Automatic report for a Completely Randomized Design (CRD)

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# 1. Model specification and data description

There are data from 3 treatments evaluated using a completely randomized design. The statistical model is

where

* is the observed response with treatment and replication .
* is the mean response over all treatments and replications.
* is the effect for treatment .
* is the error term.

In this model we assume that the errors are independent and have a normal distribution with common variance, that is, .

# 2. Analysis for trait Rice\_Total\_aboveground\_biomass\_(including\_panicles)\_Fresh\_weight\_kg

## 2.1. ANOVA

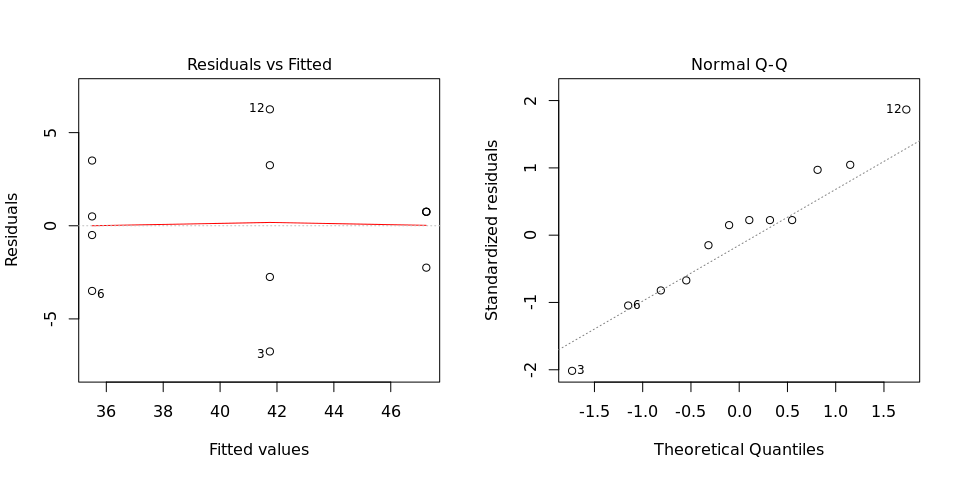
You have fitted a linear model for a CRD. The ANOVA table for your model is:

## Analysis of Variance Table  
##   
## Response: "Rice\_Total\_aboveground\_biomass\_(including\_panicles)\_Fresh\_weight\_kg"  
## Df Sum Sq Mean Sq F value Pr(>F)   
## TREATMENT 2 276.5 138.250 9.2509 0.006561 \*\*  
## Residuals 9 134.5 14.944   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

The coefficient of variation for this experiment is 9.315%. The p-value for treatments is 0.006561 which is significant at the 5% level.

## 2.2. Assumptions

Don’t forget the assumptions of the model. It is supposed that the errors are independent with a normal distribution and with the same variance for all the treatments. The following residuals plots must help you evaluate this:



Any trend in the residuals in the left plot would violate the assumption of independence while a trend in the variability of the residuals –for instance a funnel shape– suggests heterogeneity of variances. Departures from the theoretical normal line on the right plot are symptoms of lack of normality.

## 2.3. Treatment means

Below are the sorted means for each treatment with letters indicating if there are significant differences using the least significance difference method and the multiple comparisons method of Tukey, both at the 5% level.

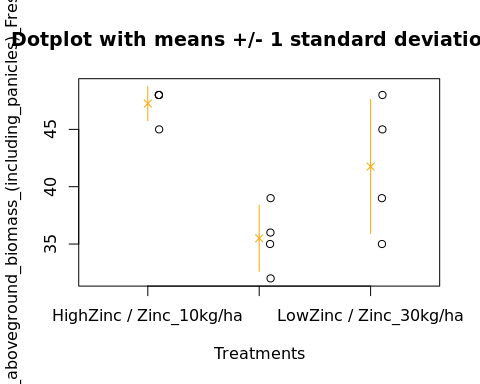
### 2.3.1. LSD test

## means groups  
## HighZinc / Zinc\_10kg/ha 47.25 a  
## LowZinc / Zinc\_30kg/ha 41.75 a  
## LowZinc / Zinc\_10kg/ha 35.50 b

### 2.3.2. Tukey test

## means groups  
## HighZinc / Zinc\_10kg/ha 47.25 a  
## LowZinc / Zinc\_30kg/ha 41.75 ab  
## LowZinc / Zinc\_10kg/ha 35.50 b

It is always good to have some visualization of the data. Because the number of treatments in your experiment is not so big, we can plot the data for each treatment:



## 2.4. Variance components

Below are the variance components for this model, under the assumption that treatments are random. Here the model is fitted using REML.

## Variance Std.Dev.  
## TREATMENT 30.82645 5.552157  
## Residual 14.94444 3.865804