

# Organic Farming, Prototype for Sustainable Agricultures

Stéphane Bellon • Servane Penvern  
Editors

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 Springer

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# Preface

## **Organic Farming—A Role Model for Productive and Ecologically-Sustainable Farming Systems**

Europe has been the pacesetter for organic farming for 40 years. The fact that between 10 and 20% of the farms and the agricultural land area have become certified organic in a few leading countries has attracted the attention of the scientific community and of policy makers. Scientific studies on public goods delivered by organic farms have become more numerous and encompass topical aspects such as soil fertility building, carbon sequestration, biodiversity at the plant, animal, and microorganism levels, and eutrophication of semi-natural and natural ecosystems, etc. Support schemes for farmers have compensated for the delivery of public goods.

The steady economic growth of the global organic food market has further fueled the public interest in organic agriculture. Is it a viable strategy that reduces the trade-offs between food and feed production on the one hand, while maintaining the regulating and supporting ecosystem services and landscape quality on the other? “Yes, but...” is the most often heard answer. “Yes” for the fact that organic farms are likely to reduce detrimental impacts on the environment and to maintain the quality of ecosystems. “But” because crop and livestock yields are, on average, less on organic farms. Without any changes to the wasteful way in which society handles, uses, and consumes food, a large-scale transformation of high-yielding farmland to organic cultivation might accelerate deforestation and (re)cultivation of ecologically-sensitive land.

The state-of-the art of scientific data on productivity is divergent and controversial. While the crop productivity of organic farms appears to be 0.7–0.8 of that of intensive farms in temperate zones, the yield ratio in marginal regions of Africa where subsistence farming is still widely spread, has been found to be in favour of organic farms. Hence, in resource- and income-poor countries, organic farming seems to offer an appropriate and low-cost way to increase productivity and to improve farm livelihood.

Despite its success in Europe and for specific cash crops on the world market, organic farming is still a niche, with only 1% of agricultural land under organic

cultivation worldwide. Organic agriculture is challenged to unlock its potential: both as a role model and a real pathway to sustainability in agriculture and food systems. As a farming system, it is knowledge-intensive and resistant to overspecialisation. This is a challenge for scientists, farm advisors and farmers, and needs to be addressed by improving education and by enabling participation and inter-disciplinary research.

The concept of eco-functional intensification goes far beyond the restrictive use of fertilisers and pesticides. It requires a fundamental redesign of farms and fields, and entails more co-operation within the organic sector. Accordingly, live-stock needs to be integrated into the nutrient and organic matter circuits in order to improve the robustness and resilience of both crops and animals, with the selection of well-adapted varieties and breeds. Finally, development pathways in organic agriculture also challenge agricultural sciences. While the basic principles of organic agriculture are persuasive and dynamic agroecological approaches, existing standards for the certification of farms and foods have become outdated. Creative research work and out-of-the-box thinking are needed to unleash social, ecological, and technological innovation in organic agriculture.

This book gives an outstanding analysis of what has been achieved, as well as an insight into what the future avenues for organic farming will be.

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The structure and content of the book is also the fruit of the many interactions we had with various colleagues: from our research unit, Ecodevelopment (INRA, Avignon, France); and during meetings of the Scientific Council of Organic Agriculture (CSAB) and the various activities of the Mixed Thematic Network dedicated to OF&F development (RMT DévAB). Many exchanges with various stakeholders in the French organic sector also encouraged us to move forward with this initiative. Mentioning all of them would be too long, but organic farmers and their representative organisations were indeed a major source of inspiration to address current issues and dynamics. At the international level, we highly benefited from the relationships established with people involved in research projects, conferences and events. In addition to allowing us to compare our ideas with those of other communities, it

also enabled us to improve our synthesis of the existing knowledge, to discover and appreciate other books, and to contribute to new projects. A pioneer scientist, Bertil Sylvander, requires special mention: he opened the way for research in OF&F at INRA, both with the CIAB and through international commitments. Concerning the editing of this book, we are grateful to Maryse Walsh (from Springer) who allowed us to see this book project through to the end.

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