



**TUS**

**Technological University of the Shannon:**

**Midlands Midwest**

Ollscoil Teicneolaíochta na Sionainne:

Lár Tíre Iarthar Láir

## **POSTGRADUATE RESEARCH OPPORTUNITY**

**Project Title:** Study of biochars in combination with anaerobic digestates as organic fertilisers and carbon sequestering agents, their effect on soil health, fertility, and biodiversity.

**Project Description:**

A significant amount of waste generated by the bioenergy sector causes damage to ecosystems. There is a very large potential for the use of the AD digestate as fertilizer that is balanced and has many benefits including returning organic nutrients to soil and pollution control, however, it is underutilized in Ireland and EU. Currently, and in spite of environmental crisis, 80% of the horticulture still uses chemical fertilizers, manufactured using fossil fuels, further damaging the environment. The use of the digestate as fertilizer is inhibited by uncertainty in application processes, variability in its chemical composition and questions about benefits to soil and crops.

Pyrolytic Biochar is another underused resource that can be combined with the AD digestate to create a balanced odourless fertiliser and soil improver. The effect of nutrient composition of AD digestate on its own and in combination with biochar on soil biodiversity will be investigated. The study will show how application of these augmented types and combinations will affect the soil's microbiome, lower animals, and crop development. Protective properties of biochar for the microbiome and carbon sequestering potential will be studied and characterised. The relationship between the rate of digestate/biochar application and the change in soil nutrient composition and biodiversity of the soil will be studied for enhanced crop production without nutrient overload and pollution.

**Duration of Project: 48 months**

**Funding Agency:** TUS Presidents Doctoral Scholarship

**Type of Degree Offered:** PhD

**Minimum Qualifications/Experience Necessary/Any Other Requirements: [list relevant undergraduate programmes]**

Candidates with primary degree in Environmental, Agricultural or any other Science Discipline

Minimum classification of *2.1 honours or equivalent*.

IELTS [International English Testing System] Applicants must have a minimum of 6.0 with no component score less than 6.0.

**Research Supervisors:**

Dr Lena Madden

Dr Tanya Beletskaya

Dr Catherine Collins

Dr Robert Johnson

**For further information please contact: Dr Lena madden [lena.madden@tus.ie](mailto:lena.madden@tus.ie)**

**Download Application Form at**

[Funded Postgraduate Research Opportunities - TUS](#)

Closing date for receipt of completed application forms is 24.04.2024

Please submit your completed application: [pro@tus.ie](mailto:pro@tus.ie)

Please reference **Project Title in all correspondence.**