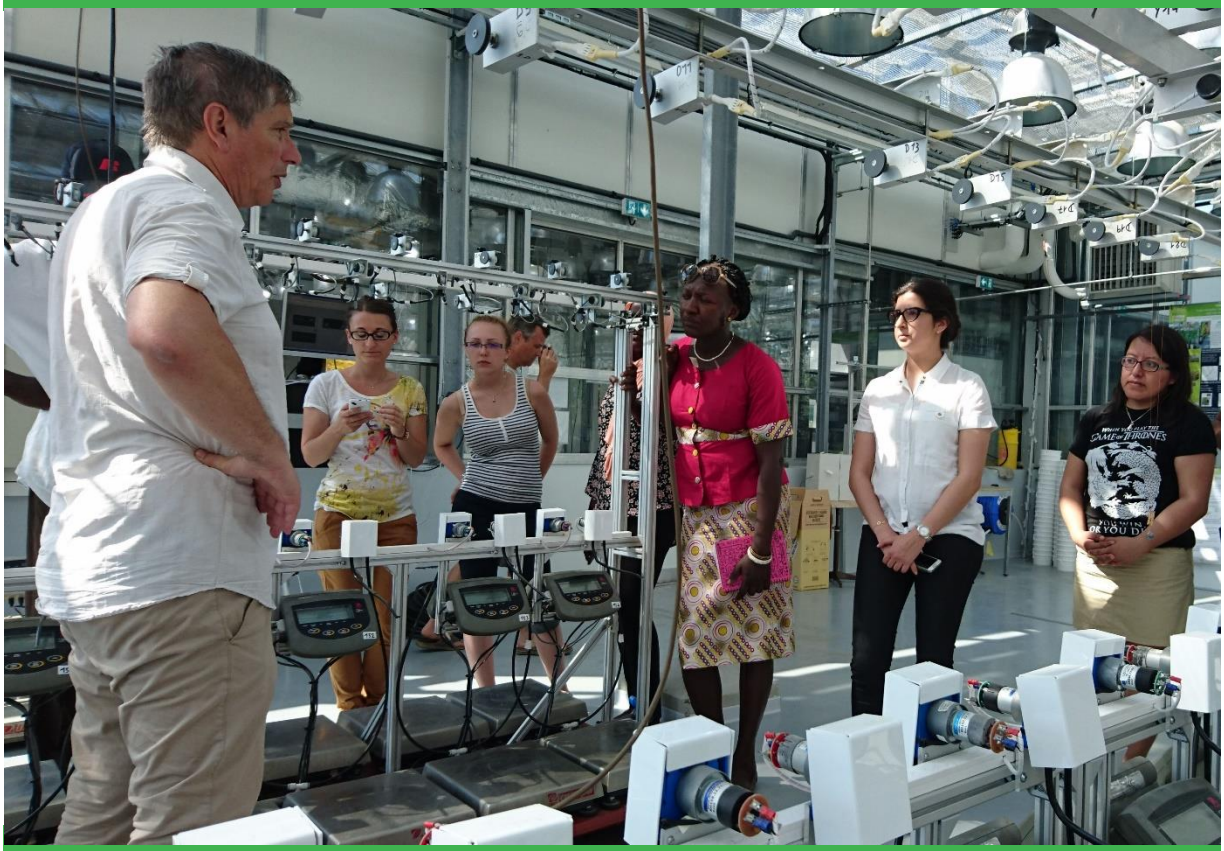
CultiVar
Training in plant breeding

Ecole Doctorale GAIA
Biodiversité
Agriculture
Alimentation
Environnement
Terre
Eau

THEMATIC SCHOOL

Analysing and modelling phenotypes for challenging environments

28 May – 1 June 2018



During the 2017 session. © A. Seye

Montpellier, France

Overview

During the 2017 session. © A. Seye

Plant breeding for challenging environments is crucial in the context of climate changes. Traits and alleles suited to fluctuating environments are complex, difficult to define and differ depending on target cropping environments. Phenotyping facilities in field and controlled conditions allow addressing this challenge but still require considerable progress in methods. Combination of genetic and crop / ecophysiological modelling can help unlocking these difficulties and support the conception of suitable genotypes.

Main objectives of this course

By the end of this course, you should:

- **be aware of new phenotyping capacities and be able to have a critical view on them.**
- **understand how the combination of phenotyping and modelling can help:**
  - **dissecting GxExM interactions,**
  - **exploring the consequences of the genetic variability of traits,**
  - **predicting crop performance in multiple environments.**

Modalities

This thematic school will take place in English for 5 days (30 hours), in Montpellier, from Monday 28th May to Friday 1st June 2018. It involves two sections.

- The first section (3 days) addresses main phenotyping methods with a combination of:
  - **seminars** that provide the ecophysiological bases for interpretation of phenotypic data,
  - **computer exercises** that allow students to better understand these concepts, based on practical cases,
  - **visits** allowing students to visualize sensors, devices and facilities.
- The second section (2 days) consists in **case studies** (groups of 2/3 students) that illustrate trade-offs between traits in a range of environmental scenarios, based on the use of a crop model. The last half day will consist of a report by groups and discussions on each case.

Course schedule

	Morning	Afternoon
Monday	**Introduction**	**Genetic and environmental control of phenology and cycle duration** (course + exercises + visit)
Tuesday	**Canopy temperature** (course + exercises + discussion)	**Intercepted light and leaf area** (course + visit + discussion)
Wednesday	**Water use and geometry of root systems** (course + exercises + visit)	**Integration at crop cycle scale, yield dissection** (course + exercises)
Thursday	**Integration at crop cycle scale** (case studies using crop model, by groups of 2-3 students)	**Integration at crop cycle scale** (case studies using crop models by groups of 2-3 students)
Friday	**Oral presentations by students on their case studies**	**Oral presentations by students on their case studies and conclusion**

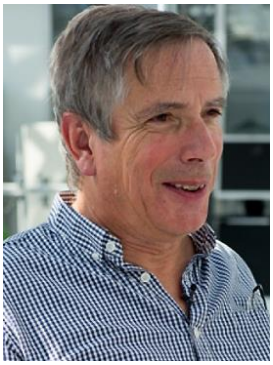
The teaching group

Delphine Luquet
(CIRAD, AGAP)

Benoit Pallas
(INRA, AGAP)

Boris Parent
(INRA, LEPSE)

François Tardieu
(INRA, LEPSE)



Claude Welcker
(INRA, LEPSE)

Prerequisites

- Standard knowledge in and interest for the following fields: physiology, ecophysiology, plant / environment relationship, data analysis…
- Skills for using Excel (charts, tables, equation formula).
- Ability to follow a whole week course in English.
- If possible, please bring a personal computer.

The INRA Phenoarch platform in Montpellier. © JM. Lacape

Application / selection criteria / financial support

This thematic school is free of charge.
Max. 20 participants can attend this course (PhD students, teachers and researchers).
Candidates will be selected according to each section of the application form, in particular interest for the topic, ability to link the course with PhD project and/or professional project, ability to ask original questions.
If you wish to apply, please send the attached application form back to Agnès Seye before 6 April 2018: agnes.seye@cirad.fr (00 33 6 63 39 24 69).
Please note that CultiVar can provide 3 PhD students or teachers originating from developing countries with a financial support (plane tickets and/or accommodation). Don't forget to ask if you are concerned.

During the 2017 session. © A. Seye

If you need more information about this course

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If you need more information about CultiVar

www.cultivar-flagship.net