to assess in how far their livestock and their holding are in balance and to find measures which could address potential imbalances.

High milk yield equals improved cost-effectiveness?

Many farmers believe that high milk yields always entail improved cost-effectiveness. However, full-cost pricing and income calculations show that it is often other factors, such as mechanization or livestock health, that play a more important role. In the autumn of 2006 a new website on organic breeding at various production levels was launched which profiles suitable AI bulls as well as experienced organic breeders who have their own breeding lines. The aim of the website is not just to extol the virtues of breeding stock but to support the establishment of breeder partnerships where less experienced breeders can benefit from their more experienced colleagues. (A similar model has already been implemented successfully in the Netherlands.) Beat Bapst and Anet Spengler hope to particularly support those breeders in developing a site-appropriate breeding strategy who so far have left the choice of bulls to the AI Technicians. They want to enable them to face the AI companies with clear objectives in mind as only a steady demand for bulls which pass on excellent health characteristics and production traits suited to the conditions on-site will promote supply of such animals.

ta

Contact: beat.bapst@fibl.org; anet.spengler@fibl.org

Funding: Bio Suisse, Zukunftsstiftung Landwirtschaft, Tierzuchtfonds, MAHLE Foundation, Rogau Foundation

Project website: www.biorindviehzucht.ch



FiBL livestock breeding expert Anet Spengler: "Cow type and holding type must be well matched."

Interaction between organic husbandry and animal genetics

Beat Bapst, in cooperation with the University of Göttingen, is conducting a study on genotype-environment interactions on organic and non-organic holdings: In how far does organic agriculture impact on genotype quantification compared to non-organic agriculture? This basic research is to provide indications for the orientation of site-appropriate breeding of dairy cows.

Funding: German Federal Ministry of Consumer Protection, Food and Agriculture (BMELV) within the context of the German Federal Organic Farming Scheme (BÖL), Bonn.

Which chicken suits organic holdings?

Worldwide there are approximately 20 lines of commercial hybrid layers which are bred by only four companies. Hybrids are not well suited to free-ranging and to organic feeding regimes. Commissioned by Demeter, FiBL is searching for suitable chicken breeds which are also economically competitive.

When chickens were banished to the indoors in early 2006 on account of avian influenza, the birds on Demeter holdings were hit particularly hard. They displayed symptoms of stress and deficiencies, resulting in feather pecking. For once, the Demeter feed had to be supplemented with vitamins and certain protein components. The required derogation was granted on condition that FiBL would be commissioned to find a type of chicken suited to organic farming.

Lay less, live longer

During the course of this work FiBL chicken expert Esther Zeltner had to have a good look at some of the undesirable developments in conventional hybrid breeding: "The hybrids used widely today are bred specifically for the still widespread battery-type systems. They lay an astonishing number of eggs – more than 300 per year – while being very economic in terms of feed needs", Ms. Zeltner explains. For free-range systems, however, these hybrid chickens are of limited use as they are no longer robust enough.

Moreover, the hybrids reach full production as early as 24 weeks of age but they are only fully mature at 30 weeks. This means that the pullets suffer malnutrition for a six-week period which can result in the undesirable habit of feather pecking. The third problem: Fluctuations in nutrient content are more prevalent in organic feed as, for example, grain from different areas varies in its nutrient content. "The modern hybrid layers which produce 300 eggs are "optimized" to such an extent that they may react to such natural variation in feed composition with stress symptoms", says Esther Zeltner. She is convinced that to counteract this problem, the hens' performance must be decreased for organic egg production. She suspects that the egg price will increase somewhat as a result despite the fact that lower performance also means cheaper feeding and a longer life for the hens. If the hens are kept for two or perhaps even four years the cost of buying in pullets will decrease significantly.

Four lines compared

In selecting the lines to be tested the project team therefore took care to use lines with a higher body weight as these will be better able to deal with fluctuations in the nutrient content of feeds. Another important criterion was a minimum performance of 240 eggs per year. Additionally the candidates must remain well feathered until the end of their utilization period. The hybrid lines Amberlink and Blausperber as well as Sussex and a Welsummer cross made it onto the shortlist. In mid-2007 Esther Zelt-

ner will be able to say which one of these four lines may be recommended for organic holdings. *ta*

Contact: esther.zeltner@fibl.org

Funding: Verein für biologisch-dynamische Landwirtschaft, Arlesheim; Albert Lehmann, Birmenstorf; Verein zur Förderung anthroposophischer Institutionen, Zug; gzh ag, Staufen; Animalco AG Geflügelzucht, Staufen



Farmers report good experience with a cross between hybrid hens and a Welsummer cock. The calm and pleasant animals have good laying performance.

FiBL researcher Esther Zeltner (left) and trainee Anne Isensee inspect a pure-bred Welsummer cock.

Socio-economics



Virtuelle Realität

Qualität
viel zu
wenig

Sozialität
Kommunikation
abgelehnt

Wahrnehmung

Wahrnehmung für
Kommunikation für
Prozess

Nur
von
Kommunikation
Kommunikation
für

Wahrnehmung für
Kommunikation für
Prozess

Wahrnehmung für
Kommunikation für
Prozess

What entrepreneurial skills do farmers need?

Current agricultural policies demand that farmers acquire entrepreneurial skills. How can these skills be fostered? What impedes them? Christine Rudmann is seeking answers to these questions within the framework of an EU project. She has already been able to put many of the results into practice with organic farmers in Switzerland.

European agriculture is undergoing radical change. The World Trade Organization (WTO) is putting pressure on the EU to open its markets. „Agricultural markets have turned into a highly competitive international market as far as prices are concerned,“ says FiBL agricultural economist Christine Rudmann. Farmers today – unlike their predecessors – are responsible themselves for ensuring that their businesses pay. To do this they need entrepreneurial skills, which have not been much called for up until now.

For the past year Rudmann has been managing the EU project „Entrepreneurial Skills of Farmers“, or EU-EsoF for short. An interdisciplinary team from six European countries has been studying the economic, social and cultural factors that either hinder or support the development of entrepreneurial skills in farmers.

„Research carried out so far into entrepreneurial activity in agriculture does not provide a uniform picture, so we began by carrying out surveys of experts in the six participating countries,“ explains Rudmann. They were surprised to find that – despite cultural differences – exactly the same skills were named by respondents in the Netherlands, Finland, England, Italy, Poland and Switzerland.

From feeding methods to networking

Five categories of skills were derived from the experts' responses. Basic skills were seen to include production expertise, such as feeding methods, as well as management skills in the areas of finance, sales and planning.

Successful farmers also stand out by virtue of the fact that they are able to identify good opportunities early on, as well as being able to assess potential risks. Farmers with strategic skills are those who are able to set goals for their business, discriminate between different strategies and – importantly – absorb, consider and implement feedback. Those who are able to cooperate with colleagues and partners, build up networks and keep them working, can further enhance their prospects of success.

Recommendations for policy makers, tips for farmers

In what ways can farming families benefit from the results of this work? „The aim of our project is, first and foremost, to deliver recommendations for action to policy decision makers,“ says Rudmann. „But in order to ensure that our



Surveys in six European countries revealed that the entrepreneurial skills seen as being those a farmer should possess were everywhere the same. These include management skills in the areas of finance, sales and planning.

results have some practical application, we will also be developing a tool that helps each farmer to get an idea of what entrepreneurial skills they possess.“

Over the coming months the project team will be studying the broader circumstances that hinder or support the development of farmers' entrepreneurial skills in the participating countries. For example, the team will analyse forms of agricultural training and education from this point of view, as well as the connection between different types of business and the skills needed to run them.

In addition to this EU project, Christine Rudmann also coordinates a network of 60 organic farming businesses in which she works jointly with consultants and practitioners on socio-economic issues. „This enables me to present the theoretical knowledge we develop in the EU project for discussion among practitioners in the farming network,“ says Rudmann. And it is precisely this interface between theory and practice, between national and international agriculture, that makes her work at FiBL so exciting.

Contact: christine.rudmann@fibl.org

Funding: European Commission, Brussels, Belgium

Project homepage: www.esofarmers.org

Image left: The same entrepreneurial skills are required throughout Europe: Christine Rudmann presents results from the EU project at workshops with Swiss organic farmers.

Agricultural policy looking towards society as a whole

One of the key themes addressed by FiBL's Socio-Economics Division, headed by Matthias Stolze, is the further development of agricultural policy for organic farming. An EU-funded research project examined which agri-policy instruments are best suited to support organic farming.

What makes the project especially exciting?

Matthias Stolze: Policy actors have been integrated in the project right from the start in order to bridge the gap between research and practice. For instance, they were involved in workshops aimed at assessing policy instruments. The ideas that emerge out of this cooperation are useful to both sides.

Which policy instruments exist?

Stolze: Generally speaking, they can be divided into three groups. One consists of "legal" instruments, such as the organic regulations in Switzerland. Then there is the possibility of offering financial incentives, as in agri-environmental programmes; and thirdly there are the "communicative tools".

What else did the project focus on besides an assessment of policy instruments?

Stolze: We took a snapshot of the diverse organic farming policies that exist in the different countries and analysed how they are integrated into policy more generally. An important part of this involved looking also at the economic situation and developing methods for evaluating the effectiveness of agri-policy measures.

How are the research results being fed into everyday policy making and policy design?

Stolze: This project and the one that preceded it led to the formation of a group of scientific experts who are now leading in the field of agricultural policy and organic farming. This group was involved in key areas of organic policy development at EU level, and its opinions were heard. Another important outcome from the project are the publications it generated. The core group alone published 12 books in the run-up to the EU Action Plan; as a result, the Commission had access to a range of important information that helped in deciding on the detailed design of the European Action Plan for Organic Food and Farming.

Putting things down on paper is one thing, but do these publications actually get read and their ideas put into practice?

Stolze: It is our experience that after about a year policy makers do actually turn to the scientists. For example, project outcomes are discussed jointly in workshops with members of the EU Commission. It has also been pleasing to see how the accession countries from eastern Europe – the Czech Republic, Poland and Slovenia – have really benefited a great deal from the scientific spadework and have very quickly developed action plans for their own countries.



Matthias Stolze has been working on agricultural policy since 1992. He sums up his work thus: "I'm pleased about the recognition that policy research on organic farming enjoys nowadays in the academic community. And also about the fact that it is no longer disputed within the EU that organic farming is justified from an economic point of view, too."

has been funded by the European Commission and the Swiss State Secretariat for Education and Research SBF.

Project website: www.irs.aber.ac.uk/EUCEEOP

Will agricultural policy need to change in the future?

Stolze: Definitely! In future agricultural policy will have to be much more oriented towards the needs of society, and especially of consumers. An agricultural policy that sees the world only through the eyes of the producers is no longer in keeping with the times. Also, communication tools are becoming more important. The Danish, for example, have introduced a Round Table in their first action plan for organic farming, where the actors gather to make plans for the future together. The role of politicians in this is to act as a facilitator, mediating between the groups and, ideally, clearing the way for new developments.

Contact: matthias.stolze@fibl.org

Funding: The EU project "Further Development of Organic Farming Policy in Europe, with Particular Emphasis on EU Enlargement", EU-CEEOP,

Organic meat: What is the secret of selling more?

Organic meat tastes good. Organic meat is of high nutritional quality. Organic meat is worth the price paid for it. – If that is so, why are sales of organic meat declining instead of developing from a niche market into a runaway success? A FiBL market research project set out to find the answers.

The project traced the path taken by organic meat from the farm to the consumer's plate. It identified a number of issues that could serve as starting points for increasing sales. Discussions with a group of butchers revealed that they would value greater involvement in the consultation process and closer cooperation with farmers in order to improve both handling and marketing. For example, meat quality could be improved through the selection of suitable breeds. Quality programmes of the sort that already exist for beef could be extended to other animals in order to ensure consistent quality. The butchers would also like to receive more detailed information about the ways in which organic methods differ from normal practice.

Customers poorly served by self-service

It is essential to improve communication if new customers are to be won over. Not all customers are aware of the high quality of organic meat and the advantages of organic methods, which include fewer additives. Analysis of advertisement content showed that consumers react positively to an emphasis on the animals and their origin. The poster that drew the most positive response in the tests depicted Swiss mountains with grazing cows. Ironically it was an advertisement by farmers using the „integrated production“ method (IP Suisse), whose animals are not reared under organic conditions. But high quality and impassioned advertising are not in themselves sufficient to increase sales. Sellers must ensure that organic meat is placed to catch the customer's eye wherever it is sold. Swiss Coop is a major retailer, yet while organic meat is easy to find in the self-service section, it is not on sale at the meat counter. Its competitor, Migros, usually has at least some organic beef available at the meat counter, but in the self-service area the organic meat is difficult to pick out among all the other items.

In the words of Katja Bahrdr of the project team, the formula for increasing sales could therefore be: “Start by producing top-quality meat, then get people keen to buy organic and display the meat well in the shops.”

mm



Organic meat must be of top quality if it is to sell well. The selection of suitable breeds is a starting point.

Contact: katja.bahrdr@fibl.org

Funding: Bio Suisse, Basel; Proviande, Berne; Vier Pfoten – Stiftung für Tierschutz, Zurich; Schweizer Metzgermeisterverband, Zurich; WWF, Zurich; Sales Promotion Fund of the Swiss Federal Office for Agriculture FOAG, Berne

We should like to thank the project advisory council as well as all participants and funders for their support.



Butchers were consulted in the FiBL organic meat project. In the workshop master butcher Ernst Stettler explained his view of the declining sales of organic meat.



Training and extension

Securing the future of organic agriculture with sound initial vocational training

Although agricultural schools are closing everywhere, Swiss organic farmers have opened a new one. It is starting life as a pilot project without a permanent base. This pilot training course is an investment by organic agriculture in its own future, depending as it does on well-trained skilled workers. Robert Obrist from the FiBL Training Office is leading the course.

More and more agricultural land is being worked by organic farmers. Now the initial training sector has caught up with this development. The first pilot training course for prospective organic farmers was launched successfully in the year 2004, and interest is as high as ever. The vocational school is run jointly by Bio Suisse, Demeter and FiBL. The initial training programme is co-financed by the Swiss Office for Professional Education and Technology (OPET) and the Coop Naturaplan Fund.

Recognized by the Swiss Federal Government and the Cantons

The training course is part of the classic three-year initial vocational training programme to qualify as a farmer, specializing in organic agriculture during the third year of training. After two years, trainees are placed on an organic farm for their third year and attend school-based courses of block instruction. The third year of traineeship differs from conventional training programmes: in addition to their classroom learning, trainees also learn practical skills on a training farm. The training programme is recognized at both Federal and Cantonal level: the final qualification leads to the award of a Federal Certificate of Competency in agriculture, with organic agriculture as the area of specialization.

