

SIMBIO-VEG: an interdisciplinary project for improvement of organic systems and methods in arable and vegetable cropping

P. Bàrberi, M. Mazzoncini, F. Bigongiali, and D. Antichi

Abstract - SIMBIO-VEG is the first large interdisciplinary research project on organic farming ever being funded in Italy. The project partnership is composed of eight Working Units including Universities as well as public and private research centres and associations, with a high degree of interaction among them. SIMBIO-VEG aims to acquire knowledge on the functioning of organic arable and vegetable cropping systems, as to (1) optimise systems management and the cultural practices (methods) therein, and improve the understanding of how organic systems and methods influence produce quality and environmental impact. SIMBIO-VEG activities are structured in four strongly integrated research lines. Line 1 aims to understand the functioning of organically-managed agroecosystems and evaluate the technical and agronomic feasibility of crop production methods applied therein. Line 2 aims to evaluate the effects of organic systems and methods on overall produce quality, including both standard and innovative methods. Line 3 aims to evaluate the sustainability of organic systems and methods through assessment of parameters and indicators related to soil quality, environmental impact, and economic viability. Lastly, line 4 is aimed to favour diffusion of results and innovation transfer through a comprehensive set of activities.¹

INTRODUCTION

Italy is one of the countries in the world with the highest share (ca. 8%) of organically-managed land on total agricultural land (Biobank, 2005). Despite this, public national research funding for organic farming is still scarce. In 2001 the Ministry for Agricultural and Forestry Policies (MiPAF) launched the first Finalised Research Project on organic farming which, however, was mainly aimed to its own research institutes. Large-scale interdisciplinary projects on food quality and safety have recently been promoted by a joint venture of Ministries, coordinated by the Ministry for Education, University and Research (MIUR), under the umbrella of the Integrated Special Fund for Research (FISR). The FISR-funded SIMBIO-VEG project is the first large-scale

national interdisciplinary project on organic farming ever being conducted.

THE SIMBIO-VEG PARTNERSHIP

SIMBIO-VEG is a large (ca. 2.1 million €) three-year (November 2005–November 2008) applied research project coordinated by the Sant'Anna School of Advanced Studies of Pisa. It includes eight Working Units (WU), many of which are composed of sub-units, representing the best available nation-wide expertise on organic farming research (Table 1). Vertical WUs represent the sites where field experiments are carried out. Mixed WUs are partners that besides conducting field experiments provide their expertise (e.g. specialised laboratory analyses) for all the vertical WUs. Project Management is based on a Steering Committee promoting full time interaction among research partners and between them and other stakeholders (e.g. pilot farmers), aimed to continuous evaluation and reorientation of activities.

Table 1. The SIMBIO-VEG partnership.

Working Unit (WU)	Type of WU	Number of sub-units
WU 1: Sant'Anna School of Advanced Studies, Pisa ^a	Vertical	1
WU 2: University of Firenze	Mixed	-
WU 3: University of Perugia	Mixed	1
WU 4: University of Padova	Vertical	-
WU 5: Research Centre for Crop Production (CRPV), Cesena ^b	Vertical	1
WU 6: Italian Association for Organic Agriculture (AIAB) ^b	Mixed	2
WU 7: Ministry of Agriculture-Institute of Plant Nutrition (CRA-ISNP), Rome ^c	Mixed	2
WU 8: Ministry of Agriculture-Institute of Cereal Crops (CRA-ISC), S. Angelo Lodigiano ^c	Mixed	2

^aPublic University, ^bPrivate partner (e.g. cooperative or association), ^cPublic research institute. For the explanation of vertical and mixed WU: see text.

P. Bàrberi and F. Bigongiali are with the Sant'Anna School of Advanced Studies (SSSUP), Land Lab, Piazza Martiri della Libertà 33, 56127 Pisa, Italy (barberi@sssup.it).

M. Mazzoncini is with the University of Pisa, Department of Agronomy and Management of the Agroecosystem (DAGA), Via S. Michele degli Scalzi 2, 56124 Pisa, Italy (mazzo@agr.unipi.it).

D. Antichi is with the University of Pisa, Interdepartmental Centre of Agri-environmental Research (CIRAA) E. Avanzi, Via Vecchia di Marina 6, 56010 S. Piero a Grado (Pisa), Italy (danymatrix@tiscali.it).

