



Activity report *2002*



Research Institute of Organic Agriculture (FiBL), Frick, Berlin, Frankfurt

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Dear readers

One can often go between delight and dismay in the space of a heartbeat. First there was joy about the splendid development of organic farming in Switzerland where thanks to 6000 dedicated organic farm families the magic ten percent hurdle has been jumped. This result pushes the organic model country Austria back to second place with Switzerland taking the lead. There was also delight as to the ambitious objectives the EU countries have set themselves with regard to supporting organic agriculture. Germany is taking the lead here, having set itself a target of twenty percent.

But then there was dismay and disbelief when food scandals suddenly included organic products. Then again, there was great enthusiasm when the spectacular results of the research carried out for decades by FiBL and the Swiss Federal Research Institutes FAL and IUL were published in *Science* in May 2002, producing a small sensation in research circles.

Organic foods, like no other, address the question as to how future farming should be developed and which qualities and values we wish to promote with these products. But if you raise your head too high above the parapet you risk getting hit.

Therefore it is an inherent part of the holistic strategy of organic farming that the market is not forced, that the standards and thus the basis of organic agriculture are maintained, that controls strictly safeguard the trust between producers and consumers, that research continuously generates innovation, and that advice and training consolidate the identification of all concerned with the organic farming concept.

I feel this is all the more important as farming continues to face difficulties in the future. I am not only thinking of subsidized American mass production but also the eastward enlargement of the EU where not only prices are concerned but also sustainability and jobs.

So far one out of every ten farm families in Switzerland has taken up organic farming. Four out of every 100 Swiss Francs are spent on fine organic products. There is so much left to do! You, the reader of this report, have in one way or another supported our work over the past two years, you have contracted us for development work or have shown great interest in our activities. We wish to express our heartfelt thanks for this. I look forward to working with you in the future.

*Dr. Otto Stich,
President of the Foundation Council FiBL Frick*



The year 2001 was a good year for organic farming. The number of converted farms has grown, and consumers, shaken by the BSE incidents, have also increasingly put their trust in organic products. Organic agriculture is being seen more and more as a model for sustainable farming and it is receiving support from political initiatives as part of the Agrarwende, the German 'turnaround in agricultural policy'.



The latest food scandals (Nitrofen, MPA) clearly show the importance of FiBL Germany's work in the areas of monitoring and control, genetic engineering and feedstuffs. The progressive products of conventional farming which promised economic benefits without side effects, and the

achievements of the modern food industry now reveal their true nature. For example, the percentage of obese people in the US has risen from 14% to 26% despite the fact that especially in the US a lot of "sugar-free" and "fat-free" products are being consumed. One has to ask what type of criteria are being used to measure food quality.

Perhaps one should remember the old tenet: Mankind is the measure of all things. And if the increasing life expectancy is being pointed out the question needs to be asked whether our young people will in the future be willing to keep financing the intensive measures for prolonging life employed by our generation. Perhaps we should contemplate that what matters is not to live forever but to get older healthy. And we are further away from that than ever, as is frighteningly obvious from the figures reported by our health services.

Healthy foods come from healthy plants and animals, not from those which are doped with everything chemistry and genetic engineering have up their sleeves and which are barely kept alive in order to perform. A negative definition of quality which refers solely to the absence of certain substances is insufficient and ultimately meaningless. If our judgement is being clouded to the extent that we merely see components, not connections, the old saying becomes true: "We don't see the wood for the trees."

As a member of the Board of Directors of FiBL Berlin e.V. I am delighted to be able to make a small contribution to using practice-oriented research and advisory services in order to accompany organic farming on its path ahead.

*Wolfgang Gutberlet,
member of the board FiBL Berlin e.V.*

One plus one equals three

The opening of FiBL Berlin, Germany and the new service contract awarded to FiBL Frick, Switzerland by the Swiss Federal Office for Agriculture were the highlights of the past two years. These have seen FiBL attain a new international position and reassess the focal areas of its work.

In May 2000, FiBL Berlin e.V. was founded as an incorporated non-profit association. In September 2001 the Berlin research and consultancy office was ready for action: A committed team of professionals with strong roots in German organic agriculture commenced work. In the meantime, FiBL Switzerland's younger sister institution has grown into an acknowledged and widely renowned competence centre for organic agriculture, with 15 members of staff and offices in Berlin and Frankfurt.

The two FiBL institutes are legally and financially independent of one another, control their own focal research issues and competencies autonomously and yet present themselves as a single team, as is shown in this latest activity report which you are now reading. This results in a breadth of expertise and a diversity of services which is unique in the sphere of research and knowledge-transfer in organic agriculture. Our clients – the organic sector, public bodies, foundations and private individuals – shall reap the benefits of teamwork without frontiers!

Can this type of cooperation work? Is the FiBL team spirit not likely to dwindle over time, in view of the differing cultural, political and socio-economic conditions affecting FiBL Frick and FiBL Berlin? Many friends and colleagues ask us this question.

But the great commitment of all who work at FiBL for the advancement of organic agriculture in all its creative variations is a unifying force. And the desire for down-to-earth professional working practices coupled with the utmost scientific transparency and integrity forges an additional bond. We gain practice daily in our new culture of cooperation, taking joint pride in successful project work and sharing the sense of disappointment in unsuccessful project applications. We at management level adopt the same practice as our staff in their numerous activities, large and small, by coordinating strategy and planning between institutions as efficiently as possible. So at FiBL, one plus one certainly adds up to three, especially and most of all in terms of the output of competent results.

Little sister

Often the younger of two sisters takes most of the limelight. Likewise we begin our report with highlights about FiBL Berlin e.V.

Of necessity, attention in Berlin was focused most acutely on the financing of the new institute, so the main strategy was active marketing of its services. The first major order won by FiBL Berlin was to construct an Internet platform for organic agriculture. The client was the regional Agriculture Ministry in North Rhine-Westphalia (NRW).

With its national organic agriculture programme, Bundesprogramm ökologischer Landbau (BÖL) the Federal German Ministry of Consumer Protection, Food and Agriculture (BMVEL) created an instrument for giving effective support to the development of

organic agriculture through expert assignments, research and development. FiBL was successful with several bids in response to calls to tender by the Federal Agency for Agriculture and Food (BLE), which was commissioned by the Ministry to implement the federal programme. The largest commission is to construct the Internet portal www.oekolandbau.de. The project, undertaken by a consortium involving FiBL, Stiftung Ökologie & Landbau – Foundation Ecology & Agriculture (SÖL) and the German Centre for Documentation and Information in Agriculture (ZADI) will become the most important BMVEL information medium on organic agriculture by the autumn of 2003. FiBL Berlin's entire range of activities has to be financed by project-related commissions. Providing expertise, research and development work in the free market in such a way as to cover all the institute's overheads is a major challenge.

Joint projects

The main focus of activity in the Animal Health Division continues to be on-farm research on herd management and antibiotic-free mastitis therapy in the 300-strong dairy herd on the biodynamic farm in Brodowin (Brandenburg, Germany). The close cooperation of veterinarians at Berlin Free University, FiBL Berlin and FiBL Frick has already given rise to three dissertations.

Both FiBL institutes have contributed substantially to European cooperation over scientific support for organic plant breeding. The result is the European Consortium for Organic Plant Breeding (ECO-PB), within which several institutes carry out joint trials and FiBL runs the secretariat.

FiBL Frick and FiBL Berlin have also widened the scope of their activities in Eastern Europe and the Third World. Here organic agriculture makes a key contribution to environmental protection and the maintenance of fertile soils. Conversion promotes entrepreneurial thinking, ecological and social responsibility and the emancipation of farming families. Organic holdings have a much higher level of autarchy than conventional farms which are reliant on buying in expensive inputs. This is an essential reason to encourage organic agriculture in these countries more than any other method of farming, not primarily for export but to establish local markets. Organic farmers and their families in Eastern Europe and the Third World are not economic competitors but like-minded partners of our own farmers.

Big sister

In the year 2001, the cooperation contract between the Swiss Federal Office for Agriculture (BLW) and FiBL Frick came to an end. In advance of this, it was possible to arrange an extension from 2002. The proportion of state funding was increased, due to the growing significance of organic agriculture in Switzerland, from 3



The organic trio in Berlin:
Urs Niggli, Beate Huber
and Robert Hermanowski
(from left to right)

million to 4.5 (2002) and subsequently to 5 million francs (2003). Thus FiBL Frick's service contract with the BLW and the Swiss Federal Office for Veterinary Medicine (BVET) constitutes a good 40 percent of its income. The remaining 60 percent of research and consultancy activities are financed through specific projects, by the cantons, various government agencies, the large grocery chains, other private firms, foundations, smaller clients and private individuals.

With the new service contract, FiBL has revised the focal points of its work. The Crop Production Division will work intensively on vegetable cultivation in the next few years to ensure that this important branch of production (11% of all land under vegetables is managed organically; CHF 166 million turnover from organic vegetables in the year 2001) is made even more environmentally friendly and the quality of products is raised even further. Furthermore FiBL has formed a new research group focussing on the quality of plant and animal products. And finally, we actively wish to develop new directions and products in biological plant protection, both for professional farmers and for amateur gardeners. Likewise more research will be invested in biodynamic agriculture which, unfortunately, is practised by only 3 percent of all organic farmers in Switzerland.

In the Animal Husbandry Division, further expansion of animal health research is on the agenda. Preventive veterinary care is of course the most important element, supplemented by complementary medicine and bio-control solutions. At the same time, animal breeding will be more intensively addressed. The issue of ecological integration of non-ruminants such as poultry and pigs into the organic farm will be important. FiBL is also building a more prominent profile in the fields of farm management, agricultural policy and organic markets.

Research without due regard for practice is not the FiBL way. Therefore we would like to finish by conveying our heartfelt thanks to the more than 300 farmers' families who place their farms and their livestock at our disposal for our various research studies.

*Urs Niggli (Director, FiBL Frick),
Beate Huber and Robert Hermanowski
(Directors, FiBL Berlin)*

Soil and plants



'Science' gets to the heart of the 21-year DOK trial

No other trial to date has delivered such a complete picture of agricultural systems according to Phil Robertson, agricultural ecologist at Michigan State University, in 'Science'. In May 2002 the learned American journal published a summary of work done during the 21-year DOK trial. John Reganold of Washington State University thinks the trial in Therwil gives organic production systems more credibility.

Indeed, organic agriculture is amazingly efficient: Nutrient inputs and fossil fuel use was 34 to 53 percent lower and applications of plant protection agents 97 percent lower than in conventional systems, yet yields in organic production systems were only 20 percent lower than in conventional systems over a 21-year period.

The reduction in yield depended heavily on the crop. Whilst the wheat yields from the organic plots in the last seven years were only 10 percent lower than in the conventional plots, the average potato yields only reached 60 to 70 percent of conventional yields. This is explained by bottlenecks in potassium supply to the potatoes and severe incidences of late blight. Differences in grass-clover yields were small – probably because this crop could benefit greatly from root symbiotic associations (*rhizobia* and *mycorrhizae*).

Higher soil fertility leads to greater efficiency

Organic management significantly enhances soil fertility. Soil microorganisms, earthworms and beneficial arthropods are approximately twice as abundant in the organic plots.

Organic activity increased progressively from system to system in the following order: Conventional without farmyard manure; conventional with farmyard manure; bioorganic; biodynamic. A microbially active soil contributes to the considerable yields achieved in organic production systems, keeping inputs of non-renewable resources low while maintaining higher soil fertility and better soil structure.

Fractions of soluble nutrients (phosphorus, potassium) were lower in the organic soils but on the other hand these cycled the phosphorus more intensively as studies at the Institute of Plant Science at the Swiss Federal Institute of Technology (ETH) Zurich demonstrated.

Moreover, studies in collaboration with the Botanical Institute of the University of Basel showed that levels of symbiotic root fungi (*mycorrhizae*) were about 40 percent higher in the organic plots, thus enhancing the nutrient uptake of plants.

Correlation between above- and below-ground production

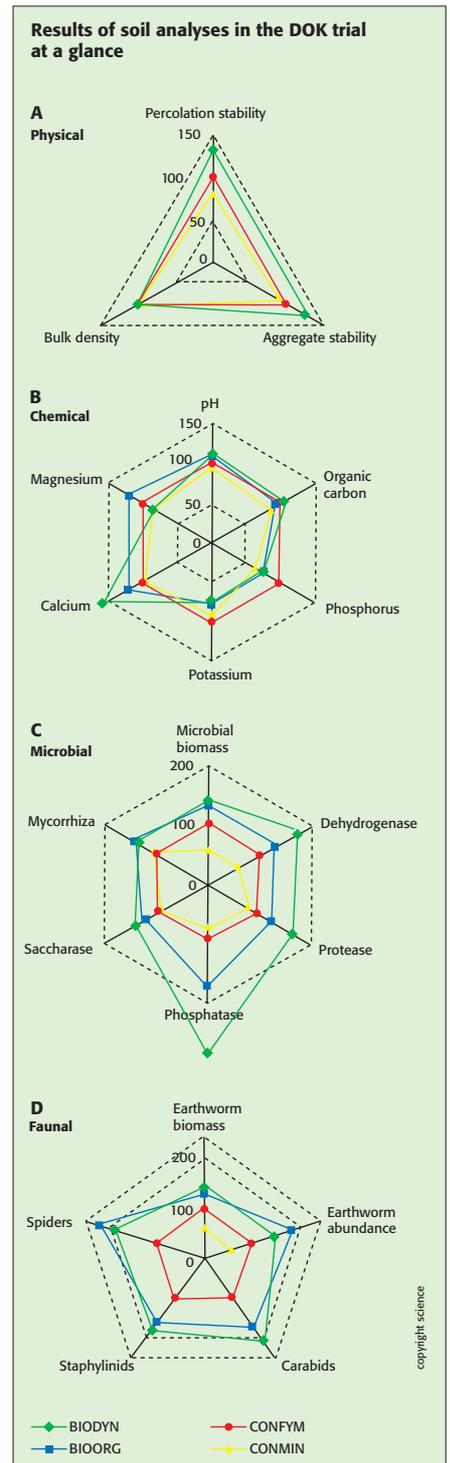
Not only was there a higher level of soil microbial activity in the organic plots, but also greater microorganism, weed and carabid biodiversity. In this way organic agriculture helps to maintain a high level of

biodiversity despite agricultural use of the land. The active, diverse microorganism communities made for efficient utilization of organic carbon sources in the soil.

It is particularly interesting that a clear correlation could be demonstrated between efficient above-ground production (energy input per unit of yield) and efficient production in the soil (soil respiration per unit of microbial biomass). Intensive interventions involving fertilizers and pesticides evidently stress the microorganisms, which then need to use organic substances more for maintenance than for growth. "It is a major achievement on the part of the Swiss Federal Office for Agriculture (Bundesamt für Landwirtschaft, BLW) to have funded the DOK Trial over such a long period" says FiBL Director Urs Niggli.

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Organic agriculture is a more efficient method of production and at the same time promotes soil fertility and biodiversity. This is the principal result of 21 years of comparative research in the DOK trial.



Physical, chemical and biological soil parameters in the DOK Trial: Percentage differences to the results of conventional management (100%).

DOK trial: Platform for interdisciplinary exchange

With publication of its research in the journal 'Science', the DOK trial has attained its highest pinnacle of recognition in its 24-year history. The two trial managers, Paul Mäder, FiBL, and David Dubois, Reckenholz Research Station, along with biodynamic farmer, Rainer Sax, and bioorganic farmer, Ruedi Frey, evaluate progress to date.

What, for you, were the most interesting findings brought to light by the DOK trial?

Ruedi Frey: The trial gave us scientific proof that organic farming methods have a rational basis. I find this extremely gratifying. I learn a great deal from my exchanges with the researchers and I am glad that my suggestions and experiences are received so openly. An impressive result for me was how the potassium supply is depleted if the compost is not covered with fleece. Of course, there is not need for a long-term trial to prove that, but the DOK trial has shown up the changes over the years very well.

Rainer Sax: The DOK trial has given us organic farmers self-confidence that we are on the right track. As a biodynamic farmer, it has always fascinated me how much goes on out of sight in the soil at the same time as above-ground, visible production. In this sense the scientific studies on soil processes are the most interesting for me.

David Dubois: From the researcher's point of view, having had this systemic research recognized on a scientific basis through the publication in 'Science' is certainly a high point. Beyond that, I think the DOK trial is a model for exchange between farmers and scientists, between pure and applied research. The DOK trial makes it possible to describe and compare organic and

integrated production systems at the Therwil site. It is an ideal complement to specialized research focussing in depth on specific issues.

Paul Mäder: For me, one of the most important results was the correlation found between energy efficiency above ground in production and efficiency of microorganisms below ground. Until now the benefit of high biodiversity had not been proven, but in the DOK trial we have been able to show that greater diversity of species in microorganism populations makes for better energy efficiency.

What does the trial do for organic farmers?

Frey: The trial is primarily research to establish basic principles, and describes the differences between systems. My professional colleagues were less interested in the trial because it did not provide direct answers to enough of their pressing questions on soil cultivation, weed regulation or selection of varieties.

Sax: I have noticed that the FiBL dossier on the DOK trial has succeeded in making the breakthrough to farmers. The DOK results feature prominently in our training and advice. On my farm, the DOK results have given me greater certainty about the management of farmyard manures, particularly when working with biodynamic preparations.



Learning with and from one another: Rainer Sax, biodynamic farmer; Paul Mäder, FiBL; David Dubois, FAL Reckenholz; Ruedi Frey, bioorganic farmer (from left to right).



'Going the rounds' with participating farmers and researchers in June 2002.

What status does the trial hold within Reckenholz and FiBL?

Dubois: For us, this project was the beginning of official cooperation with FiBL. Today the DOK trial is a flagship trial because of its system approach. Aside from the substantial knowledge we have gained, we rate it highly for the exchange of knowledge and experience that it fosters.

Mäder: The DOK trial was the first FiBL trial. It subsequently provided the methodological basis for numerous FiBL projects in the areas of soil monitoring and evaluation. Today it has become a centre of interdisciplinary research and is used by research institutions and universities in Switzerland and abroad for methodological development and evaluation.

How do you respond to the criticism that long-term trials are relatively demanding, not very innovative, inflexible and add less and less to scientific knowledge as time goes on?

Frey: In agriculture a few crop rotations is not long at all. In nature, things take longer than in other spheres.

Dubois: Long-term trials are a must for the theme of sustainability. To look at soil fertility, for instance, a trial must last for a sufficient number of years. In the course of the years, needs have changed, we have made repeated adjustments and taken up topical issues such as energy input-output analysis and biodiversity. Unfortunately though we are somewhat limited by the size of the plots.

Mäder: If the trial had been concluded after only seven years, for example, we would have had completely different results.

Sax: How flexible the trial remains is crucial to its future. We no longer have to prove that organic agriculture works. The main diseases, and hence also crop yields – with the possible exception of potatoes – are now under control. This is why, for me, the comparative system aspect is no longer such a prime concern. Instead, it is far more important to work on optimizing

each system, for instance working towards minimal soil cultivation or direct sowing. The DOK trial enabled us to demonstrate very well how far additional moves towards extensive farming are economically viable.

What new research issues do you want to address in the next few years? What new findings can be expected?

Dubois: In the area of food quality, above all, the trial offers tremendous possibilities for testing out new methods. General ecological issues such as trophic chains of microorganisms suggest obvious potential. But we also want to arrive at a better understanding of carbon and nitrogen cycles, coupled with microbial diversity – all important components of soil fertility. In the area of farmyard manures, maybe we cannot optimize the system but we can compare the microorganism populations in the manures with those in the soil in order to improve our understanding of what happens to the manure in the soil.

Mäder: Research colleagues have proposed that we should look at the structure of the clay minerals and microaggregates in relation to soil management. What the DOK trial has lacked so far is the element of economic costings. The existing data are ideally suited to monetarize the external costs. A few organic farmers are also calling on us not to just make quantitative measurements but also to trace the so-called self-regulating forces or vital forces of the production system. I am certain that in these areas, much still remains to be discovered.

