

## ACHIEVEMENTS AND CHALLENGES IN SWISS ORGANIC AGRICULTURE

Jürg M. GRUNDER<sup>1</sup>

University of Applied Sciences, Wädenswil, Switzerland

### ABSTRACT

Currently, there are 6300 organic farms in Switzerland, which manage 117'800 hectares biologically (Federal Statistical Office). That is 11% of the total agricultural area. Nearly 6,000 organic farms are a member of the Bio-Suisse. In 2006 in Switzerland Organic Products were implemented in a total of 1.2 billion francs. That's about 4.5 percent of the food market and corresponds to a consumption of 170 Swiss francs per person. This calculation shows, that Switzerland is world champion in the use of organic products. The organic market currently growing about twice as fast as the overall market. The principal benefit for organic farms is the label premium, i.e. the 15 - 50% higher prices that organic farmers earn for their products. Secondly, they benefit from the measurable progress in improving market access for the labeled products. The label "Suisse Garantie" specifies our bio -products. The label sets clear standards for production and processing and ensures a continuous, independent inspection and certification system. "Bio Suisse", a private-sector organization, is the federation of Swiss organic farmers. This umbrella organization counts 32 organic farmers' associations among its members, as well as the Research Institute of Organic Agriculture, FiBL."

1 Bio Suisse is standing for natural diversity on the organic farm, ethologically sound livestock management and feeding, no use of chemically synthesized pesticides or fertilizers, No use of genetic engineering, no use of unnecessary additives. The Swiss Research Institute of Organic Agriculture (FiBL) was founded in 1973 and is situated in Frick since 1997. It is one of the world's leading information and documentation center for organic agriculture and employs over 135 experts. The close links between different fields of research and the rapid transfer of knowledge from research to advisory work and agricultural practice are FiBL's strengths. Still, we found stagnation since 2009 of new farms changing to organic farming. There are some top problems in plant protection to be solved. Many trials have been conducted on resisting pests and diseases by promoting beneficial organisms, applying direct control measures, and improving cultivation techniques. New alternatives and achievements in the scientific research will be discussed.

**Key words:** organic agriculture, Switzerland

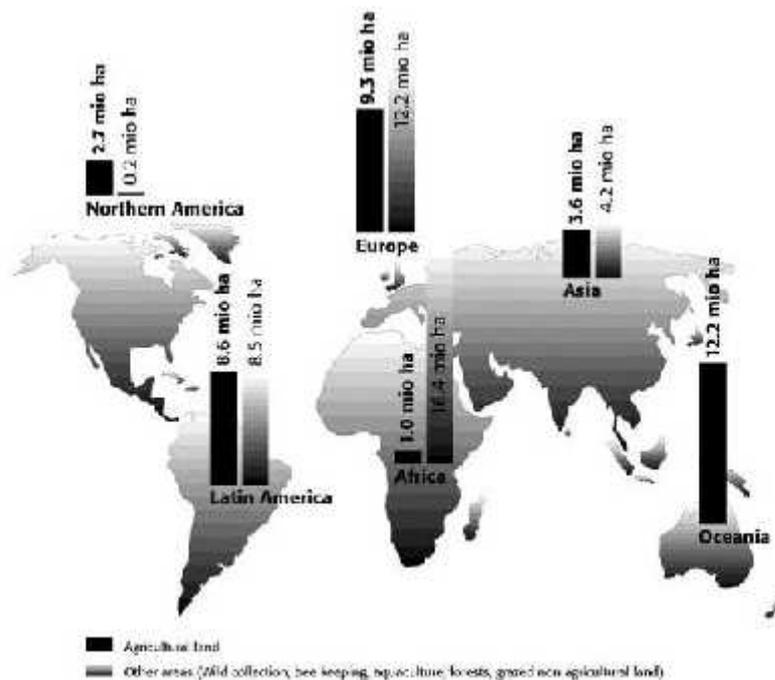
Organic agriculture is based on: The principle of health - the principle of ecology – the principle of fairness - the principle of care (IFOAM, 2012).

There are 37.2 million hectares of organic agricultural land (including in-conversion areas) worldwide. The regions with the largest areas of organic agricultural land are Oceania (12.2 million hectares, 33 percent of the world's organic agricultural land) and Europe (10.6 million hectares, 29 percent). Latin America has 6.9 million hectares (18.4 percent) followed by Asia (3.7 million hectares, 10 percent), North America (2.8 million hectares, 7.5 percent) and Africa (1.1 million hectares, 3 percent). For the detailed results of the FiBL (Forschungsinstitut für Biologischen Landbau / Swiss Research Institute of Organic

---

<sup>1</sup> Prof. Dr., Grüental, CH-8820 Wädenswil

Agriculture) and IFOAM (*International Federation of Organic Agriculture Movements*) survey, The countries with the most organic agricultural land are Australia, 12 mio Ha (Willer, 2013).



