

**rstats4ag.org, A website to help
crop and weed scientists**

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Agricolae

- Statistical Procedures for Agricultural Research
- Numerous procedures for analysing experiments
- Suggestions of numerous designs practiced in agricultural research
- No mixed models
- No multcomp (Simultaneous tests and confidence intervals for general linear hypotheses)

Weed Science Experiments

A vast majority of weed science experiments use only a few types of analyses

correlation

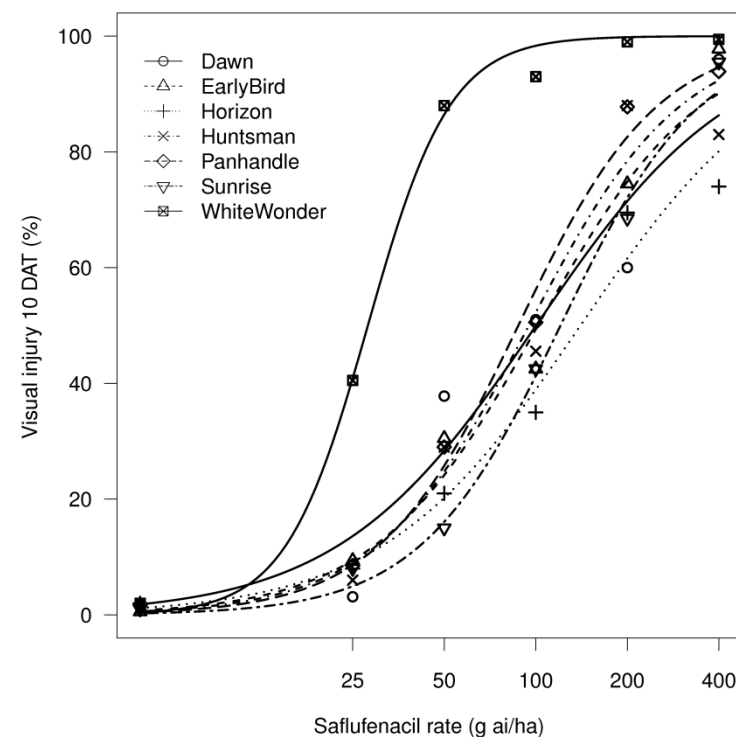
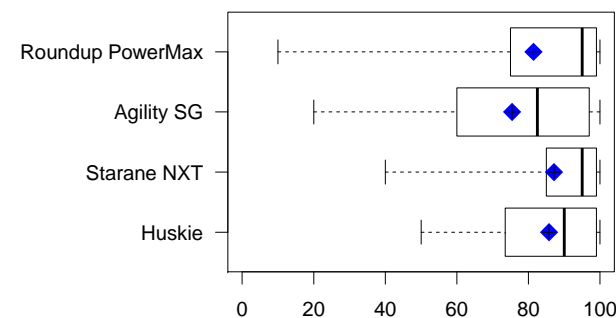
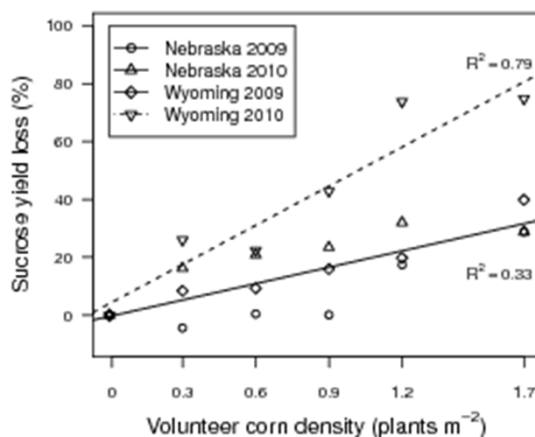
t-test

ANOVA

ANCOVA

linear regression

nonlinear regression



Rstats4ag.org

- Many examples, with explanation of code and interpretation of output
- All data sets are provided
- Code can be copy/pasted, or modified to suit specific needs



- › Introduction
 - › Getting Data Into R
 - › Calculating Descriptive Statistics
- › Data Visualization & Plotting
- › t-Tests
- › Analysis of Variance (ANOVA)
- › Linear Regression
- › Analysis of Covariance (ANCOVA)
- › Mixed Models: ANOVA
- › Mixed Models: Regression
- › Dose Response
- › Logistic Regression
- › Selectivity
- › Germination
- › Plant Competition

On this page:

- › What is this site?
- › Downloading and Installing R
 - › R packages – CRAN
 - › RStudio
- › Conventions
- › Basics of using R
- › How to get help?
 - › Help files
 - › Online help

Introduction

What is this site?