More is taught than technical production

The organic vocational school offers intensive and in-depth learning about the occupational profile of an organic farmer, as well as the natural resources on which this livelihood depends. The training covers not only technical production issues but also the principles of organic agriculture. Robert Obrist is convinced that this training course will play an important role in attracting new blood



The agricultural students are taught all about organic farming practice. Here they learn how to trim claws.

into the organic farming profession for the future: „Organic farming must be continually developed, and this is made possible first and foremost by enthusiastic skilled professionals. To reach this level, they need sound initial vocational training. This is what we aim to provide.”

In summer 2006 the second course was completed and the viability of the third is already assured. „In 2005/2006 we had a broad range of trainees: some arrived with a good level of subject knowledge, whereas for others it was their first taste of agricultural training. The average age was substantially higher than at other agricultural training facilities, and the proportion of women was also remarkable,” according to Obrist. „I am sure that this provision will soon be a permanent option like any of the other initial vocational training programmes on offer. This outcome is quite a sensation, looking back at the protracted and difficult development of initial vocational training in organic agriculture,” said FiBL Director, Urs Niggli, at the award ceremony for the second cohort of students to complete the pilot course.

as/hw

Contact: robert.obrist@fibl.org

Funding: Coop Naturaplan Fund, Basel; Bio Suisse, Basel; Verein für biologisch-dynamische Landwirtschaft, Arlesheim; Swiss Office for Professional Education and Technology (OPET), Berne.

Internet: www.bioschule.ch; www.biolehrstellen.ch



The 2005/2006 cohort at their award ceremony at FiBL.

Joint PR to strengthen marketing

The organic farmers of the Zurzach and Baden regions in the east of Aargau canton meet regularly to talk and exchange ideas. And they combine to undertake PR work for their products. The regional group is supported by the canton's Organic Advisory Service and by FiBL adviser Klaus Böhler.

Since the middle of the 1990s there has been a core group of organic farmers in the "Zurzibiet" – the 23 municipalities that make up the district of Zurzach – and the region of Baden. They meet to discuss their experiences, talk about the organic market or simply chat with colleagues in the same line of business. Since 2004 the group has been undertaking joint PR work for the region's agricultural products. Such a step is by no means an obvious one in the current climate, in which the increasing competition among direct sellers puts solidarity between businesses under strain.

A model for other regions?

"FiBL's support of the group on behalf of the Canton has been an excellent investment", explains Niklaus Messerli of the cantonal advice service. "We have achieved a great deal in a short time. The farmers appreciate having an outside person who takes part in talks and discussions and helps implement new ideas." Klaus Böhler would like to see the Aargau model being copied in other parts of Switzerland. "We should be happy to pass on the experience of the Zurzibiet and the Baden region," he says. *hw*

Contact: klaus.boehler@fibl.org

Funding: Aargau Canton; Bio Suisse, Basel; Aargauische Biolandbau Vereinigung; Alb. Lehmann Bioprodukte AG; Erlenmühle, Gossau



The Canton's support is important

The joint PR initiatives are supported by the umbrella organization Bio Suisse, by private individuals and by the canton of Aargau, which also funds the FiBL coordinating work. Klaus Böhler of the FiBL advisory service says: "We are very grateful to the Canton for its support. Since 2004 there has been considerable media interest in the region, and as a result of the group's various campaigns direct marketing can be described as going well or even very well." These campaigns include events in the region, a joint information leaflet and an attractive placemat. The group is currently designing signs which farmers will be able to erect beside their fields so that walkers and passers-by will know they are in an organic farming area.

A great success – the leaflet providing information about organic farming, with details of all the organic direct sellers in the region and their products.

Developing nature and landscapes on organic farms

Surveys have shown that many organic farmers are interested in doing more for nature conservation – but they lack the time, money, and labour to do so. This is where the concept of conservation advice for individual holdings comes in. Thomas van Elsen who is based at FiBL in Witzenhausen (Germany) has evaluated this approach.

According to Thomas van Elsen the success of the conservation advisory work is evident in that many consultations have led to concrete measures being implemented on the holdings concerned. He reckons that “a conservation advisory service ‘from the agricultural sector for the agricultural sector’ generates more conservation activities on organic farms.”

Conservation advisory service for individual holdings – a major success

In Lower Saxony, conservation advice for individual holdings has been offered over the past four years and with great success. At the Kompetenzzentrum ökologischer Landbau (KÖN, Centre of excellence for organic farming) interested farmers can avail of this advisory service: A conservation advisor provides theoretical and practical advice, helps to obtain funding, organizes hedge planting events together with school groups and mediates between farmers and the authorities in case of problems. Farmer Jörg Rüdfler who jointly with KÖN advisor Eva Meyerhoff developed a conservation strategy for his entire farm says: “I could have never done this alone. It was only during the planning process that I realized how much was involved, all the paperwork that was required once something like this becomes a public process. It was great that someone was there to work out the details, someone who is experienced in this field. That way, something that’s been there as an idea can be turned into reality. Otherwise one just gets stuck dreaming!”

Organic associations offering conservation advisory services

In a second project phase the successful model from Lower Saxony is to be used in establishing conservation advisory services for individual holdings in other German states (Länder). The responsibility for providing this service could be given to the nature conservation advice centres and possibly also to the organic associations. The latter advise farmers on production techniques and have thus already established mutual trust with the farmers. The special conservation advisory service could tap into that relationship, as is the case at the Bioland association in the state of North-Rhine/Westphalia where foundation funds have allowed for the establishment of such a service. Further projects at FiBL in Witzenhausen aim to advance the advisory approach: to develop the natural environment on organic farms means to devise whole-farm strategies, to implement the measures, and to create a new outlook for cultural landscapes and species diversity. An example of this approach is the project “Integration of nature con-



Conservation advice for individual holdings helps farmers to achieve conservation objectives: KÖN conservation advisor Eva Meyerhoff in discussions with farmer Jörg Rüdfler (Hof Michael, Endeholz, Germany).

servation objectives into organic farming – the example of the State demesne at Frankenhausen in Hesse” which is funded by the German Federal Agency for Nature Conservation (BfN). FiBL has responsibility for participation and public relations in this project. Another example is the EU project on “Social Farming” where FiBL looks at synergies between social farming and “multifunctional” aspects such as conservation and landscape development.

tve

Contact: thomas.vanelen@fibl.org

Funding: German Federal Ministry of Consumer Protection, Food and Agriculture (BMELV) within the context of the German Federal Organic Farming Scheme BÖL

Project website: www.naturschutzberatung.info

Organic face-to-face: Transparency instead of anonymity

The "Organic face-to-face" project provides online information on the provenance of organic products and on how they are produced and processed. The data processing technology used has been specially developed for a traceability system.

For consumers, it is all quite straightforward: In a shop, they buy an organic product that carries an "Organic face-to-face" number and details of the website www.bio-mit-gesicht.de. On the "Organic face-to-face" website, they can type in the number of the product and access a profile of the holding where the product originated.

"Consumers should be able to see that organic holdings belonging to the participating organizations, and their products, are not anonymous or interchangeable. They should be able to see for themselves the people behind the products, and their farms", says Rolf Mäder, who heads the project at FiBL Germany.

Visiting a farm at the click of a mouse

"Consumers can get to know the farm by making a virtual visit: they can find out who lives and works on the farm, which standards the farm conforms to, and other interesting details about the farm. In addition, the website also provides information about the product purchased, appropriate recipes and useful information on organic farming", explains Mäder.

If a consumer buys "Organic face-to-face" potatoes, for

example, these might come from the Wagners' farm. In the farm's profile, you can find out that the farm operates according to the Naturland standards, why it was converted to organic methods and what the family does to support environmental conservation. This means that the potatoes you buy off the shelf are no longer an anonymous product. Virtual visitors who want to know more can contact the Wagner family by telephone or even pay a visit in person – contact details and opening hours of the farm shop are also included in the profile.

Research projects paved the way

Two projects funded by the German Federal Organic Farming Scheme BÖL provided the starting point for the "Organic face-to-face" project: one project of the German Federation of the Organic Food Sector BÖLW, in which FiBL was involved, set out "Recommendations to ensure traceability in units involved in the organic food industry". The primary aim of this project was to enable the sector to trace back a product as precisely as possible in the event of a crisis, in order to minimize damage to individual businesses and to the organic sector as a whole. Building on the results of this project, another project entitled "Database prerequisites for traceability systems", under the overall control of FiBL, developed the data standard "OrganicXML". OrganicXML enables the exchange of traceability data between data processing systems used by different participants in the sector; it also enables automatic verification of the data by the competent organic inspection bodies.

"The first market partner to implement this system for its products was Market Ltd., the marketing association of Naturland producers. This was also the starting point for developing the website www.bio-mit-gesicht.de", says Mäder.

In order to implement the "Organic face-to-face" project as a collaborative venture with businesses operating in the sector, a limited liability company was founded in May 2006 together with the producers' association Naturland, the Naturland marketing association, and the trading firm tegut. The company is open to other businesses that share its goals. FiBL Germany provides the company director, produces the farm portraits and manages the editorial system that supports their publication on the Internet.

rm

Contact: rolf.maeder@fibl.org

Internet: www.bio-mit-gesicht.de; www.organicXML.com



Shelf marker and "Organic face-to-face" label.



Using modern technology to network the organic sector

FiBL's profile is growing as a provider of Internet-based services for the organic sector. Frank Wörner of FiBL Germany is now increasingly using state-of-the-art technology that enables efficient quality management of Internet-based services and helps to develop networks for the organic sector.

Everyone who uses the Internet is familiar with the feeling of disappointment one often has when searching for information, because many websites are poorly maintained and their information content is no longer up-to-date. Often, the reason for this is outdated technology: "static web pages" can only be altered by one person and special programming skills are needed to modify and maintain them.

Decentralized maintenance to ensure up-to-date web content

One solution is to use a modern "content management system" (CMS). A CMS enables people who have no knowledge of programming to add to or alter information on websites. Maintaining an Internet presence thus becomes easier. Website content can be updated or added in a decentralized way by a variety of individuals. Another key feature of this system is that centrally located, database-driven content can be accessed from different websites.

The FiBL web package

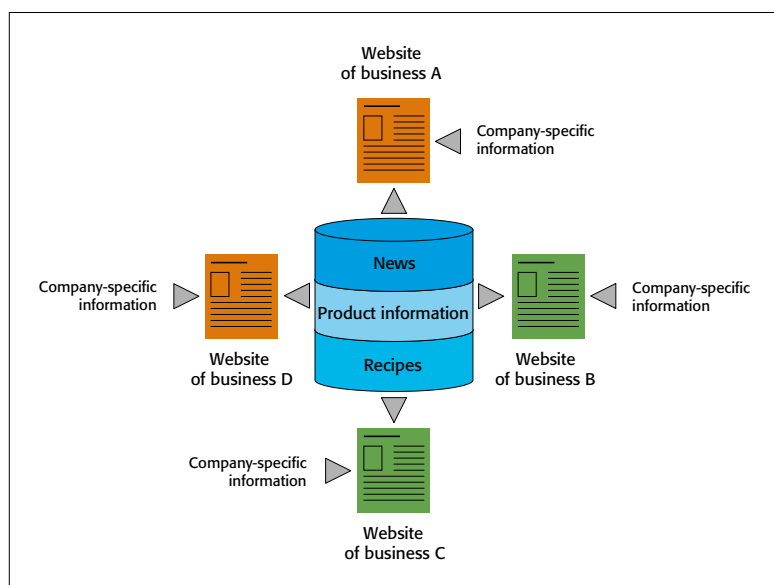
FiBL is increasingly making use of this technology to manage its Internet-based services. For some time now, FiBL has provided a comprehensive package for designing and constructing websites, including adaptation of technical systems, content structuring, consistent design and advice on setting up website maintenance systems. Frank Wörner, in charge of FiBL's Internet services, is convinced that "with decentralized collaboration on developing and maintaining web content, we can make an important contribution to building networks for the organic sector." *fw*

Contact: frank.woerner@fibl.org

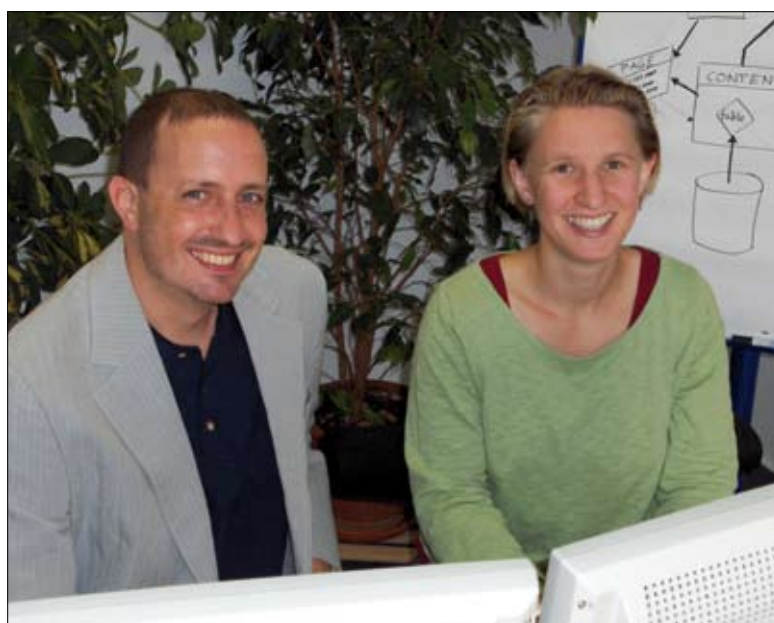
Examples of an Internet presence based on the content management system Typo3:

www.bio-mit-gesicht.de; www.bfn.de; www.naturland.de

Active networking: Frank Wörner and Natalie Kleine-Herzbruch, Internet experts at FiBL Germany, use modern technologies to link together a variety of web-based services on organic production.



The "Bio mit Gesicht" project is an example that highlights the advantages of a modern content management system: information of general interest such as news from the organic sector, information about products, or recipes, is stored centrally. In addition to this general content, businesses linked into the system have individual websites on which they provide their own specific information. This enables agricultural businesses to maintain their own content easily and cheaply in a decentralized manner.



Guiding people through the regulations maze

A large proportion of organic products in Germany and Switzerland are imported. When foreign organic products are offered to trading or processing companies, they must first check whether these products comply with European Union or Swiss requirements relating to organic produce. The website www.oekoregelungen.de provides the necessary information on all relevant importing and exporting countries. This information resource has been compiled by Beate Huber with support from colleagues and numerous specialists.

