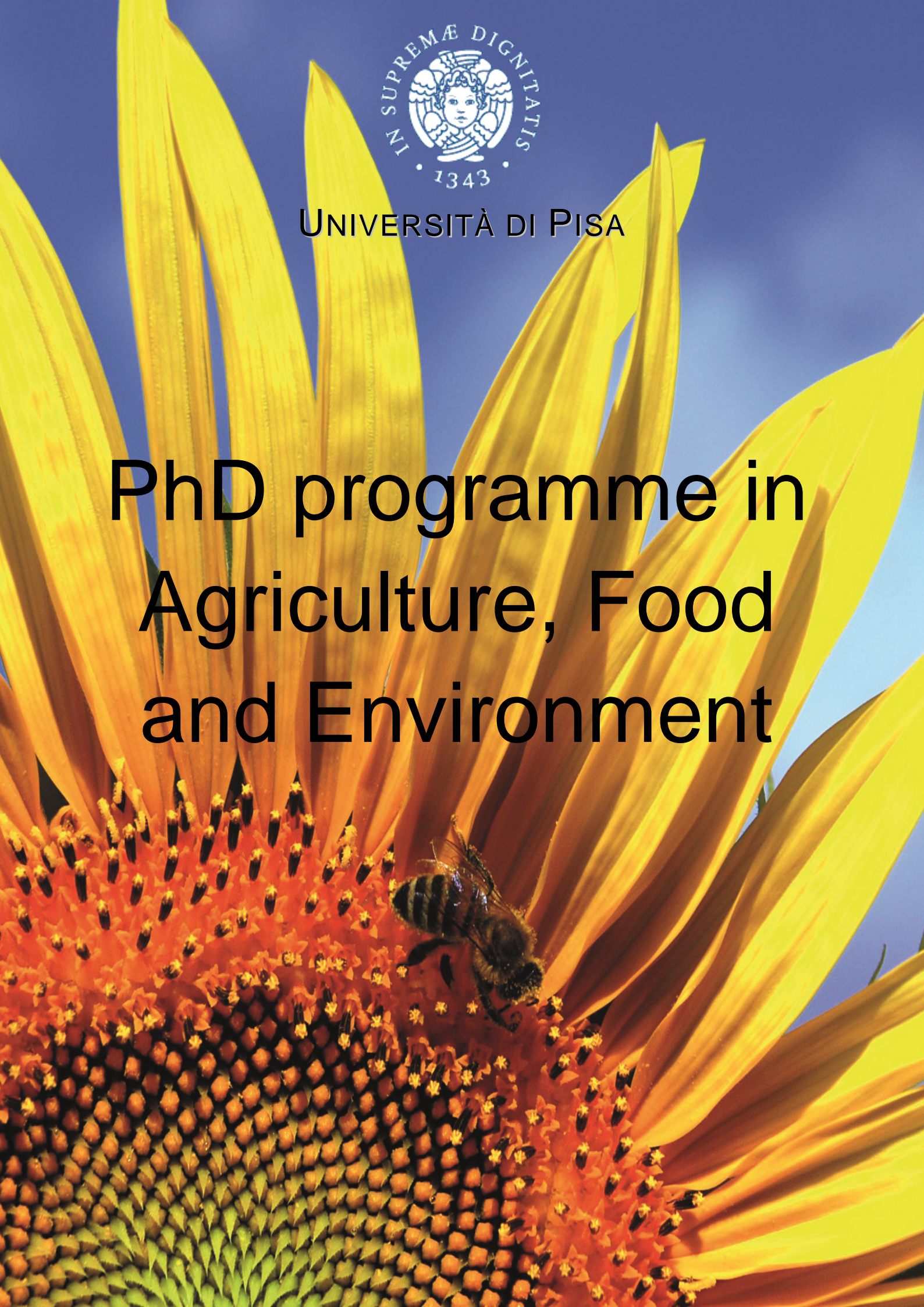




UNIVERSITÀ DI PISA

PhD programme in Agriculture, Food and Environment



PhD programme in Agriculture, Food and Environment
Department of Agriculture, Food and Environment
University of Pisa

Postal address:

Via del Borghetto 80, 56124 Pisa
Italy

Internet: <http://www.agr.unipi.it/phd-programme-in-agriculture-food-and-environment-3/>

Compilation & Final editing: A. Cavallini, A. Pardossi (University of Pisa)

Design: B. Sereni (University of Pisa)

February 2021

The information contained in this brochure is subject to change

The University of Pisa (UNIFI) is one of the most important universities in Italy and has a long tradition of excellence in terms of education and scientific research. The Department of Agriculture, Food and Environment (DAFE) is dedicated to research at the frontiers of agricultural, food and agro-environmental sciences. The Director of DAFE is currently Prof. Marcello Mele (<mailto:direttoredisaaa@unipi.it>) and the teaching staff consists of nearly 70 professors and researchers.

