

Supervisor Name: [Dr John Foulkes](#)

Division: [Plant and Crop Sciences](#)

Other Supervisor/s involved: John Spink (Teagasc, Ireland)

Project Title: **Identifying traits conferring improved tolerance of *Mycosphaerella graminicola* in wheat**

Wheat is the major grain crop in UK and Ireland. However, the climate favours the development of septoria tritici blotch (STB) caused by *Mycosphaerella graminicola*. Improvements in the disease tolerance of wheat varieties (leading to reduced yield loss per unit disease severity) would reduce the fungicide requirement, without sacrificing output.

In this project the contribution of specific canopy traits (e.g. canopy area (leaf area index) and the area of the flag leaf and its light-saturated rate of photosynthesis) to tolerance of *M. graminicola* will be investigated. The project will quantify the relationships between physiological traits and tolerance of disease and test for variation in tolerance in wheat lines developed from a cross between Mexican and UK wheat. In contrast to Europe, selection of breeding lines in the CIMMYT programme in Mexico is likely to have favoured genetic gain in tolerance, because selection is carried out in the absence of fungicide treatment.

Field experiments will test for associations between candidate traits and disease tolerance on specific wheat lines which show heritable variation for disease tolerance. The project will develop new understanding of the traits and mechanisms which determine tolerance with a focus on identifying tolerance traits which are compatible with high yield potential. A focus of the project will also be to investigate different ways of quantifying disease, including using molecular techniques (eg. qPCR). The student will be located at Oak Parks, Crop Research Centre, Teagasc, Carlow, Ireland where the field and laboratory work will be carried out.

The PhD is designed to develop a range of field experimentation and laboratory skills including molecular skills in the student, bridging across plant pathology and crop physiology. The underlying skills are highly transferable to a wide range of disciplines. The PhD studentship award includes academic fees (at HEU level) and a living stipend.

Award Start Date: January 2012

Duration of Award: 3 Years

Terms and conditions of award (if applicable) see:  
<http://www.teagasc.ie/research/postgrad/>

Funding status: HEU

Closing date for applications: 30th November 2011

Sponsor and collaborating body: Walsh PhD Fellowship (The Irish Agriculture and Food Development Authority; Teagasc)

Eligibility Requirements: Applicants should have a 2.1 or first class degree in applied plant sciences with a background in crop science an advantage.

Method by which candidates should apply: email CV to  
[john.foulkes@nottingham.ac.uk](mailto:john.foulkes@nottingham.ac.uk)