Interview: ta

Do organic soils possess health-promoting properties?

Healthy soil produces healthy plants, as experienced organic farmers have been saying for some time. For the first time, FiBL has now investigated the disease-suppressing potential of soils from different organic farms under laboratory conditions. Some of the soils showed astonishing properties.

"When we manage the soil organically it develops the capacity to influence plants positively, giving them better disease resistance and keeping them healthier." As so often in the past, here again the observations of experienced organic farmers inspired a new FiBL project.

In many plant diseases, for instance late blight of potato (*Phytophthora infestans*), the incidence of disease is influenced by the weather, by the proximity of a focus of infection and by the susceptibility of the variety. Observations in practice indicate, however, that soil properties also affect the incidence of disease. With soil-borne diseases, for instance the seedling disease *Pythium*, it has been known for some time that the soil plays an important role.

Alfred Berner, FiBL's fertilizer specialist characterizes the key issue as follows: "What management measures, what site-specific factors are responsible for soils developing suppressive properties?" In other words, can suppressive properties simply be traced back to beneficial soil and climatic conditions – regardless of whether or not organic husbandry is practised?

Eight cubic metres of soils tested

Around forty potato producers took part in this experiment. Alfred Berner comments on the methodological procedure: "After potato-planting we took two hundred litres of soil back to FiBL in Frick. To ensure that environmental conditions were the same for all soils, the experiments took place in a greenhouse. In each of these soils we carried out two crop tests: In the first, tomato plants were artificially infected with *Phytophthora* spores, and in the second we tested the resistance of soils by exposing cucumbers to the soil-borne fungus *Pythium ultimum*."

From robust growth to total failure

In fact these crop tests revealed that the soils varied quite considerably in their capacity for disease resistance. In the soil from one farm, all the cucumber plants continued to grow robustly even at the peak of the artificially induced infection. In all the other soils, practically no cucumbers grew in such conditions. For Alfred Berner, the challenge was then to sift out the factors or combinations of measures that could be responsible for these different properties from the many influencing factors such as soil data, details of the crop rotation and fertilizer applications.

The recipe is manure ...

A multiple regression analysis cast light on the mystery: In the *Pythium* test, the suppressive property of the soil increased with increased quantities of manure. The energy efficiency of microorganisms (known as the qCO_2 -value) was also unmasked as a key influential factor: The more active the microbial populations in relation to their biomass, the more intensively they could suppress the rapidly growing but not very com-

petitive *Pythium* spores. These two factors explained over sixty percent of the variation in results. So farmers can evidently use applications of manure to increase the suppressive properties of their soils because it boosts microorganism activity.

... plus a high ratio of microorganisms

The *Phytophthora* test was carried out by Sonia Gloor as part of her undergraduate thesis. Her work was supervised by Lucius Tamm, FiBL, and Cesare Gessler from the Swiss Federal Institute of Technology (ETH) Zurich. Gloor noticed that increased resistance to *Phytophthora* was more common in soils that had a high percentage of soil microorganisms. In addition, the wide ratio of microbially bound carbon to nitrogen (wide C_{mic}/N_{mic} ratio) indicates that, out of all the soil microorganisms, the presence of soil fungi has a particular correlation with disease resistance.

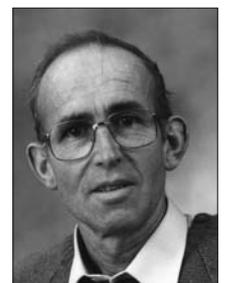
These studies were the first opportunity to obtain experimental corroboration for practical observations that different soils have a strong influence on the susceptibility of plants to disease.

However further study of the causal connections is required in order to assist farmers to utilize organic fertilizers, appropriate soil cultivation and rotation planning as part of more focused efforts to strengthen their crops' disease resistance. ta

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Proper soil management strengthens plants

“What biological plant protection means to me is not just suppressing diseases, but doing everything possible to maximize plant health. This is why I cultivate the soil in accordance with its nature and its needs. That means: applying manure or compost, including sufficient grass-clover in the crop rotation, and managing the soil so as to allow toxin-free assimilation of the available organic matter. This way, the soil itself enhances the resistance of the plants.”



Ernst Frischknecht,
organic farmer, Tann

Ernst Frischknecht



From field to glasshouse: Alfred Berner (left) and Jacques Fuchs use standardized plant tests to examine the capacity of organic soils to suppress diseases.

Speedy response to BSE crisis

When the Swiss Federal Council banned the sale of meat and blood meal as well as horn meal and shavings as organic fertilizers as a result of concerns over BSE the organic farming sector had to respond swiftly. FiBL took on the role of an information turntable and, together with its partners, embarked on a search for safe alternatives.

On 1 January 2001 the Swiss Federal Council decided to ban the sale of meat and blood meal as well as horn meal and shavings as fertilizers as a precaution in order to eliminate any risk in relation to BSE. This decision affected organic vegetable producers and horticultural holdings particularly strongly. These fertilizers were an important source of organic nitrogen for them, particularly in the spring for use on the still cold soils, and in the production of seedlings where they were used to supplement nitrogen in growing media.

High pressure research

FiBL reacted quickly and together with BIO SUISSE it sought dialogue with the authorities and with producers of growing media. FiBL had two objectives: Firstly to draft implementation guidelines with which the sector could cope, and secondly to find alternatives to the banned fertilizers. At that stage there was very little expertise in this area.

The FiBL vegetable production expert Martin Koller remembers: "Since the substances banned in early 2001 constituted 90 to 95% of all the fertilizers used in the organic production of vegetables and ornamentals we were under enormous time pressure and pressure to succeed." On 1 August 2001, seven months after the ban on sales, the ban on the use of meat and blood meal as well as horn meal and shavings came into force. Solutions had to be found by that date.

Three-level trial points to solutions

The project team around Martin Koller tested the mineralization characteristics of a number of fertilizers which are safe in terms of BSE. These were partly of animal origin, such as feather meal, chicken dung and fish guano, and partly derived from plants, such as castor oil meal, potato protein and malt culms. The tests were carried out at three levels: in the laboratory, in seedling production, and in field trials with a number of types of vegetables at five sites between Lake Constance and Seeland.

The test series has produced alternatives which work as well or even better than 'conventional' organic fertilizers, for example the malt culms. However, as these are also used in animal production they are considerably more expensive than the banned substances. Slaughter by-products from the abattoirs which are safe in terms of BSE, such as feather meal and horn meal made from horn which has been separated from bone material, are permitted again today.

Martin Koller sums up: "We were successful in protecting the producers of vegetables, seedlings, and ornamentals from major problems in the transition to the new regime. However, the prices for organic fertilizers have increased by about 20%. That bitter pill had to be swallowed." The sector is aware that the consequences could have been much more dire, and it showed its appreciation for both the FiBL Task Force and the project financing provided by Coop.

Organic vegetable producers are extremely interested in the FiBL trials with alternative fertilizers.

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What can be done about late blight?

Only after he has finished the milking does Hans Braunwalder have time for research. After a coffee break he makes a start. Braunwalder recalls, "The year before last, we had real problems with late blight. Last year was not too bad." Later he has to fetch his notes,

because the FiBL researcher would like to know the precise details. "When did you sow? When did you apply manure, and how much? And when did the blight break out?" The interview lasts for two hours.

Opportunities and problems for the tuber crop

Hans Braunwalder is not the only one: 19 Swiss organic producers from seven cantons and all the main potato production regions were surveyed in the year 2001 by FiBL staff. Areas under potato cultivation ranged from 30 ares to 6 hectares; experience in organic management ranged from 4 to 57 years; there were direct marketers, suppliers to wholesale buyers, and of course the survey covered both sides of the 'Röstigraben' (rösti gap – the line between German-speaking Switzerland, where potato patties or röstis are a speciality, and French-speaking Switzerland).

The aim was to record the opportunities and problems for organic potato production in Switzerland from the producers' viewpoint, and to assess the significance of late blight within the overall production system.

Swiss yields are among the highest

The special feature of this project is that organic producers in other countries were presented with the same questionnaire at the same time. This makes it possible to highlight climatic differences as well as peculiarities of the regional organic market. The common elements of the 'organic mentality' across national borders can also be crystallized.

The Swiss organic producers achieved yields of around 250 to 350 dt/ha. This placed them alongside their Dutch and British colleagues at the forefront of the countries studied.

Around two-thirds of the producers questioned utilized copper in the last five years. In addition, various traditional means were used to enhance plant health, for example rock flour.

And what happens if blight occurs anyway? – Around 15 percent of the farmers surveyed stated that they had been forced to put up with criticism from neighbours farming conventionally.

The surveys are a part of "Blight-MOP", an EU research project in which the Swiss Federal Office for Education and Science (Bundesamt für Bildung und Wissenschaft, BBW) funds the Swiss contribution. Within this project, new strategies are being devised for the management of late blight, which include

- trialling resistant varieties for practical suitability;
- well-founded clarification of opportunities presented by mixed cultivars, mixed crops and cultivation measures;
- research and development of alternative sprays and biological control procedures by specialized laboratories, and
- field testing of their efficacy.

Producers of organic potatoes in Switzerland and several other countries in Europe share information on their experiences with *Phytophthora*, otherwise known as late blight. The aim of the 'Blight-MOP' project is to develop new strategies to combat potato blight.

Harnessing farmers' knowledge: FiBL researcher Bernhard Speiser in discourse with potato producers.

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An overview of FiBL quality research

"Is organic food better and healthier?" "How does organic agriculture contribute to the social and ethical quality of a region?" – The multi-faceted questions which surround the issue of quality are reflected in the variety of research into quality conducted at FiBL.

Do organic products endanger our health?

Certain critics of organic agriculture maintain that organic products are contaminated with microorganisms and their toxins, since they are only protected from such pathogens by natural means, which must be weak. At FiBL, Lucius Tamm and Laurent Zahnd (undergraduate at the University of Geneva) compared the microflora found on and in apples from integrated and organic production. They were supported by Dr Liliane Petrini at the University of Geneva who took charge of the taxonomy (biological classification). The organic apples did not contain more humanotoxin-forming pathogens (having the potential to threaten human health) such as *Penicillium*, *Alternaria* or *Fusarium* spores than conventional apples. In contrast, Zahnd and Tamm found dozens of additional fungal, yeast and bacteria species. And the range of species found varied greatly depending on the production method. However little is yet known about the significance of these 'indifferent companions' to our food, neither for the plants nor for the people and animals that feed on them. Are they important to the plants' immune systems under certain circumstances – or even our own, as consumers? "We would like to study this question scientifically" proposes Lucius Tamm, head of the FiBL Plant Protection Division.

Partners: Dr. Liliane Petrini, Comano, Prof. W. Broughton, Universität Genf

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Do organic foods taste better?

Are they healthier?

Since 1997 we have been comparing the quality characteristics of organically and conventionally produced apples, carrots and tomatoes which originate from comparable pairs of farms.

Standard aspects of quality such as firmness or sugar content are equally good in organic apples and carrots and often significantly better than those from conventional production. The organic apples have tested significantly higher for levels of health-promoting polyphenols. Quality variations among the carrots were largely attributable to soil factors. These results enable us to give producers targeted advice.

'Alternative' analysis methods are also capable of revealing differences in quality. Picture-creating methods have provided astonishingly subtle differentiation of results, correlating well with the results of standard analysis and sensoric testing. The potential of picture-creating methods is certainly great but still requires a great deal of research input. In our series of tests, Kirlian photography (Gas Discharge Visualization, GDV) likewise showed a surprisingly high differentiation among leaves and apples which were otherwise indistinguishable by optical or analytical means

Commissioned by: Coop (apples); Migros (carrots, tomatoes)

Partners: Polyphenols: Munich Technical University (Prof. D. Treutter); Various substances: Swiss federal research station Wädenswil (Dr. Ernst Höhn and Dr. Ulrich Künsch); Picture-creating methods: Institute of Vital Quality (Forschungsinstitut für Vitalqualität, FiV), Wetzikon (Dr. Ursula Balzer-Graf); Kirlian photography: Institute of Computer Science, Ljubljana

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Avoiding fungicide residues in organic wine

Fungicides in organic wine? In the year 2000, even organic wines were found to contain minute residues of chemical-synthetic crop protection agents. The Laboratorium der Urkantone cantonal laboratory detected these traces in the course of a testing programme. In collaboration with the organic wine sector, Gabriela Wyss and Lucius Tamm tracked down the causes and wrote an information sheet for practitioners.

- The greatest risk of contamination exists in wineries where organic and non-organic grapes are processed side by side. Even despite thorough washing, detectable traces of pesticide can find their way into the organic wine.
- Spraying carried out on neighbouring conventional holdings constitutes less of a risk – provided that

the neighbour follows standard guidelines.

- There is bound to be a certain background environmental level of pesticide contamination.

Sponsors, partners: BIO SUISSE, BioVin, office for food inspection (Amt für Lebensmittelkontrolle) of the Cantons of Aargau, Appenzell, Glarus and Schaffhausen, Delinat, Weinhandlung am Küferweg, Coop

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A database for quality assurance

Problems relating to food production often turn into food scandals in a matter of days. In such situations, problems need to be clarified and dealt with rapidly so that innocent bystanders are not dragged into the debacle of damaged reputations and lost income. The FiBL task force for quality assurance has set up a database for systematic recording of as many cases as possible of contamination of organic and non-organic food. In the event of any new case, the necessary information can be quickly and competently assembled in a target-

ed manner for expert bodies, the media and the public. The database is also useful for compiling precautionary risk profiles for farms and crops.

Sponsor/partner: BIO SUISSE

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Improving milk quality in the Engadine Alps

A unique, herb-rich diet, traditional processing – the potential quality of alpine dairy specialities is great. Nevertheless, in many alpine herds the milk cell counts are too high. To address this in the Engadine Alps, which are predominantly organically managed, FiBL worked with the valley farmers, farm veterinarians and alpine farmers to carry out herd sanitation measures. And these sanitation measures were effective: In the alpine grazing period in summer 2001, the proportion of unsatisfactory milk samples was only 10 percent for all seven of the herds involved in the project, whereas the average for herds in the Engadine Alps not involved in the project was 30 percent. On four out of seven alps in the project, over 95 percent of milk supplied was below the cell count limit of 350,000 cells per millilitre. This meant that milk quality even surpassed the average for the whole of Switzerland. This is remarkable because the national statistics include a high proportion of the less problematic valley farms.

Partners: Cantonal veterinary office, Graubünden; cantonal office for agriculture, Graubünden; Swiss federal dairy research station (FAM); Dairy Industry Inspection and Advisory Service North East Switzerland (MIBD NOS); Lalaria Engiadinaisa (LESA – the highest-altitude dairy in Europe).

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Induced resistance – A new technology in organic agriculture

For decades the pioneers of organic farming have been reporting on the tonic and disease reducing effects of a number of herbal teas, compost extracts, rock dusts and biodynamic preparations. Science has been trying to find out about these phenomena and now collectively terms them 'induced resistance'.

The susceptibility of a plant to disease is influenced by a number of factors. For example, both heavily fertilized as well as malnourished plants are more susceptible to pests and diseases than plants receiving well-balanced nutrition. Another phenomenon which leads to increased resistance is induced resistance.

A type of vaccination

Treating plants with suitable microbiological or chemical agents stimulates their defences – a certain degree of resistance is being 'induced'. This can be achieved through the plants' leaves or through the soil.

Some resistance inductors, such as Bion have been scientifically developed to the stage of commercial application. However, these agents are not available to organic farmers as they are artificial substances.

Under the working title PEN, FiBL, Biochemie, Austria, University of Basel, Switzerland and Syngenta, Switzerland have been studying an aqueous extract of cell wall fragments of *Penicillium chrysogenum* since 1997. This fungus is produced in industrial quantities and is listed as a fertilizer suitable for organic regimes in the FiBL list of approved substances.

PEN – Carrier of hope

In a first project phase (1997–2000) we have been able to show that PEN is active against a wide spectrum of pathogens affecting a number of host species. The treatment of tomatoes, cucumbers, and vines with PEN resulted in reduced incidences of *Phytophthora infestans*, *Colletotrichum lagenarium*, *Uncinula necator*, and *Plasmopara viticola*. The effectiveness of PEN for the control of *P. viticola* (downy mildew) is particularly impressive, since other resistance inductors have shown no effect on this disease.

Practical commercial applications, however, are still a long way away. The exact nature of the effect has yet to be characterized and undesirable characteristics such as phytotoxicity must be eliminated as much as is possible. Furthermore, where possible, the substance or class of substance which is responsible for the induction of resistance should be identified. Only if the mechanism of the effect is understood can the correct application be described thus allowing for quality assurance. The identification of the effective agent is particularly demanding for complex mixtures such as natural extracts.

Since 2001 fundamental research carried out at FiBL has been able to demonstrate that PEN contains one or more substances, or substance groups which trigger the metabolic processes typical of induced resistances. Furthermore, the research eliminated the possibility that the reduced disease incidence was based on a direct fungicidal effect of the agent.

Which signals are responsible for the process?

For further research on the effect of PEN, FiBL used the plant *Arabidopsis thaliana* as a model. Metabolic

processes as well as many aspects of host-pathogen interaction are well researched for this plant species. Working with *A. thaliana* also allows for the use of the most modern analytical methods available in molecular biology. The use of different strains of *A. thaliana* with a number of pathogens enabled us to determine, for example, which signal pathways are being used by PEN in inducing resistance.

When a plant comes into contact with a resistance inductor a cascade of metabolic processes (= signal pathways) is launched. Depending on the trigger a number of signal pathways are activated which in turn results in resistance to various pathogens. Such results lead to an improved understanding of the mechanism of the effect of PEN on crop plants and allow for the comparison of PEN with other resistance inductors.

A method with a future – but the potato is not coming along

It is not yet clear whether it will be possible to develop PEN to the stage of commercial application. However, the systematic use of induced resistance in organic farming clearly has a bright future as it is fully based on natural defence mechanisms inherent in the host plant. Reduction of the susceptibility of common varieties of crop plants and thus a higher degree of yield stability appears achievable. Unfortunately this does not seem to be the case for all plant species since some, e.g. the potato, show little response to induction.

PEN is not the only resistance inductor currently under development. In the course of its testing programmes FiBL regularly assesses products and substances produced by other manufacturers and laboratories which promise similar effects. *lt/bt*

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The model plant *Arabidopsis thaliana*, infested by *Botrytis cinerea* (above) and resistant after induction with PEN (below).



A direct contribution to yield stability

“I am delighted to be involved in this project. It allows us to introduce the latest results from fundamental research at the universities into FiBL’s practice oriented research. Hence we can make a direct contribution to improving yield stability in organic farming.”

Prof. Dr. Thomas Boller

Prof. Dr. Thomas Boller, Botany Institute, University of Basel, Switzerland

Developing new techniques requires research spanning all levels, from lab to field.



How to ensure reliable yields in organic viticulture?

Cultivation difficulties and fluctuating yields deter vine growers in western Switzerland from converting to organic production. FiBL was commissioned by Coop to improve yield reliability. It was possible to alleviate the cultivation problems, but selling the wines remains a sticking point.

Is organic viticulture a feasible proposition in western Switzerland? Or are the production risks simply too great? In the mid-nineties this was still an unanswered question. Up until then, organic vine growers and FiBL had primarily refined the development of production techniques in German-speaking Switzerland. But the methods cannot automatically be transferred to the soils and climatic conditions of western Switzerland. Also at that time there were few organic wine producers in Romandie and they had numerous difficulties to contend with. In the area of crop protection, considerable problems were posed by powdery and downy mildew of grape.