One-third of all countries have legislation in place covering organic farming. In Europe, almost every country now has a law that defines the requirements that organic products have to fulfil in order to be labelled as organic. Although there is considerable agreement at international level regarding the fundamental regulations, laws in individual countries can differ substantially in the detail. This creates major difficulties for cross-border trade in organic products. Worst affected are companies that import or export organic products, and inspection bodies that certify goods for export. Production and processing units that sell their produce abroad also need guidance through the maze.

Organic Rules Database

The English-language Organic Rules database provides information on implementing and interpreting individual articles and annexes of the EU Regulation on Organic Production.

The database was compiled by FiBL in collaboration with other project partners in the context of the EU research project "Organic Revision".

The database provides vital help with decision-making for those involved in comparing and harmonizing regulations and legislation on organic farming.

Contact: otto.schmid@fibl.org

Funding: European Commission and State Secretariat for Education and Research (SER), Berne

Internet: www.organicrules.org



An inspector from Balkan Biocert inspecting a unit in Bulgaria. FiBL oversaw the setting up of the certification body Balkan Biocert with financial support from the Swiss State Secretariat for Economic Affairs (seco). FiBL's expertise in the field of international regulations has proved very useful in this project and others like it.

Laws, regulations, addresses, links

www.oekoregelungen.de is a German-language Internet site offering online information enabling the user to obtain a rapid overview of the legal provisions, the relevant standards required by private-sector labelling organizations, and a profile of organic farming in a given country. In addition, it also contains a directory of approved inspection bodies and authorities. The information is laid out clearly and presented in the form of annotated links, so that users can obtain a quick overview or, if they need to, research a topic in more depth. Links (e.g. to legislative provisions) ensure that the information provided is up-to-date and minimize the effort required to keep abreast of current developments. The inclusion of a user-friendly database programming system is also important in terms of ensuring that the information remains up-to-date in the long-term, as it enables the database to be updated rapidly. Project leader Beate Huber reports: "When preparing the country profiles, we were able to use FiBL's international network, and so we had superb first-hand access to all the necessary information." bh

Contact: beate.huber@fibl.org

Funding: Supported by the German Ministry for Food, Agriculture and Consumer Protection (BMELV) within the framework of the German Federal Organic Farming Scheme

Internet: www.oekoregelungen.de

Preventing GMO contamination of organic produce

What can actors in the organic sector do to prevent contamination of organic products by genetically modified organisms? How can they assert their claims for compensation in the event of damage occurring, and how should they conduct their public relations work in the event of a crisis? Answers are provided in a manual, which came about as a collaborative project involving FiBL, BÖLW and Öko-Institut. Interview with project spokesperson Alexander Gerber.

Why do organic farmers and processors need a manual like this? Is organic not synonymous with GMO-free in any case?

Alexander Gerber: Organic farmers and processors do not use any genetically modified plants or organisms (GMOs). Agro-genetic engineering is contrary to the principles of organic food production and is therefore explicitly prohibited in the legislation on organic production. In conventional farming, on the other hand, cultivation of genetically modified maize is permitted and genetically modified feedstuffs are traded and fed to livestock. Pollen drift from GMO crops does not stop at the boundary of the neighbouring field. During harvesting, transportation, storage and processing, GM-free operations are exposed to the risk of contamination by GMO residues. Producers, processors and traders in the organic sector need to be familiar with the measures they can take to protect themselves from contamination. They also need to be aware of their rights in the event of damage occurring.

The organic sector on the one hand is fighting to reduce the use of genetic engineering in food production. On the other hand, meanwhile, a book is being published for the event of it happening in any case. Is there not a contradiction here?

Gerber: We are still lucky in that genetically modified crops are not yet cultivated commercially on any great scale in Germany. This is worth fighting for, because the benefits are in no way commensurate with the economic, environmental and health risks. Cultivation of Bt maize, which produces a toxin that makes it resistant to the European corn borer, is currently permitted. There are, however, straightforward farming techniques that offer alternative ways of controlling corn borer. This type of maize is nevertheless cultivated on around 1,700 hectares of land, and many conventional feedstuffs contain GMO soya and GMO maize from overseas. For this reason, there is already a risk of contamination – in processing, too – by various routes, and we must protect ourselves from it and take precautionary measures against it. This is why we have produced the manual.

What sort of response have you had to the manual in organic circles?

Gerber: Good! A large number of copies of the printed version have already been dispatched. The website from which the online version of the manual can be downloaded free of charge has several hundred visitors every week. Feedback on the manual has been overwhelmingly positive.

How has the collaboration with BÖLW (Federation of the Organic Food Sector in Germany) turned out?

Gerber: Very good! Working on the manual has brought together three partners that have been working for many years in different areas connected with agro-genetic engineering: the environmental research institute Öko-Institut produced the legal section of the manual and the section on agriculture. The focus of FiBL's contribution was economic issues and issues relating to quality assurance. BÖLW, as an organization close to those involved in the industry, was responsible for ensuring that the manual as a whole was user-friendly, and contributed the chapter on communications issues. This collaborative effort generated optimum synergies. Despite having several authors, the manual is seamless since it was conceived and developed as a joint project.

Will commercial cultivation of genetically engineered crops ultimately prevail in Germany?

Gerber: As yet, nothing is set in stone; the number of critics of GMOs is multiplying and resistance is having an impact. Germany's Federal Government, for example, is considering putting its weight behind proposals in Brussels that products from livestock fed with GMO feedstuffs should also have to be labelled as GMO products. Brussels, meanwhile, wants to set more stringent safety tests and conditions for GMO approval. On the other side are the lobbies of a few, albeit powerful companies. The future of GMO-free agriculture depends to a large degree on the legislative framework. This is why it is important to fight for strict requirements, adequate rules governing liability and compliance with environmental criteria in the approval procedure. And ultimately, we all have a say, via our purchasing behaviour, in whether agro-genetic engineering will prevail in Germany or not. *Interview: cb*

Contact rolf.maeder@fibl.org

Funding: German Ministry of Food, Agriculture and Consumer Protection (BMELV) via the Federal Organic Farming Scheme

The complete German-language text of the manual "Keeping genetic engineering out of organic products" ("Bioprodukte ohne Gentechnik") is available free of charge for download as a PDF-file at www.bioXgen.de

The manual, complete with binder and index, can also be ordered online from the same website for 50 euros (including postage).

Project website: www.bioXgen.de



Alexander Gerber is director of the German Federation of the Organic Food Sector (BÖLW). BÖLW is the umbrella organization for agricultural producers, processors and traders in the organic food sector in Germany. Gerber also acts as spokesperson for the bioXgen project.

Knowledge crosses borders: Joint data sheets for organic farming

Conditions for organic production are similar in Germany, Austria and Switzerland, and in all three countries organic farming practice and research are at a high level. It therefore seems appropriate to exchange know-how and make it available to farmers across national borders. In a unique cooperative venture this idea is being implemented in the German-speaking area.

Sound practical knowledge underpins sustained progress in organic farming. Good agricultural practice makes farms more successful and safeguards the quality of biological foodstuffs. This is true in Switzerland as well as in Austria and Germany. Since growing conditions are similar in all three countries, Bioland-Beratung and the Kompetenzzentrum Ökolandbau Niedersachsen (KÖN) from Germany, together with the advisory service of BIO AUSTRIA from Austria, have joined forces with FiBL to assemble specialist knowledge of organic production in the German-speaking area and to make it available to practitioners by publishing joint technical data sheets. The aim of the cooperative venture is to create a link between practical advice and cutting-edge research findings, and to communicate this in a convincing and easily understood manner. The cross-border cooperation has generated high-quality brochures containing a great deal

of useful information. Clear synergies have arisen for the partners as they have supported each other in their commitment to the efficient communication of knowledge. The joint data sheets provide expert information on clearly defined topics, with detailed reference to country-specific situations, for example with regard to legislation or varietal issues. All the data sheets have an attractive and straightforward layout; they are written in easily understood style and include plenty of coloured illustrations, tables, photographs and summaries. gww

Contact: gilles.weidmann@fibl.org

Internet: www.shop.fibl.org

"For us these documents have rapidly become an indispensable consultancy tool, and farmers greatly appreciate the information", says Jan Plagge of the Bioland-Beratung organic advisory service.



"The series of data sheets provides farmers and disseminators with useful and attractively presented information about important and relevant aspects of organic farming. The style of the documents, with many pictures, photographs and summary tables, helps to make connections clear", points out Ulrich Ebert of the Lower Saxony organic organization Ökoring Niedersachsen.

"Practitioners profit directly from the broad experience and most up-to-date insights of the participating organizations", notes Gilles Weidmann of FiBL Switzerland.



"Austrian farmers appreciate the inclusion of the experience and insights of their German and Swiss colleagues in the data sheets. This view beyond the boundaries of our own experience is very important for us; we would not be able to produce data sheets of this quality by ourselves." says Christa Gröss of BIO AUSTRIA.



The results of this cross-border cooperation are there for all to see. Instructive booklets have already appeared on the professional cultivation of potatoes and tomatoes, on the control of Cirsium arvense (creeping thistle) and dock and on udder health. Others are in preparation, on topics that include the planting and care of hedges, the cultivation of onions and the supply of nitrogen on farms with little livestock.

Encouraging dialogue among researchers

More and more researchers are working in the area of organic farming. Many have become acquainted with the subject only through the new organic research programmes or the change in focus of the government research centres. This means that communication within organic agricultural research is becoming ever more important, since these researchers have little contact with each other and many have only limited knowledge of the principles of organic farming.

In Germany, FiBL supports dialogue among researchers through the research platform project, funded by the Federal Organic Farming Scheme BÖL. Julia Meier of FiBL Germany is in charge of the project. "We are convinced that the information we provide at <http://forschung.oekolandbau.de> plays a significant part in making research into organic agriculture more transparent. We regularly give details of new results emerging from the federal scheme or of events that are important for researchers in this field."

Avoiding overlap ...

In Switzerland, FiBL is represented in the organic agriculture research coordination group of the federal research institutions. The group's aim is to coordinate areas of research and avoid overlap. "So once a year the group organizes a meeting for all Swiss researchers working in organic agriculture as well as advisers and those whose involvement is more practical," says Thomas Alföldi, who represents FiBL in this group.

In the EU the Core Organic project was launched at the end of 2004, with the aim of setting up a single system for putting to tender organic research projects fostered by the project partners. The partners are the funders in the participating countries. For Switzerland, FiBL is pursuing the project's objectives on behalf of the Swiss Federal Office for Agriculture (FOAG). "This project has made a significant contribution to furthering collaboration in European research. National funders now provide each other with information about their areas of research. The joint call will bring European agricultural research even closer together," says joint project manager Urs Niggli. Another important element of the research network is ISOFAR, the International Society of Organic Agriculture Research, which FiBL has been instrumental in setting up.

... encouraging transparency

A central role in all these activities is played by the online archive Organic Eprints, set up by DARCOF, the Danish Research Centre for Organic Farming. The publications of FiBL workers can be downloaded here. In addition, on behalf of the German Federal Agency for Agriculture and Food (Bundesanstalt für Landwirtschaft und Ernährung – BLE) FiBL is uploading all the final reports of the Federal Organic Farming Scheme. The archive is also central to the work of the Core Organic project mentioned above. "Organic Eprints is an excellent tool for creating more transparency in European organic agriculture research. We hope that in due course other institutions will join DARCOF, FiBL and BLE in making intensive use of the archive," says Helga Willer. She is responsible for the management of Organic Eprints at FiBL. hw

Contact: thomas.alfoldi@fibl.org; julia.meier@fibl.org;
urs.niggli@fibl.org; helga.willer@fibl.org

Funding: Swiss Federal Office for Agriculture FOAG, Berne;
German Federal Ministry of Food, Agriculture and Consumer
Protection BMELV, Bonn; European Commission; Swiss State
Secretariat for Education and Research SER.

Internet: forschung.oekolandbau.de; www.orgprints.org;
www.coreorganic.org; www.isofar.org



Workshop at the Swiss organic research meeting in 2006 at FiBL in Frick, Switzerland. Participants were able to play an active part in drawing up the new programmes of work to be undertaken by the Agroscope federal research institutes and FiBL.



International cooperation

Organic cotton reduces poverty

Until now it has not been possible to reliably assess the extent to which farmers' living conditions are improved by organic cotton growing projects. A comparative study carried out by FiBL in India between 2003 and 2005 concludes that organic cultivation significantly improves the living standards of farmers and their families.



Around 3000 tonnes per year of ginned organic cotton come from bioRe's plantations in India. Of this, 1500 tonnes are bought by the Coop retail chain, which has for the last decade been selling ecologically and socially sustainable textiles under the «Naturaline» label. The success in organic cultivation is also a success for Coop – a win-win situation for everyone involved in the value chain.

On behalf of the Swiss Agency for Development and Cooperation (SDC) and WWF Switzerland, FiBL has compared the production and living conditions over two years of 60 conventional producers and 60 organic producers from the bioRe project in Maikaal, India. The bioRe project is funded by the Swiss textile company Remei. The project, launched by Remei AG in 1993 in the cotton belt of central India, has been a success story. Farmers, processors and traders all contribute to the production of high quality textiles, and everyone involved in the value chain has an appropriate share in the fruits of their labour.

Organic cotton improves living conditions ...

The bioRe farmers profit from a five-year purchase guarantee for their cotton. bioRe also pays a bonus, which rises from 10 percent in the first year of conversion to 20 percent in the third. bioRe does not limit its involvement to the purchase of cotton; it also helps the farmers market other crops such as wheat and pulses. And a special fund enables poorer farmers to build wells, cowsheds and bigogas facilities.

The FiBL study reveals that, as a result of lower production costs and the organic premium, the families of the farmers who grow organic cotton achieve an income 30 to 40 percent higher than that of conventional farmers.

... and soil fertility

In addition, organic cultivation entails fewer economic risks and involves more sustainable utilization of natural resources. The FiBL study shows that due to the improved soil fertility it takes only a few years for the yield of organ-

ic crops to reach the level typically attained in the years before conversion. In addition, organic fertilizers improve water retention in the soil, reducing the risk of a fall in yield in dry periods.

However, the study also showed that it is the smaller harvests in the early years that most deter farmers from converting to organic methods. It is therefore particularly important to provide support in the form of training and advice before and during the conversion period, and so as part of this project the FiBL has produced a comprehensive range of extension aids. The FiBL study as well as training and advisory materials are available from FiBL's website (see link below).

