DeltaGen the "one-stop-shop" for plant breeders

Presented by Dr Zulfi Jahufer

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Background:

Despite the widespread use of computation in plant breeding, there are few convenient tools that bring together the necessary functions of experimental design, data analysis and breeding method optimisation in terms of genetic gain and resource factors, in a way that is readily accessible to the breeder through a single interface.

Workshop – Sunday 23-6-2019, 14:00 – 17:00

This workshop will introduce you to a new software tool "DeltaGen" based on the power of R programming language and its package Shiny. We call this a "One stop shop" that will help plant breeders with; experimental trial design, data exploration, univariate and multivariate analysis, quantitative genetic analysis, pattern analysis, index selection, and breeding method simulation. The index selection component will enhance selection and breeding for the DairyNZ forage value index. DeltaGen can also be used as a resource for teaching.

Some of the key components of DeltaGen such as experimental design, data quality assessment, ANOVA, phenotypic correlation and pattern analysis, have general applicability across disciplines' other than plant breeding.

DeltaGen is available as freeware at, http://agrubuntu.cloudapp.net/PlantBreedingTool/
The software runs more efficiently in Google Chrome.

Workshop content

a) **Outline of software operation,**
b) **Introduction to DeltaGen components:**

- Main operations tab commands,
- Trial design generator,
- Uploading a data file,
- Checking data quality
- Univariate analysis and linear models,
- Pattern analysis (within univariate model option),
- Univariate analysis –Two trait combination,
- Estimation of genetic gain (ΔG), cost and simulation,
- Multivariate analysis,
- MANOVA (additive variance/co-variance & correlation),
- Smith-Hazel selection index,
- Pattern analysis for multiple traits.
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c) **Hands on analysis using practice data sets.**