Utilizing practical experience

Coop would like to add more Swiss wines to its organic wine range. This was its reason for commissioning FiBL to improve yield reliability in organic viticulture. "From the onset it was clear to us that we could only move production techniques forward by working jointly with the producers, combining our know-how with their precise knowledge of local conditions," explains Lucius Tamm, head of the FiBL Plant Protection Division. Pilot vineyards were established to develop as models with the aim of encouraging other vineyards in the region to convert. The following vineyards took part in the project: Domaine de Bossons in Peissy, Domaine de Roveray in Aubonne, Betrieb Martin in Bremblens and Cave du Séminaire in Sierre. The vineyards were equipped with state-of-the-art meteorological stations which allowed daily access to information on imminent risks for plant protection. "In close contact with the vineyard managers during the season we discussed and planned production measures," says Tamm. "Numerous ancillary experiments helped to clarify issues of detail or to trial new methods."

involved, switching to organic viticulture has gone very well. He praises the support he has received from FiBL and assures us: "I would like to stick with organic farming". However he still has unresolved problems with marketing because the cooperative that buys his grapes can only sell a small proportion of its wines under an organic label.

"From our perspective the project was successful," is also the conclusion of FiBL consultant Andreas Häseli. "We were able to optimize yield reliability and have considerably extended our know-how in the area of plant protection. We were able to persuade more farms of the merits of conversion too. We have also succeeded in setting up organic viticulture rings as a way of improving contacts between producers and the cantonal advisory service."

"As our next step" says FiBL viticulture specialist Dominique Léвите "we aim to further enhance wine quality."

The market is the sticking point

Organic vine growers have now mastered their technical production problems. But for organic wines to attain worthwhile market shares, a great deal remains to be done. According to Coop, it is very rare for homogenous batches of consistently reliable quality to be offered in larger quantities. This, however, along with a fair market selling price, is a critical factor in success, says Coop wine buyer Christoph Bürki.

From Coop's point of view, this means that numerous hurdles must be overcome before Swiss organic viticulture makes its breakthrough. The market situation is difficult for Swiss wines in general. But according to Christoph Bürki, Swiss organic wines have avoided the price decline suffered by many traditionally produced wines.

hw

Using data provided by a meteorological station, Dominique Léвите gauges the current risk situation in plant protection.

Production techniques improved, now quality under scrutiny

For Christophe Suter, one of the vine-growers

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Fallows – higher diversity through proper management

Rare plant species and some species whose habitats are increasingly being lost find space in wildflower and rotational fallows. Beneficial insects, spiders, birds, butterflies, and parasitic wasps find cover and food on such sites in the form of insect larvae, seeds, pollen and nectar.

However, since fallows are mostly established on nutrient-rich tillage soils the succession from the annuals sown to biennials to perennials takes place very quickly. “Especially the attractive tillage weeds decrease in numbers as the grasses increase” explains the FiBL biologist Gabi Uehlinger. Cuts and soil cultivation can improve species and structural diversity.

Since farmers are looking for specific advice as to how the quality of fallows can be maintained for a longer period, FiBL has initiated trials on maintenance techniques for fallows, six years ago at Frick and two years ago in the Grosses Moos region in the Swiss Cantons of Bern and Fribourg.

Suitable sites make maintenance easier

Sunny, rather dry sites with soils that are as nutrient-poor as possible are most suited to the establishment of fallows. Sites with strong weed competition should be repeatedly harrowed prior to sowing. Sites with persistent weeds such as common couchgrass, thistles or broad-leaved dock are not suitable.

On mineral soils spring sowings give better emergence than autumn sowings. On peaty soils, such as are found in the Grosses Moos region, sowings can also be made in the autumn, in September or October. The sown wild flowers and herbs are thus given a developmental advantage against the thermophilic species emerging in the spring, such as quickweed or cockspur, and thus are more easily established.

The immediate control of persistent weeds such as thistles or broad-leaved dock is unavoidable, especially on organic farms.

Cutting or cultivating?

In order to keep fallows in a quality condition over a period of three to six years the sites must be well observed and maintained. The following measures were compared, each carried out in a spring and an autumn variant: cut only; cut and cultivation with spring-tined harrow; cut and cultivation with chisel plough.

- Cuts and soil cultivation are usually carried out between October and March. No more than half the site should be cultivated at a time as many small animals overwinter in fallows.
- Soil cultivation in the autumn of the second fallow year gives the best results. The various species react very differently to the treatment.
- A cut without cultivation promotes meadow species (e.g. ox-eye daisy or knapweeds) more than others but it also leads to increased grass intrusion.
- Soil cultivation promotes light-demanding species (e.g. wild carrot and viper's-bugloss). Many species of fallows are light-germinators.
- Typical annual tillage weeds such as cornflower, corncockle or poppies can only rarely be sufficiently supported through soil cultivation. gu

Wildflower and rotational fallows are important semi-natural habitats. Where such sites are combined with organic agricultural systems they can enhance natural pest control. However, the correct maintenance of fallows is quite demanding. Trials conducted by FiBL show how problems can be avoided.

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Managing fallows is challenging: Trials at FiBL.

Biodiversity – not just a feast for the eyes

The maintenance and promotion of biodiversity is an important strategy employed in organic farming. The latest FiBL research demonstrates that targeted measures for the promotion of biodiversity help in the fight against pests.

On a number of pilot farm holdings in the Grosses Moos region in the Swiss Cantons of Bern and Fribourg a FiBL research team has tackled the question of whether strips sown to wildflowers and herbs ('*Buntbrachen*') can improve natural pest control, and whether the sowing of such strips can yield measurable results in terms of the efficacy of populations of beneficial organisms. The project is financed by the Cantons of Bern and Fribourg, and by *Fonds Landschaft Schweiz*, a foundation for Swiss agriculture.

Three key pest species of cabbage plants were used to examine whether parasitization, i.e. the elimination of the pests' eggs and larvae by parasitic wasps, could be improved through the sowing of wildflower strips. The rate of parasitization of the eggs of the Cabbage moth on plots bordered by strips sown in wildflowers and herbs was high at 63% compared to plots without such strips in their vicinity. The latter exhibited no parasitization of eggs. The rates of parasitization in larvae were very high at up to 94% in all plots, regardless of whether wildflower strips were present or not. However, for the Small cabbage white butterfly the FiBL researchers found a definite positive effect, i.e. a significantly increased rate of parasitization, in the plots improved with wildflower strips.

Parasites and predators as allies in organic farming

Parasitic wasps act as 'professional pest killers' if they are provided appropriate habitats. They need suitable

hiding-places and food-sources rich in sugars in order to have sufficient energy to hunt out pests and produce eggs.

The researchers also found that the wildflower strips support populations of predators, such as ground beetles and spiders, which as generalists utilize a much broader spectrum of food sources. They consume up to three times their bodyweight in prey every day and thus considerably contribute to the reduction of various pests. Pest larvae which drop to the ground are often consumed by these voraciously feeding predators.

Upcoming research topics

In order to further improve natural pest control FiBL will be addressing the following questions in its upcoming work:

- How quickly do populations of the principal beneficial organisms – predators and parasites – establish themselves? To what extent does the age of the wildflower strip influence the beneficials' efficacy in the neighbouring cropping area?
- What are the spatial and temporal requirements for semi-natural sites in order for them to fulfil the desirable functions in an agro-ecosystem? How far into a field do measures promoting beneficials penetrate with regard to their effect on natural pest control? How far are certain pests favoured by such measures?
- What measures can be taken in order to further



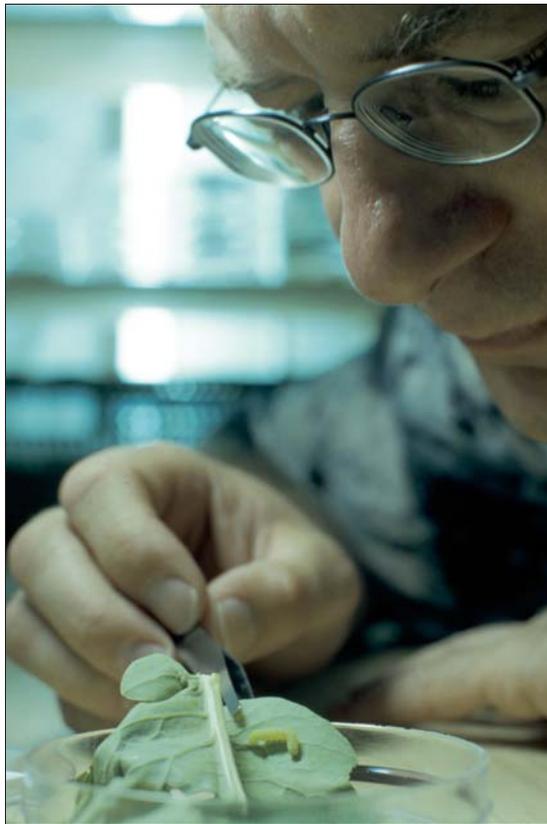
improve the quality of the wildflower strips? How can the species complement be enhanced not just in the immediate vicinity of the cropping areas but also in the wider landscape?

Fascinating connections between agro-ecology and nature conservation

“All these questions of functional biodiversity are extremely exciting for us” says Lukas Pfiffner, Head of FiBL’s Biodiversity Division. “They bring together the concerns of agro-ecology and nature conservation. The approaches developed out of this ‘merger’ should also allow the farmers to improve their production methods.”

Knowledge of the interdependencies between semi-natural habitats and production sites is very patchy, but it is important in order to optimize natural pest control in the system as a whole. Organic holdings must establish high-quality ecological compensation areas in order to reduce certain pest populations to levels below the threshold at which they inflict economic damage. *hw*

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The FiBL researchers used sweepnets to collect flying beneficials both in the cabbage fields and in the wildflower strips. The result: The diversity of beneficial wasp families and the abundance of individuals was considerably higher (14–16 families) in strips sown to wildflowers and herbs (*Buntbrachen*) than in the neighbouring cabbage fields (7–11 families). This is clear evidence for the important role of wildflower strips in establishing populations of beneficials.



Keeping genetic engineering out of organic agriculture!

How can we keep organic agriculture free of genetically modified organisms (GMOs)? That was the pressing question to be addressed by the three-person BioGene* task force set up by FiBL in 1999. What it has achieved in the meantime is a breakthrough.

In the three years since it was set up, the BioGene Division has concentrated activities in four focal areas:

- System and produce flow analyses in organic production, looking at the possible interfaces where GMOs could contaminate organic production, and developing solutions in the form of quality assurance systems. A limited amount of work has also been done on risk assessments of GMOs in ecosystems and organisms.
- Analysis of measures and development of proposals, including some for legislators, for the coexistence of GM-free agriculture and agriculture using genetically modified organisms.
- Creation of optimized conditions for organic plant breeding and for the production of organic seed and seedlings; national and international coordination of work on guidelines, information on the availability of organic seed and seedlings, setting up research to support plant breeding.
- Information for farmers, consumers, advisers, trade and industry on the above focal points through various media (reports, FiBL dossiers, Internet, TV, radio, print media, trade fair appearances).

BioGene, a successful Noah's Ark

"The wider context of current events was grist to our mill" states Karin Nowack Heimgartner of the BioGene task force, looking back. The Division's work was almost constantly in the limelight of public interest and political relevance in Switzerland and the EU. That did no harm whatsoever, in fact it hastened the pace of progress. With the collaboration of numerous actors, and also especially through pressure exerted by consumers, FiBL and the organic and environmental organizations, crucial progress has been made in the last three years:

1. Organic agriculture is now perceived as an alternative to genetic engineering and recognized as a system of production which must be protected from genetic engineering. In discussions on experimental releases of GMOs, this idea of protection is now regularly raised as a counter-argument.

2. In Switzerland and the EU, there is more or less a moratorium on the release of GMOs.
3. Legal regulations have been passed in Switzerland and the EU concerning GM contamination for the food and feedstuffs sector.

4. Organic agriculture is implementing quality assurance measures to prevent the intermixing of GMOs in agricultural production and processing. To a large extent organic products have been successfully kept GM-free. Traces of GMOs in organic products occur rarely and in minimal proportions.
5. The organic movement has recognized the necessity for clearer definition of organic breeding policy and intends to agree on standards and principles in 2002.

What next?

This marks the accomplishment of several major interim goals. Work under the 'BioGene Noah's Ark' project will be refocused and continued in an adapted organizational structure:

- The BioGene Task Force consists of one person from FiBL Switzerland and two people from FiBL Germany. The aim remains to ensure GM-free organic production. Besides its project work on current issues, the group will also offer advisory services. Furthermore case studies are planned on the actual level of contamination of organic products and the implementation of quality assurance systems in practice
- The Seed and Breeding Task Force consists of two people from FiBL Switzerland and two from FiBL Germany. It will continue to take responsibility for international and national coordination tasks on standards issues, and for information on the availability of organic seed and seedlings (www.organicXseeds.com). The new focal area however is practical research work to assist breeders.

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“BioGene has been an important and competent contractor of BUWAL and will remain one as the BioGene Task Force. This team combines expertise and practical experience in the field of GM-free agriculture” Dr. Hans Hosbach



Dr. Hans Hosbach, Swiss Agency for the Environment, Forests and Landscape (BUWAL), Biotechnology and Material Flows Section



* BioGene owes its financial viability to support provided by the Gerling Foundation. It carries out work on behalf of the Swiss Agency for the Environment, Forests and Landscape (SAEFL – BUWAL), the German Federal Environmental Agency (UBA), WWF Switzerland and BIO SUISSE.

ECO-PB supports organic plant breeding in Europe



Plant breeding and seed production for organic farming require pan-European solutions in the future. The recently founded association ECO-PB faces the challenge.

ECO-PB coordinates joint variety trials in a range of European countries.

In the spring of 2001 FiBL, together with a number of European research institutions, founded the European Consortium for Organic Plant Breeding, or ECO-PB for short. Its coordinator Klaus-Peter Wilbois gives the two principal reasons for its establishment: “Firstly, there is the danger that organic seed becomes contaminated with genetically modified organisms, and secondly the objectives of selection for the development of varieties for organic farming differ from those for conventional agriculture.”

Adapting high yielding varieties to organic conditions

Organic farming today predominantly uses modern highly-bred varieties which have been bred for producing high yields under conventional regimes. In the future it will be of crucial importance to utilize the genotypic potential for an improved adaptation of varieties to the conditions prevailing in organic farming situations. “Therefore it is an important task of ECO-PB to drive forward the development work on breeding material which is particularly suited to organic farming”, states Wilbois. ECO-PB supports the development of plant breeding efforts, providing scientific and conceptual expertise, e.g. for the development of guidelines, or on the legal background.

In its first year ECO-PB has coordinated joint winter wheat variety trials in a number of European countries. The aim of these trials is to compare the varieties’ performance under the respective conditions. Additionally, variety mixes typical of the various countries are being trialed and their performance analysed.

International plant breeding

Together with the two Dutch organizations Platform

Biologica and Louis Bolk Institute, ECO-PB organized an international workshop on organic plant breeding which was attended by experts from eleven European countries. The workshop results were made available to IFOAM’s Basic Standards Committee for the development of guidelines on plant breeding.

ECO-PB further contributed to an EU Commission hearing and elaborated various expert opinions on current European legislative procedures which are relevant to seed provision and plant breeding for organic farming.

Another objective pursued by ECO-PB is international information exchange. A website has been developed to this end (www.ecopb.org) and a monthly newsletter informs readers on current issues in the field of plant breeding and seed production.

The ECO-PB consortium now has twenty members. Membership is open to farmers, plant breeders, seed producers and farming organizations which are predominantly active in organic farming or organic plant breeding and propagation.

Christine Arncken (FiBL Switzerland) und Klaus-Peter Wilbois (FiBL Germany) represent FiBL on the executive board, with K.-P. Wilbois carrying out managing functions. This FiBL activity is financed by the *Sonnenwiese Stiftung* foundation, Vaduz and the *Zukunftsstiftung Landwirtschaft* foundation. *kpw/ta*

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Livestock



"Our animal research is also of interest for human medicine"

Why is dedicated research necessary into homeopathy for livestock? Until now, applying the findings from human medicine to animals has been quite successful.

Jörg Spranger: That is right, for a long time transferring the findings from human medicine was the usual way of treating animals homeopathically. But we are no longer so sure whether it is appropriate to equate animals one-for-one with humans. Instead we work far more on the assumption that there are major differences even between animal species. We find that the classifications of the entire animal kingdom harbour a great diversity of characters and every species has a very special position with its own character. If we are to take seriously the emphasis of homeopathy on character in human medicine, then based on the different characters of animal species we are likely to arrive at different remedies.

For example?

Spranger: The goat is a typical example. It is curious and alert, restless and willful. This is quite a contrast with the placid character of sheep, which merges into the herd without exuding much individuality. Within species the breeds are also very different. Just think of the difference between a Great Dane and a Spitz, or in cattle, the difference between a dairy breed and a beef breed. Simply applying the human distinctions to animals seems to me, at best, doubtful.

Homeopathy is an empirical science. Why is research necessary?

Spranger: I have experienced in my own practice that whereas my own observations and experience had fully convinced me of the effectiveness of particular medications, my convictions have been rocked by testing them scientifically. Certainly there is a great deal of empirical wisdom in homeopathy which we take very seriously and which we build upon. But this is of a wholly different nature from scientific certainty.

Udder inflammations, known as mastitis, can be treated with antibiotic or homeopathic medicines. In a research project in the Engadine region in Switzerland, the methods were compared. Homeopathy performed worse. Why?

Spranger: In our experiment there was a high rate of bacteriological recoveries. Following homeopathic treatment, no pathogens remained in the milk but the cell count was still 150,000 to 200,000 cells per millilitre of milk. That means that the farmer is happy because his milk is acceptable for delivery again. But scientifically we failed, because we could not get below the cell count of 100,000 that is accepted as an international norm for udder health.

In many cases, our observations tell us that the success achieved with antibiotics is relatively short-lived. Michael Walkenhorst, who monitored the work in the Engadine region, was able to document very nicely how the cell counts of the group treated with antibi-

otics, which satisfied the above norm at first, later returned to a similar level as those in the group treated homeopathically. In a German parallel study, no differences at all were found between antibiotic and homeopathic treatment with regard to the acceptability of milk quality.

Which means that antibiotics and homeopathic medicine work about equally well?

Spranger: According to our results there is little difference in success between homeopathic and antibiotic therapy for clinical mastitides. A more subtle analysis gives a clearer picture of the differences: In younger animals we achieved considerably better results than in older animals; in animals which were in any way run down when they began lactation, we achieved worse results than in those which were in better condition.

What practical conclusions can be drawn? What shape will a future therapeutic strategy take?

Spranger: Homeopathic treatment in principle for all instances of mastitis that occur, and preparation of all animals through prophylactic drying off with homeopathic medicines. Also, in early lactation a prophylactic homeopathic treatment of the whole herd is indicated. If this is seen to have failed, then we follow up by treating the animal either with a more sophisticated homeopathic preparation or, in individual cases, with antibiotics – I do not believe that we should demonize antibiotics. But the use of antibiotics in the farms that we have been supporting for a while has dropped below ten percent of its previous level.

