Cornell University

UCD DUBLIN

Genomic Selection in Plant Breeding

A hands-on short course in R

Monday 4 June - Thursday 7 June 2018

University of Granada, Spain

UNIVERSIDAD DE GRANADA

Course Programme

Course Instructors: **Dr. Julio Isidro Sánchez** University College Dublin
Dr. Deniz Akdemir Cornell University

The aim of this course is to provide a basic quantitative and statistical framework to apply genomic selection (GS) in a routine manner. The course is focusing on the application of plant breeding concepts through practical exercises in R. The course will provide participants with the relevant theory of GS models, as well as with hands-on experience with relevant GS techniques.

Day 1	**Quantitative Genetics**	**In R: Introduction**
Quantitative Genetics	Quantitative traits	R and R studio
	Sources of quantitative trait variation	Understanding basic data types in R
	Variation in population	Loop and functions in R
	Breeding Values and Heritabilities	Graphics
	Response from selection	Basic statistical operations in R
	Resemblance among relatives	
Day 2	**Genomic Selection in R**	**In R: Selection of Populations**
Genomic Selection in R	What, Why and How Genomic Selection?	Simple and Multiple Regression Analysis
	Populations in Genomic Selection	Training and Test population
	Factors affecting Genomic Selection	
	Training population optimization	
Day 3	**Statistical Analysis**	**In R:**
Statistical Analysis	Random vs. Fixed Effects	BLUPs
	Best Linear Unbiased Estimator (BLUEs)	BLUEs
	Best Linear Unbiased Predictor (BLUPs)	Kinship Matrix
	Pedigree vs. Kinship matrix	Imputation
	Imputation	One step model
	One step model	
Day 4	**Statistical Analysis**	**In R:**
Statistical Analysis in Genomic selection and Genomic Mating	Two step models	One step vs two steps models
	rrBLUP, Bayesian	G x E models
	Cross-Validations	Cross-Validation
	Optimal parental proportions and Genomic Mating	Genomic Mating

Book online now:
Reserve your place here
Or visit: bit.ly/genomicselection2018

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