2 Figure 1: Organic agricultural land and other organic areas / Source IFOAM, Survey 2011 (Willer, 2013).

Currently, there are 6300 organic farms in Switzerland, which manage 117'800 hectares biologically (Federal Statistical Office). That is 11% of the total agricultural area. Nearly 6,000 organic farms are a member of the Bio-Suisse. In 2006 in Switzerland Organic Products were implemented in a total of 1.2 billion francs. That's about 4.5 percent of the food market and corresponds to a consumption of 170 Swiss francs per person. This calculation shows that Switzerland is world champion in the use of organic products. The organic market currently is growing about twice as fast as the overall market. The principal benefit for organic farms is the label premium, i.e. the 15 - 50% higher prices that organic farmers earn for their products. Secondly, they benefit from the measurable progress in improving market access for the labeled products. The label "Suisse Garantie" specifies our bio-products. The label sets clear standards for production and processing and ensures a continuous, independent inspection and certification system. "Bio Suisse", a private-sector organization, is the federation of Swiss organic farmers. This umbrella organization counts 32 organic farmers' associations among its members, as well as the Research Institute of Organic Agriculture, FiBL."

Bio Suisse is standing for natural diversity on the organic farm, ethologically sound livestock management and feeding, no use of chemically synthesized pesticides or fertilizers, No use of genetic engineering, no use of unnecessary additives. The Swiss Research Institute of Organic Agriculture (FiBL) was founded in 1973 and is situated in Frick since 1997. It is one of the world's leading information and documentation center for organic agriculture and employs over 135 experts. The close links between different fields of research and the rapid transfer of knowledge from research to advisory work and agricultural practice are FiBL's strengths. Still, we found stagnation since 2009 of new farms changing to organic farming. But latest tendency shows up again. Many trials have been conducted on resisting pests and diseases by

promoting beneficial organisms, applying direct control measures, and improving cultivation techniques. New alternatives and achievements in the scientific research will be discussed.

FiBL (Forschungsinstitut für Biologischen Landbau / Swiss Research Institute of Organic Agriculture) is an independent, non-profit, Swiss research institute with the aim of advancing cutting-edge science in the field of organic agriculture. FiBL's research team works together with farmers to develop innovative and cost-effective solutions to boost agricultural productivity while never losing sight of environmental, health and socio-economic impacts. Alongside practical research, FiBL gives high priority to transferring knowledge into agricultural practice through advisory work, training and conferences. FiBL has offices in Switzerland, Germany and Austria and numerous projects and initiatives in Europe, Asia, Latin America and Africa. This year marks the 40th anniversary of FiBL, the Research Institute of Organic Agriculture.

Awareness of the environment has generally increased during the last couple of years, and has not failed to have an effect on agriculture. Farmers continuously face new demands requiring a more ecological approach to agriculture. This demand puts the farmers in a quandary: consumers ask for cheap foodstuffs, yet they require products to be produced in an ecological and animal-friendly manner. Furthermore, the taxpayer demands that state money ear-marked for agriculture be reserved to those farmers who produce as environmentally-friendly as possible. However, ecological production is not necessarily economically competitive. Therefore, a price has to be paid. Farmers seek to find a balance between economic viability and ecology.

Hardly any economic sector so often occupies the limelight of politics as agriculture. There is no other economic sector with its own Federal Office. A separate Agricultural Act and various ministerial orders regulate Swiss agriculture, and it is no accident that the agricultural sector, of all sectors, is so strongly regulated.

3

Agriculture controlled by the state with its fix prices and guaranteed delivery, soon led to overproduction and high costs resulting from surplus utilization. In the nineties, things changed fundamentally. Subsidies were replaced by direct payments, subject to certain requirements. Guaranteed delivery and fix prices gradually disappeared. Today, supply and demand determine the price. Farmers only receive financial support from the state if they meet the stringent conditions with regard to ecology and livestock rising. Thus, they are no longer simple producers of foodstuffs but bear a major responsibility for the maintenance of natural resources and cultivated areas. Modern agriculture will be heavily influenced by multi-functionality.

Agricultural policy remains a topic on the agenda of politicians. Increasing globalization and the EU market are further impending challenges Swiss agriculture must face.

Today, ecology is a material component of the primary and continuing education of farmers. The general rule is to produce with less dependence upon chemical fertilizers, pesticides or concentrated feed, and thus reverting to an extensive agriculture. Switzerland was one of the pioneers in the field of environmentally-friendly production methods in agriculture and remains a leading example for other countries.

Challenges in Swiss agriculture; Soil Fertility

Intensive agriculture has increased crop yields but also posed severe environmental problems. Sustainable agriculture would ideally produce good crop yields with minimal impact on ecological factors such as soil fertility. A fertile soil provides essential nutrients for crop plant growth, supports a diverse and active biotic community, exhibits a typical soil structure, and allows for an undisturbed decomposition.

An understanding of agro ecosystems is key to determining effective farming systems. FiBL (Forschungsinstitut für Biologischen Landbau / Swiss Research Institute of Organic Agriculture) report results from a 21-year study of agronomic and ecological performance of

biodynamic, bioorganic, and conventional farming systems in Central Europe. Over the years they found crop yields to be 20% lower in the organic systems, although input of fertilizer and energy was reduced by 34 to 53% and pesticide input by 97%. Enhanced soil fertility and higher biodiversity found in organic plots may render these systems less dependent on external inputs.