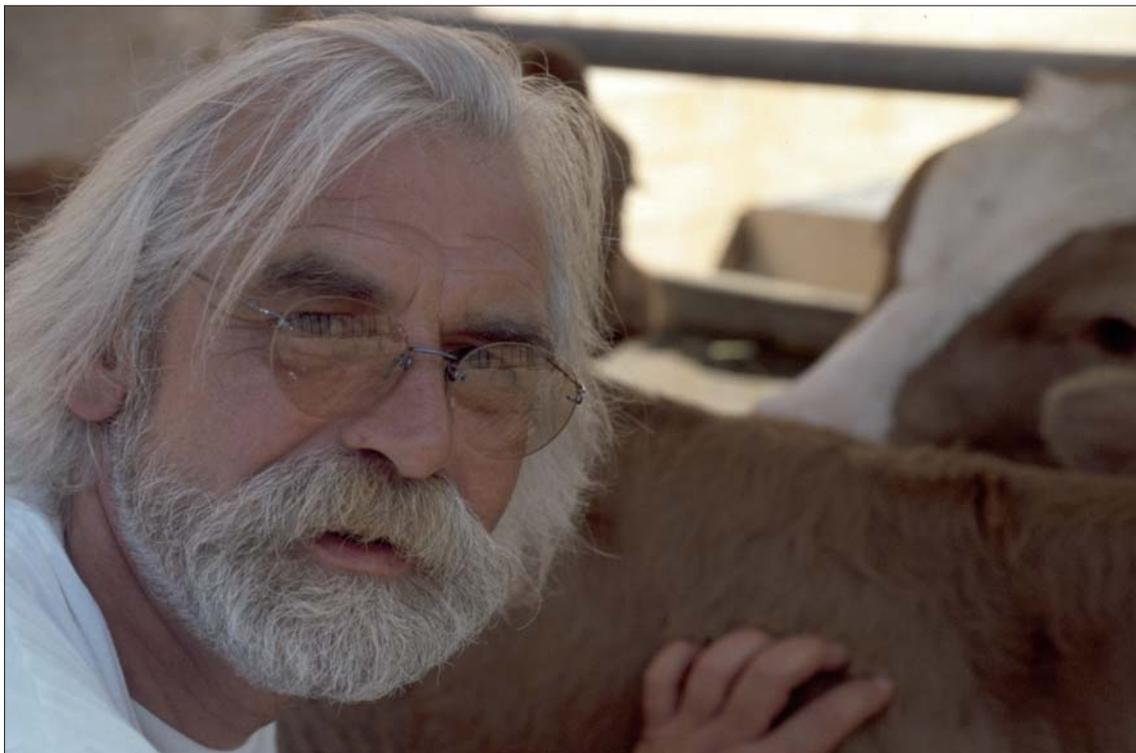
Are enough vets putting this strategy into practice?

Spranger: In Switzerland as in every other country there is a major shortage of vets with sound knowledge of homeopathy. Until a few years ago it was virtually taboo to train vets in complementary medicine. But meanwhile a process of rethinking has taken place. Today the universities in Zurich, Berlin and Vienna offer lectures in complementary medicine. FiBL also runs special further training courses for vets. These courses are very well attended and have been officially recognized by the Swiss Veterinary Association in the meantime.

Among veterinarians as much as farmers, opinions on homeopathy can differ widely at times. There is classic homeopathy which works with high potencies and the anthroposophical type which favours low potencies. In between, there is every shade of variation. Where does FiBL stand?

Spranger: We try as best we can not to be dogmatic. In addition, we have always taken care in the composition of our division to include representatives of virtually all therapeutic sub-strands. If any possibility seems halfway plausible to us, we try to test it scientifically. The status of our understanding to date is that where

New ground is being broken by FiBL's Animal Health Division as it researches complementary therapeutic strategies. This research provides health concepts for organic livestock husbandry without antibiotics; it also delivers scientific fundamentals which are of interest for human medicine. An interview with the head of division, Jörg Spranger.



Jörg Spranger: "There is a great lack of homeopathic veterinarians".

we have general problems, as with *Staphylococcus aureus*, we have problems whichever branch of therapy we try. Where we notch up successes, all strands of therapy are successful.

How does FiBL finance its projects?

Spranger: As far as applied research is concerned we have good opportunities to get our projects financed. Economic interests also come into play. The companies that offer complementary medicines are working, in parallel with organic agriculture, in a growing market. It is also a help to us that our animal research is pure research from the perspective of human medicine. Aspects of interest in veterinary medicine can provide valuable information on the conditions for efficacy of products in human medicine. This angle lowers the pressure on us to produce 'successes', because if someone is primarily interested in the much larger market of human medicine and views us more as pure basic researchers, the direct marketability of our results is of secondary interest.

For the financing of pure research in the narrower sense, there is fundamentally never any money. With one pleasing exception: Without the substantial financial support of the Weleda company in Arlesheim, the whole of FiBL's animal health research would never have come about. Today, the Swiss Federal Office for Agriculture (BLW) and the Swiss Federal Veterinary Office (BVET) contribute to our funding.

Given that we do not know how it works, is homeopathy not an aberration or even an affront to a serious researcher?

Spranger: In the scope of our research into homeo-

pathic principles we also work on models which can perhaps reveal new insights. And the question of its effect on the living system is of burning interest to us. On the other hand our division is primarily a service provider, charged with developing the most sustainable solutions for farmers. If a system works we often do not know how great a part each element of the system plays in the success of the whole. This is also completely irrelevant in the development of sustainable strategies for use in the field.

Interview: als

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Udder health without antibiotics

Mastitis is one of the main problems in dairy farming. On organic farms, too, acute, chronic and sub-clinical forms of mastitis are unfortunately a regular occurrence.

Organic standards prescribe that animals are to be treated with natural agents and complementary medicine in such cases. Only if these treatments prove unsuccessful are allopathic medical treatments allowed and chemically-synthesized pharmaceuticals may be used. However, approval from a veterinarian must be sought, and there are clearly regulated limitations.

Little experience with complementary medicine

In order to continue to reduce the use of antibiotics on organic farms, veterinary herd health management must be introduced and combined with complementary therapy and prophylaxis methods. However, there have hardly been any detailed studies on experiences in Switzerland in this regard.

Two major studies carried out by the Free University of Berlin and FiBL in Brandenburg (Germany) and the Engadin region (Switzerland) have shown that mastitis can be cured without resorting to antibiotics. However, the studies also demonstrated that comprehensive restoration of animal health can not be achieved without farm sanitation. Where conditions are 'mastitis friendly' neither allopathic nor complementary medicine can achieve lasting improvements.

Elimination of factors contributing to mastitis

The veterinarian Christophe Notz is benefiting from the experience gained in the course of the two studies. For his PhD at FiBL, he is testing an udder health concept without the use of antibiotics and in conformity with organic regulations on Swiss pilot farms. This project, which does entirely without antibiotics, is co-financed by the association of Swiss milk producers (SMP), BIO SUISSE and Demeter.

The focus of the "Herd sanitation and herd health management with minimal use of antibiotics" project ("BAT-Projekt") is the elimination of factors on the farms which contribute to mastitis. In the context of farm sanitations Christophe Notz analyses all the factors which may have an impact on the disease. He is particularly interested in the integration of livestock management practices in the overall management of the farm, in general husbandry as well as milking, feeding and replacement practices. The relationship between man and animal also gives interesting clues.

Subsequent to the holdings' structural sanitation the concept for udder health without the use of antibiotics is established in cooperation with the holdings' veterinarians. This means that consistent herd health management is being combined with complementary therapy and prophylaxis.

"In 2001 we tested the concept on three pilot farms with approximately one hundred cows. For me, the greatest challenge was to maintain the information

exchange between the participants", explains Christophe Notz. He commends the farms' veterinarians who "have implemented the complementary therapy and prophylaxis measures very well despite the fact that they had no prior experience with homeopathic therapies."

Less antibiotics – no decline in udder health

Udder health on the participating pilot farms was documented using the official milk recording data which are collected eleven times a year on all holdings. After the first year of the project, udder health had been maintained at the level prior to the project and improved in some cases. This was achieved while the use of antibiotics for the treatment of acute and sub-clinical types of mastitis, and for drying off, was reduced by more than 90 percent. Following the successful trial phase, the number of pilot holdings is now being enlarged steadily.

cn/ta

When animals are sick on organic farms, complementary medicine takes precedence over allopathic procedures. However, there has been a severe lack of studies on practical experience. A practice-oriented project is now remedying this situation – and has already yielded remarkable results.

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Christophe Notz (right) and Michael Walkenhorst apply strict criteria to their evaluations of the success of homeopathic therapies.

Udder health: Research on a large farm

Three projects have already been carried out on the theme of mastitis at the Brodowin holding, a large farm in Brandenburg, Germany. One principal result has been the astonishing efficacy of antibiotics and homeopathy used in combination.

About an hour-and-a-half's drive north from Berlin, within the Schorfheide Biosphere Reserve, is the Brodowin 'eco-village'. Forming the centre of the biodynamically managed farm is the loose-housing pen for 300 dairy cows, and its adjacent cheese dairy.

When production manager Heiner Petersen took up his post in 1996, a new awareness of quality also arrived on the farm. Petersen encountered major problems with milk quality; udder health in the herd was at a low ebb. His concept proposed conversion from previously conventional to organic herd health management. The use of antibiotics to treat mastitis (udder inflammation) was to be scaled down drastically. Needing experts in animal health, the farm called in Jörg Spranger (FiBL), Carl-Christian Merck (Berlin Free University) and Peter Klocke (Berlin Free University, now FiBL).

First improve basic conditions on the farm

Before serious plans could be made for sanitation measures to clear the herd of mastitis, the team first had to set up an almost year-long basic sanitation phase in order to overcome the critical – i.e. disease inducing – problems inherent in the conditions on the farm and in the milking process.

By November 1997 the time had come to launch the large-scale conversion of the therapeutic strategy to deal with mastitis, supported by Weleda AG (Arlesheim). The project was carried out as a dissertation by the veterinarian Sylvia Garbe. A new approach consisted of only administering antibiotics to borderline sick cows at drying off. As part of a blind placebo control experiment, all animals were given a preventative combination of homeopathic remedies targeting their stressed metabolisms (or, of course, a placebo). The idea was to examine whether the cows treated withstood their next lactation period better, in respect of udder health, than the control group.

Combination of methods proves effective

As expected, animals that were chronically sick showed no significant improvement even given homeopathic treatment. For many of these animals a short-term cure could be achieved with the support of an antibiotic at drying off, but no form of therapy showed lasting effects over the longer term.

This was in contrast to recently infected animals. Here homeopathic medicines were largely able to prevent clinically visible udder inflammations from flaring up in the lactation period following eradication of the germs by the antibiotic treatment at drying off.

In a parallel experimental approach, clinical udder inflammations during lactation were treated either with combination-homeopathic medicine or with antibiotics. The therapeutic successes of homeopathic medicines with regard to the problematic pathogens (*Staphylococcus aureus*, *Streptococci*), at 10 to 18 percent, were not satisfactory. On the other hand, in udder

inflammations caused by other infectious agents or those not found to have a bacterial cause, no essential difference was noted from standard therapy with antibiotics. Here, too, it was surprising that the combination of antibiotics and homeopathy produced very successful results.

These results led to the following findings:

- Firstly, in problem cases, homeopathic treatment in combination with antibiotics gives every chance of therapeutic success;
- Secondly, however, in organic livestock husbandry where limitations on the use of chemical medication are clearly a requirement, further solutions must be pursued with a view to dispensing completely with antibiotics.

The second Brodowin project (1999/2000) pursued a different issue: Are homeopathic dilutions beyond the point of containing even one molecule of the original substance (dilution 1:10³⁰) capable of having a positive influence on udder health?

To investigate this, a combination remedy consisting of phosphorus, silicea and sulphur was administered, both at the beginning of lactation and in the phase of the highest milk production, again in a blind placebo control experiment.

Although all the data have not yet been analysed, there are initial indications that an element of protection is afforded to udders which are healthier to begin with: Diseased udders did not respond adequately to the medication, however. The study was entirely sponsored and funded by Weleda AG (Arlesheim).

What is homeopathy capable of?

Since summer 2001, Brodowin has had a third project in progress on complementary udder health management. The project supported by the German Federal Agency for Agriculture and Food and the Software-AG Foundation sets out to answer the as-yet-unresolved question as to the effectiveness of homeopathic remedies on clinical udder inflammations. The animals were randomly divided into two groups for treatment (verum and placebo). The verum group received up to five consecutive individual homeopathic remedies (Weleda, Schwäbisch-Gmünd). The study led by Christian Fidelak (Berlin Free University, FiBL Berlin) is the first attempt to discover homeopathic effects on mastitis after making allowance for the rate of spontaneous recovery.

On organic farms, complementary remedies must be the rule and chemical-synthetic medications the absolute exception. This is laid down in the standards and regulations for organic animal husbandry.

FiBL's research activities in Brodowin will make a substantial contribution to scientific knowledge on the question of how to put appropriate veterinary health management into practice.

pk/ck

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In the large-scale holding, too, diagnostics, the wider setting and the welfare of the individual animal are the prime concerns.

Applied research on mistletoe therapy in veterinary medicine

Mistletoe has been used with a certain amount of success in human cancer patients.

FiBL is testing its application in veterinary medicine. The clients hope to gain useful insights for human medicine.

For many centuries, people have associated the white-berried mistletoe (*Viscum album*) with innate magic and mystical powers. This could be due to its botanical peculiarities. Mistletoe is parasitic, with berries that ripen in winter; the plant is evergreen and grows spherically without a vertical axis, making it independent of light and gravity.

Rudolf Steiner and Ita Wegmann introduced mistletoe to medicine as a cancer treatment some 80 years ago. Since then many patients have been treated successfully with mistletoe preparations such as ISCADOR® (Weleda, Arlesheim). Besides its effects in promoting resistance and destroying cancer cells, patients also benefit from other positive effects on their quality of life.

Is mistletoe also effective for animals?

Can objective evidence now be found for the efficacy of mistletoe-based treatments for cancer in small animals and horses? Will this enable the introduction of mistletoe therapy into veterinary medicine with high therapeutic reliability? The Animal Health Division has studied these questions for some time. So far, courses of mistletoe therapy have been administered to 80 patients of different animal species and breeds with different forms of cancer.

Building on these findings, as part of her doctoral thesis Ulrike Biegel is monitoring veterinarians, pet owners and their pets. The data collected through her own studies and by means of a standard survey form for vets and pet owners are now being structured and entered into a special documentation system originally designed by Berlin doctors. These data will serve as the basis for a clinical study, which will include only the small animals suffering from forms of cancer which appear particularly responsive to mistletoe therapy. ISCADOR® is to be administered in parallel with the primary therapy. This will enable the net beneficial effects of mistletoe treatment on the patients to be derived.

Encouraging results

In both horses and small animals, the effects noted so far were expressed in terms of improved vitality and, when combined with other therapies, better stability of seriously ill patients. In isolated cases, astonishing successes were achieved using mistletoe alone for treatment. Beside its principal indication for use in cancer therapy, experiments were also carried out on the effectiveness of mistletoe against mastitis in cattle, and on the application of mistletoe preparations to the mucous membranes of pigs. While no therapeutic effect was noted in cattle (dissertation by Irena Marc), the first experiments on pigs showed evidence, as hoped, of antibodies against mistletoe ingredients in the blood. These experiments, which continue in 2002, may contribute to finding alternatives to administering ISCADOR® by injection.

Comprehensive financial resources along with specialist support from Weleda AG (Arlesheim) and the Institute Hiscia, Society for Cancer Research (Arlesheim) make this FiBL research possible. The Animal Health Division hopes to understand the principles of the effects of mistletoe in animals within the next few years. Not for their benefit alone, but also for the good of human health.

pk/als

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Small jab, great effect? Mistletoe extracts strengthen the immune system of many animal species.

Protecting laying hens against ‘bloodsuckers’

As a temporary ectoparasite the Red poultry mite spends the day in the vicinity of the host animals; it attacks the roosting hens at night, briefly draws blood and then withdraws again into cracks and crevices in the poultry house.

A high infestation rate negatively affects the hens – their egg production declines. Since the mites are well hidden during the day there is no point in treating only the hens. Treating the poultry house usually only eliminates part of the mite population.

85 percent of poultry houses are affected!

Some time ago the Head of the Veterinary Parasitology Division of FiBL, Veronika Maurer carried out a survey on the occurrence of *D. gallinae* in 39 Swiss commercial chicken units. Her survey confirmed that the Red poultry mite is very common in Switzerland, as she found the mites in 85% of the units.

The aim of her study was to define the factors which are decisive in leading to mite infestations. Veronika Maurer was able to show that it is mostly good hygiene which limits the occurrence of the poultry mites. Houses with deep litter bedding had higher infestation rates than those where scratching areas and dung storage were separated (aviary systems and deep pit systems). In contrast, neither access to open runs nor flock size or housing size had an impact on the occurrence of the mites.

An efficient set of measures

If at all possible acaricides (miticides) containing synthetic active ingredients are not to be used on organic farms. In order to replace these, FiBL’s Veterinary Parasitology Division has tested the efficacy of a number of mechanical methods and natural agents both in the laboratory and in real housing situations.

Based on her studies Veronika Maurer recommends a threefold approach to controlling Red poultry mites (see Box below). This approach is increasingly and successfully being used in organic laying hen units and has

led to a situation where inorganic acaricides have virtually disappeared from organic poultry units. FiBL’s Veterinary Parasitology Division is working on similar strategies for other types of parasite infestation. *vm*

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As on conventional holdings, the Red poultry mite (*Dermanyssus gallinae*) is the main ectoparasite* of laying hens on organic farms. To be able to abstain from using synthetic miticides, it is essential to carry out preventative hygiene measures and regular monitoring of poultry houses.



Mites – minute ‘vampires’

Checking a mite trap



The threefold approach to mite control

If one consistently uses this threefold approach to controlling Red poultry mites, there will hardly be a need for chemically-synthesized miticides in the poultry house.

1. Hygiene: Clean the house thoroughly between batches. This eliminates a major proportion of the mites. The interior installations should be dismantled as much as is possible, soaked for a few hours and then washed with hot water and soft soap, preferably using a power hose. It pays off to make sure that the interior installations can be easily dismantled and washed when the house is constructed in the first place.
2. Continuous monitoring: To this end traps in the form of folded pieces of cloth or other artificial hiding places are hung up close to the hens’ roosting places and checked regularly. If mite infestation increases significantly during the course of the batch cycle, non-poisonous natural products such as vegetable oils or silicate powder can be used to control the mites. These cause physical damage to the mites.
3. Use natural agents: If individual highly infested spots remain these can be treated in a targeted manner with an acaricide based on a natural active ingredient. Currently the well-tested *Pyrethrum* is mostly used in such instances. New natural agents are under development.

* Ectoparasites live on the skin or outer surface of the host animal.

Parasite infestation in organic cattle – clearly not rampant

Organic livestock husbandry entails increased access to pasture. But it also means abstaining from preventative treatments with chemically-synthesized pharmaceuticals. Does this lead to increased parasite infestation? A field study has now shown that store cattle and dairy cows have fewer problems than initially thought with endoparasites*.

Regular access to an outside run or to pasture is a requirement in organic cattle rearing. However, pastures harbour parasites, and organic livestock must not be treated with preventative conventional anthelmintics.

According to Hubertus Hertzberg, a veterinarian and research scientist with FiBL's Veterinary Parasitology Division, it had been feared until now that parasites were a serious problem on organic holdings. However, due to a lack of scientific research in this area the extent of the problem was unknown. A Swedish study indicated that young cattle suffer from lungworm infestations, and Swedish organic farmers who were interviewed reported parasite problems. Detailed studies on Swiss farms have not been carried out to date. The Swiss Federal Veterinary Office (Bundesamt für Veterinärwesen), the Pfizer company and the Swiss animal welfare association Schweizer Tierschutz (STS) are therefore now jointly supporting a PhD thesis which records endoparasite infestations on Swiss dairy farms.

34 holdings tested – 'egg hunt' in the lab

The PhD student Philipp Hördegen got his initial pointers from a survey amongst cattle farmers. About two thirds of the interviewed organic farmers stated that they have had parasite problems and have treated the animals. The most frequent problems mentioned by the farmers were lungworms, gastro-intestinal worms, and liver fluke. The majority of interviewees treated with conventional vermicides, and few had trust in alternative control strategies such as pasture management and homeopathy.

In 2000 and 2001 Philipp Hördegen visited a total of 34 organic farms. At each farm he took rectal faecal samples from ten dairy cows and ten store cattle, and further blood samples in autumn. Housing systems and pasture management were recorded at the same time. In the parasite lab at FiBL Hördegen assessed the degree of infestation. Using a microscope he identified and counted the eggs of gastro-intestinal worms, tapeworms, whipworms and hairworms, *Coccidia* oocysts, lungworm larvae as well as the eggs of liver fluke and lancet liver fluke from a huge number of faecal samples.

Gastro-intestinal parasites quite frequent

One of the most important findings Philipp Hördegen made in his study is that he hardly ever saw animals on the farms he visited showing the typical symptoms of parasite infestation (skinny animals with a shaggy, dull coat, and diarrhoea or a cough).