The PhD programme in Agriculture, Food and Environment is a three-year post-graduate research course at DAFE. The official language of the PhD course is English. The Coordinator of the PhD programme is currently Prof. Andrea Cavallini (mailto:phd_coordinator@agr.unipi.it). The PhD programme has as central theme 'Food sustainability'. Its scope is articulated around three main areas: 1) biological basis of food sustainability; 2) sustainability of food production systems; 3) food quality and safety.

The course aims at training researchers with an up-to-date, excellent disciplinary ground and with a deep understanding of the systemic implications of their specific field of activity and awareness of the importance of mutual learning with enterprises, administrations and civil society. The PhD programme encourages the development of a common systemic approach through its training program, which will be centered upon the principles of sustainability science, and through its partnership strategy. In this sense, specific agreements with external institutions and/or with some firms are established for specific research themes, with double (university and external institution) supervision. After graduation, the PhD student is expected to be a highly qualified and skilful researcher in the field of basic or applied research. The job placement of PhD graduates is in public or private research centres in the sectors of agriculture, food industry and environment.

At present, the Doctorate Board includes 20 professors at the University of Pisa and 4 senior scientists at various research institutes in Italy or abroad. Currently, 48 graduate students are attending the course or are waiting for the final examination; thirteen students come from foreign universities.



Doctorate Board

SURNAME & NAME	INSTITUTION	QUALIFICATION	EMAIL	RESEARCH INTERESTS
1. <u>AGNOLUCCI, Monica</u>	UNIFI	Ass. Professor	<i>monica.agnolucci@unifi.it</i>	Agricultural and food microbiology
2. <u>ANGELINI, Gabriella Luciana</u>	UNIFI	Full Professor	<i>luciana.angelini@unifi.it</i>	Agronomy; crop production and quality of food and non-food species
3. <u>ARDUINI, Iduna</u>	UNIFI	Ass. Professor	<i>iduna.arduini@unifi.it</i>	Botany applied to agro-ecosystems
4. <u>BARTOLINI, Fabio</u>	UNIFE	Ass. Professor	<i>fabio.bartolini@unifi.it</i>	Agricultural economics; bioeconomy; modelling farmer behaviour
5. <u>BRUNORI, Gianluca</u>	UNIFI	Full Professor	<i>gianluca.brunori@unifi.it</i>	Agricultural economics; bioeconomy; agricultural and food policy
6. <u>CANALE, Angelo</u>	UNIFI	Ass. Professor	<i>angelo.canale@unifi.it</i>	Integrated pest management; insect behaviour
7. <u>CAVALLINI, Andrea</u>	UNIFI	Full Professor	<i>andrea.cavallini@unifi.it</i>	Plant genetics and genomics
8. <u>GUCCI, Riccardo</u>	UNIFI	Full Professor	<i>riccardo.gucci@unifi.it</i>	Physiology and management of fruit trees; olive trees; oil quality
9. <u>GUGLIELMINETTI, Lorenzo</u>	UNIFI	Researcher	<i>lorenzo.guglielminetti@unifi.it</i>	Plant physiology; plant proteomics
10. <u>LOCONTO, Allison-Marie</u>	INRA (France)	Senior Researcher	<i>allison-marie.loconto@inra.fr</i>	Agricultural economics; institutional innovations in conformity assessment systems
11. <u>LORENZINI, Giacomo</u>	UNIFI	Full Professor	<i>giacomo.lorenzini@unifi.it</i>	Plant pathology; air pollution and global change
12. <u>LUCCHI, Andrea</u>	UNIFI	Full Professor	<i>andrea.lucchi@unifi.it</i>	Integrate pest management
13. <u>MASSAI, Rossano</u>	UNIFI	Full Professor	<i>rossano.massai@unifi.it</i>	Management of fruit crops; fruit quality
14. <u>MAZZONCINI, Marco</u>	UNIFI	Full Professor	<i>marco.mazzoncini@unifi.it</i>	Agronomy; crop production and