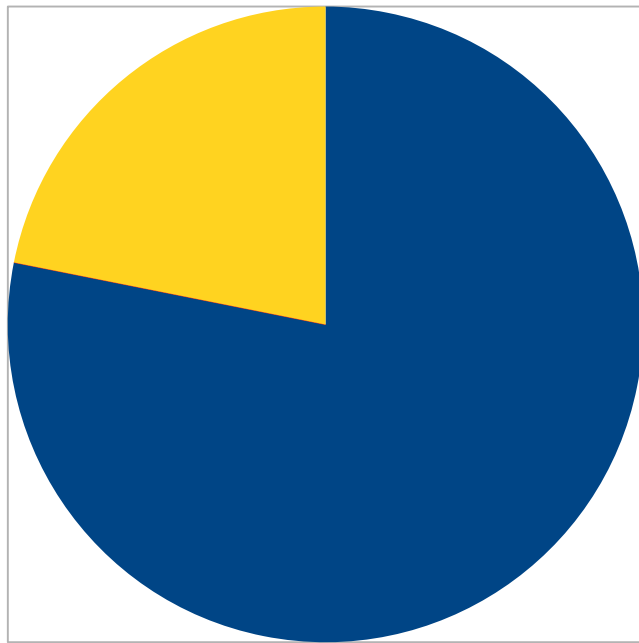
“Statistics, like all other disciplines, is dynamic; it is not a fixed set of unchanging rules passed down from Fisher and company.” -W. Stroup

There are many excellent books and websites available to students and practitioners who would like to learn the R statistical language. Even so, there are few resources that specifically address the type of designed experiments common in the plant and weed science disciplines. Statistics, and the R language, evolves over time. It is not uncommon for a book about R or statistics to become out of date within only a few years. So we decided to develop this material for the web rather than a textbook so that it could be more easily kept up to date.

This website is not meant to be a complete reference for all the capabilities of the R language, nor should it be used as a substitute for consultation with a well-trained statistician. This site will not cover many of the underlying statistical concepts for the examples provided, and as such, this is certainly not a standalone statistics resource. The purpose of this site is simply to provide information and examples on how to use the R language to analyze statistical designs that are commonly used in agricultural experiments.

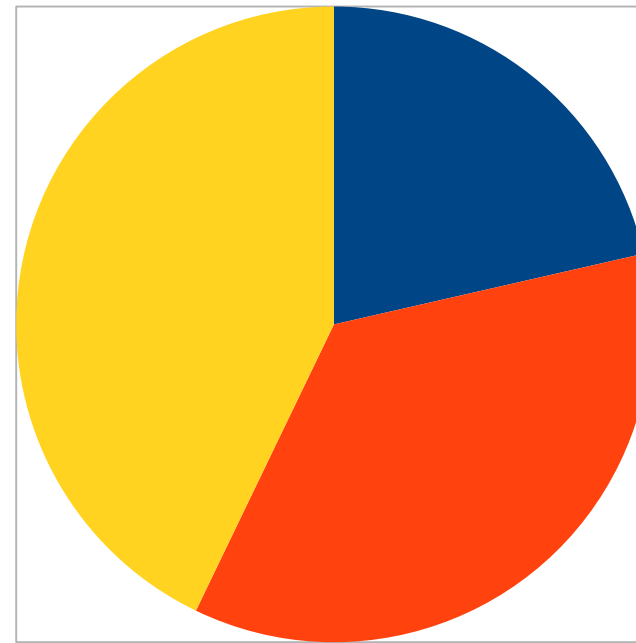
A majority of agricultural research uses a small subset of experimental designs, and thus, there is a high probability that the examples presented here will provide a framework for analysis of many agricultural experiments. It is important, though, that the researcher understands their own data and the experimental designs that were employed in the research so that these examples are not used inappropriately. As of this writing, the examples presented here are heavily focused on agronomic and weed science experiments, as that is the primary expertise of the authors. We welcome additional contributions from related disciplines to broaden the scope and usefulness of this site.