Contrary to the results from the interviews lungworms appeared of lesser importance than other parasites. Gastro-intestinal worms on the other hand, occurred quite frequently. However, Hördegen emphasises that the herd average of the number of eggs found per gram of faeces was well below the values at which treatment is normally recommended.

Animals on mountain holdings had less of a problem with gastro-intestinal worms than those on farms in the valleys. In both study years the number of eggs passed out in the faeces declined, as the age of the cattle increased. The animals often built up immunity to the parasites over time.

Pasture management neglected

On his farm visits Philipp Hördegen noticed that very few farmers actively used homeopathic treatments, and that only some of them made deliberate efforts to optimize their pasture management. Nevertheless he observed that on many farms calves and stores were pastured together.

Apart from rotating the grazing areas the joint grazing of different species (e.g. horses and cattle) or of different age groups of the same species are effective preventative measures. As store cattle shed considerably fewer eggs the joint grazing of calves and stores can reduce the contamination of pastureland and protect susceptible young stock.

In the next phase of the project complementary therapy and prophylaxis methods for the control of parasite infestations will be tested. *ta*

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Philipp Hördegen visits cows on the pasture in order to assess their degree of parasite infestation. He packs excrement samples singly, and processes them in the lab for the various tests. The microscope reveals worm eggs, *Coccidia* oocysts and lungworm larvae.

* Endoparasites live inside the host animal.



Can breeding produce fitter cows?

Organic agriculture needs robust animals. Once this basic concern is addressed, if feeding and husbandry are optimized at the same time, it will be possible to dispense wholly, or largely, with the use of antibiotics. But in dairy stock breeding, few attempts are being made to pursue this objective directly. FiBL has been tracking them down.

A vital stage to be reached in the breeding of the dairy cow that is optimized for organic conditions is a reduction in the use of antibiotics. In order to achieve this, the animals must have the right genetic predisposition, environment and feeding.

There is an urgent need for action to breed a robust cow ideally suited to organic agriculture. The top breeding priorities today are milk production and milk content. But traits for hardiness, which are of course more difficult to measure or to record, are now gaining increasing importance.

The aim is therefore to breed for improved health status in dairy cows. In a project financed by ASR (Arbeitsgemeinschaft Schweizerischer Rinderzüchter, the association of Swiss cattle breeders), FiBL set out to look for approaches directed towards this breeding objective. This study took account of both approaches currently undergoing research and methods already used in practice.

FiBL staff members Beat Bapst and Anet Spengler Neff carried out a study of the literature and a survey. For the survey, 105 questionnaires were sent to cattle breeding organizations in 15 countries. Since marker-based selection is playing an increasingly important role in breeding for fitness traits, Bapst questioned 90 European organic organizations on their acceptance of this technique.

Scandinavia at the forefront

In the Scandinavian countries, practitioners are making use of the direct approach of epidemiological monitoring of disease. To this end, health databases are operated from which information can be drawn on for estimating the breeding value of individual fitness traits or creating a health index. This method has already led to initial breeding successes. However it cannot be transposed directly onto Swiss circumstances, because in progeny assessment in Scandinavia second-generation groups are larger than in Switzerland. Moreover, Scandinavian veterinarians are semi-state-organized which enables better recording of the health and sickness data.

All the other important methods found in the litera-

ture and from the surveys work indirectly. That is to say, traits are recorded from which it can be concluded that disease resistance is better or worse. Such indirect traits include, for instance, cell count, milkability, exterior traits, hoof mass, persistency and longevity.

A very promising line of approach is to determine the precise negative energy balance at the beginning of lactation. This can be assessed by means of the Body Condition Score (BCS), via body weight, milk production and certain exterior features. These reference characteristics exhibit a high degree of heritability in some instances, making the assessment worthwhile for breeding purposes. "If the energy deficit is kept low in early lactation by reduced milking of cows, fertility problems and metabolic disturbances decrease," says Beat Bapst.

Another indirect approach is to determine the stress resistance of sires: If their stress resistance is high, their progeny can be expected to have high disease resistance. This much-debated procedure has delivered good results during research but has not yet been put into practice anywhere.

How are fitness traits weighted?

Once functional traits or fitness traits are established, the big question is how heavily they are weighted in relation to production traits in the breeding organizations' breeding programmes.

In Switzerland the proportion in overall breeding value of functional traits in the main breeds is between 33 and 45 percent. As a comparison: In brown cattle, the same figure in Denmark is 62 percent, in Austria 55 percent. In Holstein-Friesian breeding in Sweden and Denmark, the weighting of functional traits is as high as 70 percent.

In addition to collecting the productivity and health data, there are ongoing efforts to gain a more precise insight into genetic material. Using genomic analysis, i.e. mapping the genes responsible for certain characteristics, selection is becoming increasingly reliable and breeding programmes are achieving more rapid success. It is hoped that breeding for fitness traits can be simplified by means of marker-based selection.

FiBL study provides a good overview

“ ASR funded the literature review carried out by FiBL to the tune of 40,000 Swiss Francs as part of the breeding research supported by ASR.

ASR is very active in supporting breeding research with the aim of a healthy, metabolically stable high-performance cow. FiBL's literature review provides a good overview of the current international situation regarding breeding work with a view to health characteristics. It confirms our efforts in the areas of epidemiological screening, BCS (Body Condition Scoring), fertility, mastitis, and others.

From our point of view the response rate to the surveys

could have been somewhat higher which would have improved the representativeness of the statements made. It is also regrettable that the difficulty of a future application of MAS (Marker Assisted Selection) in organic farming could not be conclusively discussed, and that a detailed discussion of the interconnections between MAS and reproductive techniques (embryo transfer, in-vitro production) was beyond the scope of the study. While the study confirms the appropriateness of our strategic aims it also provides a good basis for further work on functional characteristics. ”

Rainer Saner, Dr. med. vet. FVH
Member of the R&D Dept. of the ASR



Anet Spengler Neff and Beat Bapst conducted a literature review on breeding for improved animal health.

"The organic organizations are not essentially hostile to this technique," says Bapst, in summary of the survey results. However, there is a certain amount of controversy surrounding reproduction techniques in organic agriculture. There appears to be a need for fundamental and cross-border regulation of the use of reproductive techniques, genome analyses and marker-based selection for organic agriculture, concludes Bapst. *als*

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“The genetic diversity of our livestock is a part of world heritage”

The veterinarian Anita Idel laments the loss of genetic diversity and the increased susceptibility to disease which accompanies modern high performance livestock breeding. However, Idel and FiBL Berlin do not just identify the problem – they act too. Here is an interview with Anita Idel.

Anita Idel, you are a veterinarian but you are concerned with livestock breeding. Why is that?

Anita Idel: Over the past 30 years productivity in the livestock sector has increased enormously. This was made possible by combining intensive livestock keeping and feeding methods with selective breeding for high performance. Today we can see the negative side of this selective focus – every food scandal inevitably involves feedstuffs. Breeding for high performance in conjunction with selecting for early maturity have led to increased susceptibility to infectious diseases, joint inflammation and mastitis as well as circulatory, metabolic and fertility problems.

And this has also had an impact on genetic diversity?

Yes, it leads to the loss of breeds which are less productive – in terms of litres and kilograms per year. Many breeds have been driven to extinction and a third of the breeds documented by the FAO are threatened with extinction since there are not enough funds available for their maintenance and enhancement. However, it is not only the loss of breeds that is problematic but also the narrowing genetic base of modern breeds and hybrid lines. The trend towards inbreeding increases the degree of genetic uniformity in the animals. The more similar the animals are, the more limited is a herd's or population's reaction potential towards cases of infection, parasites or epidemics.

You also maintain intensive contacts with livestock breeders in the developing countries?

Globally a significant proportion of local breeds is in the care of pastoral peoples and traditional livestock owners in developing countries. Examples would be pig landraces in China, “holy cows” in India and free-range poultry foraging in vegetable gardens in Latin America and Asia. Every Indian draught ox helps maintain at least one large family. There are loans available for tractors and diesel but not for animal feed. The threat of people slipping into the poverty of urban slums thus increases in times of drought. Together with the World Herders Council (Conseil Mondial des Eleveurs) and the League for Pastoral Peoples I am trying to raise awareness for the global importance of these problems and the commonalities in the issues, and we try to network stakeholders. The crossbreeding of European breeds with robust landraces has already been of high commercial value in the past. With regard to traditionally kept animals there are thus not only breeding issues, but intellectual property rights and socio-economic questions are also becoming more pressing. The tragic fact that currently two local breeds become extinct every week shows that the industrialized nations must provide immediate support for the developing countries. We must provide for the survival of animal genetic resources today in order for us to be able to use them sustainably tomorrow.





Every Indian draught ox helps maintain at least one large family

What kind of work do you do in relation to livestock breeding in Germany?

In Berlin we would like to continue the work on dual use chickens. There is a gap in the breed spectrum between the high performance hybrid strains, which under current conditions are also the most economic choice for organic farms, and the purebreds which are only of interest to hobby breeders. Nobody is working on the breeding potential of landraces which are robust and suitable for free-ranging. Of course we will not be able to get these breeds to lay 300 eggs per year as today's hybrids do. But a somewhat lower performance will at least be compensated for by other characteristics which will also be rewarded by the consumer. There is first and foremost the good health of the animals, but also special qualities of the eggs (large, raised egg yolks for example), dual use as layers and table birds, suitability for free-ranging, less featherpecking etc.

What are your current activities?

Currently my focus is on the cooperation with Eastern European countries. I have already established good contacts with persons in government and science responsible for maintaining poultry breeds in Poland.

A number of Polish landraces which were described as early as the 1950s sell very well locally on account of the quality of their eggs. I would like to establish a basis for Polish-German breeding projects with the aim of developing a healthy and productive dual use chicken for organic farms.

Interview: un

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Socio-economics



Piloting successful organic marketing initiatives

OMIaRD is the acronym for Organic Marketing Initiatives and Rural Development. Three of FiBL's experts are participating in this project.

Four research questions

According to marketing expert Toralf Richter the team has posed four principal questions as part of the project:

- What marketing initiatives are there in Switzerland and how successful are they?
- What contribution can these initiatives make to sustainable development in rural areas?
- What are the general factors that promote, or hamper, the consumption of organic products in Switzerland?

How has the organic market been developing in Switzerland? What are the prospects for the future?

Filling the knowledge gaps on the organic market in Europe

The project participants in the various countries work on the same questions in parallel with their partners. "We hope to be able to fill a major knowledge gap with regard to the organic market in Europe. Currently available information is merely of a very general nature. We only know that the size of the market for organic products in Western Europe is currently at approximately 12,000 million dollars, and that annual growth is around 20%. We also know that Germany is the largest market in absolute terms and that the organic markets in Switzerland and Denmark have the highest shares in the respective total markets."

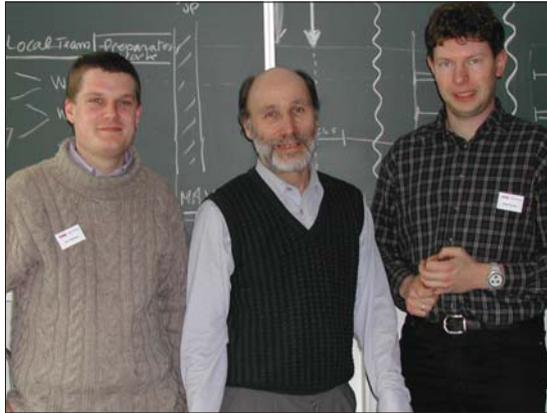
Additionally, information on the composition of the product spectrum in the individual countries is available from another EU project.

Organic farming as a motor for regional development?

"We are not exactly sure as to which factors are necessary for success, and what contribution organic farming and the marketing of organic products can make to regional development", says Toralf Richter.

With the OMIaRD project the team strives to develop solid proposals for the players in the organic sector, and it hopes to thus make an important contribution to the continued positive development of the organic market and rural development in Europe.

"We have looked at fifteen marketing initiatives in Switzerland, such as Biofarm, Bioweidebeef and Napfmilch, and we are now working on publishing the results" explains Jörn Sanders, a member of the FiBL research team. The results will be published entitled "Biovermarktungsinitiativen in der Schweiz" (Organic marketing initiatives in Switzerland) in 2003. There are also plans to develop a pan-European handbook for regional marketing initiatives together with the other project partners.



What is it that makes an OMI successful?

What are the decisive factors that make or break an organic marketing initiative? Based on the experiences of the FiBL experts it is often the commitment of individuals which determines the success of an OMI. Coordination and efficient cooperation are significant – an example would be the reduction in costs for product collection. Product strategies and effective communication of the specific characteristics of the products are also important.

"Especially the last point is not easy", explains project leader Otto Schmid. "In Switzerland organic products are primarily distributed by wholesalers. These have as yet shown only limited interest in promoting regional specialities. However, perhaps it will be possible in the future to have a degree of regional differentiation in organic products. We would regard this as a contribution to strengthening the regions, and of course to organic farming in general."

The sights are set on the Swiss organic market

The research team has only just begun its work on the second part of the project, the analysis of the Swiss organic market. Currently the team is carrying out consumer surveys in order to record motives for and barriers to the purchasing of organic products. This is the first time studies of such depth have been carried out in Europe.

"For Switzerland we found that there is a relatively high degree of confidence in organic products, and particularly in the BIO SUISSE Knospe ('bud') label" states Jörn Sanders. "The main motives for purchases are animal husbandry fulfilling the welfare requirements of livestock, healthy products, fear of residues, enjoyment of good food, and environmental protection."

Following their fieldwork the researchers aim to develop a communication strategy for organic products together with their European partners.

hw

OMIaRD project homepage www.irs.aber.ac.uk/omiard/

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Can regional organic marketing initiatives (OMIs) strengthen the development of rural areas in Europe? This is a question explored by FiBL's Socio-Economics Division as part of an EU research project (OMIaRD) involving a further seven European research institutions.

Getting OMIs going: Jörn Sanders, Otto Schmid and Toralf Richter (from left) provide the FiBL input to the EU project OMIaRD.

Which way forward with organic policy for the expanding EU?



Otto Schmid and Matthias Stolze are launching a new project with European partners.

Matthias Stolze, FiBL Switzerland is coordinating an EU project. Is that not rather astonishing, since it involves an institute in a non-EU state studying EU agricultural policy in relation to organic agriculture?

Matthias Stolze: Since the bilateral agreements have taken effect, Swiss partners can also coordinate EU projects. Because FiBL had already been very heavily involved in the preparations, it was only logical to commission FiBL to coordinate the project as well. However the bilateral treaties were only signed after we were awarded the contract for the project. This is why we are only allowed to take charge of scientific coordination, and Nic Lampkin from the University of Wales is responsible for administrative management.

Who are your project partners?

Matthias Stolze: We are working on the project with colleagues at the universities of Hohenheim (D), Ancona (I), Wales (UK) and Warsaw (P) and the German Federal Agricultural Research Station in Braunschweig (D), the Research Institute of Agricultural Economics in Prague and the International Center for Sustainable Development in Ljubljana (Slovenia). A few years ago, we successfully carried out a project on the impacts of EU agricultural policy with most of these partners. We are well established as a team.

Three of the eight project partners are from eastern Europe, why is that?

Matthias Stolze: There are major differences in the development of organic agriculture and the political support it receives in western, central and eastern Europe. In eastern Europe, organic agriculture only gained in importance in the 1990s. Organic products are usually produced on behalf of western processors – the domestic market tends to be underdeveloped. Although there is state support through acreage premiums or loans at low interest rates, a greater incentive is that producers can earn significantly higher prices by exporting organic products rather than conventional produce. Central and eastern European farmers can convert large areas to organic production within extremely short timescales because in the communist and post-communist era they frequently had no choice but to use low-input land management.

With EU enlargement, the concern is to integrate these

different systems under one common set of political framework conditions and a common market. Therefore the key question in this project is how agricultural policy needs to be designed for organic farming in Europe, and how EU enlargement will impact on the organic sector.

What other goals will the project pursue?

Matthias Stolze: We want to present political decision-makers with a sound basis to assess whether the right conditions exist for a policy to promote organic farming, and how this policy could be developed further. In order to make such a policy feasible, possible collisions between interest groups must be anticipated, so we are also investigating the interplay of actors and representatives of particular market and political interest groups. Originally this method of network analysis came from the political sciences. We are now applying it to the organic sector for the first time.

What benefits do you hope to achieve with network analysis?

Matthias Stolze: We are conducting research directly at source – only this time, not among farmers and on farms but among political players and their organizations, in the foyers and lobbies. We are looking into the way that the political system functions. In this way we can identify barriers and issue specific relevant recommendations to policymakers. *ta*

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14,000 hectares ripe for conversion? Berlin summons our expertise

As the 19th century turned to the 20th, the city of Berlin deliberately bought up farms close to the city to create banks of land and to secure the city's food supply. The management company Stadtgüter mbH Berlin now manages around 14,000 hectares distributed over the nine farm units of Joachimsdorf, Sputendorf, Grossbeeren, Wassermannsdorf, Birkholz, Albertshof, Schönerlinde, Lanke and Wansdorf.

The management company is now interested in selling around three-quarters of its shares to a private consortium. The city has requested that the new owners should convert to organic agriculture if at all possible.

Two arms of FiBL join forces

The management company commissioned FiBL to undertake a conversion and viability study for the nine farm units. This assessment is to serve as the basis for negotiating the sale.

"A conversion plan for farms of this size can only be managed by means of efficient cooperation among a number of specialists," believes Matthias Stolze, project coordinator. Anita Idel of FiBL Berlin adds: "This commission has been our first opportunity to prove the united strength of FiBL Berlin and FiBL Frick."

Three phases of planning

In order to come up with reliable pricing assumptions as a basis for calculating economic viability, the FiBL project team first worked with the external market expert Wolfram Dienel to analyse current and potential marketing channels. This revealed that marketing efforts for farms of this size needed to target national and international markets.

The next step was for business administration professional Siegfried Hartnagel to check the individual farm units for potential obstacles to conversion. With their 6000 dairy cows, livestock farming along with market fruit production is a main focus of current production. Together with the livestock expert, Anita Idel, he calculated the investment costs necessary to bring the housing up to the requirements of the EU Regulation on organic animal husbandry.

Calculations of the economic viability of conversion of crop production and livestock husbandry revealed that:

- Four farms can be converted to organic agriculture without major difficulties;
- Two farms are only of limited suitability for organic farming. This is due to their current patterns of land use and because the land includes former sewage fields (for disposal of municipal wastes);
- Three farms are very unsuitable for organic agriculture. The amount of investment required to replace fully-slatted floors, to increase the space for lying down and to improve ventilation in the housing would be much too great. Additionally, these are also farms that include land formerly used as sewage fields. The potential contamination of the soil is not compatible with organic management.

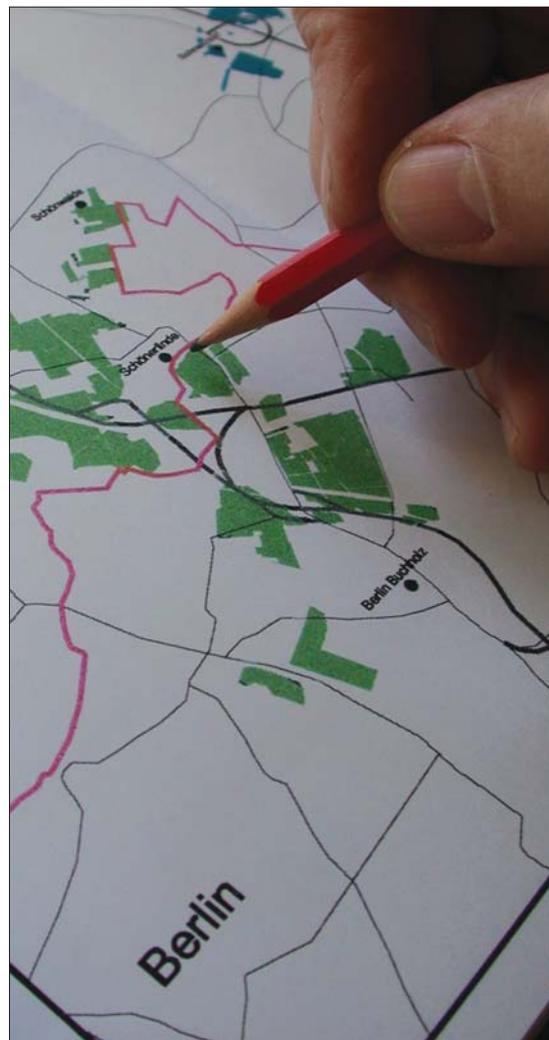
What the city gains from organic conversion

In his assessment of the environmental services provided by farm conversion, the environmental economist Matthias Stolze came to the conclusion that conversion of the farms to organic agriculture would have positive impacts on the region in terms of biodiversity, landscape design, groundwater protection and the recreational and scenic value of the landscape. He found that the value of the city farms to the city of Berlin encompassed the external effects of this multifunctionality as well as the purely financial proceeds of privatization. "Thanks to the professional synergies between Berlin and Frick we were able to deliver this report on time," Matthias Stolze sums up. The team had just two months in which to accomplish this comprehensive assessment.