				organic agriculture
15. <u>MELE, Marcello</u>	UNIFI	Full Professor	<i>marcello.mele@unipi.it</i>	Lipid metabolism in ruminants; rumen fermentation and methane emission; milk and meat quality.
16. <u>NALI, Cristina</u>	UNIFI	Full Professor	<i>cristina.nali@unipi.it</i>	Air pollution and global change; tree hazard assessment
17. <u>PARDOSSI, Alberto</u>	UNIFI	Full Professor	<i>alberto.pardossi@unipi.it</i>	Greenhouse and nursery management; hydroponic technology
18. <u>PEZZAROSSA, Beatrice</u>	CNR	Senior Researcher	<i>beatrice.pezzarossa@ise.cnr.it</i>	Trace elements in the soil-plant system; soil quality
19. <u>PISTELLI, Laura</u>	UNIFI	Researcher	<i>laura.pistelli@unipi.it</i>	Plant physiology; herbs and officinal plants
20. <u>RAFFAELLI, Michele</u>	UNIFI	Full Professor	<i>michele.raffaelli@unipi.it</i>	Machines for soil tillage, conservation and no tillage, physical weed control, soil disinfection with physical methods
21. <u>RANIERI, Annamaria</u>	UNIFI	Full Professor	<i>anna.maria.ranieri@unipi.it</i>	Food quality, plant stress physiology and biochemistry
22. <u>RUFFONI, Barbara</u>	CREA	Senior Researcher	<i>barbara.ruffoni@crea.gov.it</i>	Physiology and biochemistry of ornamental plants
23. <u>SCARTAZZA, Andrea</u>	CNR	Senior Researcher	<i>andrea.scartazza@cnr.it</i>	Environmental sciences
24. <u>SERRA, Andrea</u>	UNIFI	Ass. Professor	<i>andrea.serra@unipi.it</i>	Animal food production and quality
25. <u>ZINNAI, Angela</u>	UNIFI	Ass. Professor	<i>angela.zinnai@unipi.it</i>	Food technology

Programme overview

The PhD programme essentially consists in conducting an original research work under supervision and writing a dissertation (thesis) concerning the following topics:

- food science and technology;
- genomics, proteomics and metabolomics of species of agricultural interest;
- multifunctional agriculture;
- plant and animal production systems, even in urban environment;
- plant physiology, ecology and biochemistry;
- plant, animal and microbial biotechnologies;
- technologies for plant and soil protection and environmental bioremediation.

Each PhD student is supported by a supervisor at DAFE. The PhD students also supervise MSc students and participate in educational activities such as courses, seminars, summer schools and congresses partly organized by the University of Pisa for all its PhD students and partly by DAFE, which will offer specific courses for its doctoral students, following a tailor-made training plan aimed at achieving in-depth knowledge of specific scientific issues and improving general skills.

The so-called "transversal" activity, organized by the University of Pisa, will include a "Scientific English" course, an "Open Science and Research Data Management" course, a "Statistics for Research" course, a "Computer Tools for Research and Research Promotion" course and a "Responsible Research and Innovation" course. These courses will be held in the period January-June 2022.

The teaching activity specifically organized by DAFE for its PhD students will include:

- Course "*Fundamentals of Statistics for Agricultural Research*". March-April 2022. Lecturers: Prof. G. Conte (Univ. of Pisa); Prof. N. Macchiotta (Univ. of Sassari).
- Course "*Publishing in International Scientific Journals*". June 2022. Lecturer: Dr. G. Benelli (Univ. of Pisa).
- Course "*Innovative methodologies in Agricultural Sciences*". October 2022. Lecturer: to be nominated.

Students generally will attend other courses, seminars and scientific meetings organized by DAFE. The detailed programme of these teaching activities will be available at the end of February 2022.

At the end of each year, each PhD student holds a public seminar and prepares a report on his/her academic and research activities, which must be evaluated and approved by the Doctorate Board.

All the PhD students are invited to spend at least six months in renowned research institutes abroad during the second and/or third year of the course.

At the end of the course, the thesis (in English) is preliminary evaluated by two external referees belonging to other Universities in Italy or abroad.

Finally, the PhD degree is awarded after a public examination in the form of defence of the dissertation before an external committee, which is appointed by the Doctorate Board.

Each candidate must publish at least one scientific paper in an indexed journal (ISI–Web of Knowledge/Scopus) before graduation.

A list of current PhD projects is reported below.