THE SIMBIO-VEG PROJECT

SIMBIO-VEG is a comprehensive project that aims to acquire knowledge on the functioning of organic

arable and vegetable cropping systems, as to (1) optimise systems management and the cultural practices (methods) therein, and improve the understanding of how organic systems and methods influence produce quality and environmental impact. In the end, project results should benefit a variety of end-users such as farmers, consumers, and policy-makers. One of the major goals of SIMBIO-VEG is to highlight the relationships between systems and/or methods of organic management and overall produce quality (food technological, nutritional, health, safety, and sensorial values). Special emphasis is put on the optimisation of methods (e.g. soil tillage, fertilisation, green manure, pest and weed control) *within* organic systems. As such, all the three scientifically rigorous long-term experiments comparing conventional (or integrated) and organic farming presently being run in Italy (in Pisa, Firenze and Perugia) are included in the Project. Two of them are also part of the ISOFAR Long-Term Experiments (LTE) Committee (ISOFAR, 2005).

SIMBIO-VEG activities stem from results of concertation between farmers, the food industry, technicians, certification bodies, scientists, administrators and consumers on the definition of research priorities for organic farming in Italy, carried out in the 1999-2002 period and in which many SIMBIO-VEG partners took an active role.

SIMBIO-VEG activities are structured in four strongly integrated research lines (Fig. 1) that contribute to meeting the overall Project objective. Each line includes several specific objectives with correspondent sub-activities and expected results. The comparison between conventional (or integrated) and organic systems is limited to those issues for which clear results are needed but still lacking, e.g. food and soil quality parameters.

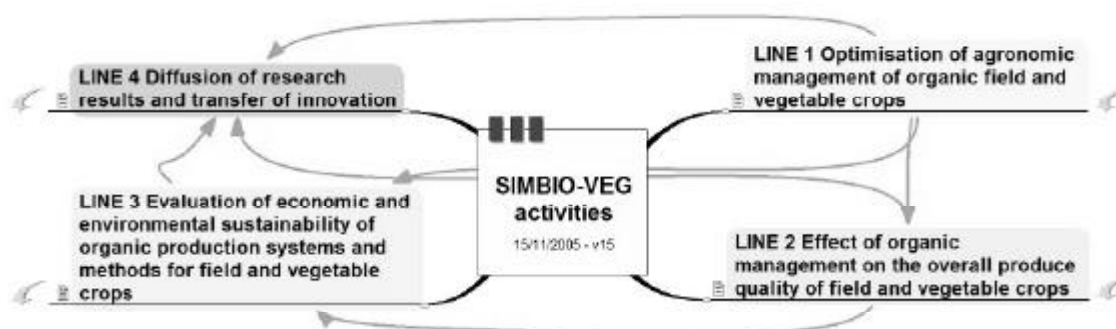


Figure 1. Programme of research activities envisaged in the SIMBIO-VEG Project.

Line 1 aims to acquire the knowledge necessary to (1) understand the functioning of organically-managed agroecosystems and (2) evaluate the technical and agronomic feasibility of crop production methods applied within organic systems. This line mainly involves vertical WUs, where some of the most representative Italian field and vegetable cropping systems are being studied and improved. Involvement of the above-mentioned LTEs allows to conduct research in field-scale experiments which have been converted to organic agriculture >8 years ago, thus representing a very sound situation for organic farming research.

Line 2 aims to evaluate the effects of organic systems and methods on overall produce quality, including both standard (e.g. analysis of nutritional value, health effects, attitude to food processing, mycotoxins and pesticide residues) and innovative (e.g. sensorial analysis) methods. Where possible, organic and conventional produce coming from the same long-term experiment are being compared. Samples coming from the research sites included in Line 1 are selected in such a way to understand causal relationships between crop management and produce quality.

Line 3 aims to evaluate the sustainability of organic systems and methods through assessment of parameters and indicators related to (1) soil quality and environmental impact (physical, chemical, biological and energy use-related parameters) and (2) economic viability (also through appropriate comparisons with commercial organic farms). Systems global sustainability will be assessed by means of a research methodology employed in a previous European Network on Integrated and Ecological Arable Farming Systems (Vereijken, 1997).

Line 4 aims to promote diffusion of project results and innovation transfer through a comprehensive set of popularisation activities. These include the organisation of events of information and knowledge exchange between scientists and farmers, through both direct (conferences, workshops, mixed scientists/farmers working groups, extension fora, field days), classical indirect (reports, scientific and extension papers, production of technical booklets and dossiers) and innovative indirect (e.g. online discussion forum) activities. Transfer of innovation will also be conducted through a panel of pilot farms representative of all the agricultural areas taken into account by SIMBIO-VEG. Further information will soon be available at: www.simbioveg.org

REFERENCES

- Biobank (2005). Statistics on organic farming in Italy. Available: www.biobank.it
- ISOFAR (2005). ISOFAR Committee on Long-Term Experiments (LTE). Available: <http://www.isofar.org/sections/wg-long-term-experiments.html>
- Vereijken P. (1997). *European Journal of Agronomy* 7, 235-250.