Around Berlin, the city owns 14,000 ha of farmland distributed over nine farm units. Parts of these are soon to be sold to a private consortium and placed under organic management. FiBL Berlin and FiBL Frick examined the feasibility of this plan.

ta

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*Training
and extension*



www.oekolandbau.de: Tailored information on the Web

The Internet and organic agriculture – how does that match?

Frank Wörner: Organic agriculture with its production techniques is every bit as contemporary as the communication medium of the Internet. The two go together very well.

Who is the target audience of the new website (address not yet decided), for which FiBL Berlin and Stiftung Ökologie & Landbau (SÖL) – Foundation Ecology & Agriculture and the German Centre for Documentation and Information in Agriculture (ZADI) have been jointly responsible since May 2002?

Robert Hermanowski: The target audience consists firstly of practitioners and experts in agriculture, processing, trade and non-domestic catering, with access through so-called 'expert portals'. 'Public portals' will target consumers, including children and young people as a target group in their own right. The new Internet portal is intended to give them rapid access to up-to-date and comprehensive information.

What is new about this website? There are already a whole range of sites on this theme.

Wörner: The information available on the Internet does not cover all of the issues by any means. On the contrary, there are many gaps in the information available. Also, much of the information is scattered about on the web. Hence the task is firstly to repackage information for the Internet and develop new content, and secondly to channel existing information. If there is factually based and comprehensible information elsewhere on the Internet, we will indicate it with a commented link.

Very briefly, what will be the structure of the new website?

Hermanowski: It is primarily founded on a broad

range of background information. In a way it is a reference work on all the key areas of organic agriculture. Secondly there will be a news section filled with the most up-to-the-minute information. Thirdly it will have a service section including addresses, reading tips and web links. And fourthly it will deal with special themes by presenting all the information on a theme in a way that appeals to the target group and is relevant to practice. A most important strand running through this will be online tools to support users in their daily work, for example a 'crop rotation planner' for farmers or a 'sausage calculator' for organic butchers.

What is FiBL's contribution?

Hermanowski: FiBL is involved in the project management and the provision of content. FiBL Berlin is playing the coordinating role in project management. Frank Wörner and Rolf Mäder are coordinating the content-related and technical procedures for the project; I am the project leader and publicity officer. The Frankfurt project office is managed by FiBL. And of course FiBL is contributing a substantial volume of material to the site, in that FiBL Berlin and FiBL Frick are providing content to be developed for Internet use.

Is it actually possible to reach the target groups over the Internet? There is always speculation about how many farmers even have access to the Internet.

Wörner: That is a crux question, whether farmers actually have Internet access, and of course it is a basic prerequisite. We looked at the statistics beforehand to find out how many farmers use the Internet and what information they want to find on it. The figures showed us that many farmers are relatively inexperienced users of the Internet. Adding the many complete beginners into the equation, this is something that we will have to take into consideration.

FiBL Berlin is working with other partners to set up a comprehensive Internet portal on organic agriculture by the end of 2003. The client is the German Federal Ministry of Consumer Protection, Food and Agriculture (BMVEL). – An interview with project manager, Robert Hermanowski and project coordinator, Frank Wörner.



The Internet portal is a product of teamwork – combining content, editing and technology.



The organic networkers:
Robert Hermanowski (left)
and Frank Wörner

Within the target groups, in some cases there is a very broad spectrum to cover. Practitioners, for example, may range from a small family farm in the Black Forest to a large-scale operation in former East Germany.

Wörner: Our concept responds to this in that we have set up three possible levels of access. The knowledge to be found on the website can be divided into beginners' knowledge, practitioners' knowledge and expert knowledge. Anybody can pick out precisely the package of information that they need.

Is there not a danger that the website will overload visitors by bringing up too many unduly complex themes? How can people get informed without being swamped?

Hermanowski: Here again the concept of the three access levels (beginners/experts/practitioners) should help users to keep things in perspective. Because not only is there great divergence in interests between target groups, but also each individual person has an individual need for information – regardless of whether they are male or female, a farmer interested in conversion, an organic farmer, a trader or a consumer. All of them want to find tailored information quickly. That is what it is all about. In which case, less can really be more: Less content, better presented, means better quality information.

The objectives of the project also include motivating visitors. What is meant by that?

Wörner: We want to appeal to those who visit the website not just with what it says but also how the information is presented. The website should motivate people to become better informed on organic agriculture, not just once but time and again. It is meant to arouse their interest in organic farming.

Interview: mm

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from the beginning of October 2002:
www.oekolandbau.de

Electronic portal on organic farming

The Internet portal (www.oekolandbau.de) shall make it easier for all target groups to find their way around in the world of organic farming, and provide them with information comprehensively, efficiently and in tune with users and their needs. It targets practitioners, experts and consumers. The Internet portal will be financed within the scope of the German Federal 'Organic Agriculture' Programme. The project launch was in May 2002. The portal has been established jointly by the Research Institute of Organic Agriculture – FiBL Berlin e.V., Foundation Ecology and Agriculture – Stiftung Ökologie und Landbau (SÖL), Bad Dürkheim and the German Centre for Documentation and Information in Agriculture (ZADI), Bonn.

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Organic farming: more than replacing chemical fertilizers with slurry

“Apart from production techniques the training and education of prospective organic farmers should also place more emphasis on the background to organic agriculture and cover its basic tenets in more depth”, says Robert Obrist, Head of the BIO SUISSE Education Committee. The respect for the essence of soil, plants, animals and people in one’s daily contact with them should be given a stronger emphasis in training.

Integrated into conventional training and education

As part of the training course “Agriculture with special emphasis on organic farming”, as is provided in the Cantons of Bern, Baselland, Grisons, Zug and Zurich, the trainees have to spend at least one year of their apprenticeship on an organic holding.

The third year is spent at an agricultural college as usual. There the trainees have the opportunity to acquire additional knowledge on organic farming. The majority of classes are taken together with the prospective conventional farming colleagues. As a result, there is often not enough time to study the basic tenets and the background of organic agriculture in depth. Furthermore the discussions for and against organic farming in the classrooms are not always very constructive.

Greater depth through independence

BIO SUISSE aims to gradually establish its own centre of expertise, in order to offer more in-depth study opportunities in the field of organic agriculture. In 2001 Robert Obrist and the BIO SUISSE Education Committee jointly developed a concept for such a centre and submitted a project proposal to the Federal Office for Professional Education and Technology.

“It is simply not enough to substitute the slurry tank for the fertilizer bag, or the homeopathic medicine for the antibiotics – organic farming is more than that!”, says Obrist. For this reason the focus of training and education on production techniques should be extended to better include those aspects that make up the essence of organic farming.

A number of surveys both in Switzerland and abroad confirm that there is demand for such more in-depth training. Following a start-up phase at FiBL in Frick, this organic college would, if Obrist’s ideas come to

fruition, transfer to a cantonal agricultural training and advisory centre.

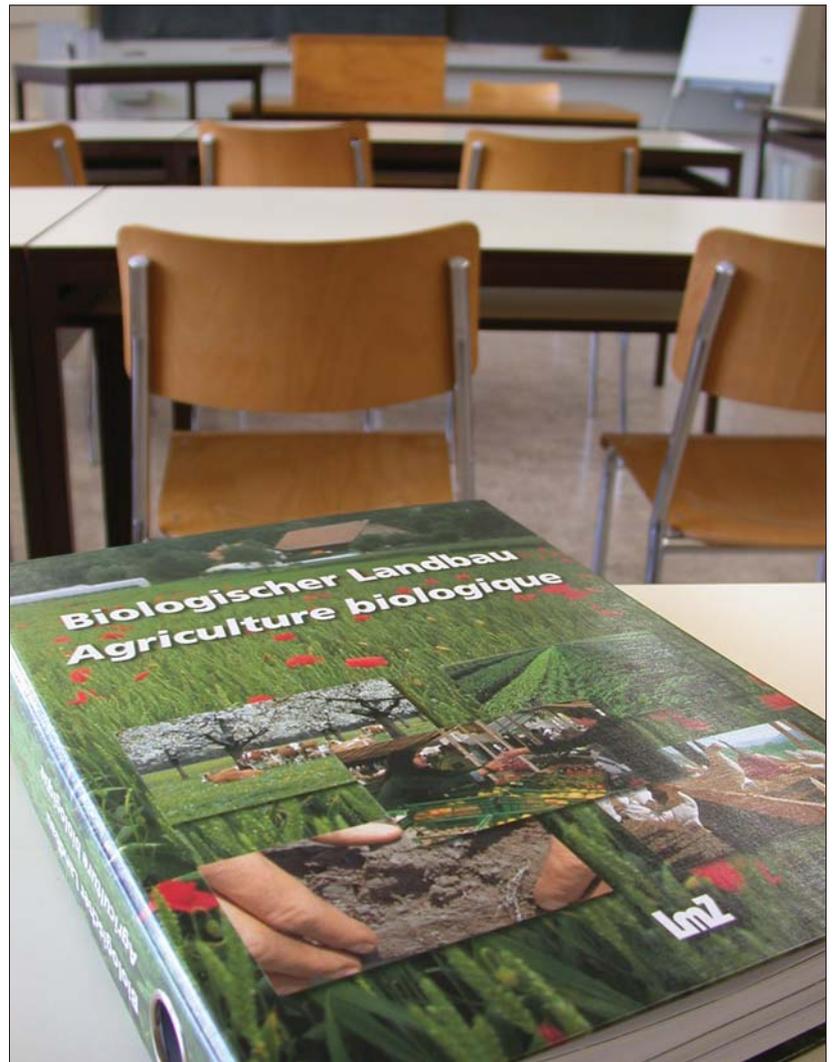
However, a first attempt to train prospective organic farmers in a “3rd apprenticeship year pilot project” failed due to political resistance from farming circles. Arguments such as “dividing agriculture”, “no new professions” and the competition of agricultural education centres for a dwindling number of apprentices have led to the project’s failure.

Nevertheless Obrist is optimistic: “Organic research has also been able to establish and distinguish itself over the past few years, despite massive resistance. This is not least due to the support received from the farmers. The same is bound to happen in the educational arena. This is what we will work towards.” *ro/ta*

An increasing number of agricultural colleges offer courses such as “Agriculture with special emphasis on organic farming”. Such organic courses are integrated into conventional training. BIO SUISSE aims to establish an independent centre of expertise. However, as yet there is strong resistance.

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When will Switzerland have a dedicated organic college?



BIO SUISSE training centre at FiBL

BIO SUISSE is accredited by the Federal Office for Professional Education and Technology as a professional organization and it therefore shares responsibility for issues in training and education for organic farming. BIO SUISSE has set up an Education Committee which has its office at FiBL in Frick.

This committee looks after a number of education projects as well as an “apprenticeship exchange” at www.biolehrstellen.ch.

FiBL publications: Attractive presentation of organic know-how

FiBL's publications put the results of FiBL research into the hands of farmers, advisers and other interested parties.

Many of FiBL's publications are available in several languages and are disseminated internationally.

FiBL technical data sheets are an indispensable aid for practitioners. They provide concise information on individual themes and demonstrate solutions to key problems. The technical data sheets contain four-colour illustrations throughout. There are FiBL technical data sheets on almost all the main crops and on many cross-cutting issues such as pest control or nutrient inputs in vegetable production. A growing range of livestock management issues are also dealt with in the form of technical data sheets. Additionally, FiBL offers numerous address lists and notes on recommended varieties. The website www.fibl.ch or the FiBL secretariat can provide an overview.

Dossiers to keep pace with the times

FiBL dossiers provide comprehensive information on topical issues in organic agriculture. They are important as sources of information and for reference in debate, for anyone with a special interest. Dossiers published to date are

- Dossier No. 1: Results from a 21 year old field trial. Organic farming enhances soil fertility and biodiversity
- Dossier No. 2: Plant Breeding Techniques. An Evaluation for Organic Plant Breeding

FiBL manuals and practitioners' files summarize all the specialist knowledge in one particular thematic area relevant to organic farming practitioners. FiBL manuals are in preparation on biodynamic agriculture and animal health.

Open channel for educational media and advisory material

In future FiBL will increasingly make its information available in electronic form. Even now, the Checklist 2002 for conversion consultancy in Switzerland is available on CD-ROM. The manual used by many advisers contains a complete listing of the key points for conversion to organic production under the BIO SUISSE Knospe label, including checklists and forms in Excel format, along with information sheets, address lists and reference works in PDF file format. Sample pages of the checklists can be viewed on FiBL's website, www.fibl.ch ('Publications' section). The FiBL transparency collection for practitioners and consultants will also be available on CD-ROM. For the German food information service AID (AID Infodienst Verbraucherschutz • Ernährung • Landwirtschaft e.V.) FiBL Berlin devised a transparency collection appealing primarily to consumers.

Commissioned by the International Federation of Organic Agriculture Movements IFOAM, FiBL has developed training materials for organic agriculture in the tropics. This 'Training Manual' provides full instructions for practitioners and contains numerous transparencies.

bio aktuell: the journal of the organic movement

In collaboration with BIO SUISSE, FiBL publishes the journal *bio aktuell* (French *bio actualités*; 10 issues per year). The magazine deals with themes of organic agriculture, the organic market, agricultural policy and social issues surrounding the organic movement. The magazine is developing increasingly into a platform for debate, and readers always have the last word. The target readership of *bio aktuell* is the organic movement: Organic farmers, organic advisers, processors of organic foods, everyone involved in the continuously expanding organic market and all who take an interest in the diverse and lively organic scene.

Ökologie & Landbau: Critical and competent

Stiftung Ökologie & Landbau (SÖL), the German Foundation Ecology & Agriculture is the publisher of the journal *Ökologie & Landbau*, primarily addressed to scientists and specialists. A cooperation arrangement has existed with FiBL since 1997. Each of its four annual issues contains articles by FiBL staff as well as the column 'News from FiBL'. The journal is addressed to agricultural scientists, students, agricultural policy makers, consultants and practitioners in organic farming, along with the food processing industry and food trade.

Internet presence is gaining ground

FiBL offers several Internet sites on organic agriculture: Information on both institutes can be accessed at www.fibl.ch and www.fibl.de. As time passes, both sites will be supplemented with more specialist content from FiBL in all subject areas of organic agriculture, and developed into comprehensive information resources.

FiBL Germany had great success in attracting orders for Internet-based work. Working with SÖL, it is realizing an Internet platform on organic agriculture for the North Rhine-Westphalian Agriculture Ministry, and one for the Federal German Ministry of Consumer Protection, Food and Agriculture (www.oekolandbau.de). The construction of the latter website accounts for a volume of finance of EUR 3.6 million. This makes it the best-financed organic agriculture site on the web, and hence in the world. FiBL strives to use this platform to present all key information on organic agriculture in an attractive and accessible way, both to organic professionals and to the general public.

FiBL also manages Internet sites on special issues in organic agriculture:

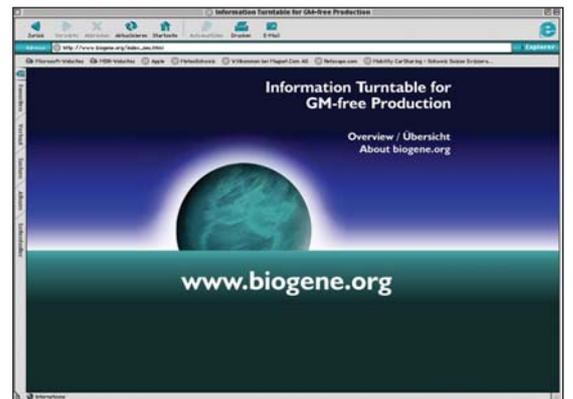
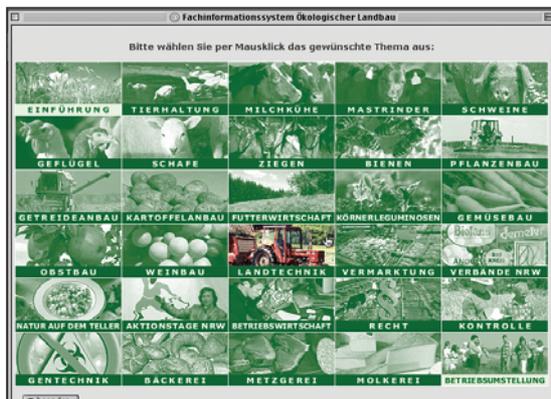
- Seeds (www.organicXseeds.com)
- Genetic engineering and organic agriculture (www.biogene.org)
- Organic farming research (www.organic-research.org).

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A selection of FiBL publications.





fiBL.ch and fiBL.de produce a range of Web pages on special issues in organic farming, and maintain a presence at the principal trade fairs.

New impetus for organic cherry production

Cherry production has a long tradition in north-western Switzerland, and it is an important enterprise on many holdings. However, those who wish to produce cherries organically face a whole array of pests and diseases: winter moth, cherry fruit-fly, black cherry aphid, and leaf spot disease (*Clasterosporium carpophilum*) all cause trouble but the key problem is the fungus *Monilia laxa*.

It is because of *Monilia* that many holdings in north-western Switzerland do not dare to convert to organic production. The Canton of Baselland has been financing FiBL's research and advisory projects in pursuit of this goal for many years now.

Tests conducted on pilot holdings

Andi Häseli, fruit production expert at FiBL, was able to draw on some experiences with direct and indirect control measures for *Monilia* gathered over the past years.

His FiBL colleague, Lucius Tamm, concluded from research for his PhD thesis that a good pruning regime combined with the meticulous removal of fruit mummies can very much reduce the *Monilia* problem. And Andi Häseli had previously also tested the efficacy of numerous organic plant protection products for the fungus.

"It was our aim to establish whether it is possible to successfully produce organic cherries using all the direct and indirect measures in an optimum manner", Häseli explains. "For this purpose we chose four organic holdings and one IP holding, with cherry production as an important enterprise, and where the farm managers take a strong interest in cherry production."

Over the following four years Andi Häseli and the five farm managers pulled all the stops in plant protection: they achieved better results with more efficient sticky bands for winter moths, they used an improved trap for cherry fruit flies, and a new generation of organically acceptable plant protection products gave hope for combating *Monilia*.

Yield instabilities hamper market development

In addition to cultivation techniques, Andi Häseli has also worked intensively on marketing. Together with the relevant BIO SUISSE special commission he launched marketing campaigns and sought solutions jointly with wholesalers.

However, the sales never quite developed momentum. The quantities delivered were too small for the markets and fluctuated substantially. Despite a few partial successes Andi Häseli concludes after his four years of research that organic cherry production can hardly be economic given current production methods. He adds that "we have to completely restructure stone fruit production on organic holdings".

Separate systems for dessert cherries and cherries for processing

For the production of dessert cherries, Häseli sees a future only with dwarf trees. Canopies are to protect the cherries from *Monilia*. Such systems have already been used for some time in integrated production in order to protect the large-fruited varieties from splitting. In organic orchards such canopies would also protect the flowers from *Monilia* attacks.

