



Quantitative Genetics and Advanced Breeding Course

Instructors:

Dr. Bruce Walsh (University of Arizona, USA)

Dr. Lucia Gutierrez (University of Wisconsin –
Madison, USA; SLU, Sweden, visiting scholar)

5-9 June 2023

SLU Alnarp, Sweden



AUDIENCE

While breeding is among humankind's oldest and most important endeavors, it remains a highly dynamic field. There is a constant flux of new technologies for plant improvement, such as advances in genomics, bioinformatics, high throughput phenotyping, and new statistical approaches for selection, gene mapping, and genotype by environment interactions. The course offers breeders state-of-the art training in these modern tools. The goal is to transfer current technologies to a wide audience of users including **commercial breeders** or **academics** (i.e. Ph.D. students, post-docs, researchers and professors) interested in breeding.

COURSE CONTENT

The course is divided in two modules.

Module I will cover an Introduction to Quantitative Genetics including an introduction to modern breeding, basic genetics, basic statistics, allelic effects and genetic variances, resemblance between relatives, heritability and experimental design, QTL mapping, association mapping, inbreeding, heterosis, and mass and family selection.

Module II will cover linear algebra, multivariate selection, index selection, linear mixed models, BLUP, GWAS, marker assisted selection, genomic selection, and genotype by environment interaction.

REFERENCES

Bernardo, Breeding for Quantitative Traits in Plants, 2nd ed.

Lynch & Walsh, Genetics and Analysis of Quantitative Traits (Sinauer 1998)

Walsh & Lynch, Evolution and Selection of Quantitative Traits (Oxford 2018)

LOGISTICS

Registration. Participation is free but you have to pay for your accommodation and food, and you must register. A Swedish Fika (coffee) will be served daily. Please register at the following link: [registration](#)

Venue. The course will be held at the Alnarp campus of the Swedish Agricultural University (SLU) in Southern Sweden. The campus is conveniently located close to Lund and Malmö with easy access to public transportation, international airport, and lodging.