Current PhD projects

CANDIDATE	YEAR	THESIS SUBJECT	SUPERVISOR [OPPONENT]
1. ABENAIM, Linda	1	<i>Hermetia illucens (Diptera Stratiomyidae) Mass Rearing: Chitosan Extraction, De Novo Genome Assembly and Molecular Farming Units for the Production and Delivery of Anti-Inflammatory Peptides</i>	B. Conti, R. Giovannoni [T. Giordani]
2. ALLALI, Tarek	1	<i>Agri-Food Value Chains' Sustainability Assessment – A New Guiding Analytical Framework</i>	G. Brunori [M. Moretti]
3. ALPIZAR ROJAS, Daniel	2	<i>Food systems as drivers of inequality in livelihoods and food and nutrition security</i>	F. Galli [G. Brunori]
4. AMARIE, Roxana	1	<i>Strategies to Improve the Sustainability of Production Systems and Meat Quality of Swine</i>	A. Serra [A. Castagna]
5. BAYISSA, Debella Deressa	2	<i>Institutional Innovations in Irrigated Family Farming for Sustainable Food and Nutrition Security: The Case of Indris Irrigation Scheme, Oromia National Regional State, Ethiopia</i>	P. Prosperi [G. Brunori]
6. BECAGLI, Michelangelo	3	<i>Effects of biochar on chemical and biological properties in soil plant system</i>	R. Cardelli [A. Pardossi, M. Mazzoncini]

7. BEN HAMOUDA, Fatma	1	<i>Agrohydrological Sensor- and Model-based Tools for Sustainable Irrigation Management of Sparse Crops Under Soil Water Deficit Conditions</i>	G. Rallo [S. Fuentes]
8. BIANCHI, Alessandro	1	<i>Evaluation of the Shelf Life of Different Foods Combining Chemical/Physical, Sensory and Non-Destructive Analyses</i>	F. Mencarelli, A. Zinnai [M.F. Quartacci]
9. BUONACCORSI, Alessandro	2	<i>Environmental and socio-economic impacts of innovative tomato cropping systems in mediterranean commercial greenhouses: life cycle analysis and cost-effectiveness</i>	F. Bartolini [L. Incrocci]
10. CELA, Fatjon	2	<i>How do Arbuscular Mycorrhizal Fungi influence plant response to sup-optimal or stressful growing conditions in semi-artificial cropping systems?</i>	L. Incrocci, L. Avio [A. Pardossi]
11. CHIELLINI, Carolina	2	<i>Evaluation of heavy metal decontamination performances in algae and plants</i>	L. Guglielminetti, L. Pistelli [A. Scartazza, A. Ciurli]
12. CHINEDU TEMPLE, Obi	3+	<i>The Impact of International Migration on Agriculture, Food and Rural Development of Home and Host Communities: Evidence from Nigerian Migrants in Italy and Belgium</i>	F. Bartolini [G. Brunori]
13. CLEMENTE, Clarissa	1	<i>Agronomic Improvement of Camelina (Camelina sativa (L.) Crantz) for Sustainable Poultry Feeding and Healthy Food Products</i>	S. Tavarini, L. Angelini [N. Silvestri]
14. ESNARRIAGA NAIMID DEL VALLE, Dayana	3+	<i>Plant to plant and plant to soil interactions in intercrops and mixed crops</i>	I. Arduini [M. Mariotti]

15. FARINA, Priscilla	2	<i>Eco-friendly strategies for the management of harmful insects</i>	B. Conti [A. Lucchi]
16. FIACCADORI, Ivan	1	<i>Implementing Organic Multifunctional Agriculture in Landscape Architecture. New Aesthetics and Methods, Amidst Conservation, Development and Climate Change</i>	P. Vernieri, F. Monacci [G. Lorenzini]
17. FOGGI, Giulia	2	<i>Development of dietary strategies to modulate rumen fermentation: effects of Plant Secondary Metabolites (PSM) on methane emission and milk and beef quality</i>	M. Mele [M. Mazzoncini]
18. GAGLIARDI, Lorenzo	1	<i>Comparison and Evaluation of Innovative Techniques and Equipment for Weed and Cover Crop Management in Conservative Organic Farming Systems</i>	M. Fontanelli [M. Raffaelli]
19. GIOVANNINI, Luca	3	<i>Molecular and functional diversity of beneficial microorganisms associated with the mycorrhizosphere</i>	M. Giovannetti, A. Turrini [C. Sbrana]
20. KNICKEL, Marina	3	<i>Limiting and enabling factors in transdisciplinary research: The example of Living Labs for rural-urban relations in the EU-funded research project ROBUST</i>	G. Brunori, D. Maye [P. Prosperi]
21. LEPORE, Fabio	2	<i>Socio-economic impact of digitisation in agriculture and in rural development</i>	G. Brunori [F. Galli]
22. MACALUSO, Monica	3	<i>The valorization of olive oils through innovation and optimization of packaging and storage conditions adopted in order to increase the olive growing sustainability</i>	A. Zinnai [M.F. Quartacci, F. Venturi]
23. MANNUCCI, Alessia	3+	<i>UV radiation and leaf-root communication in fungal pathogen resistance and fortification of food plants</i>	M.F. Quartacci [L. Guglielminetti]

