Prof. Dr Paolo Bàrberi

Curriculum

- Born at Seravezza (Lucca, Italy) 20 August 1964.

1. Academic record

- Dec 1989: MSc in Agricultural Sciences, University of Pisa, Italy (110/110, cum maxima laude).
- Sep 1994: PhD in Environmentally-Sound Innovative Crop Management Practices, University of Pisa, Italy.
- 1994-1996: Research Assistant at the Interdipartmental Centre of Agri-Environmental Research “E. Avanzi”, University of Pisa, Italy.
- Nov 1996-Jun 2000: Assistant Professor in Agronomy and Field Crops at the Department of Crop Production, University of Tuscia, Viterbo, Italy.
- Jul 2000-May 2006: Assistant Professor in Agronomy and Field Crops at the Class of Experimental Sciences, Sector of Agricultural Sciences, Sant'Anna School of Advanced Studies (SSSA), Pisa, Italy.
- From 1 Jun 2006: Associate Professor in Agronomy and Field Crops at Land Lab, SSSA.
- From 1 Jun 2009: Professor in Agronomy and Field Crops at Land Lab (from 1 January 2011: Institute of Life Sciences), SSSA. Head of the Agroecology research area.
- November 2013: National Scientific Habilitation as Full Professor in Agronomy and Field Crops.

2. Research activity

2.1 Agroecology and functional agrobiodiversity

- Optimization of organic and low-input cropping systems through the use of functional agrobiodiversity at genetic, species and/or habitat levels: selection and/or combination of attributes (traits) related to the provision of agroecological services (participative on-farm research and on-station research):
    - Genetic diversity in arable and vegetable cropping systems: (i) cultivar mixtures, (ii) evolutionary (composite cross) populations, (iii) cover crop species and/or cultivar mixtures: effects on yield, yield quality, weed and disease suppression, soil fertility.
    - Species diversity in arable and vegetable cropping systems: (i) cover crops, (ii) living mulches, (iii) cover crop mixtures: effects on yield, yield quality, weed and disease suppression, competition with cash crop, soil quality.
    - Habitat diversity in arable and perennial (olive) cropping systems: interactions between field margin complex structure, vegetation composition, insect pests and natural enemies. Effects on potential in-field weed reduction

and biological pest control, and on trade-offs between these two agroecological services.

- Participatory research in sub-Sharan agricultural and agroforestry systems: (i) effect on species and management diversity on soil quality preservation (case study: Ethiopia); (ii) introduction of cover crop (*Stylosanthes guianensis*) to improve weed suppression in no-till rainfed rice systems (case study: Madagascar); (iii) empowerment of farmers capacity to increase sustainability through valuation and use of agrobiodiversity in agroforestry systems based on shea (karité; *Vitellaria paradoxa*), millet, sorghum and niébé (*Vigna unguiculata*) (case study: Mali).
- Agrobiodiversity and arbuscular mycorrhyzal fungi (AMF): (i) effect of genetic diversity (maize and tomato) and species diversity (cover crops, inoculated AMF) on cash crop growth, yield and quality and on soil quality; (ii) interactions between AMF, weeds, cash crops (maize) and cover crops.
- Conservation agriculture in organic and low-input arable and vegetable systems: effect of reduced- and zero tillage, cover crops and their species and functional diversity on cash crop yield, soil quality and weed suppression.
- Development of a weed functional traits database to (i) predict weed community dynamics as related to agroecosystem management and (ii) evaluate their potential provision of agroecological services and disservices.
- Dynamics of weed flora and vegetation as related to agricultural abandonment and urban sprawl at landscape level (case study: maize).
- Development of indicator systems to evaluate agronomic, environmental, socio-economic, and global sustainability in organic arable (livestock and stockless) and vegetable cropping systems. Case studies: (a) organic beef farm of the San Rossore Estate (Regional Natural Park of Migliarino-San Rossore-Massaciuccoli, Tuscany), (b) organic vagetable pilot farms in various Italian regions; (c) group of mountain livestock farmers in transition towards agroecological management (Giudicarie Valley, Trento, Northern Italy).

