

Impacts of agrivoltaics on biodiversity and soil physical properties

Walsh Scholars Reference Number: 2025224

University: Dublin City University

Funding: Research Ireland (BiOrbic)

Research Institution: Teagasc

Location: Teagasc, Johnstown Castle, Co. Wexford

Proposed Start Date: September/October 2026

Project Summary

As photovoltaic (PV) technology expands rapidly across Ireland, there is growing interest in agrivoltaic systems that combine farming with solar electricity generation. Sheep grazing beneath solar panels is currently the only viable livestock enterprise within utility-scale solar farms, allowing agricultural production to continue alongside renewable energy generation. However, there is limited understanding of how these systems influence biodiversity, soil physical properties, and wider ecosystem functioning.

This PhD forms part of the BiOrbic OviVoltaics project, which is investigating the integration of utility-scale solar generation with animal production systems to create resilient and sustainable farming solutions. The successful student will investigate how agrivoltaic systems influence biodiversity and ecosystem functioning by examining the relationships between biodiversity patterns and the microclimatic conditions beneath solar panels.

The student will compare management systems with sheep grazing and without grazing, assessing pollinator feeding and nesting behaviour, plant community composition, and the ecological benefits of sheep grazing within agrivoltaic systems. Fieldwork will include biodiversity surveys of plants and pollinators alongside ecohydrological monitoring using sensor networks deployed on solar farms in Counties Meath and Wexford. The research will examine how microclimate, grazing management, and habitat characteristics interact to influence biodiversity, soil health, and ecosystem processes.

Throughout the project, the student will gain expertise in field-based ecological research, biodiversity surveys, ecohydrological monitoring, experimental design, and environmental data analysis while working within a multidisciplinary research team. By integrating biodiversity, soil, microclimate, and management data, the research will generate evidence to support the development of biodiversity enhancement strategies for solar farms.

The findings will inform the sustainable management and future deployment of agrivoltaic systems by supporting the development of biodiversity enhancement strategies co-designed with stakeholders and end users.

Supervision

The project will be supervised by Dr Saorla Kavanagh, Teagasc, whose research focuses on farmland biodiversity, ecology, and sustainable land management. Co-supervision will be provided by Professor Fiona Reegan and Dr Ciprian Briciu Burghina, Dublin City University, who contribute complementary expertise in environmental and chemical sciences.

Together, the supervisory team provides the student with a strong interdisciplinary research environment spanning ecology, environmental science, and sustainable land use, supported through close collaboration between Teagasc and Dublin City University.

Research Environment

The successful student will be based within the Farmland Biodiversity Group at Teagasc, Johnstown Castle, and registered as a PhD student at Dublin City University. The project forms part of the collaborative BiOrbic OviVoltaics programme, providing opportunities to work within a multidisciplinary research team investigating the integration of renewable energy and sustainable agriculture.

The student will undertake field-based research on commercial solar farms in Counties Meath and Wexford, gaining experience in ecological monitoring, environmental sensor technologies, and stakeholder engagement while collaborating with researchers and industry partners.

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 minimum Second Class Honours (2.1) degree (or equivalent) in entomology, environmental science, plant science, zoology, or a related discipline
- Demonstrate analytical skills in field and/or laboratory research, including data handling, analysis, and presentation
- Show the ability to think critically and apply multidisciplinary approaches to research
- Work effectively both independently and as part of a multidisciplinary team
- Possess excellent written and verbal communication skills
- Be willing to undertake fieldwork and engage with landowners and farmers
- Hold a full, clean driving licence valid in Ireland
- Meet Dublin City University postgraduate entry and English language requirements

Funding Details

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

- €25,000 annual stipend
- University fees covered up to €5,500 per annum

How to Apply

Applicants should submit the following to **Dr Saorla Kavanagh** (saorla.kavanagh@teagasc.ie) with the subject line:

"PhD Application – Walsh Scholars Reference: 2025224"

Required documents:

- CV (including two referees)
- 1–2 page personal statement outlining: Why you are interested in this project; Why you are a strong candidate for this PhD

Applications should be submitted by **5 pm, Wednesday 19th August 2026**.

Interviews: Shortlisted candidates will be invited to interview online on **Monday 24th August**.

Further Information

Informal enquiries are welcome and may be directed to **Dr Saorla Kavanagh** at saorla.kavanagh@teagasc.ie.