24. MARCHICA, Alessandra	3+	<i>Characterization and isolation of genes and proteins involved in abiotic stress response in sage (Salvia officinalis L.)</i>	E. Pellegrini, R. Bernardi [L. Guidi]
25. MARCHIONI, Ilaria	3+	<i>Edible flowers as new source of nutraceutical foods</i>	L. Pistelli [A. Pardossi]
26. METTA, Matteo	2	<i>Analysis of socio-economic dynamics in agri-food systems and policy impacts</i>	F. Bartolini [G. Brunori]
27. MOLINA NAVAS, Natalia	3	<i>Interactive innovation in agriculture</i>	G. Brunori [F. Galli]
28. OLIVIERI, Matteo	2	<i>Improving the provision of public goods by agri-environmental-climate schemes</i>	F. Bartolini [D. Viaggi]
29. PAGNI, Lorenzo	1	<i>Interaction in the Multi-Actor Platform and Community Approach for Rural Development Policies - The Case of Tuscany</i>	F. Galli [S. Arcuri]
30. PALAI, Giacomo	3	<i>Soil water availability effects on yield and fruit quality in fruit trees and grapevine</i>	C. D'Onofrio, G. Caruso [S.D. Castellarin]
31. PEDRELLI, Athos	2	<i>Stone fruits and Plum pox virus (PPV): epidemiological aspects, molecular diagnosis, genetic characterization and host-pathogen interactions</i>	A. Materazzi [C. Campani, D. Rizzo]
32. PISUTTU, Claudia	3	<i>How to counteract the Ailanthus altissima invasion: could Verticillium have a role in the biological control of the "Tree of Heaven"?</i>	G. Lorenzini [R. Bernardi]
33. PUIG SIRERA, Angela	3+	<i>Agro-hydrological and spectral models to improve the accuracy of monitoring water status and irrigation efficiency in Mediterranean arboreal crops</i>	G. Rallo [D. Intrigliolo]

34. PURNAWAN, Endar	3+	<i>Development of Small Food Business in the Kawasan Mandiri Pangan (KMP) Program in Border Area in Indonesia</i>	G. Brunori [A. Rossi]
35. RABELO LANZA, Marya Cristina	3	<i>Multitemporal analysis of land use and land cover changes in Mediterranean area by integrating information from European data-bases, remote sensing and local surveys</i>	N. Silvestri [T. Sabbatini]
36. DA ROCHA O. TEIXEIRA, Raiza	3+	<i>The role of small farmers on nutrition security: a gender-sensitive analysis</i>	G. Brunori [F. Galli]
37. SCIAMPAGNA, Maria	1	<i>Priming Effect of UV-B Radiation Towards Abiotic/Biotic Stresses in Tomato Plants. A Tool to Increase Plant Resistance and to Improve the Nutraceutical of Fruit</i>	A. Castagna, A. Ranieri [L. Guglielminetti]
38. SERMONETA, Colomba	2	<i>Experimental statistics: new indicators to support the agricultural field</i>	A. Serra, G. Brunori [A. Di Lauro]
39. SIMONI, Samuel	2	<i>Genetic characterization of the biosynthesis of steviol glycosides and polyphenols in Stevia rebaudiana (Bertoni)</i>	T. Giordani, S. Tavarini [R. Bernardi]
40. SPADA, Maria	2	<i>Botrytis cinerea-Lactuca sativa L. pathosystem: Nanoparticles-mediated delivery of dsRNA in Spray-Induced Gene Silencing (SIGS) for plant disease control</i>	S. Pecchia, C. Pugliesi [A. Pardossi, M. Fambrini]
41. SPORTELLI, Mino	3	<i>Innovative strategies and machines to manage weeds in urban environment and in conservation agriculture</i>	C. Frasconi, M. Volterrani [M. Fontanelli]
42. TAGLIERI, Isabella	3+	<i>Innovative technologies for the production and preservation of natural leavening products with high nutraceutical content</i>	A. Zinnai, F. Venturi [M.F. Quartacci]