Paul Nussbaumer in Aesch (Baselland) is one of the few organic cherry producers who has had the courage to erect such a canopy over his cherry orchard. Andi Häseli will continue to support and advise him over the coming years. After all the set-backs in organic cherry production Häseli has become rather cautious: "While the canopy will reliably protect the cherries from *Monilia* we have to make sure that it does not generate new problems."

And what about the standard trees that are so prominent in the landscape? Andi Häseli is convinced that "if these were replaced with robust varieties that allow for harvesting with shakers the production of cherries for processing and distilling could definitely become economic again. This would allow for the maintenance of the region's scenic qualities into the future." *ta*

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Organic cherry producers have to deal with enormous difficulties. Their most feared enemy is the disease *Monilia*. It leads to yield instabilities and thus hampers the establishment of regular distribution channels. Stone fruit production on organic holdings must be restructured; otherwise it will be at risk.

Andi Häseli: "We have to restructure stone fruit production on organic holdings."



An approach for the future of cattle rearing

FiBL is showing new ways in organic cattle rearing. FiBL advisor Eric Meili developed the Bio Weide-Beef® programme (organic pastured beef cattle). This has resulted in an interdisciplinary research project.

The FiBL “Bio Weide-Beef®” approach, i.e. the fattening of beef cattle breeds in connection with a strict pasturing regime, has become the standard method of organic beef production over the past few years in Switzerland. ‘Organic pastured beef cattle’ is more than just a fattening strategy. It is an overall concept providing a new baseline strategy for organic cattle rearing, and links milk and meat production closely. The idea for the project came from FiBL advisor Eric Meili, and it has developed into an interdisciplinary research project financed by Migros.

Taking the future into our own hands

Eric Meili is convinced that “in the next few years there will be radical changes in both dairy cattle and in beef cattle rearing in Switzerland.” It would thus be in the interest of the organic farming sector to take the future into its own hands. He asserts that ‘organic pastured beef cattle’ is an efficient concept which will be able to meet future challenges.

The ideal the FiBL advisor envisages is a community of cattle farmers who specialize in the various cattle rearing enterprises. The dairy farmer would split his/her herd into a breeding herd and a beef herd. The breeding herd would be bred with bulls of a dairy breed while the beef herd would be bred with bulls of a beef breed.

The dairy farmers would rear the female offspring of the breeding herd as replacements while the male offspring would be sold on to partner holdings specialized in beef cattle rearing. The calves of the beef herd would result from cross-breeding with beef breeds. They would be suckled for five months and then sold on to partner holdings producing “Bio Weide-Beef®”.

Supply and demand are growing steadily

All finishers report the stock upon purchase to the “IG Bio Weide-Beef” organization which then can keep track of the exact number of animals being fattened. The abattoirs can thus be given monthly predictions of how many animals they can expect for slaughter. Over the past few years both supply and demand have grown steadily, and presently approximately 30 animals are slaughtered per week. “IG Bio Weide-Beef” works together with two market partners, i.e. the cattle trading company Linus Silvestri AG and Migros Ostschweiz, a major food wholesaler in Eastern Switzerland.

In the initial phase all supplies went to Migros Ostschweiz which now obtains 15% of its fresh meat from the organic label. The organic meat can also increasingly be found in the self-service counters of Migros branches.

Research accompanies programme establishment

The establishment of the organic pastured beef cattle programme is being supported by a research and

implementation project financed by Migros. Beat Bapst, a member of FiBL’s Animal Husbandry and Breeding Division, is the project head. In order to determine the current situation a strength/weakness analysis was carried out during the first year which yielded an overall very positive result for the programme.

As part of this analysis two consumer surveys were carried out. In the region covered by Migros Ostschweiz the FiBL marketing expert Toralf Richter looked at the consumers’ familiarity with the programme and their satisfaction with the meat quality.

He further visited all the Migros branches offering the label in order to assess the meat presentation and to see how well informed the Migros staff was. On the basis of the results from these ‘store checks’ he devised a training workshop for the Migros Ostschweiz butchers. Sigg Hartnagel, who also works with FiBL, calculated the economic impact on farm holdings of converting from dairying to ‘organic pastured beef cattle’. The results were used in an information leaflet which aids organic farmers contemplating participation in the programme in their decision-making process.

More pasturing – more parasites

The analysis of strengths and weaknesses has also shown that parasites present a problem for the ‘organic pastured beef cattle’ concept. Continuous access to pasture entails that there is a high risk of parasite infestation, particularly at the susceptible age. For this reason FiBL has initiated a research project on parasite infestation in organic cattle under the leadership of the parasitologist Hubertus Hertzberg.

Pricing à la organic

For the farmers price policy is an important reason for converting to ‘organic pastured beef cattle’ as in this programme the basic tenets of organic farming filter right through into the marketing sphere.

In the joint pricing meetings held by producers, retailers, and Migros a constructive negotiation culture has been established which is characterized by mutual understanding. As a result prices for slaughter animals have been relatively high and, importantly, stable over long periods. Even short-term oversupply situations do not negatively impact on prices. They are to be absorbed by way of a solidarity fund. This is another characteristic of an innovative, interdisciplinary FiBL project.

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Support the 'organic pastured beef cattle' (*Bioweidebeef*) project from pasture to shop counter: Toralf Richter, Beat Bapst, Eric Meili, Hubertus Hertzberg and Daniel Böhler (from left to right).

On a rainy day the phone never stops ringing

Since 1998 there has been an agreement between FiBL and the Swiss Conference of the Cantonal Directors of Agriculture, which recognises the key services offered by FiBL's advisory and documentation service. All German-Swiss Cantons as well as Freiburg, Valais and Tessin, and Liechtenstein pay an annual basic fee to FiBL which covers phone information services, documentation and a part of the courses on offer.

An increasing number of agricultural holdings and companies in the food sector wish to convert to organic systems. However, it is not always easy, especially for new entrants, to find their way around in the organic scene. "The need for information has grown significantly over the past few years" states Hansueli Dierauer, the Head of FiBL's Advisory Service. "Every day our advisory team in Frick receives numerous phone enquiries from all over Switzerland." The phone rings most on rainy Mondays. There is also an increasing number of enquiries coming in via e-mail. The offices of the external FiBL advisors Eric Meili, Martin Lichtenhahn and Paolo van den Berge are equally busy. "We can feel the pressure the farmers suffer. They expect an ever faster service. The enquiries mainly relate to standards, nutrient input/output accounting, fertilizers, livestock purchases, varieties, new production techniques, silage additives, weeds, pests and diseases, and even protection from crows and wild boars."

The information turntable at Frick

The FiBL advisors act as an information turntable. They pass on enquiries to experts within FiBL, or to third parties such as bio.inspecta or the relevant BIO SUISSE committees. The FiBL advisors do not just know who to contact on a particular issue, they are themselves experts in one or more fields (see Box). Especially the cantonal organic advisers, who need to cover all fields, like to draw on this expertise. Many of

FiBL's information leaflets and documentations could not have been produced without the advisors' practical knowledge and problem-solving abilities.

FiBL courses as meeting points

Every year the FiBL advisory team organises about a dozen training courses. Conferences on vegetable production, fruit production or tillage production are like 'class reunions' for the individual sectors. Other well-liked meeting places for the organic farmers are field visits and machinery demonstrations.

How can this continued success be explained? The FiBL training courses are the most rapid channel for disseminating the latest scientific findings. "Our advantage stems from the fact that our courses are offered in various parts of the country, and therefore we can reach more organic farmers", explains Hansueli Dierauer and smiles, "We don't know cantonal borders".

ta



FiBL advisors' areas of expertise (from left to right)

Res Schmutz	Organic standards, tillage production
Eric Meili	Livestock management
Stefan Heller	Feeds, feeding and feed production
Hansueli Dierauer	Tillage production, water resource protection, weeds
Andi Häseli	Top-fruit, grapes, soft fruit
Martin Lichtenhahn	Vegetable production
Paolo van den Berge (not on the picture)	Vegetable production, ornamentals
Barbara Früh	Pigs, chickens
Jean-Luc Tschabold	Fruit production (French-speaking Switzerland)

"FiBL's advisory publications set the standard"

"As an organic consultant I support farmers in conversion on their way into organic agriculture and support successfully converted farms in their day-to-day operations with suggestions, information and offers of training. Our farming clientele expects an organic consultant to have an extremely broad range of expertise: strawberry production, nutrient balances, housing conversion or direct marketing – the consultant must be able to supply input on all these areas. An impossible undertaking! That is why I am glad that FiBL exists. With its advisory publications, FiBL continues to set the standard in the organic sector. Although the requirements and procedures in organic agriculture are constantly increasing in complexity, these manuals are useful in practice because external training and extension experts are recruited to assist in updating them.

The FiBL advisory service is able to supplement our all-round provision when information is needed in specialist areas or when local advisors like myself reach the limit of our capacity in our own cantons. Cooperation with FiBL consultants is professional and constructive – even though, if you like, we are in competition with each other!"

Ueli Straub



Ueli Straub, organic consultant at Strickhof Agricultural College, Lindau/ZH

List of feedstuffs creates transparency and security

Many organic farms are dependent on bought-in feedstuffs. The Nitrofen scandal in Germany made it plain that the same stringent selection criteria are necessary for feedstuffs as for plant protection agents and fertilizers, in order to safeguard organic farmers and consumers from unpleasant surprises in future.

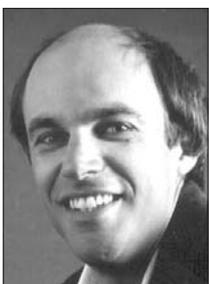
Complex animal feeding

Since the year 2000, Stefan Heller has maintained the FiBL list of approved feedstuffs, commissioned by BIO SUISSE. In two main categories, this document lists what may be fed to organically reared animals. Anything not on the list is not permitted ('limiting list'). The category of feed components, for instance, includes cereal or soya-cake while mineral feeds, trace elements and vitamins are found under the additives heading.

"Before the list of feedstuffs existed, there was a great deal of scope for interpreting the feeding standards" says the FiBL feedstuffs expert, looking back. According to Heller, one reason for this is that the feedstuffs industry offers its customers numerous advisory services free of charge. The livestock keepers gladly take advantage of this opportunity because it is very important to them to provide their animals with the right diet. It is also very complex to find the ideal mix of vitamins and trace elements. "In this way, many farmers delegate the responsibility for feeds to their feedstuff suppliers," states Heller.

Contact point for diverse needs

Heller's task is to check the composition of the feedstuffs for organic compliance. In this regard, he sees himself principally as a turntable for exchanging information and reconciling interests. Heller tries to ensure that his brief takes equal account of the concerns of organic farmers, veterinarians, the feedstuffs industry and the labelling and inspection organizations. Although over the years Heller has become a consultant specializing in feeds, he is glad to be able to draw on the expertise of his FiBL colleagues in specific problem cases.



Christof Dietler,
Managing Director
of BIO SUISSE

“ Organic meat and other animal products stand out not only due to particularly high-welfare animal husbandry. The quality of organic meat with the Knospe ('bud') label is especially high because organic feeds must be 100% organically managed. FiBL's expertise, and that of the competent expert Stefan Heller, helps BIO SUISSE to target critical points in the key area of feeding. ”

Christof Dietler

Difficulties arise when those involved only consider feed problems from one point of view. "The feeding issue calls for a holistic approach," emphasizes Heller. For example from the veterinary point of view, additives such as yeast or sodium bicarbonate are often recommended as pH-buffers in the rumen. But a diet appropriate to ruminants including a high proportion of raw feed renders such buffers completely unnecessary, according to Heller. Another substance, propylene glycol, administered as a source of energy for high productivity, is not really necessary if productivity is adapted to the forage base available.

Reducing dependencies

Particularly in the feeding of ruminants, the main problem is often that output is not adapted to the forage base of the farm. The constant increase in milk production widens the gap further, and the problem escalates.

In pig keeping, there is a widespread high dependency



A veritable clearinghouse on all things relating to feedstuffs: Stefan Heller (left)

on bought-in feedstuffs. Often a very high proportion of the pigs' diet is bought in. Since animal proteins are no longer allowed, the protein supply and in particular provision of the essential amino acid lysin has become more difficult. With poultry there is a similar situation as with pigs, except that here the problem is in supplying methionin.

Heller is convinced that the feeding of organically reared animals can only become more independent in future if breeding takes account of the needs of organic agriculture. But as long as the risk of BSE means the enforced incineration of large quantities of valuable proteins, a self-contained feed cycle will remain an illusion.

Heller hopes that solutions will soon be found to this problem to end this ecological nonsense. He sees it as a particular task of organic farming to point out ways of keeping the nutrients from slaughter by-products within the nutritional cycle. *ta*

Contact: stefan.heller@fiibl.ch

A united effort towards improving drinking water resources

The Swiss Confederation is offering an incentive programme for projects which are suited to reduce nitrate contamination of drinking waters. The six-year restoration programme in the Klettgau region in the Canton of Schaffhausen is one of eleven projects approved and financially supported by the Swiss Confederation. FiBL participates in this interdisciplinary project.

Three hundred and fifty Swiss municipalities are still struggling with excessive nitrate values in their drinking water supplies. Since 1999 the Confederation has provided 60 million Swiss Francs annually for measures reducing nitrate contamination. The cantons must clearly delineate a watershed and cover at least 20% of the costs of the measures in order to receive the funding. "The demands set by the government for these nitrate projects are very high", states FiBL advisor Hansueli Dierauer.

The project team in Klettgau consists of hydrogeologists as well as experts from the Swiss Federal Institute for Environmental Science and Technology, the cantonal civil engineering office, the cantonal laboratory and the cantonal agricultural office. It is Dierauer's responsibility that the most suited agricultural measures are actually implemented on the farms. His many years of experience with FiBL in sustainable tillage farming and in participatory implementation stand him in good stead in this work.

It is not a problem for Dierauer that the farms in Klettgau are exclusively IP holdings. Some of the holdings are becoming more and more interested in organic production. Conversion to organic farming is not necessarily a guarantor for an improvement in groundwater quality. However, according to Dierauer the problem would be largely resolved since organic farms, especially those with low stocking rates, must carefully manage their nitrogen resources. But the most important factor, says Dierauer, is the motivation of the participating farmers.

Catalogue of most effective measures

According to Dierauer "there are many recommendations for ways to reduce nitrate concentrations in groundwater. The question is how much the individual measures can really contribute to solving the problem." As a first step the project team compiled a catalogue of

the twelve most effective measures. These include such drastic measures as the establishment of extensive grassland on tillage fields or the re-structuring of entire holdings. However, measures such as converting to direct-drilling, the reduction of nitrogen fertilizer use by 20 percent, or the establishment of grass leys are included in the catalogue and are being reimbursed.

Farmers should have a say

In order to balance measures with reimbursements a number of workshops were held with interested farmers. FiBL's business management expert Siegfried Hartnagel calculated the economic impact of the measures on the affected holdings. He discussed the results with the participants and slowly but surely it emerged which of the measures would find the farmers' approval and what order of reimbursements would have to be attached to each.

Continuous monitoring of results

The above consensus is not all that is required. The Swiss Confederation wants to ensure that the demanded reduction to 35 mg nitrates per litre of water is really being achieved. Using the simulation programme "N-Sim" Hansueli Dierauer and the engineering firm Ökoge in Schaffhausen computed the impact of the measures selected.

"For example, we don't know exactly how much of a reduction in nitrates can result from direct-drilling on Klettgau's soils", says Dierauer. "Therefore we have set up test plots on three sites. One half of each site will be managed as before, on the other half we implement all possible measures from the catalogue. Once a month we measure nitrate concentrations in the gravitational water. In this way we can check and adapt our catalogue of measures." ta

Contact: hansueli.dierauer@fibl.ch

Six questions for Roger Biedermann, member of the project management team and Cantonal Chemist for the Cantons of Aargau, Appenzell, Glarus, and Schaffhausen.



Hansueli Müller, Neunkirch district councillor, and Roger Biedermann, cantonal chemist (right) in the Klettgau project area.

Most of the holdings in the Klettgau region are integrated producers. Why did the project management contract FiBL to carry out the study?

In the cross-border Interreg study "Entwicklungskonzeption Klettgaurinne" (Development Conception Klettgaurinne) FiBL has formulated pioneering economically and ecologically optimized proposals for the sustainable use of the Klettgau cultural landscape. We wanted to build on that expertise.

How would you appraise the project now that the first two of the six years have passed?

We are still in the start-up phase of the "Nitrate Reduction in the Klettgau Region Pilot Project". There is a great deal of interest from those concerned (farmers and municipal authorities) and it motivates us to do our work well.

Nitrates in drinking water supplies is an old problem. How come it still has not been solved?

The problem is not only the nitrates but nitrogen in general. The use of nitrogen must be optimized. Only if we release less nitrogen into the environment can we be successful throughout the country.

What is your assessment of the effort to yield ratio for such nitrate projects?

We deliberately chose the term "pilot project", amongst other reasons to be able to answer this very question.



The gravely soils in the Klettgau region are readily permeable and therefore greatly at risk of wash-out. Monitoring performance: The measures adopted are checked by means of suction cups.



Field visits and machine demonstrations show new opportunities to the farmers.



Based not only upon computer simulations: Performance monitoring on trial plots.

*International
cooperation*



All-round consultancy in Albania

Late summer in the hilly region of Albania. Annoying wasps feed on the sweet grapes on the vines, which twine archaically around ancient oaks.

Enver Isufi, an adviser from the Albanian Organic Agricultural Association (OAA) and FiBL consultant Martin Lichtenhahn inspect a wasp-trap trial. Various mixtures of sugar, vinegar and fermenting fruits are used as baits in the test. Thus using simple, locally available materials, the Albanian adviser succeeded in developing and perfecting an organically compliant method for wasp control for use in practice.

Accessing markets

Accompanying Enver Isufi on a visit to the OAA model farm of Pedrit Tresa, idyllically situated in the hilly country south of the capital city Tirana. The small farm is experimenting with organic agriculture. Pedrit produces vegetables such as tomatoes, melons and okra. Beside other products such as melons and free-

Wintry rain sets the scene on the Ionian Sea. On the Karaburuni peninsula in southern Albania, Lavdosh Ferruni, managing director of OAA accompanies the FiBL consultant Eric Meili to examine sheep and goat husbandry practices in the area. In winter the livestock herders use the meadows near the sea, in summer they move the herds up to alpine grazing at 2000-metre altitude. This traditional system based on seasonal movements works just as well now as ever. The two experts discuss with the livestock farmers specific aspects where milk processing could be improved.

Developing structures

At a workshop in Tirana, the leading figures in the OAA work with organic experts from Switzerland, Germany and the Czech Republic to develop a strategy for their organization. Who are our buyers, how strict should our standards be, how shall we brand our products?

In the framework of a project directed by the Swiss Agency for Development and Cooperation (SDC), FiBL experts are providing advice to the Albanian organic organization OAA. 'Capacity building' is to create the preconditions enabling OAA to develop into an independent organization, offering its own consultancy and professional training services.



range turkeys, the okra is popular and sells well in the nearby capital, now even commanding a higher price for organic quality.

It is typical of OAA projects that alongside agricultural production, efforts are also made to improve processing and access to markets. The principle is to provide agronomic consultancy only hand in hand with market development. For a short time, a few farmers have been running a joint OAA stall in the Tirana marketplace. Currently the main products on offer are teas and medicinal herbs, but in the next few months fruit and vegetables will be added.

Improving traditional systems

The two advisers, Isufi and Lichtenhahn, drive on towards Tirana. Close to the city in an old glasshouse, Arben Islami is producing fresh herbs according to BIO SUISSE standards, for export. The farm manager complains of fungal attacks on various herbs. The two advisors notice that the ground is much too moist. There has been excessive watering, and the pipes have also begun to leak. Drier growing conditions reduce the risk of fungal infection, an effective measure averting the need for plant protection agents.

In Albania, organic agriculture is only in the early stages of development. Due to material shortages, the first phase of the FiBL project is promoting 'low external input agriculture' (LEIA). This involves the farmers using techniques from organic agriculture, even though they have not yet obtained whole-farm organic certification. Where marketing opportunities allow, these will eventually become fully certified organic farms.