FiBL's research cooperation with bioRe India continues in the form of a comparative system trial in the tropics (see page 44). The long-term comparative study in Maikaal will help to verify and supplement the results of the two-year cotton study. lk

Contact: lukas.kilcher@fibl.org

Funding: Swiss Agency for Development and Cooperation (SDC) and WWF Switzerland

Project website: www.organiccotton.fibl.org

Do organic methods work in the Tropics?

In the northern hemisphere organic farming methods are now established as an effective and sustainable agricultural system. But do organic methods also work in the South? A comparative trial in Kenya should provide an answer.

Whether organic agriculture can make a significant contribution to food security, poverty reduction and resource conservation in developing countries is a controversial issue. According to one point of view, the countries of the southern hemisphere need to utilize everything that modern technology has to offer in connection with breeding, crop protection and fertilization if they are to feed their growing populations. Opponents of this view are con-



In the low-input variants mixed cultivation is frequent. Cabbage and sweetcorn are important for the food security of the population.

vinced that the key to success lies in organic husbandry, because organic systems make more efficient use of farm-owned and local resources such as native seed, preventive crop protection and farmyard fertilizers.

There has until now been a lack of scientific comparisons of the two cultivation systems in the tropics. So in March 2006 FiBL, working with local and international partners, launched a long-term trial in Kenya which will compare the effects of different cultivation systems on yield security, soil fertility, biodiversity, resource efficiency and income. The trial in Kenya is part of a network of long-term trials being set up by FiBL with local partners in Africa, Asia and Latin America.

Experienced partners

«Kenya was identified as a suitable location because we can work there with the well-known International Centre of Insect Physiology and Ecology (ICIPE) », says agronomist Christine Zundel. A long-term trial was launched at two sites simultaneously. «With two locations our results are more reliable », says Zundel. It is also necessary to have a reserve in case one location suddenly needs to be abandoned.

Intensive and extensive cultivation for market and home use

The project team is comparing conventional and organic

systems at two intensity levels. The low-input variants of the two systems represent a subsistence economy in which small-scale farmers use their own fertilizers and minimal pesticides to produce food primarily for their own families. Anything left over is sold at the local market. The high-input variants of the two systems are commercially oriented.

In Kenya two growing seasons per year are possible. The first and longer one lasts from March to July and the second from October to January. In the low-input variant sweetcorn and beans are grown during the long growing season and various vegetables during the short one; all the crops are grown in mixed cultivation. In the high-input variant maize is grown first for export as baby sweetcorn; this is followed by a lucrative vegetable such as cabbage, green beans or mangetout.

It is primarily the Europeans who are awaiting the first results with eagerness, observes Christine Zundel factually. Kenyan farmers and researchers have not yet shown much interest in organic methods. But that could be about to change. As a result of the increasing demands of the re-



Christine Zundel in conversation with farmers.

tail food trade for food safety standards (EUREPGAP), organic methods could represent an important solution for some producers. ta

Contact: christine.zundel@fibl.org

Funding: Coop Naturaplan Fund, Basel; Biovision, Zurich

Lebanon: Organic farming for a region in crisis

FiBL has been active in Lebanon since 2002, supporting the creation of a certification body and the development of a market for organic products. The war that broke out in the summer of 2006 between Hizbollah militias and the Israeli army raises questions about the future of the entire country – including the small successes of the Lebanese organic movement.

FiBL made its first fact-finding visit to Lebanon in 2002. The country was then recovering from the devastation wrought by the civil war. Well-off Lebanese citizens were returning from abroad and the national economy was slowly starting to thrive again. However, farms – most of which are small – were still struggling with low prices, an infrastructure in ruins and limited access to local and export markets. In these circumstances organic agriculture is a very suitable means of combating poverty and developing rural areas.

The Swiss State Secretariat for Economic Affairs (seco) commissioned FiBL to develop a proposal for a project promoting organic agriculture in Lebanon. Having carried out an evaluation and consulted with the future partners, the two FiBL experts – Beate Huber and Paul van den Berge – decided to pursue two strategies: the support of a Lebanese certification body and the development of the market for organic products.

Establishing certification, developing the market

Setting up an internationally recognized certification body



is a lengthy and resource-consuming process. The initial period, when there are few customers and the demand for certified produce is small, is particularly difficult. Fortunately a suitable partner has been found in LibanCert, who were also prepared to bear the economic risk.

For the market development the project team adopted a multi-stage approach. One component of this is the provision of support for the newly founded Association for Lebanese Organic Agriculture (ALOA). The project also finances the employment of the marketing coordinator Nada Omeira and her coaching. Another component is the promotion of a range of market initiatives. The initiative «Les Artisans de l'Olivier» markets organic olive oil from different areas of Lebanon, combining premium

quality with a regional approach. The second initiative, «Wadi el Tayim» is a women's cooperative that produces Lebanese specialities by hand-made methods. Its products are aimed at expatriate Arabs, who greatly appreciate Lebanese specialities. The third initiative is «Souk el Tayeb», or the "market of delights". Souk el Tayeb organizes weekly farmers' markets in Beirut. As a result of a number of promotional activities that have been sup-



The market initiatives supported by the project display their products at an international organic fair in Dubai.

ported by the project, Souk el Tayeb is very well known and has become a meeting point for consumers, artists, intellectuals and students.

Organic agriculture in wartime

In July 2006 the Hizbollah militia abducted two Israeli soldiers, triggering fierce attacks from Israel. Once again death and destruction hold sway. Despite the difficult conditions the organic movement continues to work for the development of organic agriculture. For example, Souk el Tayeb has moved its weekly market into the mountains so that the less affected farmers and producers can sell their products.

Seco and FiBL continue to support their partners in time of war. In this difficult and dangerous situation the project partners and FiBL can count on the support of seco and the Swiss embassy in Beirut. bh

Contact: beate.huber@fibl.org; paul.vandenberge@fibl.org

Funding: Swiss State Secretariat for Economic Affairs (seco), Berne

Picture left: A member of the women's cooperative «Wadi el Tayim» prepares «robb el banadoura», a paste made of tomatoes and spices.

Training and Extension (TE)			
Global	TE 001	Handbook on the organic market for developing countries	2000, 2003
Global	TE 002	Handbook Organic Coffee, Cocoa and Tea	2001–2002
Global	TE 003	Ifoam Training Manual for the tropics	2001–2002
Global	TE 004	Ifoam Training Manual for the moist and arid tropics	2003–2005
Global	TE 005	Manual on organic fruit and vegetable production in the tropics	2002–2003
Algeria	TE 006	Organic conversion course	2001–2002
Bulgaria, Romania	TE 007	SCOPEs Bulgaria/Romania	2000–2003
Bulgaria	TE 008	Bioselena	1997–
Chile	TE 009	Conversion planning	2002
China	TE 010	BATS seminar	2001
China	TE 011	Feasibility appraisal, Mesago	2002
China	TE 012	Advice on Ifoam accreditation for OFDC	2002
China	TE 013	Coaching Competence Centre, Hebei University	2000
China	TE 014	Project evaluation	2002
China	TE 015	Organic farming courses	2000
Ghana	TE 016	Conversion advice for herb production	1999
Hong Kong	TE 017	Organic farming concept, Long Valley	2000
Colombia	TE 018	Courses on poultry management	2001–2001
Croatia (East Slavonia)	TE 019	Courses for extension workers in Slavonia	2001
South-eastern Europe	TE 020	Information system	2003
Spain	TE 021	Feasibility study, Andalusia	1997–2000
Sri Lanka	TE 022	Evaluation of training provision, GSS and HSL	2002
Ukraine	TE 023	Curriculum development	1998–2000
Albania	TE 024	Sustainable agriculture in Albania (SASA)	2006–2008
Bulgaria	TE 025	Advice on an organic programme for Bulgaria (SOAP)	2005–2007
China	TE 026	Label advice	2003–2006
Chile	TE 027	Technical datasheet series for organic farming	2001–2006
India	TE 028	International Competence Centre for Organic Agriculture ICCOA	2003–
India	TE 029	Agri-tourism in the Sangla Valley, North India	2005–2006
Latin America	TE 030	Latin American platform for organic research and production	2004–
Macedonia	TE 031	Developing organic farming in Macedonia (OradeM)	2005–2008
Serbia	TE 032	Label advice for soft fruit and top fruit	2004–
Spain	TE 033	Master programme and technical datasheets, Catalonia	2003–
Spain	TE 034	Organic farming development, Valencia	2006–
Tunisia	TE 035	Technical datasheets for Tunisia	2006–

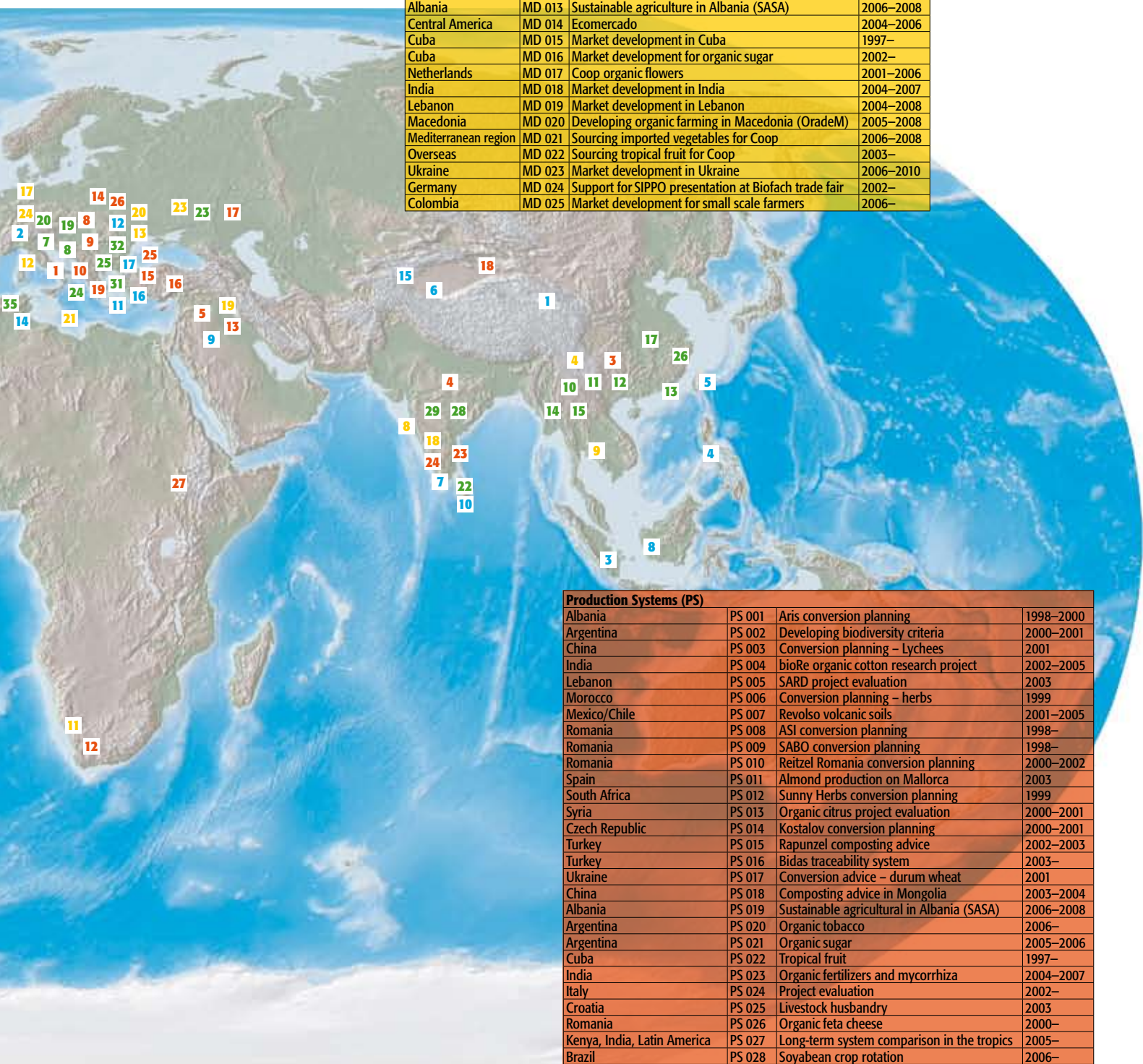
Activities of the International Cooperation Division

Organic farming has a special potential to contribute to socio-economically and ecologically sustainable development in the poorer countries of the world. This is why FiBL disseminates and develops organic farming practice and sustainable farming techniques worldwide through:

- › Researching and developing production systems with a firm focus on practical requirements
- › Delivering education and extension services with the aim of giving access to organic cultivation methods for farmers, extension workers and education centres
- › Providing market development, value chain coaching and market research
- › Developing certification systems and providing advice on legislation and policy

Certification, Standards and Policy (CP)			
China	CP 001	Advice on a certification programme for China	2000
Germany	CP 002	Organic regulations webpage	2002–2003
Indonesia	CP 003	Pilot project for organic certification in Indonesia	2003–
Philippines	CP 004	Advice on a certification programme for the Philippines	2000–2002
Taiwan	CP 005	Advice on a certification programme for Taiwan	2001
Southern Caucasus	CP 006	Advice on a certification programme for the Caucasus region	2004
India	CP 007	Indocert	2002–2008
Indonesia	CP 008	Local organic certification	2005–2006
Lebanon	CP 009	Libancert	2004–2008
Sri Lanka	CP 010	Local organic certification	2006–2007
Macedonia	CP 011	Development of organic farming in Macedonia (OradeM): Policy advice	2005–2008
Romania	CP 012	Ecoinspect Romania	2003–2008
Spain	CP 013	Organic action plan for Catalonia	2006–
Tunisia	CP 014	Organic action plan for Tunisia	2003–2006
Ukraine	CP 015	Certeco Ukraine	2006–2010
Albania	CP 016	Sustainable agricultural in Albania (SASA)	2006–2008
Bulgaria	CP 017	Balkan Biocert	2002–2008

