Workshop on the free Statistical Software ***R***

Using appropriate statistics for regression in physical, chemical and biological weed control

Time: 2015
Duration: 4 days (17-20 May)
Venue: University of Mohaghegh Ardabili, Ardabil, Iran.

Local coordinator: Assistant Prof. Mohammad Taghi Alebrahim,
Department of Agronomy and Plant breeding,
Faculty of Agriculture,
University of Mohaghegh Ardabili.
m_ebrahim@uma.ac.ir

Instructors: Prof. Jens Carl Streibig,
Faculty of Science,
University of Copenhagen.

Uncertainty happens and we must use statistics to determine how closely data correspond to working hypotheses. Whether you publish in international journals or at local meetings, you present effects of treatments, be it weed infestation, herbicide rate or intensity of physical control, and you are expected to present statistical analyses to substantiate you results.

If you have ever wondered when to use analyses of variance or regressions then this course is for you. We will try to answer these questions and provide you with guidelines on how to select scientifically and statistically sound analyses without using unnecessary statistical jargon.

The course is based on the open source **R** **http://www.r-project.org/**

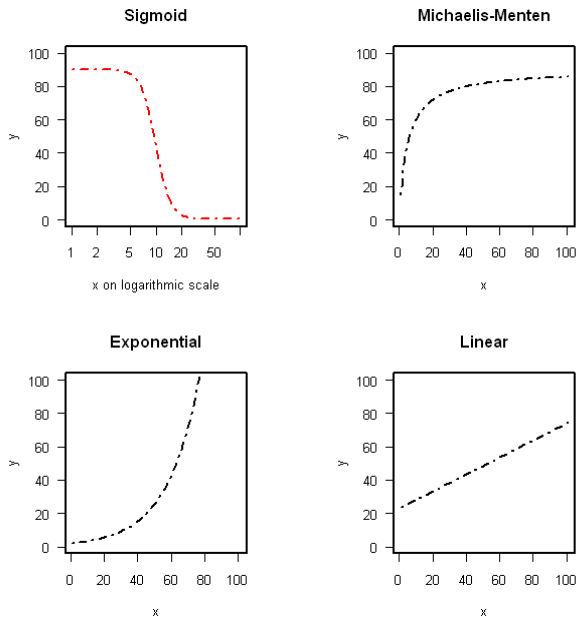
Note **R** is platform independent http://cran.at.r-project.org/index.html

Documentation, manuals and textbooks are free and available in several languages, for example;
http://cran.r-project.org/doc/contrib/Martinez-RforBiologistv1.1.pdf

The course will use the newly developed internet site http://rstats4ag.org/ in the teaching.

The prerequisite for being admitted is that participants bring their own data and a laptop and are prepared to share data and analyses with the other participants.

These four curves describe most dynamic phenomena in biological disciplines including Weed Science.
Three of those are nonlinear curves, which have one or sometimes two limits (asymptotes) between which the responses range.
We will demonstrate how to easily fit those linear and nonlinear curves and test whether the model used is appropriate



Day	Headline	Content
1 13:00 18:00	Getting data into R, the R programme and basic statistics	Introduction of teachers and participants. Objective of the workshop Installation of **R** and packages. Get your data in shape Introductory Statistic Summary of dataset, statistically and graphically Introduction to ANOVA, Regression and ANCOVA (Analysis of co-variance), similarities and differences) The importance of rate of change in biology Why multiple comparisons on quantitative responses as a function of continuous independent variables are wrong, and why regressions are superior Work on own data
2 8:00 17:00	Linear Regression	Graphic presentation Design of experiments Is the relationship Linear? The statistical assumption How to report a regression analysis To transform and not transform that is the question? Back-transformation Work on own data
3. 8:00 17:00	Nonlinear regression	What is the difference between linear and nonlinear regression The most common models in biology How to report a nonlinear regressions analysis The use and misuse of R^2 in regressions The use and misuse of error bars in regression Work on own data
4 8:00 17:00	Special topics	How to properly analyze germination Dose-response curves and ED10, 50 and 90 for herbicides and applying models Do not blindly copy what other weed scientists have done in statistics Finishing working on own data