



Understanding and Overcoming Yield Constraints of Spring Barley in Non-Plough Crop Establishment Systems.

Walsh Scholars Reference: 2026002

University: University College Dublin

Funding: Teagasc Walsh Scholarship

Research Institution: Teagasc

Location: Teagasc Oak Park, Carlow

Proposed Start Date: September 2026

Project Summary

This PhD will examine the causes of yield limitation in spring barley grown under non-plough establishment systems and develop agronomic strategies to support their reliable and sustainable use. Non-plough systems, including minimum tillage and direct drilling, offer clear economic and environmental advantages such as reduced fuel and labour requirements, lower establishment costs, and potential improvements in soil health. Despite these benefits, adoption in Ireland remains limited, largely due to variable crop performance and consistent yield penalties when compared with conventional plough-based systems.

The research will address key knowledge gaps by identifying the factors responsible for yield constraints in non-plough systems and evaluating whether changes in sowing date, seed rate, agronomic management, and varietal choice can alleviate these constraints. A programme of multi-site field experiments across contrasting soil types will be used to benchmark system performance, identify yield-limiting processes, and assess targeted agronomic interventions. Where yield penalties persist, mechanistic studies will investigate crop–soil interactions and genotype × management × environment relationships.

The project is directly aligned with agri-food research priorities, contributing to climate-smart cropping and sustainable intensification. Outputs will include practical, evidence-based guidance for growers and advisors, alongside insights relevant to breeders, industry stakeholders, and the wider research community.

Supervision

The project will be supervised by Dr Jack Jameson and Mr John Spink at Teagasc Oak Park, whose expertise spans crop agronomy and crop physiology, with a strong focus on cereal production systems. Co-supervision will be provided by Professor Kevin McDonnell and Dr Cathal McCabe at University College Dublin, contributing complementary university-based expertise and providing academic oversight and access to UCD's postgraduate research supports. Together, the supervisory team combines applied, field-based agronomic research with academic training and institutional support, ensuring a robust and coherent supervisory framework for the project.

Research Environment

You will be registered at University College Dublin and based at Teagasc Oak Park Crops Research Centre, the national centre of excellence for crops research in Ireland, for the duration of your studies.

Teagasc Oak Park hosts extensive experimental land resources, advanced plot-scale equipment, and crop measurement and phenotyping capacity, supporting high-quality field-based research under Irish conditions. The centre brings together multidisciplinary expertise across agronomy, plant pathology, weed science, entomology, computational biology, molecular genetics, and plant breeding, enabling integrated approaches to crop systems research.

As a Walsh Scholar, you will be part of a vibrant national and international research community, with opportunities for collaboration across Teagasc, UCD, and external research partners supporting innovation in sustainable crop production systems.



Career and Training Opportunities

The Teagasc Walsh Scholars Programme provides a structured four-year training and development framework designed to support both academic excellence and long-term career readiness. Scholars develop advanced scientific and analytical expertise alongside transferable skills in communication, project management, and stakeholder engagement through expert-led training, workshops, and tailored professional development.

Opportunities are provided to present research at national and international conferences, supporting professional networking and active engagement with the wider research community. Dedicated final-year career supports focus on preparing scholars for impactful roles across research, industry, advisory services, and policy, in Ireland and internationally.

Through the Teagasc International Training Awards, scholars may undertake an international research placement of up to 12 weeks aligned with their PhD project. Outstanding achievement may also be recognised through the Walsh Scholars of the Year and Gold Medal Awards.

Candidate Profile and Eligibility

Applicants should ideally:

- Hold a First or Upper Second Class Honours degree (2.1 or equivalent) or an MSc in agricultural science, agronomy, biology, botany, or a related discipline
- Demonstrate a working knowledge of Irish agriculture and cropping systems
- Show strong analytical, critical thinking, and problem-solving skills
- Be highly motivated and willing to undertake extensive experimental fieldwork
- Possess excellent written and verbal communication skills
- Hold a full, clean driving licence valid in Ireland
- Meet University College Dublin postgraduate entry requirements, including English language requirements where applicable

Funding Details

This is a fully funded four-year PhD funded by Teagasc, including:

- €25,000 annual stipend
- University fees covered up to €6,000 per annum

How to Apply

Applicants should complete the [online application form](#) by **4:00pm on Wednesday, 18 March 2026**.

Applications must include a curriculum vitae and a 1–2 page statement of motivation, submitted as part of the online application.

Interviews

Shortlisted candidates will be invited to interview in **early to mid-April 2026**. Online interviews can be accommodated.

Further Information

Informal enquiries are welcome and may be directed to: Dr Jack Jameson – jack.jameson@teagasc.ie

Further information on the Walsh Scholars Programme is available at:

<https://teagasc.ie/about/research-innovation/the-walsh-scholars-programme/about-the-programme/>