



Indo-UK Centre For The Improvement Of Nitrogen Use Efficiency In Wheat

## INEW course on Wheat Genetics and Marker Development



**Bristol/Norwich, UK**

**11-16 June 2017**



The Indo-UK Centre for The Improvement of Nitrogen Use Efficiency in Wheat (INEW) is a Virtual Joint Centre that brings together major UK and Indian wheat researchers with programmes on wheat improvement to determine the genetic control of nitrogen use efficiency in wheat. The aim of the INEW course on Wheat Genetics and Marker Development is to offer training in the genetic analysis methodologies employed at the University of Bristol and at the John Innes Centre. The participants will gain the skills necessary to apply these methodologies in their own research.

### TARGET AUDIENCE

The course is aimed at anyone with an interest in cereals research and crop breeding. The course is an entry level introduction, giving a taste of wheat genetics, from wheat crossing, modern genotyping techniques to QTL analysis. Applications are welcome from Indian and UK PhD students, early career scientists and breeders. A total of 12 places are available for this course and preference will be given to those working within or associated with INEW.

The course is a five-day programme held at Bristol University and at the John Innes Centre (JIC), Norwich. At Bristol the course will cover SNP discovery from next generation sequencing data and design of SNP assays for genotyping in hexaploid wheat. This will then be followed by a lab based practical session to demonstrate different genotyping platforms in action with evaluation of the data produced. At the JIC, the course will deliver a module on germplasm development, including a practical session on wheat crossing and a guided visit to the JIC field wheat plots. Furthermore, two modules on current quantitative genetic data analysis and a tour of the Germplasm Resource Unit will be part of the programme at JIC. The complete course will demonstrate all parts of a successful wheat genetics programme. The modules will be taught in classroom lectures and demonstrations, followed by hands-on exercises and discussion of the results. This will allow the participants to apply their new skills and knowledge to research questions at home. Additionally, a visit to CEREALS 2017, the leading technical event for the UK arable industry with exhibits, crop plots, working demonstrations, and more, is included.

### PREREQUISITES

It is essential that participants are fluent English speakers, as this intensive course will be given in English. Successful applicants will be provided with bibliography to read in advance.

## PROGRAM COSTS

The course is fully financed by INEW and includes:

- Accommodation on or near the university campus for six nights:  
Sunday 11 June to Saturday 17 June, three days in Bristol, three days in Norwich.
- Meals and refreshments Monday to Friday and a workshop dinner on Thursday evening.
- Entrance fee to CEREALS 2017
- transport in minibus from Bristol University to Norwich via CEREALS 2017

**Please note: participants are responsible for booking and paying for their own travel arrangements to Bristol and from Norwich. Participants are also responsible for obtaining their own visas; INEW will provide letters of support for these.**

## APPLICATION DEADLINE

The deadline for submission of application is: **17:00 (GMT), Tuesday 28 February 2017.**

Applicants are required to submit their completed application form, CV (max. length two sides of A4) and a letter of recommendation from their Head of Department (or equivalent).

Applications should be sent by email to [inew.communication@rothamsted.ac.uk](mailto:inew.communication@rothamsted.ac.uk) quoting "INEW Wheat Genetics course 2017". Successful applicants will be notified shortly after the application deadline

## COVERED TOPICS

### SNP discovery:

- Next generation sequencing
- Methods for SNP discovery in hexaploid wheat

### Genotyping:

- Using current genetic resources to design SNP assays
- Hands on lab based practical to demonstrate KASP genotyping
- Demonstration of Affymetrix genotyping using the GeneTitan
- Analysis of KASP and Axiom genotyping data.

### Germplasm development:

- Collating and maintaining collections of precise stocks
- Production of novel material through accurate crossing of germplasm
- Efficient development of mapping populations accurately under glass.
- Transfer from precise glasshouse stocks to field trials for evaluation and bulking.

### Quantitative Genetics:

- Genetic mapping with low and high density genotype datasets
- QTL discovery

**Sunday 11 June**

Arrival in Bristol

**Day 1 Monday 12 June, Bristol University**

- Strategies for the identification of useful genes in wheat germplasm collections

**Day 2 Tuesday 13 June, Bristol University**

- Wheat bioinformatics: How to find 'your' gene
- SNP genotyping practical

**Day 3 Wednesday 14 June: CEREALS 2017**

**Day 4 Thursday 15 June, Norwich**

- Wheat germplasm development (theory and practical)
- Genetic mapping (theory and practical)

*Workshop dinner*

**Day 5 Friday 16 June, Norwich**

- Visit to the Germplasm Resource Unit, JIC
- Quantitative Trait Locus (QTL) identification (theory and practical)
- Final discussion

**Saturday 16 June**

Departure from Norwich