

Marie Curie PhD student position

A PhD position is offered under the FertiCycle ETN project, which will train 15 PhD students in the field of developing new processes for production of bio-based fertilisers, recycling wasted resources and estimating their market potential.

UNITO offers the following position:

Title:

Designing novel peat-free organo-mineral fertiliser production from recyclables

Background:

Organo-mineral fertilisers are mixed fertilisers in which an organic fraction is thought to increase the efficiency of the mineral component. They are used especially in horticulture and fruit production, where the economical returns of fertilisation are higher. However, the interaction between the organic and the mineral parts is not well known. Organo-mineral fertilisers can supply crops with macronutrients and micronutrients. In addition, they could behave as bio-stimulants, owing to the presence of active carbon compounds, but this effect is still to be studied.

The organic part of organo-mineral fertilisers is traditionally based on peat, which is a natural non-renewable resource. Bio-wastes, a renewable and recycled resource, have the potential to replace peat in innovative organo-mineral fertilisers.

In this PhD study we wish to explore the possibility to produce new effective organo-mineral fertilisers based on bio-waste. This requires the development of an innovative technological transformation process of bio-wastes together with the industrial partner, the fertiliser company SCAM. The effects on the crop will be analysed in detail, taking into account the availability and dynamics of macro- and micro-nutrients, and possible bio-stimulant effects.

Objective:

To develop new environmental-friendly, peat-free, highly efficient organo-mineral fertilisers from recyclable organic sources, for commercial use on high-value field crops, horticultural crops and fruit trees.

Research activities:

The PhD student will work on producing new effective organo-mineral fertilisers based on bio-waste. This requires the development of an innovative technological transformation process of bio-wastes together with the industrial partner, the fertiliser company SCAM. Different organic matrices derived from various waste materials (e.g. separated, composted or digested manure solids, grape or olive pomace, crop residues, municipal waste residuals) will be tested and modified in collaboration with SCAM, to develop new peat-free organo-mineral fertiliser products. Special innovation focus will be posed on minimising potential contaminants, increasing the quality organic fraction of the final fertiliser and controlling nutrient release dynamics.

The PhD student work will focus on characterising the organic fraction, and evaluating the effects on the crop of such newly developed fertilisers through pot trials in growth chamber, field test in

small plots, and farm application to assess the fertiliser quality, release of nutrients, and potential environmental risks. Isotope studies will also be used to evaluate the availability and dynamics of macro- and micro-nutrients, and possible bio-stimulant effects of these fertilisers

Methods will integrate different scales and approaches: chemical fine characterization of the organic fraction, pot trials in growth chamber, field test in small plots, and farm application to assess the fertiliser quality, release of nutrients, and potential environmental risks. Information on the fertiliser physico-chemical properties, blending potential with mineral fertilisers and NPK + micronutrient release will be used to optimise formulation and production processes.

Collaboration with other ESR's in the project will be relevant.

Place of work:

The place of employment is University of Turin, Italy, and the place of work is the Grugliasco University Campus, largo Braccini, 2, Grugliasco, Italy

The candidate will also be asked to do secondment (internship as visiting researcher) at SCAM fertiliser industry (www.scam.it) and in one of the other FertiCycle partners for a shorter period of time (1-3 months).

Supervisors:

Principal supervisors will be professors Carlo Grignani (carlo.grignani@unito.it) and Laura Zavattaro (laura.zavattaro@unito.it) and co-supervisor professor Jakob Magid (jma@plen.ku.dk) at Copenhagen University.

Contacts:

Applicants seeking further information are invited to contact:
Carlo Grignani (carlo.grignani@unito.it) and Laura Zavattaro (laura.zavattaro@unito.it)

Contract:

The position is full-time (40 h/wk) for 3 years.

The salary is approx. € 48166.56 per year (gross amount) + 3000.00 € per year of family allowance depending on the actual family status of the recruited researcher.

Required qualifications of the applicants:

Type of degree:

Applicants need to have an MSc degree in Agricultural Sciences, Soil Science, Environmental Science or similar

Skills and competences / experience:

- Experience with plant fertilisation trials (pot or field) and methods for the determination of plant nutrient availability and fertiliser value, chemical and microbiological analysis and treatment of soils, organic wastes and other type of residues will be an advantage.
- Good skills in data management and analysis

- Strong communication (written and oral) and interpersonal skills
- Experience with cross-disciplinary and/or multi-cultural collaboration will be an advantage

All interested candidates are encouraged to apply, regardless of their personal background.

Eligibility criteria

In order for applicants to be eligible for this position, they have to fulfil certain criteria.

H2020 MSCA Mobility Rule: applicants must not have resided or carried out their main activity (work, studies, etc.) in the country of the host organisation (in this case Italy) for more than 12 months in the 3 years immediately before the recruitment date (start of contract). Compulsory national service, short stays such as holidays, and time spent as part of a procedure for obtaining refugee status are not taken into account.

H2020 MSCA eligibility criteria: Early Stage Researchers (ESRs) must be, at the date of recruitment by the host organisation, in the first four years (full-time equivalent research experience) of their research careers and have not been awarded a doctoral degree. Full-Time Equivalent Research Experience is measured from the date when the researcher obtained the degree entitling him/her to embark on a doctorate (either in the country in which the degree was obtained or in the country in which the researcher is recruited, even if a doctorate was never started or envisaged).

Application procedures

Before you apply

Information and attachments:

Please be aware that you must have all relevant appendices, attachments, addresses for referees, etc. ready when you apply, as the entire application must be uploaded to the system in one go.

Documentation of language skills:

The minimum English language is a B level

How to apply:

Send an email to: carlo.grignani@unito.it and laura.zavattaro@unito.it, with all documents in attachment.

All information in the application must be in English.

Please include:

- Cover Letter, detailing your motivation, background and expectations for applying for this specific PhD project
- CV including
 - Personal information and contacts
 - Education
 - Work experiences
 - Personal skills
 - List of publications

- Diploma (BSc and MSc)
- Documentation of English language skills (if any)
- Publications (if any)
- Presentation letters with full contact details (Name, address, telephone & email) of 1-3 academic or professional referees

The deadline for applications is **14 April 2020, 23:59 GMT +2**

The University wishes our staff to reflect the diversity of society and thus welcomes applications from all qualified candidates regardless of personal background. Note that for the EU H2020 MSCA program certain eligibility criteria apply.

After the expiry of the deadline for applications, an Evaluation Committee will be appointed to select applications. Selected candidates will be interviewed using long-distance connections. Eligible candidates will be met personally for a final physical interview. The main criterion for selection will be the research potential of the applicant and the above mentioned skills.

The University of Turin reserves the right to verify the authenticity of educational diploma and to request additional information.

The application will be rejected if it is proven, or if the University has reasonable belief, that the information provided is false or if the applicant refuses to provide the requested information, whether or not an offer has already been made.

The successful candidate will then be requested to formally apply for enrolment as a PhD student at the PhD school of the University of Turin.

Recruitment will adhere to the principles of the European Charter for Researchers and Code of Conduct for Recruitment.