2.2. Weed ecology and management

- Analysis and dynamics of weed vegetation and seedbank (weed community structure and dynamics, species diversity/dominance patterns, functional groups) in organic and low-input arable and vegetable cropping systems.
- Comparison among different methodologies for weed seedbank analysis (seed extraction *vs* seedling emergence).
- Weed seed germination and seedling early growth as related to (i) biometric and morphological traits (e.g. seed weight and colour), environmental factors (light, temperature, stratification), management factors (e.g. presence of potentially allelopathic crop/cover crop residues, presence of AMF).
- Development of Integrated Weed Management Systems with an agroecological approach, through the combination of preventive, cultural and direct methods.
    - Preventive methods: (i) green manure crops and their species and/or cultivar mixtures, (ii) (dead) mulches: physical, chemical (allelopathy) and biological effects; (iii) use of soil amendments (e.g. compost); (iv) crop rotation/sequence optimization; (v) thermal methods (e.g. soil solarization, soil steaming with activating compounds).
    - Cultural methods: increase of crop competitive ability through (i) competitive cultivars and/or cultivar mixtures, (ii) living mulches, (iii) crop spatial arrangement, (iv) timing and placement of mineral nitrogen fertilizers.
    - Direct methods: (i) mechanical weed control (spring-tine harrow, precision hoe, torsion weeder), (ii) thermal weed control (flame-weeding).

2.3 Long-term organic and low-input arable cropping system experiments at field scale

- Effects on crop yield, resource use efficiency, resistance and resilience, energy efficiency, soil quality (physical and chemical characteristics, soil organic matter dynamics), weed suppression and community shifts, gross margins, and other agri-environmental parameters:
    - MASCOT (Mediterranean Arable Systems COmparison Trial). Comparison between conventional and organic management for a 5-yr arable crop rotation (start: 2000).
    - CIMAS (Conventional *vs* Integrated Management System). Comparison between conventional and integrated management for a 6-yr arable crop rotation (start: 1993).
    - COVER CROP. Comparison between four cover crops, two tillage systems (ploughing *vs* reduced tillage) and four mineral nitrogen rates in a low-input 4-yr arable crop rotation.
    - MABRO (MAize-Based ROtations). Comparison between different 2-yr and 3-yr maize-based conventional arable crop rotations with three mineral nitrogen rates.

3. Teaching activity

- 1997- : University courses at BSc, MSc and PhD level. Presently, he runs courses in Applied Agroecology, Weed Ecology and Management, Environmental Risk Assessment of Genetically Modified Plants, Principles of Tropical Agronomy (MSc level, in Italian), Research Methodology in Agrobiosciences, Principles of Agrobiodiversity (PhD level, in English), at SSSA.
- 2001- : Lectures (in Italian and English) in Agroecology, Environmental Agronomy, Integrated and Organic Agriculture, Agrobiodiversity at the University of Pisa, the Mediterranean Agronomic Institutes in Bari, Italy (CIHEAM-IAMB) and Chania, Greece (CIHEAM-MAICH), and in several courses for post-graduates and professionals organised by Italian Universities and other research and/or teaching institutions.
- 1999: invited to give a series of lectures and seminars at the Imperial College at Wye (University of London, UK).
- 2002: invited visiting professor at the Department of Agriculture, Western Australia (Perth): lectures, seminars, meetings with scientists, farmers and professionals, public relation activities.
- Invited as keynote speaker in several scientific conferences and summer schools in Europe and overseas.
- Sep 2007, Jun 2009, Oct 2010, Oct 2012: organised four International Summer Schools for PhD students at SIAF Volterra (Italy), as part of the activities of the EU-RTD FP6 Network of Excellence ENDURE and ENDURE-ERG (www.endure-network.eu). Subjects: (1) Biodiversity supporting crop protection; (2) Modelling approaches to support IPM; (3) New and emerging agricultural pests, diseases and weeds; (4) Agroecological engineering for crop protection.
- Feb 2007: co-organised the First International Winter School in Landscape Agronomy at SSSA.
- 2001-2005: coordinated a one-year post-graduate course in Promotion and Control of Food Quality (SSSA; 86% placement rate at 6 months).
- 2013- : Coordinator (member of Faculty since 2004) of the International PhD Programme in Agrobiodiversity (SSSA; www.sssup.it/agrobiodiversity), promoted by the National Academy of Sciences and funded by the Italian Ministry of University and Research (MiUR). From 2008 to 2013: Coordinator of Curriculum B (Functional Biodiversity in Agroecosystems).
- 2004- : member of Faculty of the PhD Programme in Agrobiosciences (SSSA).

- 2004-2008: Scientific Coordinator of a post-graduate specialisation course in Tropical Agriculture, Agroforestry, Pasture Systems and Rural Development (SSSA).