43. TANI, Camilla	1	<i>Molecular Approaches for the Development of Innovative Techniques for the Biological Control of Lobesia botrana (Lepidoptera Tortricidae)</i>	B. Conti, R. Giovannoni [A. Lucchi]
44. TRAMACERE, Lorenzo Gabriele	2	<i>Evaluation of agri-environmental dynamics following the introduction of agroforestry systems in arable cropping systems in the Mediterranean area</i>	M. Mazzoncini, D. Antichi [M. Mele]
45. UJVARI, Gergely	2	<i>Diversity and functionality of root endophytic bacterial communities as affected by arbuscular mycorrhizal symbionts and their associated microbiota</i>	M. Agnolucci, A. Turrini [L. Avio]
46. VENTIMIGLIA, Maria	3	<i>ASTER-REP, a database of Asteraceae transposable sequences</i>	F. Mascagni [A. Zuccolo]
47. VIVIANI, Ambra	2	<i>Application of genome editing in Lactuca sativa L. to increase Ascorbic Acid content in leaves</i>	T. Giordani, C. Pugliesi [L. Pistelli, M. Fambrini]
48. ZENI, Valeria	1	<i>Biological Control of Arthropod Pests of Horticultural Crops in the Mediterranean Area</i>	A. Canale, G. Benelli [G. Germinara]



Recent (2018-2020) PhD dissertations

STUDENT	YEAR	TITLE	SUPERVISOR
ABOU-CHEHADE, Lara	2019	<i>Performance of field vegetable cropping systems in organic farming: effects of tillage and cover crop management</i>	D. Antichi, M. Mazzoncini
ARCURI, Sabrina	2018	<i>Assessment of the impact of global drivers of change on Europe's food security</i>	G. Brunori
BONILLA LOOR, Mario Javier	2018	<i>Physiological and molecular interactions between plants and beneficial fungi</i>	L. Avio, M. Giovannetti
CALZONE, Antonella	2021	<i>Future Mediterranean scenario: will the pomegranate be a crop species?</i>	E. Pellegrini, B.E. Maserti [D. Remorini]
CECCANTI, Costanza	2020	<i>Wild plants, a better alternative to common vegetables and their nutritional and toxic properties as ready-prepared fresh salads and V gamma vegetables</i>	A. Pardossi, L. Guidi [L. Angelini]
CIUCCI, Francesca	2020	<i>Productive and metabolic response of Maremmana and Aubrac steers maintained in feedlot or grazing systems</i>	A. Serra, M. Mele [T. Giordani]
IBRAHIM EHDADAN, Jamal Ali Mohamed	2018	<i>The effects of agricultural policies on wheat production in Libya. Policy Analysis Matrix Approach (PAM)</i>	G. Brunori
LO PICCOLO, Ermes	2019	<i>Anthocyanin presence influences physiological and metabolic leaf processes in a red morph of <i>Prunus cerasifera</i> Ehrh.</i>	D. Remorini
MARTINI, Andrea	2018	<i>Agronomic and phytochemical evaluation of <i>Avena sativa</i> L. and <i>Stevia rebaudiana</i> Bert. as sources of food and bio-active compounds</i>	L. Angelini
MATTIONI, Dalia	2019	<i>The role of the Fera in sustaining healthy food practices in Costa Rica: implications for food retail environment interventions</i>	G. Brunori
MOLES, Tommaso Michele	2019	<i>Physiological characterization of the tomato landrace <i>Ciettaicale</i></i>	L. Guglielminetti, P. Picciarelli