Organic agriculture is also an important choice for Albanian agricultural policy. National organic legislation, which is currently being developed, should create the right conditions for a regulated national market and for the export of organic products.

Counteracting rural exodus

Alongside agronomic expertise, in this project FiBL is also providing support in the areas of project management and planning. The OAA needs to be able to plan and implement projects independently in future. Only this will preserve jobs in the agricultural sector and counteract poverty and rural exodus

ml

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Communication at work: Martin Lichtenhahn (right) talking to Albanian farmers and at a workshop in Tirana. Jiří Urban (second from right) of Pro Bio from the Czech Republic is also providing consultancy.

INDOCERT: An independent certification body for India

Until now, organic inspection and certification in India has been carried out almost exclusively by foreign firms. This is very expensive. Often there is also a lack of adaptation to Indian problems and conditions. FiBL is helping to set up a local inspection and certification office.

The INDOCERT project came into being as a result of 'IFOAM 2000'*. Indian participants made contact with FiBL staff during the conference, asking whether FiBL could provide support for the establishment of a local inspection and certification office.

As a first step, the International Cooperation Division carried out a workshop in India with interested organizations. This meeting was a key milestone on the road to establishing INDOCERT. Subsequently participants collaborated on a business plan. The Swiss State Secretariat for Economic Affairs (seco) was willing to meet the financial start-up costs.

Moving towards independence

Work is progressing well; at the end of 2002, INDOCERT should be in a position to commence operations.

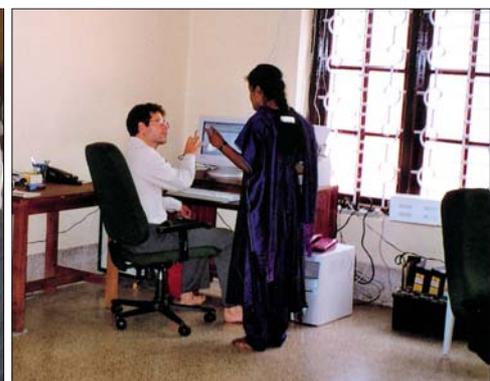
Following a phased plan, FiBL will then withdraw in stages from the project leaving INDOCERT able to

In India, organic farming is on the rise. Organic products are mainly produced for export (rice, cotton, spices, tropical fruits, tea and legumes). Gradually, though, a domestic market for organic products is emerging. The main reason for Indian consumers to buy organic products is their rising health consciousness. Ecological and social reasons carry less weight.

India strives for EU organic approval

The Indian government has also begun to take organic agriculture very seriously. It recently worked out its own detailed organic legislation, drawing heavily on the international basic standards and accreditation criteria set out by IFOAM.

The Indian government is endeavouring to be accepted into the European Union's 'third country list' so that India can export organic products to Europe in future without problems – an ambitious undertaking! With the introduction of the Indian organic law, an impor-



accomplish all phases of inspection and certification independently by the year 2006.

Until now, organic inspection in India has been almost exclusively in the hands of European and American companies. This often led to problems, not just because of the high costs generated in the developing country but also because there was often a lack of precise knowledge of local conditions, meaning that firms failed to adapt their work adequately to specific local problems.

Impetus for the Indian organic movement

"By setting up an independent local certification office, we would like to contribute to solving the problems associated with foreign certification," says Beate Huber, responsible within the project for the area of certification and accreditation. "However, inspection and certification are not the sole concerns of INDOCERT," adds project manager Frank Eyhorn: "We are also concerned with the development of the Indian organic movement, which can gain an identity of its own and fresh impetus from a local certification system."

* IFOAM, the International Federation of Organic Agriculture Movements, organizes an international conference every two years. In 2000, FiBL hosted the Organic World Congress in Basel.

tant status will accrue to INDOCERT as the only purely Indian certification body so far established.

FiBL is not only supporting the establishment of inspection and certification bodies in India. Similar projects are going on in Bulgaria and the Philippines, in each case involving cooperation with the Swiss firms bio.inspecta and Institute for Market Ecology (IMO).

hw

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Organic certification in China

OFDC, the Chinese inspection and certification body, is located in Nanjing, a former dynastic capital with an extensive history. With its five million inhabitants, Nanjing is only a medium-sized city in China.

The challenge begins in the taxi

At first glance, you notice few significant differences to major western cities. But as soon as you board the taxi and realize that even sign language is no help, and only the Chinese symbols on a sheet of paper can get you to the desired destination, you realize that communication between east and west is quite a unique challenge. How much of a change this is from 'little' Europe becomes clear when planning inspections, necessitating a one- or two-day bus or train journey or even the booking of a flight.

Peasant structures have been a thing of the past for some time; private ownership was abolished decades ago. The conditions of property ownership and busi-

ness structures are barely comprehensible to the western mind.

organize unannounced inspections so that the additional costs are not too great a burden on the farms? Together, Xie Biao, the quality assurance officer of OFDC, and FiBL expert Beate Huber are developing a new structure for documentation so that the inspector can later maintain a perspective over the flood of essential forms, manuals and procedural instructions. With Zhou Zeijang, chair of the certification commission, and Tai Chongmei, manager of the certification department, the inspection procedures are being critically questioned and the sanctions regime deliberated. Solutions are sought which are adapted to Chinese circumstances and can be put into daily practice. On the one hand, the high standards set in the west for a strict and efficient inspection system must be satisfied. On the other hand, the system developed must not be imposed by external or superior authorities; the inspection and certification staff and the farms themselves must be able to live by it and sustain it.

In the poor regions of western China, organic model farms, advisory bodies and a certification office have been set up over the last few years. The certification office now wishes to obtain IFOAM accreditation. Beate Huber of FiBL Germany is providing support.



ness structures are barely comprehensible to the western mind.

With FiBL towards international recognition

The certification body OFDC was established with assistance from Gesellschaft für technische Zusammenarbeit (GTZ, German Technical Cooperation). The project additionally includes the establishment of model organic farms, especially in the poverty-afflicted west of China, and the establishment of an advisory office. In the sixth and final year of project support, OFDC would like to attain IFOAM accreditation, in order to be recognized internationally as an inspection and certification body. FiBL is advising OFDC on its introduction of the strict international standards developed in the west for inspection bodies. "The consultancy is helping us to better understand the requirements for IFOAM accreditation and to put them into practice," says the managing director of OFDC, Xingji Xiao.

The Chinese inspection body struggles with the same problems as those in Europe: How does one carry out an 'internal audit'? How can the ban on genetically modified organisms best be policed? How does one

Certification in the south is also protection for the north

Commitment with hearts and minds to local organic inspection and certification also means added protection for organic agriculture in Europe. We can no longer conceive of our domestic markets without products like green tea, soy sauce, rice or sesame. An efficient system of inspection and certification in the countries of production prevents the import of organic food scandals. It can also contribute quite substantially to the development of regional markets for organic products.

The aim of the Chinese-German project is to combat the negative impacts of population growth and high rates of industrialization, because rural China is particularly at risk from soil erosion and environmental pollution.

bh

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With *appellation d'origine*: Organic citrus juice from Cuba

FiBL is monitoring the conversion of several major citrus production units in Cuba and supporting the marketing of organic citrus juices in Europe.



Conversion plan: Organic agriculture is a knowledge-intensive method of production. Conversion calls for new methods and the willingness to put these into practice with sensitivity to local conditions. Experienced consultants are working in close cooperation with Cuban institutions and FiBL to support the conversion process on citrus plantations.



Market: In Switzerland the fruit juices from Cuba are distributed exclusively by Coop. It is the first time that Cuban citrus juice has been sold with a label of origin. Coop is supportive of the developmental character of this project and has remained loyal to Cuban producers even after the severe loss of harvest due to Hurricane Michelle in autumn 2001. For the organic oranges, Cuban farmers receive more than double the price paid for conventional fruit.

Since 1997 FiBL has been collaborating on a project to set up organic citrus production in Cuba. The partners are IIFT, the institute for tropical fruits in Havana, Agricultural Services and Investments (ASI) from Lucerne, an investment group specializing in organic farming, and Sur Continente, a Chilean trading company in Havana. FiBL is monitoring the conversion of several major citrus plantations in Cuba and supporting the marketing of organic citrus juices in Europe. At the same time it is taking part in joint trials with the IIFT to improve production methods.

Consultancy services provided by FiBL include: Zu den Beratungsaufgaben des FiBL gehören:

- Consultancy on conversion, market analyses, economic studies
- Advice to cooperatives and the institute for tropical fruits on:
 - Plant nutrition, particularly nitrogen fertilizer application in the Cuban climatic conditions
 - Soil management and cover
 - Production of composts from local raw materials
 - Mechanization of soil cultivation and fertilizer application

Organic products for the international market are normally marketed by Cuban export monopoly companies in cooperation with European importers. Organic certification is currently geared wholly to export; a national market for organic products is a distant prospect. Preliminary discussions have been initiated on setting up a local organic certification body in cooperation with FiBL. *lk*

Contact: lukas.kilcher@fibl.ch

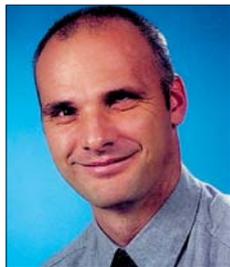


Inspection: Cuba still has no local organic certification body; all organic projects are certified by European firms. Bio.inspecta inspects and certifies the entire production chain for this project from the citrus cooperatives via the Cuban juice factories to packaging in Switzerland.



Compost: The main difficulty in making the transition to organic citrus production in Cuba is plant nutrition. The key to success in organic citrus production is a combination of legume undersowings and compost. The manufacture of high quality compost is primarily a logistical problem. Farms of a size of 200 ha or more require quantities in the region of 5000–10,000 tonnes per year. The mechanization of soil cultivation and fertilizer application calls for substantial investment.

“ Our investment group believes in organic agriculture because it allows us to achieve sustainability in numerous respects. As a joint coordinator for the Cuban organic citrus project, I bring together the economic interests of the investors and the Cuban partners. However, it is impossible for an individual to handle the detailed technical matters. Here competent consultancy is needed for decision making, as well as support in implementing this demanding project. FiBL offers both in a superb package. Thanks to its broad experience in organic agriculture – from production to market research – and thanks to its international integration, FiBL is an ideal partner for us. We especially appreciate its differentiated advice and great empathy for our needs, given the complex circumstances in our project locations. ”



Harald Horder, Agricultural Services and Investments GmbH (ASI)

Harald Horder



Soil protection: Heavy rainfall and high temperatures in Cuba speed up the mineralization of nutrients and slow down the accumulation of organic matter in the soil. Legumes are the most appropriate solution for soil management and cover and a substitute for herbicides. The selection of appropriate varieties is limited in Cuba due to the great shortage of seed.



Pest protection: In the tropics, diseases and pests proliferate rapidly. Most producers respond with massive applications of chemicals. But beneficial organisms also flourish abundantly under tropical conditions! Since the end of the 1980s, Cuba has invested in biological pest control – with great success. The efforts and progress made in this area brought the Caribbean island the alternative Nobel Prize from the Right Livelihood foundation in 1999. This experience is paying off enormously in Cuban organic agriculture.

*Financing projects
and activities*



Expenses and earnings in 2000 and 2001 (in Swiss Francs)

	2000	2001
Expenses		
Staff	6 026 492.35	5 919 226.65
Operating expenses		
• Project costs	3 067 700.70	1 851 380.28
• Infrastructure	910 189.21	971 471.20
Financial expenses	78 937.38	77 640.56
Depreciation	385 689.00	240 767.85
Net income	5 530.58	2 194.73
Total	10 414 539.22	9 062 681.27
Earnings		
Research	5 321 169.97	5 826 608.72
Advisory, service/information	3 651 465.65	1 482 901.57
International Cooperation	671 656.10	1 144 070.28
General donations	111 634.94	173 305.30
Working farm, agriculture	285 531.41	60 037.40
Catering	373 081.15	375 758.00
Total	10 414 539.22	9 062 681.27

FiBL Frick (Switzerland) is a charitable foundation funded by the Swiss Confederation and the cantons, by municipalities, companies, foundations, associations and private individuals.

Our clients, sponsors and contracting partners are listed on page 62. The project presentations in the annual report also note the respective financiers. Unfortunately, we are unable to present all of our projects in the annual report. However, we would like to express our sincere appreciation and gratitude to all who have sponsored FiBL.

About a third of the budget (43% from 2002) is provided by the Swiss Federal Office of Agriculture (BLW) and the Federal Veterinary Office (BVET).

In 2000 FiBL hosted the 13th International IFOAM Scientific Conference in Basel with 1700 participants from all over the globe. This briefly increased FiBL's turnover by 2.2 million to 10.4 million Swiss Francs. In 2001 the incoming funds for research projects have again increased by 500,000 Swiss Francs. The International Cooperation Division has also stepped up its activities in a major way (with an increase by 450,000 Swiss Francs). The increase in donations by 60,000 Swiss Francs is also most welcome. This allows us to engage in new and unconventional projects.

un

Research and development projects

Bundesamt für Landwirtschaft (BLW)
 Bundesamt für Veterinärwesen (BVET)
 Bundesamt für Bildung und Wissenschaft (BBW)
 Coop
 Weleda AG, Arlesheim
 Bundesamt für Umwelt, Wald und Landschaft (BUWAL)
 Migros-Genossenschaftsbund
 Gerling Stiftung
 BIO SUISSE, Basel
 Bundesamt für Berufsbildung und Technologie (BBT)
 Verein für Krebsforschung (Hiscia), Arlesheim

Alfa Laval, Kloten/Zuzo
 Amt für Umwelt und Landwirtschaft,
 Naturschutzinspektorat, Bern
 Arbeitsgemeinschaft Schweizerischer Rinderzüchter
 (ASR)
 Arbeitskreis Landwirtschaft und Tourismus, Schopfheim-
 Gersbach
 Baudirektion Kanton Fribourg, Abt. Natur- &
 Landschaftsschutz
 Bayer
 Bio Vin
 Biochemie, A-Kundl
 Bioland Regionalstellen: Oberbayern, Nordrhein-
 Westfalen
 Blieninger GmbH, D-Vilsbiburg
 Louis Bolk Instituut, NL
 Bundesanstalt für Landwirtschaft und Ernährung (BLE),
 Bonn
 Delinat AG
 Direktion des Innern und der Landwirtschaft Kanton
 Fribourg
 Eden Bioscience, F
 Evidenz-Stiftung, Arlesheim
 Fischer Wasserenergetik, D-Hohenschäftlarn
 Fonds Landschaft Schweiz FLS
 Hauert & Co., HBG-Düngerbetrieb, Grossaffoltern
 IFUL, Müllheim
 Institut für Natur-, Landschafts- und Umweltschutz
 (NLU) der Universität Basel
 Kant. Fachstelle für landwirtschaftlichen Bodenschutz
 und Düngung, LBBZ, Frick
 Kanton Aargau
 Kanton Baselland
 Kanton Basel-Stadt
 Kanton Bern
 Kanton Jura
 Kanton Luzern
 Kanton St. Gallen
 Kanton Zürich
 Kantonales Amt für Landwirtschaft Graubünden
 Kantonales Veterinäramt Graubünden
 Klinik für Geburtshilfe und Jungtier- und
 Eutererkrankungen, Universität Zürich
 Koordinationsstelle: Biotopverbund Grosses Moos
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The consolidated year-end financial statements and earning statements for the two years covered by the present report are available from FiBL, CH-5070 Frick, Switzerland, (phone +41 0)62 865 72 72.

Financing projects and activities

FiBL Berlin e.V. is a charitable association financed entirely through projects. There is presently no prospect of support from the federal German government or from the governments of the regional states of Germany. Due to the lack of basic financing, FiBL Berlin must take a cost-covering approach to all projects. This places very high demands upon efficient and cost-effective working procedures, and upon project acquisition procedures.

FiBL Berlin commenced business activities in May 2001. The main concern in the start-up year was to acquire projects and set up the office in Berlin. In order to minimize start-up costs, in the year 2001 most staff were only remunerated for services actually rendered, on a freelance basis. In 2002, after it had become clear that contracts were developing well, these were taken on as salaried staff.

Due to the complicated requirements placed upon year-end accounts of charitable associations in

Germany, these accounts were not yet available for the year 2001 for FiBL Berlin when the present report went to print. Turnover totalled approximately Euro 110,000. Revenue came mainly from projects for the city of Berlin (for an expertise on the agricultural holdings owned by the city), the German regional state (Land) of North-Rhine/Westphalia (for an organic farming information system), the German food information service AID (for sets of overhead transparencies) and the German Federal Environmental Agency UBA (for a study on green genetic engineering and organic farming), as well as from financial support provided by the Forschungsring research grouping and the Zukunftsstiftung Landwirtschaft foundation for the establishment of an animal health coordination centre. The deficit for this start-up phase is expected to figure about Euro 50,000. We would like to use this opportunity to express our sincere gratitude to all clients, including those not named here. *bh*

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Director

Crop Production: Annual Crops

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DOK Trial, soil biology, mycorrhiza



Berner Alfred, Dipl. Ing.-Agr. ETH
Composting, fertilizers,
disease suppression, analytics



Fejfar Vit,
Ing. Chem.
Analytics, laboratory



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Soil biology, soil ecology



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Dipl. Ing. HTL
Field crop production experiments



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ornamental plants, analytics

Seed

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research and seed production issues



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Dipl. Ing.-Agr. ETH
Seed database

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fruit production experiments

Plant Protection: Phytopathology

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homologation, organic plant protection products



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Slugs and snails, potato varieties



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entomology, pests



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Plant Protection: Beneficials, Habitat Management

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Agri-environmental programmes



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Production of vegetables and ornamentals

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phone, general secretariat



Schindler Maja,
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Williner Stefan,
Personnel, accounting



Zimmermann Maria,
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and

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(as of July 2002)**

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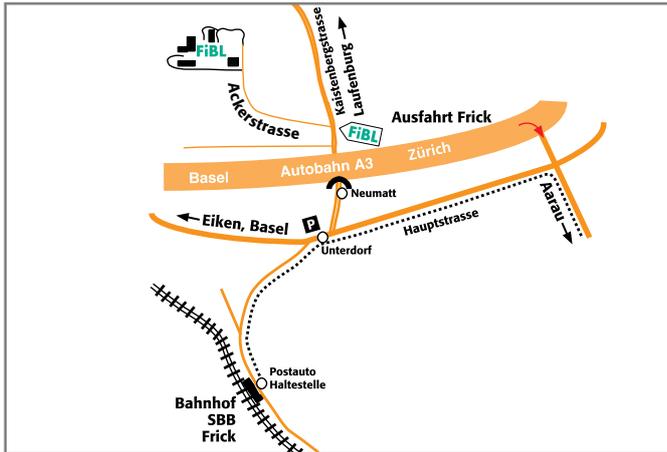
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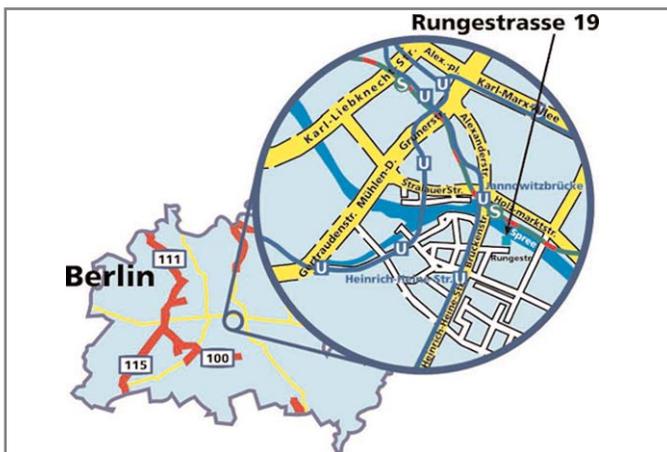
The activity report is also available in German and in French

For a list of publications, an overview of the current FiBL-projects and a listing of the memberships of the FiBL staff in official commissions see www.fibl.ch and www.fibl.de

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