Market Development (MD)			
Argentina	MD 001	Ojo de Agua	2002–2005
Brazil	MD 002	Sourcing tropical fruit for Migros	2000–2001
Chile	MD 003	Amber project	2001–2002
China	MD 004	Organic herb advice	2002–2003
Costa Rica, Ecuador	MD 005	Organic banana evaluation for Coop	2001–2004
Netherlands	MD 006	Flower project, Coop	2002
Netherlands	MD 007	Label advice on mushrooms	2002
India	MD 008	IFAD thematic evaluation	2004
India and Thailand	MD 009	Sourcing Basmati and Jasmine rice for Coop	2002
Nicaragua	MD 010	Evaluation of organic farming organizations in Nicaragua	2002–2003
South Africa	MD 011	Export promotion for organic products	2000
Italy	MD 012	Sourcing organic rice	2003–2004
Albania	MD 013	Sustainable agriculture in Albania (SASA)	2006–2008
Central America	MD 014	Ecomercado	2004–2006
Cuba	MD 015	Market development in Cuba	1997–
Cuba	MD 016	Market development for organic sugar	2002–
Netherlands	MD 017	Coop organic flowers	2001–2006
India	MD 018	Market development in India	2004–2007
Lebanon	MD 019	Market development in Lebanon	2004–2008
Macedonia	MD 020	Developing organic farming in Macedonia (OradeM)	2005–2008
Mediterranean region	MD 021	Sourcing imported vegetables for Coop	2006–2008
Overseas	MD 022	Sourcing tropical fruit for Coop	2003–
Ukraine	MD 023	Market development in Ukraine	2006–2010
Germany	MD 024	Support for SIPPO presentation at Biofach trade fair	2002–
Colombia	MD 025	Market development for small scale farmers	2006–



Production Systems (PS)			
Albania	PS 001	Aris conversion planning	1998–2000
Argentina	PS 002	Developing biodiversity criteria	2000–2001
China	PS 003	Conversion planning – Lychees	2001
India	PS 004	bioRe organic cotton research project	2002–2005
Lebanon	PS 005	SARD project evaluation	2003
Morocco	PS 006	Conversion planning – herbs	1999
Mexico/Chile	PS 007	Revolso volcanic soils	2001–2005
Romania	PS 008	ASI conversion planning	1998–
Romania	PS 009	SABO conversion planning	1998–
Romania	PS 010	Reitzel Romania conversion planning	2000–2002
Spain	PS 011	Almond production on Mallorca	2003
South Africa	PS 012	Sunny Herbs conversion planning	1999
Syria	PS 013	Organic citrus project evaluation	2000–2001
Czech Republic	PS 014	Kostalov conversion planning	2000–2001
Turkey	PS 015	Rapunzel composting advice	2002–2003
Turkey	PS 016	Bidas traceability system	2003–
Ukraine	PS 017	Conversion advice – durum wheat	2001
China	PS 018	Composting advice in Mongolia	2003–2004
Albania	PS 019	Sustainable agricultural in Albania (SASA)	2006–2008
Argentina	PS 020	Organic tobacco	2006–
Argentina	PS 021	Organic sugar	2005–2006
Cuba	PS 022	Tropical fruit	1997–
India	PS 023	Organic fertilizers and mycorrhiza	2004–2007
Italy	PS 024	Project evaluation	2002–
Croatia	PS 025	Livestock husbandry	2003
Romania	PS 026	Organic feta cheese	2000–
Kenya, India, Latin America	PS 027	Long-term system comparison in the tropics	2005–
Brazil	PS 028	Soyabean crop rotation	2006–

Staff, founding and projects of FiBL Switzerland



Income and expenditure of FiBL Switzerland in 2005 and 2004

	(in Swiss francs)	2005	2004
Income			
Research projects		5 150 102.67	4 818 071.96
Service mandate for Swiss federal agencies (Federal Office for Agriculture, Federal Veterinary Office)		5 000 000.00	5 000 000.00
Advisory service and training		1 156 428.81	998 920.35
Communication (periodicals, data sheets, Internet)		930 969.07	811 493.28
International cooperation		2 163 747.93	2 028 711.43
Pilot farm		54 834.95	57 543.68
Catering, housekeeping		430 958.93	437 180.78
Donations, miscellaneous income		96 716.87	241 045.06
Total income		14 983 759.23	14 392 966.54
Expenditure			
Personnel expenses		-9 550 163.70	-9 159 469.10
Material expenses			
Experimental/trial material, laboratory, analytics, projects		-3 368 535.66	-3 553 092.74
Premises, office supplies, other administrative, information technology, advertising		-1 007 852.17	-1 295 354.64
Financial result		-125 316.62	-63 982.27
Depreciation		-1 017 800.60	-443 320.20
Total expenditure		-15 069 668.75	-14 515 218.95
Non-recurring income/expenditure		96 801.30	128 534.65
Net profit for the year		10 891.78	6 282.24

Developments in FiBL Switzerland's finances from 2004 to 2005

FiBL Switzerland is a non-profit-making foundation providing practice-oriented research and consultancy on organic agriculture, species-appropriate livestock management, holistic animal health and careful food processing since 1973.

For the past 33 years, FiBL staff have been wholeheartedly convinced of the great potential that organic farming holds for society. This commitment is an important reason why we have been able to persuade numerous private and public-sector bodies and individuals to invest in innovation and continuing development in organic farming. A list of all clients, donors and sponsors can be found on the next page.

Today FiBL is rather unique among research and consultancy institutions: it is able to mobilize funds from a large number of sources, it operates in areas of great importance for society and for the future, and it is structured as a business enterprise. This makes FiBL a rare example of a functioning private-public partnership (PPP). FiBL combines a close relationship with local actors and an international sphere of action. As a result, a great deal of knowledge flows into and out of Switzerland.

Following a period of growth for FiBL in 2002 and 2003, the years 2004 and 2005 saw a consolidation of its income at just under 15 million Swiss francs. The number of research projects increased again, largely due to the successful acquisition of EU projects within the 6th EU Framework Programme. The service mandate for Swiss federal agencies, an important source of core funding for FiBL, has remained stable since 2003 at 5 million francs annually (representing about one-third of FiBL's total income). Demand for advisory services also increased both within Switzerland and internationally. The growth in research projects also meant that FiBL needed to expand its research facilities (laboratories, analytical equipment, machines, etc.). This caused a marked increase in depreciation costs, which rose to 1 million francs in 2005. We are immensely grateful to all FiBL's partners, sponsors, clients and donors for their financial and moral commitment. Their endorsement gives FiBL a sense of being strongly supported, and spurs us on to go the extra mile.

Otto Stich and Urs Niggli

Clients and donors of FiBL Switzerland 2004 – 2005

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 Coop Naturaplan Fund, Basel
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Many others have supported us. Our heartfelt thanks!

As private institutions we continue to depend on you in the future and are always pleased to receive small and large donations (PC 80-40697-0).

For further information, see also page 72.

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	Schindler Maja Accounting, secretariat		Bär Markus lic. phil. Editor 'bioaktuell'		Häseli Andreas, Dipl. Ing. Agr. HTL, Fruit production & viticulture, plant protection		van den Berge Paul Dipl.-Ing. HTL, Vegetables, ornamentals, standards
	Williner Stefan Personal- & Personnel management, accountancy		Gorba Daniel Layout designer Graphics		König Zeltner Cornelia Dipl. Zool., Training & education, apprenticeship exchange		Ziegler Katia, Diploma in Agricultural Engineering, Standards, certification
	Zimmermann Maria Accountancy		Kirchgraber Claudia Dipl. Graphic Design Graphic design		Lichtenhahn Martin Diploma in Agricultural Engineering, Vegetable & herb production, courses		Zundel Christine Diploma in Agricultural Engineering, Africa, on-farm research
	Catering		Morgner Marion Dr. rer. nat. Editor, Internet & print		Meili Eric, Diploma in Agricultural Engineering, Milk & meat, building construction		Research
	Ackermann Anita Restaurant		Schädeli Alfred Dipl.-Ing. Agr. HTL Editor 'bioaktuell' & 'Beiträge'		Obrist Robert, Diploma in Agricultural Engineering, Education, projects in the regions		Soil sciences
	Belloli André Manager of internal services		Schmutz Res Dipl.-Ing. Agr. HTL Advisory documents		Springer Bettina, Diploma in Agricultural Engineering, Advisor, farm management and building construction		Arncken-Karutz Christine, Diploma in Agricultural Engineering Breeding, cereal quality

 <i>Berner Alfred, Diploma in Agricultural Engineering Farmyard manures, fertilizers</i>		 <i>Wyss Eric Dr. phil. Head of division: Entomology</i>	 <i>Hertzberg Hubertus PD, Dr. med. vet. Endoparasites</i>
 <i>Billmann Bettina Dipl.-Ing. agr. Ornamental plants</i>	 <i>Amsler Thomas Horticulture Field trials, laboratory</i>		 <i>Krenmayr Ilse Dipl.- Ing. agr. Veterinary parasitology lab</i>
 <i>Fliessbach Andreas Dr. sc. agr. Soil biology and soil ecology</i>	 <i>Fuchs Jacques Dr. sc. ETH Phytopathology, composts</i>	 <i>Biegel Ulrike med. vet Mistletoe therapy for dogs and cats</i>	 <i>Maurer Veronika Dr. sc. ETH, Head of division: Veterinary parasitology</i>
 <i>Frei Robert Dipl.-Ing. Agr. HTL Field crop production experiments</i>	 <i>Larbi Mohamed Ing.-Agr. Phytopathology</i>	 <i>Clottu Ophélie med. vet Mistletoe therapy for horses</i>	 <i>Perler Erika Biology laboratory Field and laboratory trials</i>
 <i>Mäder Paul, Dr. phil, Diploma in Agricultural Engineering, Head of division: Soil science</i>	 <i>Schärer Hans-Jakob Diploma in Agricultural Engineering, Phytopathology, seed</i>	 <i>Heil Fritz Dr. sc. agr. Health of dairy cows</i>	
 <i>Nietlispach Bruno, Lab technician Dipl. nature and environment special- ist, Laboratory, analytics</i>	 <i>Specht Nicole Dipl. Ing. Agr. FH Lab and trial technician</i>	 <i>Ivemeyer Silvia. Dipl. Ing. FH Animal husbandry, animal health</i>	 <i>Bapst Beat, Diploma in Agricultural Engineering Head of division: Livestock breeding and husbandry</i>
 <i>Thommen Andreas Diploma in Agricultural Engineering, Organic seed</i>	 <i>Speiser Bernhard Dr. phil. Potatoes, auxiliary inputs, slugs & snails</i>	 <i>Klocke Peter Dr. med. vet. Head of division: Animal health</i>	 <i>Hirt Helen Dipl. Zool. Poultry husbandry & breeding</i>
 <i>Vieweger Anja Dipl.-Ing. FH Vegetable production, mycorrhiza</i>	 <i>Tamm Lucius, Dr. phil, Diploma in Agricultural Engineering, Head of division: Phytopathology</i>	 <i>Maeschli Ariane Dr. med. vet. Health of dairy cows</i>	 <i>Spengler Neff Anet Diploma in Agricultural Engineering, Animal health, animal breeding</i>
	 <i>Thürig Barbara Dr. phil. Phytopathology</i>	 <i>Majewsky Vera, med. vet, Research into effects of homoeopathic substances</i>	 <i>Zeltner Esther, Dipl. phil- nat., Livestock husbandry & breeding (poultry and minor livestock)</i>
		 <i>Notz Christophe med. vet Complementary medicine</i>	
 <i>Koller Martin Dipl.- Ing. FH Vegetable production</i>			
 <i>Fahrmi André Wine grower Viticulture</i>	 <i>Daniel Claudia Dipl. Ing. Horticulture FH, Biological pest control</i>	 <i>Schneider Claudia Dipl.- Ing. agr. Ethology, cows</i>	 <i>Bahrdt Katja Dipl.-Ing. agr Consumer and market research</i>
 <i>Léвите Dominique Dipl. Ing. IUVV Viticulture, oenology</i>	 <i>Holzherr Philipp Dipl.-Ing. agr. ETH Biodiversity & habitat management</i>	 <i>Walkenhorst Michael med. vet Health of dairy cows</i>	 <i>Bolliger Conradin Betriebswirtschaft, Soziologie</i>
 <i>Suter Francisco, Dipl. Ing.- Agr., Fruit, soft- fruit production, tree nurseries</i>	 <i>Luka Henryk Dr. phil, Ing. agr. Biodiversity, taxonomy</i>		 <i>Kretzschmar-Rüger Ursula, Food engineer Processing of organic foods</i>
 <i>Tuchs Schmid Andreas Ing. HTL Weinbau Manager FiBL vineyard</i>	 <i>Pfiffner Lukas, Dr. phil. nat, Diploma in Agricul- tural Engineering, Biodiver- sity & habitat management</i>	 <i>Amsler-Kepalaite Zivile Dipl. Agroecology Field trials, laboratory</i>	 <i>Landau Bettina Dr.sc.agr. Organisation EU projects</i>
 <i>Weibel Franco, Dr. sc. ETH, Head of division: Plant production, fruit production</i>	 <i>Schlatter Christian Dipl. Umwelt-Natw. ETH, Biodiversity & habitat management</i>	 <i>Heckendorn Felix M Sc Endoparasites in ruminants</i>	 <i>Moschitz Heidrun Dipl.- Ing. agr. Agricultural policy</i>

 Richter Toralf Dr. Ing.-Agr. Consumer and market research	 Stolz Hanna M.Sc. Consumer and market research	 Kerbage Laurent Food engineer Food quality	
 Rudmann Christine Dr. sc. ETH Farm management, farm network	 Stolze Matthias Dr. sc. agr. Head of division: Socio-economics	 Nowack Heimgartner Karin, Dipl. Env. Sc. ETH, Dipl. MTEC ETH Food quality	 Allemann Marianne Experimental farm staff
 Sanders Jörn, BSc (Hons) Organic Agriculture, Agricultural policy, rural development		 Oehen Bernadette Dipl. Botany MAS ETH Freedom from genetic engineering	 Allemann Pius Master Farm Manager Master farm manager
 Schader Christian Dipl.- Ing. agr. Agricultural policy, multifunctionality	 Granado José Dr. phil. Microbiology, foods	 Wyss Gabriela Dr. sc. nat. Head of division: Food quality	
 Schmid Otto, Diploma in Agricultural Engineering, Rural development, standards	 Hilber Isabel Dipl. Natw. ETH Residues in soils		

Staff arrivals

At Sevkan
Bär Markus
Bolliger Conradin
Chevillat Véronique
Clerc Maurice
Granado José
Hajdarasic Ahmo
Hilber Isabel
Holzherr Philipp
Kerbage Laurent
König Monika
Maeschli Ariane
Majewsky Vera
Portmann Katrin
Schär Lisbeth
Springer Bettina
Stolz Hanna
Ziegler Katia
Zundel Christine

Staff departures

Eyhorn Frank
Guyer Ursula
Kieffer-Kern Edith
Rüegg-Mühlethaler Irene
Scherr Claudia
Schiess Christophe
Schmid Andrea
Spranger Jörg
Uehlinger Gabriela
Wanner Bruno

