TEGASC PHD WALSH FELLOWSHIP OPPORTUNITY

"Influence of root:soil interactions to enhance plant resilience to abiotic stress in Irish cereal crops"

Background: A fully funded four-year PhD is offered for a project entitled "Influence of root:soil interactions to enhance plant resilience to abiotic stress in Irish cereal crops". This project is funded by the Teagasc Walsh Fellowship scheme.

Project Summary: A detailed understanding of roots and their immediate soil environment is a primary factor determining the availability of resources and is extrinsically linked to plant productivity. Yet, our understanding of how roots interact with the soil, especially at the micro-scale level, remains limited. Roots are inherently difficult to assess in an agricultural setting and as a consequence breeders have largely ignored the contribution of roots to productivity. However, to overcome some of the challenges faced by Irish Farmers, such as Nitrogen Use Efficiency, lodging and waterlogging, optimising the root systems and soil management practices simultaneously will be key. This project aims to determine the variance of Barley and Oat root phenotypes from the Virtual Irish Centre for Crop Improvement (VICCI) project field trials and the resilience to abiotic stresses and the suitability to Irish conditions. Through traditional and non-destructive techniques a greater understanding of how such differences in root:soil interactions at the soil structure microscale enhances plant resilience to coping with waterlogging will be gained. Investigations will take place to determine differences in root architectures and phenotypes create contrasting soil structure and how this may minimise flooding through greater infiltration rates into the soil profile. The influence that roots have on the physical and biological formation of soil structure and the generation of water stable aggregates will be measured in different soil types. This project will contribute to the identification of barley and oat root phenotypes suited to various Irish soil hydrological conditions which will benefit growers and the cereal crop industry.

Objectives:

- Determine the variance of Barley and Oat root phenotypes from VICCI field trials.
- Investigate if differences in root architectures create contrasting soil structure and how this may minimise flooding.
- Understand how such differences in root:soil interactions at the soil structure microscale enhance plant resilience to coping with waterlogging.

Requirements/Award: Applications are sought from a highly motivated individual who has a first or upper second class degree in agricultural sciences, plant science, soil science, crop science, or closely related disciplines and a willingness to learn. A clean and valid European driving licence is mandatory. The fellowship funding is €22,000 per annum and includes University fees of up to a maximum of €6,000 per annum and is tenable for 4 years. The work will be based either at University College Dublin, County Dublin or Teagasc Oak Park, County Carlow.

Further Information/Applications: Submit an electronic copy of Curriculum Vitae, a letter of interest and the names and email addresses of two academic referees to saoirse.tracy@ucd.ie. For informal queries please email Dr Saoirse Tracy. Please also see the website for the Virtual Irish Centre for Crop Improvement (VICCI) project http://www.vicci.ie/

Closing date: 1st September 2017
Start date: September/October 2017