A TWO WEEK COURSE
18th March – 29th March 2019
Statistics, computation and data handling, molecular genetics, population genetics, quantitative genetics, linkage analysis, genomic selection, association mapping, marker assisted selection
Tutors: Prof Ian Mackay & Dr Keith Gardner

Quantitative Methods in Plant Breeding
This annual two week postgraduate level course, which we successfully ran for the first time in 2008, introduces participants to methods in quantitative genetics and statistics. Course content ranges from the well established, for example variety trial design and analysis, to more contemporary methods such as linkage disequilibrium mapping and genomic selection. Emphasis is on practical application of methods to breeding programmes with theory covered in sufficient depth to allow confident evaluation and application of methods to plant breeding programmes. The course provides an opportunity for participants to become familiar with the concepts and utilization of contemporary methods and software at all stages in the breeding process.

Who should attend?
Plant breeders and plant geneticists who have some background knowledge of statistics and quantitative genetics, but who wish to understand and be able to apply these methods more thoroughly. Post-graduate students working on the detection and analysis of genes controlling the inheritance of complex traits.
The course is limited to 24 participants.

Course content
Revision/refresher: Basic statistics and genetics
Statistics: Regression, ANOVA, statistical software
Trial design and analysis: Principles of good design, blocking, spatial analysis
The mixed model: Variance components, REML, BLUPs & BLUEs
Population genetics: Single and multiple locus disequilibrium
Quantitative genetics: QTL, selection theory, genotype x environment interaction
Linkage analysis: Genetic maps, alternative mapping populations
Association mapping: Population structure and methods for its control
Genomic selection: Application in plant breeding
Marker assisted selection: Strengths, weaknesses, methods
Software used includes R, Structure, R/QTL, rrBLUP
## Course Details

**Duration**
Week 1: Monday 18th March–Friday 22nd March 2019.
Week 2: Monday 25th March–Friday 29th March 2019.

**What’s included**
Course materials, refreshments, lunches, local excursions, a pub meal, the course dinner and transport to and from the hotels at Orchard Park.

**Accommodation**
Delegates should book their own hotel rooms. Three hotels with reasonable rates close to NIAB are:

- **Premier Inn Cambridge North**, £60-90/night for B&B. Directly opposite NIAB and about 1.5 miles to the city centre.
- **Premier Inn A14**, £55-80/night for B&B.
- **Travelodge Orchard Park**, £40-70/night for B&B.

Hotels 2 & 3 are adjacent and about 2 miles from NIAB and the city centre. A bus route to the city centre is close. On course days we will organise transport from these hotels to NIAB and back again.

For the best rates we advise you to book rooms early using the websites www.premierinn.com and www.travelodge.co.uk.

**Course Cost**
Postgraduate student – £999; others – £1499 (no VAT applicable).

**How to apply**
You can apply online at [www.artistraining.com/QMPB](http://www.artistraining.com/QMPB) or complete the form below and return it via the following methods:

- **Post**: Alise Petrie-Symes, NIAB, Huntingdon Road, Cambridge CB3 0LE, UK
- **Phone**: +44 1223 342229
- **Scan and email**: Alise.Petrie-Symes@niab.com

Please do not send bank or debit/credit card details by email. The course is limited to 24 participants on a first come basis. Please book as early as possible as we are usually oversubscribed. The closing date for applications is 31st January 2019.

**Payment**
We can accept payment by debit/credit card and UK cheque. Contact us if you want to pay by card over the telephone. We also accept overseas bank transfers; contact us for details.

**Contact details**
Please address any queries to Alise Petrie-Symes on +44 1223 342229 or Alise.Petrie-Symes@niab.com

## QUANTITATIVE METHODS IN PLANT BREEDING

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NIAB, Huntingdon Road, Cambridge CB3 0LE

www.niab.com