4

Figure 2: Biodynamic (A) and conventional (B) soil surface in winter wheat plots. Earthworm casts and weed seedlings are more frequent in the biodynamic plot. Disaggregation of soil particles in the conventional plots leads to a smoother soil surface. Wheat row distance is 0.167 m. Source: T. Alföldi, (FiBL)].

Mycorrhizae as members of the soil community ameliorate plant mineral nutrition and contribute to soil aggregate formation. Root length colonized by mycorrhizae in organic farming systems was 40% higher than in conventional systems.

The mission of FiBL's International Division is to develop and promote sustainable agricultural and marketing systems in developing and transitional countries in order to improve the well-being of poor rural households and to increase overall access to sufficient amounts of good-quality, fairly-priced food. FiBL's International Division specializes in research and extension in developing and transitional countries to help them to develop organic sector and market. Division members collaborate with thematic FiBL experts in other divisions to meet the specific needs of various private and public organizations. They cooperate with companies, non-governmental organizations and governmental agencies in planning, analyzing and implementing interventions to foster sustainable food production and marketing. They work with local partners and, if necessary, help them to build their strategic and operational capacities thus making a real and lasting difference. FiBL also shares its expertise with its partners to develop the technical, analytical, and communication skills of local staff. With almost 40 years of experience with organic farming and market and sector development worldwide, FiBL's International Division is a strong, flexible and efficient project partner. The extensive in-house capacities mean that we can draw on a wide range of thematic expertise. Based on their own media and networking channels through which communicate about their activities and achievements in the following three main areas: 1. Sustainable Food Production – applied research and extension activities to foster environmentally-friendly, quality, agricultural production. 2. Strategic Market Development – developing and enhancing business opportunities through sound value chain interventions and creating public awareness. 3. Policy and Sector Development – functional support for

improved legal and institutional conditions to provide a supportive environment for organic farming and food.

Search for replacements of copper, plant extracts instead of copper

For nearly twenty years, scientists of FiBL have been searching for ways to dispense with the controversial use of copper in organic agriculture. A few years ago it seemed that the research potential had been exhausted. Now there is renewed hope in the form of extracts from plants and microorganisms, new testing systems and scientific partnerships. The use of copper as a pesticide goes way back: this metal has been in use in agriculture for more than 150 years, and for more than twenty years FiBL has been looking for ways to cut back on or even eliminate copper use. Copper accumulates in soil and exerts long-term negative impacts on soil life. "Because it is effective against many different fungal and bacterial pathogens, copper is an outstanding pesticide. It is as versatile as a Swiss army knife," says plant pathologist Lucius Tamm. "Hence replacing copper means more than just finding a new product, but also developing many control strategies for a wide variety of diseases."

A key strategy in potato, grape and apple production is resistant varieties in combination with specific pruning techniques and hygiene measures. FiBL has already done much research and development work in this area. With the help of forecasting systems and improved application technology, organic farmers were able to cut back on copper use and substantially improve yield security. In the search for substitute products as well, FiBL experts have been successful in introducing alternative materials based on clay or potassium bicarbonate on the market. Give up or start all over again. They tested every possible substance produced by industry and research institutions. None of the products fulfilled the demanding requirements of everyday practice. It is still like looking for a needle in a haystack, says Tamm. But meanwhile, we have developed a testing system at FiBL that enables us to screen hundreds of extracts methodically and quickly for efficacy against various diseases. The federal stimulus programme enabled us to make crucial investments in equipment." The methodical searching of "libraries", a standard practice in private pesticide research and development, is the exception rather than the rule in other research because there is hardly any public funding available for such efforts. Hence the support from the Coop Sustainability Fund is of tremendous importance to the development of alternatives to copper. In collaboration with the University of Basel, Lucius Tamm and his team have tested over 1600 different extracts to date. Whether the proverbial needle is among them remains to be seen, although some very interesting candidates have turned up. Meanwhile the search for a copper substitute continues on a European level as well, with FiBL participation. The aim of the "Co-Free" project started in early 2012 is to further develop potential replacements for copper.

Organic farming is evolving continuously, and markets are becoming ever more differentiated. Novel challenges include fiber crop production and aquaculture. Organic convenience products are gaining ground, placing major demands upon food processing technology. Moreover, the poverty and food insecurity prevailing in many parts of the world are a prime concern of the international community and a serious challenge to farmers, extension workers and scientists. Organic farming remains vibrant and challenging.

## REFERENCES

- The IFOAM standard for organic production and processing. ISBN; 978-3-940946-99-7, 2012  
Maeder P. et al., Soil Fertility and Biodiversity in Organic Farming. Science 31 May 2002: Vol. 296 no. 5573 pp. 1694-1697.  
Willer H. The World of Organic Agriculture», FiBL, IFOAM, 1. Auflage, 344 Seiten, ISBN 978-3-03736-233-4, 2013.