One week intensive course

Experimental design and analysis of field and laboratory trials

Target group:
Students, researchers, extension service, industry, NGOs, etc.

Where: **Egerton University, Njoro Kenya**

When: March 13-17, 2023

How to register:
send filled application from to: gentwork@boku.ac.at
before February 20, 2023

Your instructor: Dr. Sebastian Michel
Plant Breeder and Quantitative Geneticist. Lecturer and researcher at the University of Natural Resources and Life Sciences Vienna.
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For further information please contact:
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https://short.boku.ac.at/gentwork

africa uninet   https://africa-uninet.at

One week intensive course

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During this lecture you will learn how to use the statistical package R for fitting mixed models and familiarize yourself with the usage of this package.

The following topics will be discussed during the course:

- Introduction into the R statistical environment (regression analysis, t-test, analysis of variance)
- Randomized complete block design (prelude to random blocks)
- Incomplete block designs (augmented designs, α designs, p-rep, row-column designs)
- Multi-factorial trial designs (genotype x environment interaction, split-plot designs, strip-plot designs)

Participants will be able to set up a linear mixed model for their designed experiments and can implement such models using statistical packages such as R. Participants will be furthermore able to analyze the data obtained in plant breeding and plant production field and laboratory trials as well as interpret and display the relevant results.

Prerequisites for participation:

- Basics in Biostatistics (linear regression, analysis of variance)
- Basic knowledge of biology, plant breeding, plant production, or a related discipline
- Laptop with an installation the latest versions of R and RStudio (freeware)

$$\begin{bmatrix} \mathbf{X^TX} & \mathbf{X^TZ} \\ \mathbf{Z^TX} & \mathbf{Z^TZ + A^{-1}}\alpha \end{bmatrix} \begin{bmatrix} \mathbf{b} \\ \mathbf{u} \end{bmatrix} = \begin{bmatrix} \mathbf{X^Ty} \\ \mathbf{Z^Ty} \end{bmatrix}$$

Teacher:
Dr. Sebastian Michel; sebastian.michel@boku.ac.at