

**Information on Postgraduate Research Scholarship – Ref: 3E 2020-14**

**Faculty: FES Department: Agriculture, Health and Environment, NRI**

**Project Title: Harnessing** **pollination services for increased bean yields in smallholder farming systems in East Africa**.

**Lead Supervisor: Professor Philip C Stevenson**

**Project Description:** Pollinators contribute to the yield of 75% of crops including most legumes. Pollination services (PS) benefit from florally rich natural and semi-natural habitat with abundant nectar and pollen while a lack of floral resources contributes to pollinator decline. However, plant species richness in and of itself may not always enhance PS. Interventions to supplement nectar and pollen provision and augment PS must be underpinned by evidence of the contribution of specific plants to key pollinators and their potential trade-offs as weeds. Not all flowers are important for all pollinators and not all flower visitors pollinate beans. This project will continue our work addressing knowledge gaps in PS in a bean agri-system in East Africa.

We recently reported that field beans (*Phaseolus vulgaris* L.), from which pollinators were excluded, produced less than 50% of the yield than open pollinated or hand pollinated plants. Thus, where PS is sub-optimal, farmers could lose out on yield potential. To optimise PS in a bean agri-system the specific and most important pollinators need to be determined experimentally along with the margin plants that best support them. The overarching aim of this study is therefore to identify the key pollinators of beans and the margin flowers on which they forage through monitoring, observation and sequencing bee collected pollen.

The action will evaluate the impact of different crop fields, field margins and non-crop habitat on smallholder bean-maize farm ecosystem services at multiple scales and determine specifically the role of trees as components of bean system landscapes as pollinator forage and refuge. The candidate will also develop predictive tools to evaluate landscape traits for promoting pollination ecosystem services using spatial analysis. These objectives will be addressed through landscape and farm-scale assessments of floral resource and refuge for beneficial insects using high resolution spatial analysis, DNA sequencing, chemical analysis, and farm-scale assessment of pollination services as well as monitoring pollen deposition of specific pollinators and interactions between these pollinators and non-crop flowers.

The student will work primarily in Tanzania at the Sustainable Agriculture, Biodiversity and Ecosystem Management (SABEM) Department in Arusha at the Nelson Mandela African Institution of Science and Technology (for more information: https://www.nm-aist.ac.tz/index.php/schools/lisbe). Molecular and chemical research will be undertaken in the UK at the Natural Resources Institute, University of Greenwich, UK.

**Bursary available (subject to satisfactory performance):**

Year 1: £15,009 Year 2: In line with UKRI rate Year 3: In line with UKRI rate

In addition, the successful candidate will receive a waiver for tuition fees for the duration of their three-year scholarship. Students may be liable for tuition fees after this period.

**Duration: 3 years, Full-Time Study**

|  |  |
| --- | --- |
| ***Person Specification of Essential (E) or Desirable (D) requirements:*** | |
| ***Criteria: Essential or Desirable*** | ***E or D*** |
| ***Education and Training:*** | |
| * 1st Class or 2nd class, First Division (Upper Second Class) Honours Degree or a taught Master’s degree with a minimum average of 60% in all areas of assessment (UK or UK equivalent) in a relevant area to the proposed research project | **E** |
| * For those whose first language is not English and/or if from a country where English is not the majority spoken language (as recognised by the UKBA), a language proficiency score of at least IELTS 6.5 (in all elements of the test) or an equivalent UK VISA and Immigration secure English Language Test is required, unless the degree above was taught in English **and** obtained in a majority English speaking country, e.g. UK, USA, Australia, New Zealand, etc, as recognised by the UKBA. | **E** |
| ***Experience & Skills:*** | |
| * Previous experience of undertaking research (e.g. undergraduate or taught masters dissertation) | **E** |
| * Experience of living and working in sub-Saharan Africa or self-organised field work in Africa | **D** |
| * Speak and understand Kiswahili or other East African language | **D** |
| * First author in a research article published by a peer-reviewed interntational science-indexed journal | **D** |
| * Experience of molecular genetic tools such as PCR | **D** |
| * Experience with GIS and/or ecological modelling as a desirable | **D** |
| * Familiarity with East African insect or plant biodiversity | **D** |
| ***Personal Attributes:*** | |
| * Understands the fundamental differences between a taught degree and a research degree in terms of approach and personal discipline/motivation | **E** |
| * Able to, under guidance, complete independent work successfully | **E** |
| ***Other Requirements:*** | |
| * The scholarship must commence before 4 Feb 2021 | **E** |

**For further information contact: Prof Philip C Stevenson p.c.stevenson@gre.ac.uk; Dr Sarah Arnold s.e.j.arnold@gre.ac.uk or Prof. Anna Treydte anna.treydte@nm-aist.ac.uk**

**Making an application:**

Please read this information before making an application. Information on the application process is available at: https://www.gre.ac.uk/research/study/apply/application-process. Applications need to be made online via this link. **No other form of application will be considered**.

All applications **must include** the following information. **Applications not containing these documents will not be considered.**

* In the first part of the application select the following: **Agriculture, Health and Environment (MPhil/PhD)**
* **Scholarship Reference Number** **(Ref)**– included in the personal statement section together with your personal statement as to why you are applying
* **a CV including 2 referees** \*
* **academic qualification certificates/transcripts and IELTs/English Language certificate if you are an international applicant or if English is not your first language or you are from a country where English is not the majority spoken language as defined by the UK Border Agency** \*

\**upload to the qualification section of the application form. Attachments must be a PDF format.*

Before submitting your application you are encouraged to liaise with the Lead Supervisor on the details above.

**Closing date for applications: *midnight UTC on 10 November 2020***