4. Affiliation and official duties in scientific societies, peer-review activities for scientific journals and research projects, project management

- He is one of the 19 founders of Agroecology Europe (established on 27 January 2016 at Domaine de Graux, Tournai, Belgium, www.agroecology-europe.org).
- Member of all the major international scientific societies active in weed science: European Weed Research Society (EWRS, 1996-), Weed Science Society of America (WSSA, 1996-), and International Weed Science Society (IWSS, 1996-). In the EWRS, he has served as Scientific Secretary (2002-09), Vice-President (2010-11), President (2012-13) and Past-President (2014-15).
- Member of the Executive Board of the Italian Weed Research Society (SIRFI, 2001-), Vice-President of the Italian Research Group on Organic Farming (GRAB-It, 2007-11) and Member of the Executive Board of the Italian Research Network on Organic Farming (RIRAB, 2009- ,Secretary 2009-12).
- Member of the Italian Society of Agronomy (SIA, 2000-), the International Society for Organic Farming Research (ISOFAR, 2005-), the Ecological Society of America (ESA, 2008-14), the British Ecological Society (BES, 2009-14), and the European Society of Agronomy (2015-).
- 1999- : organiser of 21 scientific symposia/workshops (7 national + 14 international) and chairman/session organiser in 26 international scientific symposia/workshops in Europe, Africa, America and Asia.
- 2006-2007: Field Editor of the international journal Agronomy for Sustainable Development (INRA, France; ISI Impact Factor 2015: 4.141).
- Member of the Editorial Board of the international peer-reviewed journals Herbologia (2003-) and Italian Journal of Agronomy/Rivista di Agronomia (2006-).
- Peer-reviewer of international scientific journals (Agricultural and Forest Entomology, Agriculture, Ecosystems & Environment, Agronomy for Sustainable Development, Annals of Applied Biology, Biological Agriculture and Horticulture, Crop Protection, Ecological Applications, Environmental Evidence, European Journal of Agronomy, Field Crops Research, Italian Journal of Agronomy/Rivista di Agronomia, Journal of Agronomy and Crop Science, Oikos, Organic Agriculture, PLOS One, Proceedings of the Royal Society-Section B, Soil and Tillage Research, Sustainable Agriculture Research, Weed Research, Agrochimica, Agricoltura Mediterranea, among others) and national scientific journals (Rivista Italiana di Agrometeorologia).
- Guest Editor of the Special Issue '2nd Congress of the Italian Network on Organic Agriculture Research (RIRAB)', Organic Agriculture, Springer (2014).
- Reviewer of PhD research projects/dissertations for the Wageningen University (The Netherlands), INPL Nancy, AgroParisTech, ISARA Lyon, Université de Bourgogne (France), Universitat de Barcelona and Universidade de Vigo (Spain), SLU Uppsala (Sweden), Universidad de Buenos Aires (Argentina), Banaras Hindu University, Varanasi (India), Università di Milano, Padova, Perugia and Torino (Italy).
- External Expert for the evaluation of researchers curricula, research units and divisions, Italian (ANVUR) and French (HCERES, formerly AERES) Agencies for the Evaluation of University and Research, INRA (France).
- Expert evaluator of research and demonstration projects in agriculture for the Ministry of University and Research (MiUR) and for Region Lombardy, Italy.
- Member of the Peer Review Panel "Arable Crop Sciences and Pesticide Safety" for the Department for Environment, Food and Rural Affairs (DEFRA), UK. Peer Reviewer of

research applications at the Biotechnology and Biological Sciences Research Council (BBSRC, UK), The Netherlands Organisation for Scientific Research (NWO, NL), the Swiss Agency for Development and Cooperation (SDC, CH), the International Centre for Research in Organic Farming Systems (ICROFS, DK), the CEnter for Synthesis and Analysis on Biodiversity (CESAB, FR), and the Rustaveli Foundation (GE).

