Automatic report for a split-split-plot design

AgroFIMS

January 12, 2021

Table of Contents

# 1. Model specification and data description

There are data for a split-split-plot design with 6 levels for the main plot factor, 12 levels for the sub-plot factor, 36 levels for the sub-sub-plot factor, and 2 replications for the main plot factor. The statistical model is

$$
y\_{ijk} = \mu + \alpha\_i + \beta\_j + \gamma\_k + \delta\_l + (\alpha\beta)\_{ij} + (\alpha\gamma)\_{ik} + (\alpha\delta)\_{il} + (\beta\gamma)\_{jk} + (\beta\delta)\_{jl} + (\gamma\delta)\_{kl} \\
+ (\alpha\beta\gamma)\_{ijk} + (\alpha\beta\delta)\_{ijl} + (\alpha\gamma\delta)\_{ikl} + (\beta\gamma\delta)\_{jkl} + (\alpha\beta\gamma\delta)\_{ijkl}
$$

where

* $y\_{ijkl}$ is the observed response with level $i$ of the main plot factor, level $j$ of the sub-plot factor, level $k$ of the sub-sub-plot factor, and replication $l$.
* $μ$ is the mean response over all levels of factors and replications.
* $α\_{i}$ is the effect for level $i$ of the main plot factor.
* $β\_{j}$ is the effect for level $j$ of the sub-plot factor.
* $γ\_{k}$ is the effect for level $k$ of the sub-sub-plot factor.
* $δ\_{l}$ is the effect of replication $l$.
* $(αβ)\_{ij}$, $(αγ)\_{ik}$, $(αδ)\_{il}$, $(βγ)\_{jk}$, $(βδ)\_{jl}$, $(γδ)\_{kl}$, $(αβγ)\_{ijk}$, $(αβδ)\_{ijl}$, $(αγδ)\_{ikl}$, $(βγδ)\_{jkl}$, and $(αβγδ)\_{ijkl}$ the corresponding interactions.

In this model $(αδ)\_{il}$ is the error term for the main plot factor, $(βδ)\_{jl}$ and $(αβδ)\_{ijl}$ are pooled to form the error term for the split-plot factor, and $(γδ)\_{kl}$, $(αγδ)\_{ikl}$, $(βγδ)\_{jkl}$, and $(αβγδ)\_{ijkl}$ are pooled to form the error term for the sub-sub-plot factor.

# 2. Analysis for trait chickpea\_grain\_fresh\_weight\_100\_grain\_g

## 2.1. ANOVA

## Analysis of Variance Table
##
## Response: y
## Df Sum Sq Mean Sq F value Pr(>F)
## rep 1 0.4 0.4
## mpf 4 18897.7 4724.4
## Ea 0 0.0
## spf 6 0.0 0.0
## mpf:spf
## Eb
## sspf 24 0.0 0.0
## sspf:mpf
## sspf:spf
## sspf:mpf:spf
## Ec

# 3. Analysis for trait chickpea\_grain\_moisture\_content\_100\_grain\_percent

## 3.1. ANOVA

## Analysis of Variance Table
##
## Response: y
## Df Sum Sq Mean Sq F value Pr(>F)
## rep 1 292 291.7
## mpf 4 36736 9184.0
## Ea 0 0
## spf 6 0 0.0
## mpf:spf
## Eb
## sspf 24 0 0.0
## sspf:mpf
## sspf:spf
## sspf:mpf:spf
## Ec