Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

SLUkurs

Syllabus

PFS0171 Linear Model, Breeding value, Genomic Selection and Norm of Reaction, 4.0 credits

Syllabus approved

2020-01-22

Subjects

Biology

Education cycle

Third cycle

Grading scale

Pass / Failed
The requirements for attaining different grades are described in the course assessment criteria which are contained in a supplement to the course syllabus. Current information on assessment criteria shall be made available at the start of the course.

Language

English

Prior knowledge

Basic training in statistics, computing and genetics or equivalent with a master degree in plant biology.

Objective, including learning outcomes

The purpose of this course is to familiarise participants with basic and advanced linear models and the latest analytical approaches for quantitative traits. Lectures

will give insight into how similarity among relatives can be used to derive quantitative genetics parameters and the estimation and prediction of these parameters including breeding values can be done using mixed linear models. Using modern genomics, how genomic selection can be used to increase selection efficiency. Using both linear and non-linear models, how the norm of the reaction of population and genotypes can be estimated. This will give students a solid foundation in future breeding program design and using genomics and norm of reaction in advanced breeding program for climate adaptation. It covers from basic linear to mixed linear model and their application to breeding value prediction, G by E interaction, genomic selection and modelling of norm of reaction. The basic use of software R and ASReml will be covered and applied to practicals and exercises

Content

Introduction of R
Linear mixed models
Resemblance Among Relatives
Genetic (genotypic) values (Concept and estimation)
Individual tree model
Spatial model and breeding value prediction
Exploratory Marker Data Analysis
Genomic selection
Genotype x Environmental Interactions
Norm of reaction

Requirements for examination

Examination will be in the form of assignment. Current information on assessment criteria shall be made available at the start of the course. Course grading as Quiz (40%) and final assignments (60%).

Additional information

Lectures and demonstration 56 (7 days)
Examination and course evaluation 10 h
Self studies 40 h
Totally 106 h

Responsible department

Department of Forest Genetics and Plant Physiology