Statistical Packages Reported in *Weed Science*



All analyses

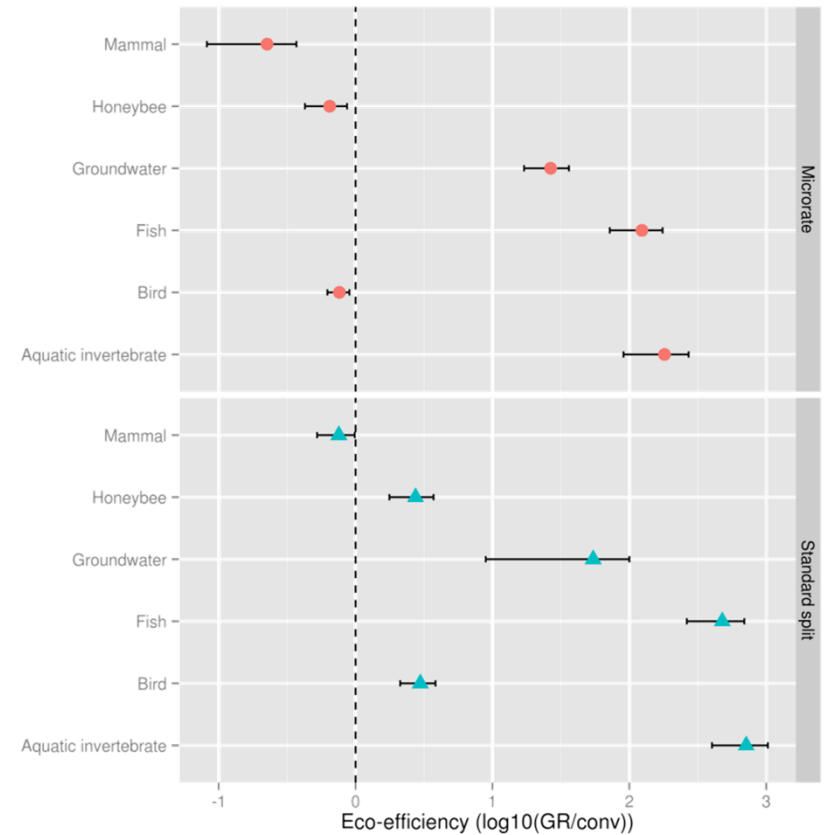
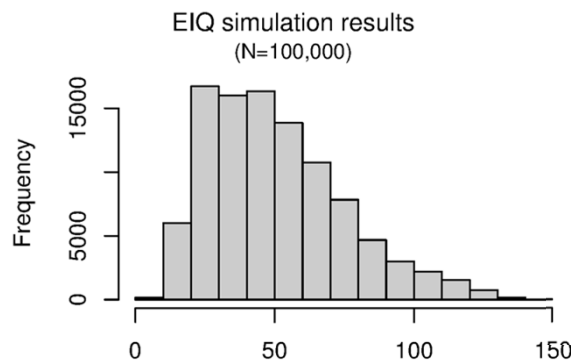
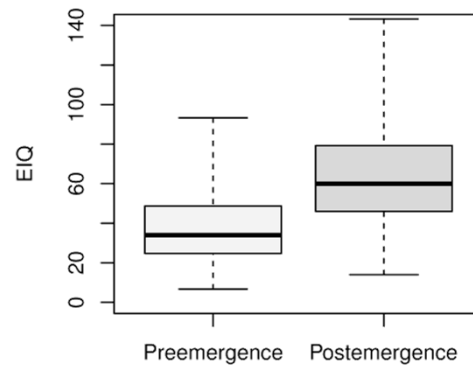
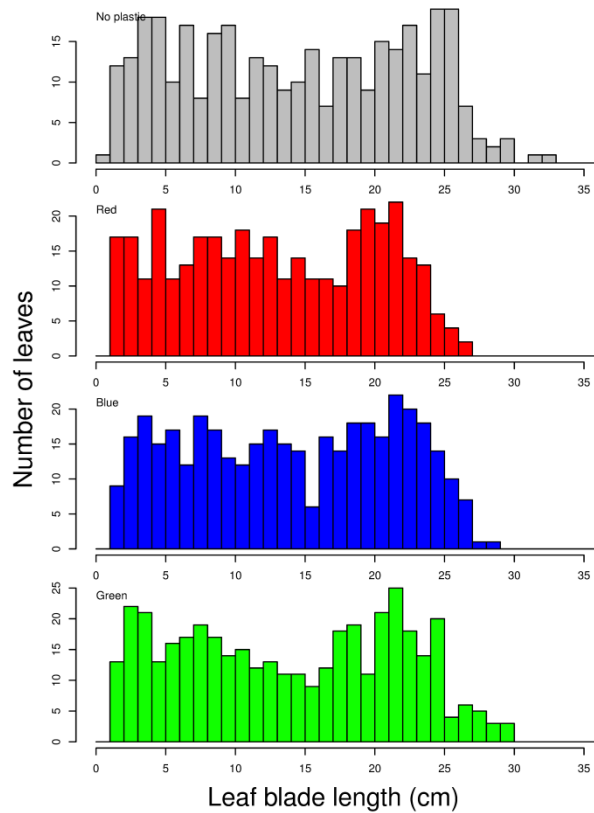
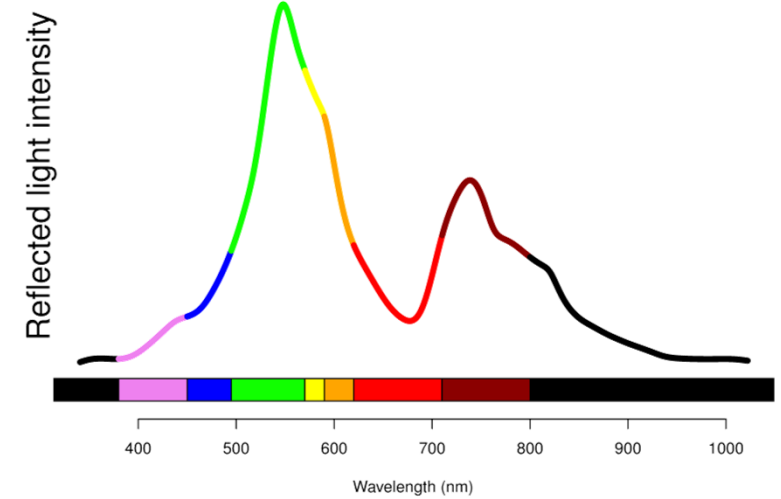
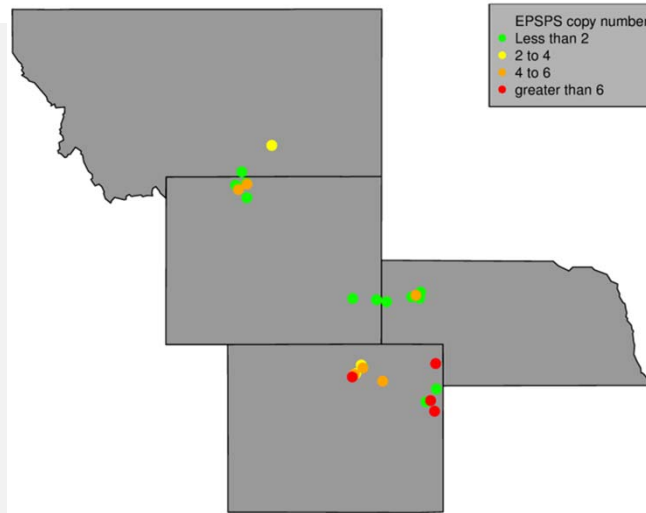
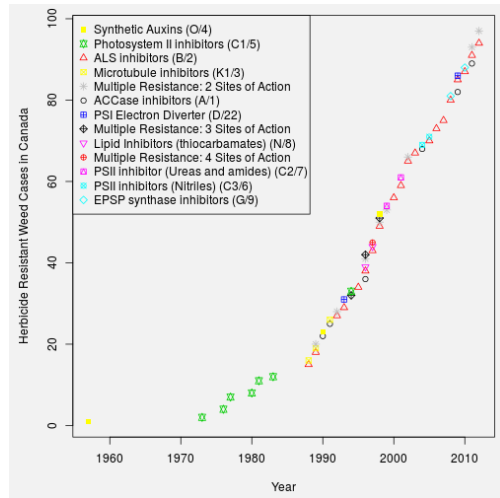
■ SAS/JMP
■ Other



Nonlinear regression

■ SAS/JMP
■ R
■ Other

R Graph examples



Why Switch from SAS to R?

- FREE!
 - Very important in many parts of the world
- GRAPHICS!
- Portable
- Extensions & packages for nearly any analysis/graphics need
- Can interface with other languages and databases

Why not switch?

- Most agricultural statisticians use SAS
- R is a different language
 - How many years has it taken to become proficient in SAS?
- R is not very 'accessible' to weed scientists
 - Most books/tutorials/cook books are aimed at other disciplines

Unknown Problems with R

- When teaching R in the less fortunate areas of the World where internet is unstable, we experience some existential problems:
- Installing add-on packages
 - Dependencies are a pain in the neck
 - Most time it does not work automatically
 - Forget about `Install.packages(" ", dependencies=TRUE)`
- Solution
 - Give list (database) of each add on package dependencies.
 - We can download zipfiles of add-on packages and then install

QUESTIONS?

www.rstats4ag.org