Tucson Plant Breeding Institute in Uruguay

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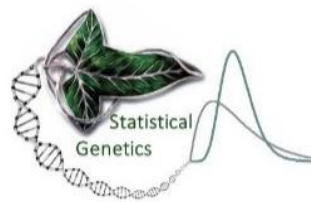
Module 1: Introduction to Plant Quantitative Genetics

Module 2: Advanced Statistical Plant Breeding

March 19-23, 2018 Punta del Este, Uruguay

Registration: https://docs.google.com/forms/d/1zimrGtoUsm4pTL_nF1beyka6iE3CfABGi_DWPmkvzN8/prefill

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Module 1: Introduction to Plant Quantitative Genetics

Target audience: Geneticists and molecular biologists with an interest in classic approaches to plant breeding that are critical for molecular breeding.

Goals: An introduction to the basic machinery of quantitative genetics useful for plant breeders.

Assumed background: some exposure to statistics (regressions, ANOVA, covariances).

Lectures:
1. Introduction to Modern Plant Breeding
2. Basic Genetics
3. Basic Statistics
4. Variance Decomposition
5. Resemblance Between Relatives
6. Heritability and Field Designs
7. QTL Mapping
8. Association Mapping
9. Inbreeding Heterosis
10. Mass and Family Selection

Instructors:

Prof. Bruce Walsh, Depts. of Ecology & Evolutionary Biology, Plant Science, Animal Science, Molecular & Cellular Biology, University of Arizona, USA.

Prof. Michael Gore, Associate Professor of Molecular Breeding and Genetics, Cornell University, USA.

Prof. Lucia Gutierrez, Assistant Professor of Cereals Breeding and Quantitative Genetics, University of Wisconsin-Madison, USA, and Associate Professor of Statistics, Facultad de Agronomia, Universidad de la Republica, Uruguay.

Module 2: Advanced Statistical Plant Breeding

Target audience: Geneticists and molecular biologists with an interest in classic approaches to plant breeding that are critical for molecular breeding.

Goals: An introduction to methods for gene detection, mapping, and selection with a focus on marker-based approaches.

Assumed background: Introduction to plant quantitative genetics module or similar background.

Lectures:
1. Linear Algebra
2. Multivariate Selection
3. Index Selection
4. Mixed Models
5. Association Mapping in Structured Populations
6. BLUP
7. Marker-Assisted and Genomic Selection
8. GxE I: Stability Measures and AMMI
9. GxE II: Mixed Models
10. Summary: Integrating classical and molecular breeding

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