Trainees

Ackermann Florian
Aiziber Zaldivar Anacabe
Alder Thomas
Bähler Corinne
Baraibar Padro Bárbara
Beyer Stefanie
Bodini Antonella
Brecht Isabelle
Denzel Christoph
Dippold Axel
Dollinger Julia
Fachira Artur
Fankhauser Christoph
Gnehm Felix
Graf Philip
Grogoriev Grigore
Haug Thomas
Hengartner Bettina
Herzog Simone
Holzherr Philipp
Hügli Christian
Isensee Anne
Kilchsperger Rahel-Félice
Kovács Annamária
Künzel Heidi
Lieber Susann
Neudecker Angelika
Pape Tobias
Rieger Simone
Sanmartin Julian Carmen
Schneider Antonia
Spranger Ronja
Staepli Pamela
Stolz Hanna
Triaca Carmen
Wiederkehr Daniel
Winkler Manuel
Wüthrich Katharina

Student guests

Blume Oliver
Frey-Wacker Rita
Glaser Pascal
Jenny Michael
Maier Birgit
Maurer Elisabeth
Müller Claudia
Pasche Aline
Psarros Panagiotis
Rehmann Marietta
Reist Christian
Rios Elena
van der Meer Markus
von Ah José
Vonarburg Urs Peter
von Körber Hellmut
Vonesch Gerhard
Wyss Andreas

Visitors

Antonic Zivka
Baumann Denise
Frokaj Kristina
Ineichen Lukas
Kerkeni Amel
Kiener Jonas
Moesch Michèle
Ribo Marta
Sans Serra F. Xavier
Schaller Sabrina
Schindler Tobias
Scott-Baird Emer
Trumpie Janine
Ulrich Agnieszka

Community service

Holzherr Philipp

Freelancers

Beck Alexander
Belser Rosmarie
Halpin Darren
Kaufmann Rolf
Kilchsperger Rahel
Kraushaar Flurin
Schär Andrea








Students producing diploma theses

Bartels Ulfila
Bigler Christoph
Hahn Priska
Hildermann Isabell
Lambelet Sophie
Lieber Susann
Menk Julia
Pyttlik Claudia
Schmidt Rebekka
Thalmann Maria
Vila Camps Lluís
Vogt Lea
Weber Felix
Winterling Andrea







Overview of FiBL research areas 2006–2007

1. Soil and plants

	<p><i>Biodynamic preparations, amongst other things, are being used to improve soil fertility and produce quality. There are questions with regard to their efficacy.</i></p> <ul style="list-style-type: none"> › Scientific information on the biological and agronomic performance capability of biodynamic production systems. › Scientific evidence for the effectiveness of individual measures taken in biodynamic farming. › Improved fertilization and soil management strategies with special consideration given to biodynamic techniques. › Long-term monitoring on commercial bio-dynamic holdings.
	<p><i>The maintenance and improvement of soil fertility is a central objective in organic farming.</i></p> <ul style="list-style-type: none"> › Evaluation of soil quality in organic and conventional agricultural systems. › Functionality of the soil micro-flora in agricultural soils. › Risks from pesticides › Management of mycorrhizal fungi › Effects of inoculation with micro-organisms on soil biocoenoses
	<p><i>Organically grown seeds and vegetative propagating material are still not being used consistently. The reasons for this situation include difficulties in the production of seeds and vegetative propagating material, gaps in the regulations and in enforcement, lack of knowledge with regard to availability, and insufficient availability of suitable varieties.</i></p> <ul style="list-style-type: none"> › Ensure the availability of organic seeds and vegetative propagating material: Online database, lists, research to accompany breeding efforts, analysis of problems and demand, production and quality assurance, regulatory systems and market controls, knowledge transfer and implementation. › Interactions between wheat varieties and mycorrhizal fungi.
	<p><i>The key problems concerning cultivation techniques in the organic production of pome fruit, stone fruit, and soft fruit are as follows: Choice of varieties and rootstocks, fertilization and soil fertility, weed control, thinning, and quality optimization.</i></p> <ul style="list-style-type: none"> › Increased yield security, improved product quality and greater ecological services in organic top fruit and soft fruit production. › Development of economic organic production of cherries, plums, pears, and table grapes as well as transplants. › New strategies for the cultivation of standard fruit trees and for agroforestry. › Close integration of FiBL advisory services and active contact with practitioners and marketing circles in order to assure the swift implementation of research results. › Long-term trials on the efficacy of biodynamic preparations.
	<p><i>The key problems concerning cultivation techniques in the organic production of grapes and in viticulture are the choice of cultivars, green cover management, fertilization and soil fertility, canopy management, and wine production</i></p> <ul style="list-style-type: none"> › Increased yield security and quality in organic viticulture, for both European grape cultivars and interspecific cultivars. › Lowering of production costs. › Improved vinification of fungus-resistant grapes. › Development of organic grape nursery production. › Improved marketing in viticulture.
	<p><i>Organic production of vegetables and ornamental plants is usually highly specialized and therefore prone to problems. Nutrient and energy cycles as well the self-regulation of agricultural systems must be improved.</i></p> <ul style="list-style-type: none"> › Variety recommendations for organically propagated vegetable seeds and a well functioning implementation of regulations on organic seed. › Further rationalization of production techniques. › Development of the organic production of ornamental plants.

 <p>Cultivation techniques in potato production</p>	<p>Potato blight (pathogen: <i>Phytophthora infestans</i>) is one of the most significant limiting factors in organic potato production. Copper is as yet the only effective controlling agent for this disease. Alternatives must quickly be found in order to avoid the need for the continued application of copper.</p> <ul style="list-style-type: none"> ➤ Improved yield security and quality in potato production. ➤ Replacement of copper through the use of alternative cropping strategies.
 <p>Interaction of soils, plants, and diseases</p>	<p>Soil characteristics can influence the susceptibility of crop plants for soil-borne and air-borne diseases.</p> <ul style="list-style-type: none"> ➤ Determination of the suppressive and resistance-inducing potential of soils. ➤ Use of biotests to determine the disease-suppressive characteristics of composts in relation to the initial material used and the composting techniques applied. ➤ Investigation of the interdependencies between soil-biological and soil-chemical characteristics and disease suppression. ➤ Development of workable methods for the targeted improvement of disease-suppressant characteristics in soils and substrates for arable, fruit, wine, and vegetable production..
 <p>Resistance induction using natural substances</p>	<p>Crop plants have a number of defence mechanisms against disease-causing agents which can be activated using "elicitors".</p> <ul style="list-style-type: none"> ➤ Fundamental principles of resistance induction through potential resistance inducers. ➤ Clarification of the spectrum of activity of resistance inducers and of the causes of desirable and undesirable side effects. ➤ Illustration of the potential and limitations of resistance induction with regard to key diseases in viticulture, pome fruit and vegetable production.
 <p>New plant protection products</p>	<p>A number of plant protection products and plant tonics are approved for use in organic plant production. The requirements in terms of effectiveness as well as ecotoxicology and human toxicology are increasing. The currently still approved copper products have a special status, as they will be banned in the foreseeable future. Therefore the finding of alternatives to copper-based fungicides is of the highest priority.</p> <ul style="list-style-type: none"> ➤ Evaluation of fungicides and resistance inducers compatible with organic production. ➤ Making plant protectants available which are in conformity with the organic regulations and which provide clear advantages in terms of their environmental behaviour, the protection of users, low residue levels and yield security.
 <p>Plant protection: Strategies, epidemiology</p>	<p>In organic farming, plant protection problems are tackled wherever possible by preventative measures, such as healthy seed, hygiene, resistant varieties, cultivar mixes, agronomic measures and optimum soil fertility. Plant protection products need to be used with optimum application techniques and timing. Warning systems are being evaluated under organic conditions.</p> <ul style="list-style-type: none"> ➤ Development of workable plant protection strategies for fruit, vegetable, and potato production as well as for viticulture.
 <p>Evaluation of approved auxiliary substances</p>	<p>The use of approved auxiliary substances in organic farming is regulated by the standards. These are more like principles in character and do not advise on individual proprietary products or on the use of new active agents or beneficial organisms. For this reason a detailed positive list has been developed for users and inspection personnel.</p> <ul style="list-style-type: none"> ➤ Annual publication of the list of approved auxiliary substances in conformity with the organic regulations. ➤ Further development of criteria for the evaluation of approved auxiliary substances in close cooperation with label organizations and authorities inside and outside of the country.
 <p>Biocontrol</p>	<p>One strategy for pest control is to release predators, parasites and micro-organisms: e.g. nematodes to control soil-borne pests, fungi to control cherry fruit fly and ladybirds to control aphids.</p> <ul style="list-style-type: none"> ➤ Development of workable organic control methods for pests and diseases in fruit and vegetable production. ➤ Improvement of application techniques and thus effectiveness for known products based on micro-organisms.





 <p>Entomology in fruit production (Substance tests)</p>	<p>Amongst the unsolved problems in organic fruit production are cherry fruit fly, various fruit moth and aphid species as well as woolly apple aphids.</p> <ul style="list-style-type: none"> ➤ New insecticides and repellent substances compatible with organic production for the control of the most significant pests in fruit production are being tested. ➤ Organic fruit production shall be improved in agronomic, ecological and economic terms with the aid of optimum recommendations for the use of these substances.
 <p>Entomology in vegetable production</p>	<p>Because of the great variety of vegetable crops, the number of pest species is very high. For many pests encountered in organic vegetable production there are no or not sufficiently effective methods for their direct control.</p> <ul style="list-style-type: none"> ➤ Making new insecticides and repellent substances available to producers to control the most significant pests in vegetable production. ➤ The use of physical barriers (vertical crop protection nets) for the control of vegetable pests is to be made even more easy and economic.
 <p>Pest regulation by way of functional biodiversity</p>	<p>The opportunities for direct plant protection in organic production are limited. Therefore the provision of near-natural habitat elements for beneficial organisms is of great importance.</p> <ul style="list-style-type: none"> ➤ Development and testing of ecological measures for landscape design as a basis for pest regulation in organic farming. ➤ Encouragement of beneficials through habitat management in order to increase parasitism and predation of key pest species. ➤ Analysis of pest-regulating effects at plot level and landscape level in tillage production.
 <p>Wildlife-friendly organic farming</p>	<p>Much evidence has been presented showing that organic farming enhances biodiversity. Targeted support of organic production that is beneficial to wild fauna aims at making organic farmers even more aware of conservation measures.</p> <ul style="list-style-type: none"> ➤ Development of simple evaluation criteria to be used by producers which allow them to assess the conservation value of their holdings ➤ Optimized linkage of habitat elements at farm level and landscape level ➤ Development of management practices on cultivated land that are beneficial to wild fauna (e.g. mowing techniques, alternate mowing, harrowing) ➤ Nature conservation and landscape protection as an enterprise: intensive cooperation with local and regional tourism interests to whom intact landscapes are a sales asset. ➤ For this research area model farms are being selected in Switzerland, Austria and the Czech Republic which will serve as models for interested farmers and regional authorities.
 <p>Herbology</p>	<p>Deep-rooted weeds are a major problem in organic production. Indirect measures such as adapted crop rotations, multi-annual meadowing and mechanical control are well known but are not always and not in all locations successful or feasible.</p> <ul style="list-style-type: none"> ➤ Development of new, more economic indirect or direct control mechanisms for a variety of perennial weeds. ➤ Provision of scientific knowledge to aid decisions on whether antagonists or natural herbicides are suitable to organic farming.
 <p>Quality of organic products</p>	<p>Safety and health benefits are important motives for consumers of organic foods. Scientifically validated methods are needed which allow for the assessment of food quality. "Holistic" methods and of late also the microbiology of food products have priority in this regard.</p> <ul style="list-style-type: none"> ➤ Explanation of the relevance of differences in the micro-flora of fruit discovered between organic production and integrated production for the quality and physiological value of the foods. ➤ Examination of the microbiological "authenticity" of organic products using genetic markers. ➤ Interpretation of the differences also in terms of nutritional physiology. Routine establishment of one or more holistic quality assessment methods at FiBL. ➤ Using feeding trials to clarify how organically produced feed impacts on the meat quality and physiological condition of rabbits.
 <p>Quality assurance in organic production</p>	<p>Organic products can only be as "pure" as the environment in which they were produced. It is therefore possible that pesticide residues or genetically modified organisms may also be traceable in organic products.</p> <ul style="list-style-type: none"> ➤ Quality assurance for organic products. ➤ Establishment, expansion and management of residue database (pesticides, GMO, mycotoxins). ➤ Preparation of expert reports on cases in which residues were found and development of suitable measures ➤ Projects on the safeguarding of traceability. ➤ Studies and clarifications with regard to quality assurance for organic products in accordance with HACCP. ➤ Information platform for producers, processors, label organizations, authorities, trade, consumers.