- Expert evaluator of EU-RTD Projects: FP6, FP7 and Horizon 2020. Member of the External Scientific Panel, EU FP7 Project RUFUS (2008-10) and EU Horizon 2020 Project OK-Net Arable (2015-18).
- Member of the 'Environmental Risk Assessment' and 'Agronomic and Phenotypic Characterisation' Working Groups, European Food Safety Authority (EFSA) Panel on Genetically Modified Organisms (2011-).
- Member of the Panel for the Assessment of Biopesticides, EU Southern Zone (France, Greece, Italy and Spain) (2015-).
- External examiner of the BSc and MSc courses 'Tropical crop protection' and 'Weed Science', University of West Indies, St Augustine Campus, Trinidad & Tobago.
- External expert of the Italian Institute of Agricultural Economics (INEA); Leader of the Cropping Systems Working Group, Experts Group on Organic Farming (PQAI1, previously PQA5), Italian Ministry for Agriculture, Food and Forestry (MiPAAF, 2009-).
- Member of the Committee of Appeal for Valoritalia srl on issues regarding organic farming (2016-).
- 2005-2009: Scientific Coordinator of the national Research Project SIMBIO-VEG (Systems and methods of organic farming to improve the quality of produce and the environment; www.simbio-veg.org; budget: 2.1 million €; 2005-09).
- 2003-2008: Coordinator of the Monitoring Project of the San Rossore Estate (Migliarino-San Rossore-Massaciuccoli Regional Natural Park, Tuscany) organic farm.
- 2005- : Scientific Responsible for SSSA of the MiPAAF Projects FERTORTOMEDBIO (2005-2009), COMPARABIMUS (2010-2013) and COFICO (2011-2012) on soil fertility management through use of green manure/living mulches and compost in organic farming and on innovative non-chemical weed management strategies in organic vegetable farming.
- 2017-2020: Scientific Responsible for SSSA of the Autonomous Province of Trento Project RDP Measure 16.1.1 (Working Groups of the European Innovation Partnership) INVERSION (Agroecological innovations to improve resilience and sustainability of mountain livestock systems); Coordinator: Az. Agr. Cattafesta, S. Lorenzo Dorsino TN.
- 2004-2008: Scientific Responsible for SSSA of the IFAD-IPGRI/Bioversity and IFAD-ICRAF/World Agroforestry Centre Projects "Empowering Sahelian farmers to leverage their crop diversity assets for enhanced livelihood strategies".
- 2007-2010: Team Leader of SSSA in the EU-RTD FP6 Network of Excellence ENDURE (European Network for the Durable Exploitation of Crop Protection Strategies, www.endure-network.eu), in which he coordinated the sub-activity SA1.2 (Joint Educational Programme). Member of the ENDURE Network of Experts and delegate of Scuola Superiore Sant'Anna Director in the ENDURE Governing Council and in the ENDURE European Research Group (ERG, 2011-).
- 2010-2014: Team Leader of SSSA and coordinator of WP4 (Exploitation of diversity in crop management) in the EU-RTD FP7 Large Collaborative Project SOLIBAM (Strategies for Organic and Low-input Integrated Breeding and Management, www.solibam.eu).
- 2012-2015: Team Leader of SSSA in the EU-RTD FP7 Small Collaborative Project OSCAR (Optimising Subsidiary Crop Applications in Rotations, www.oscar-covercrops.eu).
- 2011-2014: Team Leader of SSSA and coordinator of WP4 (Improved weed management

and functional weed biodiversity under conservation methods) in the FP7 ERA-NET Core-Organic II Project TILMAN-ORG (Reduced TILlage and green MANures for sustainable ORGanic cropping systems, www.tilman-org.net).

- 2015-2018: Team Leader of SSSA and coordinator of WP2 (Crop-weed-soil interactions in organic conservation agriculture systems) in the H2020 ERA-NET Core-Organic Plus Project FertilCrop (Managing FERTILity building in organic CROPping systems, www.fertilcrop.net).
- 2016-2018: Team Leader of SSSA and coordinator of WP3 (Conceptual framework, requirements and scenarios) in the H2020 ICT Project CAPSELLA (Collective Awareness PlatformS for Environmentally-sound Land management based on data technoLogies and Agrobiodiversity, www.capsella.eu).
- 2017-2021: Team Leader of SSSA and coordinator of T1.1 (Assessment of performance and ecosystem services from on-farm innovative legume-based cropping systems) in the H2020 SFS-26 Project LEGVALUE (Fostering sustainable legume-based cropping systems and agri-feed and food chains in the EU).
- Responsible of the Memoranda of Understanding between SSSA and (a), the Slow Food Association, Bra (Italy), (b) the University of Costarica, (c) the Mediterranean Agronomic Insitutes of Bari, Italy (CIHEAM-IAMB) and Chania, Greece (CIHEAM-MAICH) and (d) the Institute of Agriculture and Animal Science, Tribhuvan University, Nepal.
- 2006- : member of the Slowfood International University Network "Terra Madre" on Sustainable Agriculture.
- 2015- : planner and scientific coordinator of the International Gateway to the Science of Agrobiodiversity (www.agrobiodiversity.science).
- Total external funds raised (2002-): 2,401,163 €.

Skills and awards

- Excellent in English. Fluent in French. Basic in Spanish.
- In 2005 he received a Special Mention for the dissemination of science by the Higher Secretariat of the President of the Italian Republic (Hon. Carlo Azeglio Ciampi).

Publications

- He has authored or co-authored ca. 280 national and international scientific papers, book chapters and editorships.

Further information

- Personal website: https://mail.sssup.it/~barberi/index.htm

Pisa, 31 July 2017