Stats for Rub test

CT

June 5, 2016

library(tidyr)  
library (dplyr)

##   
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':  
##   
## filter, lag

## The following objects are masked from 'package:base':  
##   
## intersect, setdiff, setequal, union

library (ggplot2)  
library(agricolae)  
library(knitr)  
library (lubridate)

##   
## Attaching package: 'lubridate'

## The following object is masked from 'package:base':  
##   
## date

library(rgr)

## Warning: package 'rgr' was built under R version 3.3.2

## Loading required package: MASS

##   
## Attaching package: 'MASS'

## The following object is masked from 'package:dplyr':  
##   
## select

## Loading required package: fastICA

## Warning: package 'fastICA' was built under R version 3.3.2

setwd("C:\\Users\\EdCarmen\\Documents\\CarmenProjects2016\\Gitsubclover\\RubTest")  
getwd()

## [1] "C:/Users/EdCarmen/Documents/CarmenProjects2016/GitSubclover/RubTest"

file <- read.table("RubTest.txt",header=TRUE)  
head(file)

## CV Rep depth Treat Seeds Softseeds Propo  
## 1 A 1 S Rub 50 18 0.36  
## 2 A 2 S Rub 50 29 0.58  
## 3 A 3 S Rub 50 20 0.40  
## 4 A 1 S Unrub 50 20 0.40  
## 5 A 2 S Unrub 50 19 0.38  
## 6 A 3 S Unrub 50 23 0.46

summary(file)

## CV Rep depth Treat Seeds Softseeds   
## A:6 Min. :1 S:12 Rub :6 Min. :50 Min. :15.00   
## W:6 1st Qu.:1 Unrub:6 1st Qu.:50 1st Qu.:18.00   
## Median :2 Median :50 Median :19.50   
## Mean :2 Mean :50 Mean :19.92   
## 3rd Qu.:3 3rd Qu.:50 3rd Qu.:20.25   
## Max. :3 Max. :50 Max. :29.00   
## Propo   
## Min. :0.3000   
## 1st Qu.:0.3600   
## Median :0.3900   
## Mean :0.3983   
## 3rd Qu.:0.4050   
## Max. :0.5800

# define factors and formats  
file <- file %>%  
 mutate(  
 Treat = as.factor(Treat),  
 Rep = as.factor(Rep),  
 CV = as.factor(CV))  
   
  
str(file)

## 'data.frame': 12 obs. of 7 variables:  
## $ CV : Factor w/ 2 levels "A","W": 1 1 1 1 1 1 2 2 2 2 ...  
## $ Rep : Factor w/ 3 levels "1","2","3": 1 2 3 1 2 3 1 2 3 1 ...  
## $ depth : Factor w/ 1 level "S": 1 1 1 1 1 1 1 1 1 1 ...  
## $ Treat : Factor w/ 2 levels "Rub","Unrub": 1 1 1 2 2 2 1 1 1 2 ...  
## $ Seeds : int 50 50 50 50 50 50 50 50 50 50 ...  
## $ Softseeds: int 18 29 20 20 19 23 15 18 18 18 ...  
## $ Propo : num 0.36 0.58 0.4 0.4 0.38 0.46 0.3 0.36 0.36 0.36 ...

summary(file)

## CV Rep depth Treat Seeds Softseeds   
## A:6 1:4 S:12 Rub :6 Min. :50 Min. :15.00   
## W:6 2:4 Unrub:6 1st Qu.:50 1st Qu.:18.00   
## 3:4 Median :50 Median :19.50   
## Mean :50 Mean :19.92   
## 3rd Qu.:50 3rd Qu.:20.25   
## Max. :50 Max. :29.00   
## Propo   
## Min. :0.3000   
## 1st Qu.:0.3600   
## Median :0.3900   
## Mean :0.3983   
## 3rd Qu.:0.4050   
## Max. :0.5800

head(file)

## CV Rep depth Treat Seeds Softseeds Propo  
## 1 A 1 S Rub 50 18 0.36  
## 2 A 2 S Rub 50 29 0.58  
## 3 A 3 S Rub 50 20 0.40  
## 4 A 1 S Unrub 50 20 0.40  
## 5 A 2 S Unrub 50 19 0.38  
## 6 A 3 S Unrub 50 23 0.46

df<- file %>%  
 mutate(HardSeedsPercent = 100-((Softseeds/Seeds)\*100)) %>%  
 dplyr::select(CV,Treat,  
 Rep,HardSeedsPercent)  
  
 df <- as.data.frame(df)  
head(df)

## CV Treat Rep HardSeedsPercent  
## 1 A Rub 1 64  
## 2 A Rub 2 42  
## 3 A Rub 3 60  
## 4 A Unrub 1 60  
## 5 A Unrub 2 62  
## 6 A Unrub 3 54

Here ANOVA according S. Saville advice : LSD test unprotected

summary(df)

## CV Treat Rep HardSeedsPercent  
## A:6 Rub :6 1:4 Min. :42.00   
## W:6 Unrub:6 2:4 1st Qu.:59.50   
## 3:4 Median :61.00   
## Mean :60.17   
## 3rd Qu.:64.00   
## Max. :70.00

#df <- df %>%  
 #filter(SowingD=="2015-06-24")  
 #-------------------------------------------------  
# anova   
file <- df  
file.subset <- file   
  
head(file.subset)

## CV Treat Rep HardSeedsPercent  
## 1 A Rub 1 64  
## 2 A Rub 2 42  
## 3 A Rub 3 60  
## 4 A Unrub 1 60  
## 5 A Unrub 2 62  
## 6 A Unrub 3 54

summary(file.subset)

## CV Treat Rep HardSeedsPercent  
## A:6 Rub :6 1:4 Min. :42.00   
## W:6 Unrub:6 2:4 1st Qu.:59.50   
## 3:4 Median :61.00   
## Mean :60.17   
## 3rd Qu.:64.00   
## Max. :70.00

#ANOVA  
my.anova <- aov(HardSeedsPercent ~ Treat\*CV + Rep, data = file.subset)  
  
summary(my.anova)

## Df Sum Sq Mean Sq F value Pr(>F)  
## Treat 1 3.00 3.00 0.078 0.790  
## CV 1 120.33 120.33 3.121 0.128  
## Rep 2 120.67 60.33 1.565 0.284  
## Treat:CV 1 56.33 56.33 1.461 0.272  
## Residuals 6 231.33 38.56

Then use multiple comparisons of means

#Means separation after ANOVA  
(LSD.test(my.anova, c("Treat"), alpha= 0.05, p.adj="none"))

## $statistics  
## Mean CV MSerror LSD  
## 60.16667 10.32019 38.55556 8.772052  
##   
## $parameters  
## Df ntr t.value alpha test name.t  
## 6 2 2.446912 0.05 Fisher-LSD Treat  
##   
## $means  
## HardSeedsPercent std r LCL UCL Min Max  
## Rub 60.66667 9.688481 6 54.46389 66.86944 42 70  
## Unrub 59.66667 3.444803 6 53.46389 65.86944 54 64  
##   
## $comparison  
## NULL  
##   
## $groups  
## trt means M  
## 1 Rub 60.66667 a  
## 2 Unrub 59.66667 a