 <p>GMO-free organic production</p>	<p>Organic farming consciously abstains from the use of GMOs as such interventions into genetic material are not consistent with its principles. However, GMOs can inadvertently contaminate organic foods through seeds, pollen dispersal, bought-in feeds, or cooperatively used machinery for transport, storage or processing.</p> <ul style="list-style-type: none"> › Evaluation of measures and constant improvement of these measures to guarantee the production and processing of foods without genetic engineering. › Appraisal of the cost of GMO avoidance from field to fork. › Clarification of the conditions for the coexistence of the production of GM-crops and organic crops in Switzerland from field to fork. › Examination of the special coexistence conditions along the Swiss border. › Study of the impacts of GMO contamination of agricultural seed. › Further development of the GMO environmental monitoring strategy through pollen collection from rapeseed and maize.
 <p>Food processing</p>	<p>Organic farming follows the organic tenet from field to fork. Apart from fresh produce such as fruit, vegetables and fresh meat, organic products obviously also reach the consumer in a processed state. Products ranging from yoghurt, bread and salad sauces to pizza and potato chips are available.</p> <ul style="list-style-type: none"> › Elaboration of fundamental principles for the further development of government regulations (e.g. EU Organic Regulation 2092/91) › Development of guidelines for food processors for the processing of organic foods › Practically relevant, problem-oriented research (e.g. substitution of chlorine in water for washing fresh-cut lettuce)
 <p>Farm management</p>	<p>Organic farming differs from other production systems with regard to cost-price structures and direct payments. Detailed baseline data are required for conversion planning and farm management on the one hand and for price calculations on the other.</p> <ul style="list-style-type: none"> › Updating the catalogue of gross margins for organic farming. › Provision of economic efficiency calculations for individual farm enterprises considering changing market and agricultural policy conditions. › Analysis of production structures (holding type, soil index, ecological compensation etc.)
 <p>Agricultural policy</p>	<p>Apart from market developments, it is the agri-policy environment which is an essential economic factor for the further development of organic farming.</p> <ul style="list-style-type: none"> › Analysis of the impact of different agri-policy environments on organic farming in Switzerland: Impacts on income, farm business organization, supply, and the relative advantage of organic farming. › Development of future business strategies for organic holdings. › Assessment of the acceptance of policy instruments for organic farming. › Analysis of the institutional network for organic farming policy. › Establishment of a policy information system for organic farming in Switzerland.
 <p>Farm network</p>	<p>Structural change, falling prices and the widening of the income gap between the agricultural and the non-agricultural sectors are likely to continue in the future. At the foreign policy front the pressure for trade liberalization under the WTO and under bilateral agreements is growing. The holding network is to help evaluate agri-policy measures and illustrate development perspectives by holding type.</p> <ul style="list-style-type: none"> › Establishment and maintenance of a representative network of holdings › Improvement of the economic data situation. › Observation of the socio-economic development of organic holdings. › Price monitoring in the organic sector.
 <p>Organic statistics</p>	<p>A lack of information on the growing organic markets hampers political decision-making and leads to planning uncertainties in the marketplace.</p> <ul style="list-style-type: none"> › Provision of production and market data for the organic sector. › Investigation of the supply potential for individual product groups. › Assessment of supply and demand for selected market segments. › Improvement of market transparency for organic products. › Improvement of the survey methodology for market and production data. › Harmonization of existing European data survey methods. › Analysis of successful marketing initiatives

2. Agricultural policy and markets

 <p>Market and consumer studies</p>	<p>Since the mid 1990s organic products have increasingly been sold through wholesalers. The retail chains vary in terms of their commitment to and their success in the sale of organic products. Differences in their strategic objectives as well as in marketing would appear to be factors limiting success.</p> <ul style="list-style-type: none"> • Analysis of consumer behaviour. • Optimization of the presentation of organic products in the shops. • International supermarket trend studies. • Development of marketing strategies for organic products. • Analysis of the added value chain for organic products.
 <p>Standards</p>	<p>The organic standards are under continuous development. With increasing international trade, the importance of harmonizing standards is also growing.</p> <ul style="list-style-type: none"> • Further development of the Swiss Organic Farming Ordinance. • Further development of the international IFOAM Basic Standards for organic farming. • Further development of the international standards for organically produced products under the Codex Alimentarius and the EU Regulation 2092/91. • Development of assessment and evaluation systems for organic standards.
 <p>Multifunctionality: The role of organic farming</p>	<p>Agriculture provides services going beyond the production of food. Its contribution to maintaining the integrity of life-support systems, its maintenance of the cultural landscape and its contribution to decentralized settlement as well as its provision of social services are subsumed under the term 'multifunctionality'.</p> <ul style="list-style-type: none"> • Analysis of the multifunctional services provided by organic farming. • Analysis of the international agri-policy environment for the development of a multifunctional farming sector. • Development of policy recommendations with regard to multifunctionality.

3. Animal health and livestock husbandry

 <p>Effects of homeopathic substances</p>	<p>Are homeopathic remedies effective? Using simple and safe testing systems the potential effects of potentized substances are to be shown in a replicable manner. To this end the growth of yeasts (<i>Saccharomyces cerevisiae</i> and <i>Schizosaccharomyces pombe</i>) and duckweed (<i>Lemna minor</i>) in relation to a variety of potencies of an original homeopathic substance is measured.</p> <ul style="list-style-type: none"> • Scientific proof of possible effects of potentized substances on the growth and morphology of lower organisms.
 <p>Integrated animal health strategies</p>	<p>Pursuant to the Swiss Organic Farming Ordinance animal health is to be stabilized primarily by way of prevention at the herd/flock level, by optimizing the general environment (feeding, hygiene, man-animal relationship etc.) and with the use of complementary medicine. In the context of the Pro-Q project this strategy is being introduced by practitioners throughout Switzerland. The strategy is supplemented by scientific evaluation of many of the procedures as well as by training and support measures for veterinarians and farmers.</p> <ul style="list-style-type: none"> • Improved animal health including a clear reduction in the use of therapeutics, especially those leaving problematic residues.
 <p>Clinical trials</p>	<p>There is still a lack of meaningful evidence of the effectiveness of complementary pharmaceuticals in livestock. Therefore studies are to be instigated which will assess in how far these therapeutics are able to successfully control illnesses such as mastitis, infertility or gastro-intestinal problems. To this end clinical trials under Randomized Control Trial (RCT) conditions or application observations as Single Case Studies are being carried out.</p> <ul style="list-style-type: none"> • Evaluation of the effectiveness of complementary pharmaceuticals, especially homeopathic remedies and phytotherapeutics.
 <p>General conditions for animal health</p>	<p>Animal health is fundamentally related to the constitution of the animals, i.e. their susceptibility to illnesses, and to the environmental conditions in which they live.</p> <ul style="list-style-type: none"> • Research into the behaviour and temperament of dairy cows of strong constitution and differences between the former and cows of weak constitution under similar conditions. • Establish an optimum size for loose houses to be stocked with horned cows and assess the impact of the relationship between man and animal on udder health. • Improvements in the condition of the animals and the conditions under which the dairy cows are kept.

 <p>Mistletoe therapy in livestock</p>	<p>Mistletoe has been used in the treatment of cancer in humans since the 1920s. For a number of years now veterinarians have also reported its success in the treatment of tumours in small animals and horses. Is Iscador effective in the same way for all animals? Is it effective in treating all types of tumours? Should the same therapy system that is used for humans also be used for livestock? Which mistletoe species are to be preferred? These are the type of questions which are to be answered through an empirical network.</p> <ul style="list-style-type: none"> • Research on the effects and effectiveness of Iscador in animals, particularly dogs, cats, and horses.
 <p>Poultry production</p>	<p>Problems and unresolved questions in organic poultry and egg production concern the way the animals are kept, feeding, hygiene, animal health and suitable lines.</p> <ul style="list-style-type: none"> • Develop well-founded recommendations for practitioners and advisors on the keeping of laying hens and broilers, incl. flock sizes, the design of outdoor ranges, pasture management, hygiene measures and the control of parasites. • Provide more suitable lines of layers and broilers for organic producers (suitability for free-ranging, prolonged lifetime of layers, sensible utilization of male chicks).
 <p>Organic cattle breeding</p>	<p>In cattle breeding today, milk yields and nutrient content (especially protein) are very important. From the point of view of organic farming, health and constitution parameters are not being given enough attention.</p> <ul style="list-style-type: none"> • Breeding options for cattle are to be developed and tested which allow for more attention being given to health parameters. Objectives such as a high lifetime yield based on basic feedstuffs and good adaptation to varying site conditions are likely to be priorities. • Additionally, possible interactions between genotypes and the environment are to be identified and, where applicable, strategies are to be developed which help utilize these interactions in practical breeding.
 <p>Status analysis: Parasites in organic livestock</p>	<p>Organic farms are likely to have to deal with a higher degree of parasitation for two reasons: Firstly the animals have more contact with parasites due to the required pasturing and access to ranges and secondly the use of prophylactic medication is prohibited.</p> <ul style="list-style-type: none"> • Documentation and evaluation of parasitation of different livestock categories on organic holdings. • Holding-specific surveys on the parasite problem as a basis for targeted measures to control parasites.
 <p>Endoparasites in ruminants</p>	<p>At present anthelmintics (wormers) containing synthetic active ingredients are commonly used in ruminants on both organic and conventional holdings. Alternatives to these treatments are being tested and include preventative pasture management, organic control using nematophagous fungi (<i>Duddingtonia flagrans</i>) as well as the use of plants containing elevated amounts of condensed tannins or other anthelmintic active ingredients.</p> <ul style="list-style-type: none"> • Development of improved preventative measures to control gastro-intestinal worms. • Development of alternative treatments to control gastro-intestinal worms. • Establishment of validated methods in organic farming practice.
 <p>Endoparasites in poultry and pigs</p>	<p>The problem of endoparasites is one of the most significant health problems in poultry production. The control of gastro-intestinal worms is virtually exclusively being achieved with a conventional anthelmintic drug. A variety of approaches to the management of ranges and litter are being tested in a multi-annual trial with laying hens and their impact on parasitation is being studied.</p> <ul style="list-style-type: none"> • Development of improved preventative measures and alternative treatments to control gastro-intestinal worms in laying hens. • Investigation of the transferability of such measures and treatments from chickens to pigs.
 <p>Control of ectoparasites</p>	<p>Ectoparasites such as flies (common houseflies, stable flies), horseflies and red poultry mites are a significant problem on organic holdings. While there are certain well-known preventative measures against ectoparasites, these are often not sufficient to lower infestation to tolerable levels.</p> <ul style="list-style-type: none"> • Development of improved preventative measures to control ectoparasites. • Development of alternative measures to control ectoparasites. • Establishment of validated methods in organic farming practice.



Staff, funding and projects – FiBL Germany



Staff, funding and projects – FiBL Austria

Income and expenditure of FiBL Germany in 2005 and 2004

	(in euros)	2005	2004
Income			
Research and development		1 136 393	1 078 833
Other		15 067	8 297
Total income		1 151 460	1 087 130
Expenditure			
Personnel expenses		626 592	614 176
Material expenses			
Project costs		364 016	298 920
Premises, office supplies, other administrative, information technology and advertising		107 269	141 461
Depreciation		19 360	24 140
Total expenditure		1 117 237	1 078 697
Operating result		34 222	8 433

Developments in FiBL Germany finances from 2004 to 2005

FiBL Germany (FiBL Deutschland e.V.) is a non-profit-making organization that finances itself by providing scientific services to organic agriculture, particularly at the interface between research and practice. Its clients and donors are public institutions, predominantly from the German federal government, the EU, as well as associations and companies.

In 2004 its income totalled around one million euros, while in 2005 it reached around 1.1 million euros. Although FiBL Germany had no start-up funding and finances itself exclusively through projects and services, it managed to build up reserves of approximately 8000 euros in 2004 and 34,000 euros in 2005. Together with its reserves generated in the previous years, this has laid an important foundation for the continued development of FiBL Germany. These results are particularly welcome in the light of the fact that the budget for setting up the Internet portal www.oekolandbau.de, FiBL Germany's most significant project, was continually reduced and the shortfall had to be made up from revenues. The share of income generated via the portal thus fell from 50 percent in 2003 to 36 percent in 2004 and 29 percent in 2005. Projections for 2006 indicate that a further fall to approximately 9 percent can be offset. The goal of developing new services and projects for the "post-portal" period during the lifetime of the portal project has therefore been achieved. It goes without saying that this was only possible due to the tremendous commitment of FiBL Germany staff. Developing the portal and bringing the project to a successful conclusion required great effort on the part of all those involved.

We warmly thank our clients and donors from the public

and private sectors and organic farming organizations, as well as our Swiss colleagues and association members for the support and trust they have shown us over the past few years. In doing so they have contributed quite substantially to the success of the FiBL Germany venture!


*Robert Hermanowski, Director FiBL Germany,
and Rolf Mäder, Finance officer*

Clients and donors of FiBL Germany in 2004 and 2005

Bioland Bundesverband, Mainz
 Büro Lebensmittelkunde & Qualität, Oberleichtersbach
 E-cert IT GmbH, Lebring
 European Commission, Brussels
 European Consortium for Organic Plant Breeding (ECOPB)
 FiBL Switzerland, Frick
 German Agricultural Marketing Board (CMA), Bonn
 Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz
 (BMELV)/Bundesprogramm ökologischer Landbau, DE-Bonn
 German Federal Agency for Agriculture and Food (BLE), Bonn
 German Federal Agency for Nature Conservation (BfN), Bonn
 German Federation of the Organic Food Sector (BÖLW), Berlin
 Landschaftsverband Rheinland, Cologne
 M & P GmbH, Bonn/BLE
 Ministry for the Environment, Nature Conservation, Agriculture and Consumer
 Protection of the state of North-Rhine/Westphalia, Düsseldorf
 ÖGS, Frankfurt/CMA Bonn
 Ökoprüfzeichen GmbH, Bonn
 Pleon, Bonn
 Rentenbank, Frankfurt





Board and staff of FiBL Germany



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	Prof. Dr. Jürgen Hess, Kassel/Witzenhausen, Head of Department of Organic Farming and Cropping, University of Kassel (Faculty of Organic Agricultural Sciences)
	Beate Huber Frick FiBL Switzerland, International Cooperation
	Dr. Urs Niggli Frick Director, FiBL Frick
	Dr. Felix Prinz zu Löwenstein, Otzberg; Chair of the German Federation of the Organic Food Industry (BÖLW) and of the Naturland organic producers' association, farmer
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	Dr. Uli Zerger Bad Dürkheim, Executive Manager of the Foundation Ecology and Agriculture (SÖL)

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	Schreiter Birgit Accounting
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	Wilbois Klaus-Peter Dr. agr., Head of division, crop production, plant protection, plant breeding
Communication and Internet	
	Binder Cordula Dipl.-Ing. agr. Internet, editing
	Kleine-Herzbruch Natalie, Dipl. Ing. Landscape Planning Web design
	Meier Julia Dipl. Biol. Research communication
	Wörner Frank Dipl. oec. troph. (FH) Internet programming, EDP



Quality Assurance	
	Liebel Boris, Dipl.-Ing. Food Technology Events and trade fairs, QA systems
	Mäder Rolf, Dipl.-Ing. agr., Head of division, QA, farm input products, genetic engineering
	van Elsen Thomas Dr. rer. nat. Nature conservation & landscape
Freelancers	
Beck Alexander, Dr. agr. Billmann Bettina, Dipl.-Ing. agr. Hermanowski Susanne, Dipl. Päd.; Snigula Jasmin, Dipl.-Ing. agr. Waller Astrid	

Activity areas – FiBL Germany

 <p>Internet</p>	<p>The Internet has developed into an important communication instrument. This also holds true for organic agriculture. Work ranges from conceptual, scientific and editorial maintenance to design and technical implementation.</p> <ul style="list-style-type: none"> › Content and technical maintenance of www.allesbio.de, www.betriebsmittel.org, www.bio-mitgesellschaft.de, www.bioXgen.de, www.eco-pb.org, www.gruene-werkstatt.de, www.naturschutzberatung.info, www.oekoregelungen.de, www.organicXseeds.com, www.praxisversuche.de as well as the science module of the central Internet portal www.forschung.oekolandbau.de. › Content management and technical support for www.1000biokuechen.de, www.abim-lucerne.ch, www.aoea.de, www.aeol.org, www.bioinstitut.cz, www.bio-find-ich-kuhl.de, www.biorindviehzucht.ch, www.bio-spitzenkoeche.de, www.eco-ab.org, www.esofarmers.org, www.fibl.org, www.isofar.org, www.naturland.de, www.oegs.de, www.organicinputs.org, www.organicqh.org, www.orgap.org, www.transgen.ch, www.weingut.fibl.org 	<p>Communication</p>	
 <p>Social farming</p>	<p>The majority of the farm holdings working with handicapped people are organic. These holdings require specific advisory services and support in networking.</p> <ul style="list-style-type: none"> › Annual conference › Advisory services for individual holdings › Content support for information offered at www.gruene-werkstatt.de › Participation in EU projects 		<p>Agriculture</p>
 <p>Seed</p>	<ul style="list-style-type: none"> › Seed health: Assessment of products compatible with organic production and treatment methods for seed-borne diseases. Preparation of practical guides for maintaining seed health for selected tillage and vegetable crops. › OrganicXseeds: Implementation of the EU Regulation with regard to the use of seed and seed potatoes in organic farming with the help of the www.organicXseeds.com database in five European countries (Belgium, Germany, Luxembourg, Switzerland, and the United Kingdom). 		
 <p>Farm inputs</p>	<ul style="list-style-type: none"> › Assessment of agricultural inputs and auxiliary substances, for example fertilizers, plant protection products, feeds, disinfectants, cleaning agents, with regard to their consistency with the principles of organic agriculture. › Compilation and publication of the list of farm inputs for organic farming in Germany (see www.betriebsmittel.org). 		