NARI, Anita	2019	<i>Producing olive oil with a high nutraceutical and organoleptic quality using innovative operative technique (extraction and storage method)</i>	A. Zinnai
ORLANDO, Jacopo Gabriele	2020	<i>The role of multifunctionality principle into social responsibility initiatives</i>	G. Brunori [M. Rovai]
PALLA, Michela	2018	<i>Molecular and functional biodiversity of microorganisms related to food production</i>	M. Giovannetti, M. Agnolucci
PALMIOLI, Lucia	2020	<i>Small farms, small food businesses and sustainable food security</i>	G. Brunori [F. Di Iacovo]
PIERRO, Roberto	2019	<i>Symptom severity and multilocus sequence typing analysis of 'Candidatus Phytoplasma solani' strains in Tuscan vineyards</i>	A. Materazzi
PIRCHIO, Michel	2019	<i>Development of innovative machines for turfgrass management and turf quality control</i>	M. Fontanelli, M. Volterrani
RICCIARDI, Renato	2019	<i>Biological control of pests in the vineyard with semio-chemicals and beneficial insects</i>	A. Lucchi
SANTIN, Marco	2019	<i>UV-B signalling in fruits: from perception to fruit quality</i>	A. Ranieri
SOLORZANO ZAMBRANO, Liceth Yanina	2018	<i>Functional genomics of fig (Ficus carica L.)</i>	A. Cavallini
USAI, Gabriele	2019	<i>Structural genomics for plant breeding: the fig (Ficus carica L.), an ancient crop with promising perspectives</i>	L. Natali, F. Mascagni
VANGELISTI, Alberto	2018	<i>Transcriptome analyses through next generation sequencing</i>	T. Giordani
VICENTE MUNOZ, Isabel	2020	<i>Application of CRISPR-Cas9 technology to produce mutant fungal strains for biocontrol of crop plant diseases</i>	G. Vannacci, S. Sarrocco [T. Giordani]
XIAOGUO, 'Stone' Ying	2018	<i>Wine quality changes under different storage conditions</i>	A. Zinnai
ZAPPARATA, Antonio	2018	<i>Insights on the mechanisms of action of the Trichoderma-based biopesticide Remedier®</i>	G. Vannacci

Publications

From 2019 to 2020, PhD students at DAFE have published more than one hundred articles, including research or review papers in peer-reviewed journals or in conference proceedings. A selection of publications related to the subject of the dissertation of PhD students or of fellows graduated after 2018 is reported below:

- Abou Chehade L.**, Antichi D., Martelloni L., Frasconi C., Sbrana M., Mazzoncini M., Peruzzi A. (2019). Evaluation of the agronomic performance of organic processing tomato as affected by different cover crop residues management. *Agronomy* 9: 504.
- Agnolucci M., **Palla M.**, Cristani C., Cavallo N., Giovannetti M., De Angelis M., Gobbetti M., Minervini F. (2019). Beneficial Plant Microorganisms Affect the Endophytic Bacterial Communities of Durum Wheat Roots as Detected by Different Molecular Approaches. *Frontiers in Microbiology* 10: 2500.
- Angelini L.G., **Abou Chehade L.**, Foschi L., Tavarini S. (2020). Performance and potentiality of camelina (*Camelina sativa* L. Crantz) genotypes in response to sowing date under Mediterranean environment. *Agronomy* 10: 1929.
- Avio L., Maggini R., **Ujvári G.**, Incrocci L., Giovannetti M., Turrini A. (2020). Phenolics content and antioxidant activity in the leaves of two artichoke cultivars are differentially affected by six mycorrhizal symbionts. *Scientia Horticulturae* 264: 109153.
- Benelli G., Pavoni L., **Zeni V.**, **Ricciardi R.**, Cosci F., Cacopardo G., Gendusa S., Spinozzi E., Petrelli R., Cappellacci L., Maggi F., Pavela R., Bonacucina G., Lucchi A. (2020). Developing a Highly Stable *Carlina acaulis* Essential Oil Nanoemulsion for Managing *Lobesia botrana*. *Nanomaterials* 10: 1876.
- Calzone A.**, Cotrozzi L., Pellegrini E., Guidi L., Lorenzini G., Nali C. (2020). Differential response strategies of pomegranate cultivars lead to similar tolerance to increasing salt concentrations. *Scientia Horticulturae* 271: 109441.
- Calzone A.**, Podda A., Lorenzini G., Maserti B., Carrari E., Deleanu E., Hoshika Y., Haworth M., Nali C., Badea O., Pellegrini E., Fares S., Paoletti E. (2019). Cross-talk between physiological and biochemical adjustments by *Punica granatum* cv. Dente di cavallo mitigates the effects of salinity and ozone stress. *Science of the Total Environment* 656: 589-597.
- Cardelli R., **Becagli M.**, Marchini F., Saviozzi A. (2019). Biochar impact on the estimation of the colorimetric-based enzymatic assays of soil. *Soil Use & Management* 35: 478-481.
- Caruso G., Zarco-Tejada P.J., González-Dugo V., Moriondo M., Tozzini L., **Palai G.**, Rallo G., Hornero A., Primicerio J., Gucci R. (2019). High-resolution imagery acquired from an unmanned platform to estimate biophysical and geometrical parameters of olive trees under different irrigation regimes. *PLoS ONE* 14: e0210804.
- Ceccanti C.**, Landi M., Incrocci L., Pardossi A., Guidi L. (2020). Suitability of Hydroponically-Grown *Rumex acetosa* L. as Fresh-Cut Produce. *Horticulturae* 6: 4.
- Ceccanti C.**, Landi M., Rocchetti G., Miras Moreno M.B., Lucini L., Incrocci L., Pardossi A., Guidi L. (2019) Hydroponically grown *Sanguisorba minor* Scop.: Effects of cut and storage on fresh-cut produce. *Antioxidants* 8: 631.
- Ceccanti C.**, Rocchetti G., Lucini L., Giuberti G., Landi M., Biagiotti S., Guidi L. (2020). Comparative phytochemical profile of the elephant garlic (*Allium ampeloprasum* var. holmense) and the common garlic (*Allium sativum*) from the Val di Chiana area (Tuscany, Italy) before and after in vitro gastrointestinal digestion. *Food Chemistry* 338: 128011.
- Chiellini C.**, Guglielminetti L., Pistelli L., Ciurli A. (2020). Screening of Trace Metal Elements for Pollution Tolerance of Freshwater and Marine Microalgal Strains: Overview and Perspectives. *Algal Research* 45: 101751.