 <p>On-farm research</p>	<p>The design of trials on commercial holdings calls for special guidance. To this end an online guide to field trials has been developed which guides farmers through the entire process from designing the trial right through to the evaluation of the results and which outlines the necessary measures to be taken. (www.praxisversuche.de)</p>
 <p>Plant protection</p>	<ul style="list-style-type: none"> › Coordination of the forum on plant protection in organic agriculture, an expert roundtable on important topics in organic plant protection.

Quality assurance

 <p>Traceability</p>	<p>The central project is the "Bio mit Gesicht" (BMG) initiative ("Organic face-to-face"). This initiative uses the Internet to create transparency in food production, to show where organic products are produced, how they are produced, and how they are processed. The aim is to demonstrate to consumers that the organic farms participating in this system are not anonymous or exchangeable. The project has achieved assurance of origin across the various steps in the production chain which creates transparency and security of organic products beyond legal requirements. Central performance features are traceability through the various processing and trade levels and the inclusion of a number of different quality assurance systems.</p> <ul style="list-style-type: none"> › Companies can make the origin and development of purchased products transparent to the consumer. › BMG allows companies to build a quality-based profile. › Companies can use the system as a technical traceability system without having to undertake major investments.
 <p>Genetic engineering</p>	<ul style="list-style-type: none"> › Informing market participants on the legal situation. › Development and establishment of measures and tools to safeguard GMO-free production and processing of foods. › Supporting company communications.

Landscape development and nature conservation

 <p>Farming and the cultural landscape</p>	<p>Landscape development and the promotion of species diversity at farm level are increasingly being discussed as a future challenge of multifunctional agriculture. A number of projects at Witzenhausen are working at the interface between farming and the cultural landscape:</p> <ul style="list-style-type: none"> › Support for the establishment of conservation advisory services for individual organic farms which use the farmers' interest in nature conservation as a starting point: www.naturschutzberatung.info › Participation, PR work and in-process research in vegetation science as part of the project "Integration of nature conservation objectives into organic farming – the example of the State demesne at Frankenhäuser in Hesse" › Opportunities for landscape development and nature conservation in "social farming" (EU Social Farming Project) › Development of a protection strategy for endangered arable weeds that can be implemented nationwide.
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Income and expenditure of FiBL Austria in 2005

	(in euros)	2005
Income		
Research and development		87 860.–
Education		31 376.–
Other		113 649.–
Total income		232 885.–
Expenditure		
Personnel costs		107 960.–
Miscellaneous		75 833.–
Project-related material and equipment		26 638.–
Office-related costs		7 193.–
Total expenditure		217 624.–
Surplus		15 261.–

FiBL Austria has operated as a non-profit-making organization since May 2004, and 2005 was thus its first full financial year in accounting terms. With a total income of around 232,000 euros and a total expenditure of around 217,000 euros, FiBL Austria recorded a surplus of 15,000 euros for the year 2005. Since 2005, the Austrian Ministry for Agriculture, Forestry, Environment and Water Management has funded a variety of projects in the areas of innovation, research and education. In the field of research into risks associated with genetic engineering, FiBL Austria receives support from the Austrian Ministry for Health and Women. The government of the state of Lower Austria and the Lower Austrian Rural Institute of Further Education (LFI) provide support in the thematic areas of education and on-farm research for implementation and development of crop cultivation methods. The Swiss Sonnenwiese Foundation provides financial support for research on issues relating to biodiversity and organic production.

We are grateful to our public sector clients at federal and state level, to the Chambers of Agriculture and the organic associations. We also warmly thank our Swiss colleagues for the energetic support they have given FiBL Austria.

Andreas Kranzler

Clients and donors of FiBL Austria

- › BIO AUSTRIA, Vienna
- › Chamber of Agriculture of Lower Austria, St. Pölten
- › Ecolab, Vienna
- › Federal Ministry for Agriculture, Forestry, Environment and Water Management, Vienna
- › Federal Ministry for Health and Women, Vienna
- › FiBL Switzerland, Frick
- › Office of the government of the state of Lower Austria, St. Pölten
- › Rural Institute of Further Education (LFI) of Lower Austria, St. Pölten
- › Sonnenwiese Foundation, Vaduz, Liechtenstein
- › University of Kassel, Witzenhausen, Germany
- › University of Veterinary Medicine, Vienna

Board and staff of FiBL Austria

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	Mag. Andreas Kranzler Vienna Director FiBL Austria
	Beate Huber FiBL Switzerland, International Cooperation
	Alexandra Pohl Vienna Lobbying Coordinator/BIO AUSTRIA
	Werner Zollitsch, Vienna, Head of the Department of Sustainable Agricultural Systems at the University of Natural Resources and Applied Life Sciences, Vienna

	Staff at FiBL Austria
	Bizaj Martina Animal husbandry, animal health
	Kranzler Andreas Mag. rer. nat. Director FiBL Austria
	Meindl Peter Mag. Dr. rer. nat.
	Stöger Elisabeth med. vet Ruminant health
	Velimirov Alberta Dr. phil. Food quality
	Freelancer
	Scheffknecht Susanne, Mag. rer. nat.

Activity areas – FiBL Austria

	<p>With 10% of holdings under organic management Austria has a very high share in organic production. In order to expand on this high level it will be necessary to quickly address issues arising in commercial production and to provide competent answers. FiBL Austria is in the process of establishing a contact point for organic certifying organizations, advisors, and veterinarians. In terms of animal health, focal issues will be local, practical herd/flock health management, further training for the attendant veterinarians, and the establishment of a service point in cooperation with existing organizations.</p> <ul style="list-style-type: none"> ➤ Implementation of EU Regulation 1804/99 on organic livestock production. ➤ Active support on animal health issues in commercial farming. ➤ Promotion of good communication between all stakeholders in organic farming.
<p>Animal health</p>	
	<p>The successful production of organic products also requires that up-to-date technical information is made available in an appealing manner. The objective is to establish and maintain the swift transfer of knowledge between researchers and advisors and down to the farms. Knowledge and experience gained in both Austria and abroad is being edited and made available to practitioners using a variety of information media.</p> <ul style="list-style-type: none"> ➤ Preparation of information leaflets and CDs in cooperation with organic certifying organizations, research institutions and authorities. ➤ Training the trainers: Further education and training for advisors. ➤ Training activities for farmers, consumers and veterinarians, focussing on issues of animal health, food quality, genetic engineering and crop production. ➤ Establishment of databases and websites.
<p>Communication</p>	
	<p>In cooperation with the farmers the latest agricultural research results are assessed as to their workability. It is also an objective to scientifically assess the effectiveness of farmer knowledge and new approaches to herd/flock management with reference to specific locations. Knowledge gained in such trials will be made available to organic farmers through regional events and written documentation.</p> <ul style="list-style-type: none"> ➤ Test the suitability of individual cultivars for organic farming under commercial conditions. ➤ Tackle current questions arising in farming practice, especially with regard to herd/flock management and mixed cropping.
<p>On-farm research</p>	
	<p>To identify cultivation-related aspects of quality, we use various methods – notably feed preference tests, tasting, degradation tests – to examine the properties of organic products. We develop quality testing tools that can be used both in comparative studies of organic and conventionally produced food, and in studies aiming to optimize organic production techniques.</p>
<p>Food quality</p>	
	<p>Our risk research in the field of genetic engineering explores potential impacts upon health and fertility caused by the feeding of genetically modified feedstuffs. This involves long-term, multi-generation feeding experiments with laboratory rats, which receive genetically modified maize as test diet in order to examine chronic toxicological effects.</p>
<p>Genetic engineering</p>	

Publications by FiBL staff in 2005 and 2006

Please note that the following list is merely a selection of FiBL's publications. All the data sheets, dossiers and further publications put out by FiBL are available through the FiBL Shop at <http://www.fibl.org/shop>. Scientific publications are archived in the Organic Eprints database (<http://orgprints.org/>).

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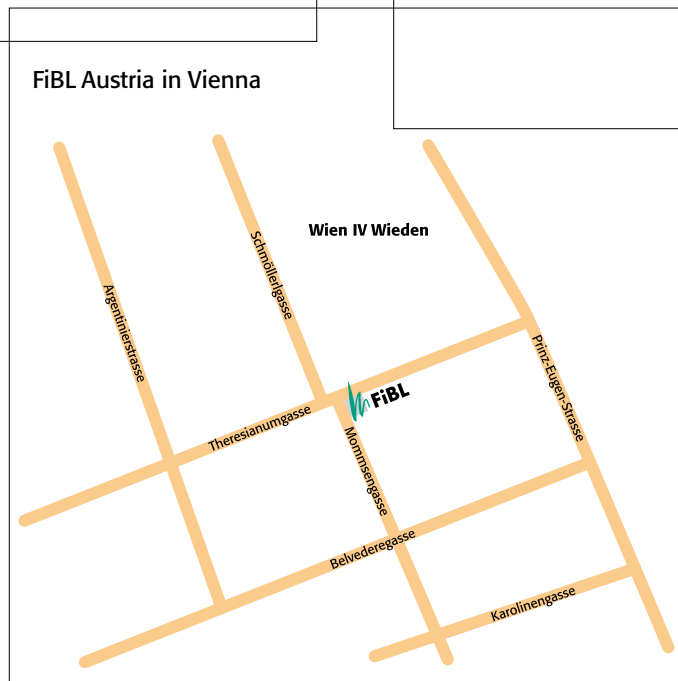
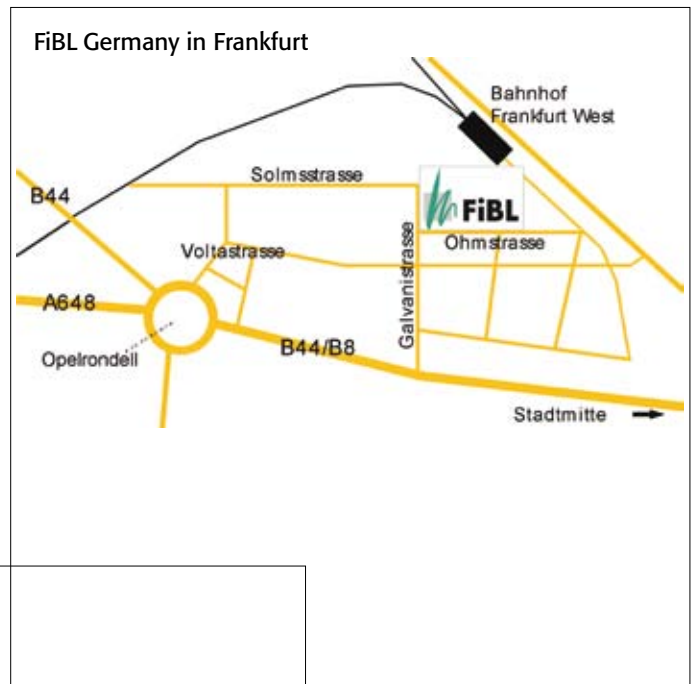
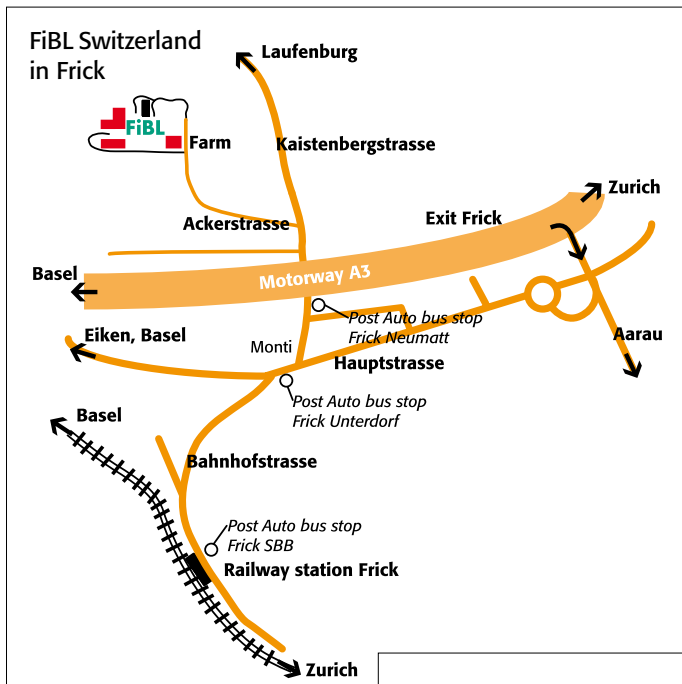
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Research Institute of Organic Agriculture Switzerland
 Ackerstrasse, P.O. box, CH-5070 Frick
 Telephone +41 (0)62 865 72 72, Fax +41 (0)62 865 72 73
info.suisse@fibl.org, www.fibl.org

Research Institute of Organic Agriculture Germany
 Galvanistrasse 28, D-60486 Frankfurt am Main
 Telephone +49 (0)69 71 37 69 90, Fax +49 (0)69 71 37 69 99
info.deutschland@fibl.org, www.fibl.org

Research Institute of Organic Agriculture Austria
 Theresianumgasse 11/1, A-1040 Vienna
 Telephone +43-(0)1-9076313, Fax +43-(0)1-4037050-191
info.oesterreich@fibl.org, www.fibl.org