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Applications

Candidates are required to have a Master's degree and have to demonstrate good knowledge of the research themes reported above.

The number of graduates students admitted to each program varies from year to year depending on the number of grants available and the results of the selection process. For instance, 12 candidates were admitted in 2020 (XXXVI cycle, 2020-2023) and nine scholarships were available, including one reserved for candidates who have achieved their MSc degree abroad.

A grant consists of a stipend of approx. € 13,600 per year (including social security contribution) for the whole duration of the PhD programme (3 years maximum). The grant is increased by 50% if the student does an internship (at least 15 days) abroad in a foreign academic or research institution. After the first year, each candidate receives an annual research contribution of approximately € 1,600.

The selection of PhD candidates is based on their educational (f.i., average exam grade, final numerical grade for the entire degree, honour etc.) and scientific (publications, positions as young scientist, stage abroad etc.) curriculum and on an interview (either on site or via web conference) conducted in the research areas that every year the Board proposes to the new candidates.

The admission call is open in May-June and the selection takes place in July-September. The candidates should check the website (<http://dottorato.unipi.it/index.php/en/>) regularly for additional information on deadlines for applications, proposed research subjects, selection criteria, date(s) of interview, number of scholarships and positions without scholarship, and university fee.

Candidates may also be admitted, at any time, under the supernumerary category if:

- they hold a grant or a similar form of funding which is part of a project promoted by the European Union and/or other European or international organizations;
- they are non-EU citizens who do not reside in Italy and hold a grant or have some form of economic support from their country of origin.

Supernumerary PhD candidates may be required to pay an annual departmental fee (bench fee), which depends on the type of research work and will be determined by the DAFE. For further information on the admission of supernumerary students, the candidates should look at <http://dottorato.unipi.it/index.php/en/> and/or contact the Coordinator (mailto:phd_coordinator@agr.unipi.it).

Living in Pisa

The cost of living in Pisa is approximately € 600-700 per month; for instance, the rental for student accommodation ranges between € 300 and € 400 per month.

Free registration to the Italian National Health Service (SSN) guarantees medical care for all Italian students. Health care assistance is also available to all European citizens (belonging to EU Member States and EEA States) who have the EHIC/TEAM card (European Health Insurance Card) or who enrol in the SSN. For non-EU foreign citizens (who belong to countries which are outside the European Union and of the European Economic Area), the insurance coverage for health services or hospitalization is required to obtain an entry visa in Italy and then later the residence permit.

Further information can be found in the International Student's Guide (https://www.unipi.it/index.php/erasmus-programme/item/download/12096_a29ded56d63481040f6be5ce001f1c09)

Contacts

- Secretariat: Dr. Stefano Fanti, DAFE, Via del Borghetto 80, 56124 Pisa (Italy)
Tel. +39 050 2216 083; fax +39 050 2210 606; email: stefano.fanti@unipi.it
- Coordinator: Prof. Andrea Cavallini, DAFE, Via del Borghetto 80, 56124 Pisa (Italy)
email: phd_coordinator@agr.unipi.it.

