title: "Seed Number and yield " author: "CT" date: "Thursday, FEbruary 19, 2016" output: word\_document: default pdf\_document: default

#This script reads the SeedBurrYield and tests Data first anaylsed in SeedYieldProject1

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\\SeedYieldIv2")  
getwd()

## [1] "C:/Users/EdCarmen/Documents/CarmenProjects2016/GitSubclover/SeedYieldIv2"

df\_seedY <- read.table("SeedYieldIv2.txt",header=TRUE)  
head(df\_seedY)

## Cultivar SowingD SowTreat sample\_area\_m2 Block Depth  
## 1 Antas 2015-06-24 S1 2 1 Above  
## 2 Antas 2015-06-24 S1 2 1 Below  
## 3 Monti 2015-06-24 S1 2 1 Above  
## 4 Monti 2015-06-24 S1 2 1 Below  
## 5 Denmark 2015-06-24 S1 2 1 Above  
## 6 Denmark 2015-06-24 S1 2 1 Below  
## bur\_total\_weight\_g bur\_no\_subSample bur\_weight\_subSample\_g seed\_weight\_g  
## 1 24.1 50 5.0 1.206  
## 2 3.0 10 0.8 0.354  
## 3 27.8 50 3.1 1.180  
## 4 33.7 50 3.0 0.732  
## 5 16.5 50 3.0 0.836  
## 6 20.7 50 3.2 0.914  
## Seedskg\_ha  
## 1 29.06460  
## 2 6.63750  
## 3 52.90968  
## 4 41.11400  
## 5 22.99000  
## 6 29.56219

summary(df\_seedY)

## Cultivar SowingD SowTreat sample\_area\_m2 Block   
## Antas :36 2015-06-24:36 S1:36 Min. :0.1000 Min. :1   
## Denmark :36 2015-07-28:36 S2:36 1st Qu.:0.1300 1st Qu.:1   
## Leura :36 2015-09-15:36 S3:36 Median :0.1650 Median :2   
## Monti :36 2015-11-05:36 S4:36 Mean :0.4767 Mean :2   
## Narrikup :36 2016-02-17:36 S6:36 3rd Qu.:0.3000 3rd Qu.:3   
## Woogenellup:36 2016-03-15:36 S7:36 Max. :2.0000 Max. :3   
## Depth bur\_total\_weight\_g bur\_no\_subSample bur\_weight\_subSample\_g  
## Above:108 Min. : 0.03 Min. : 1.0 Min. : 0.030   
## Below:108 1st Qu.: 2.99 1st Qu.:50.0 1st Qu.: 1.725   
## Median : 19.58 Median :50.0 Median : 2.700   
## Mean : 31.48 Mean :46.8 Mean : 2.782   
## 3rd Qu.: 42.36 3rd Qu.:50.0 3rd Qu.: 3.377   
## Max. :272.20 Max. :98.0 Max. :25.120   
## seed\_weight\_g Seedskg\_ha   
## Min. :0.0050 Min. : 0.50   
## 1st Qu.:0.5215 1st Qu.: 41.92   
## Median :0.9995 Median : 181.99   
## Mean :0.9364 Mean : 450.20   
## 3rd Qu.:1.2777 3rd Qu.: 653.37   
## Max. :2.2950 Max. :2573.60

Here ANOVA according S. Saville advice : LSD test unprotected by sowing date individually

#Filter S1, S2, S3, S6 , S7   
summary(df\_seedY)

## Cultivar SowingD SowTreat sample\_area\_m2 Block   
## Antas :36 2015-06-24:36 S1:36 Min. :0.1000 Min. :1   
## Denmark :36 2015-07-28:36 S2:36 1st Qu.:0.1300 1st Qu.:1   
## Leura :36 2015-09-15:36 S3:36 Median :0.1650 Median :2   
## Monti :36 2015-11-05:36 S4:36 Mean :0.4767 Mean :2   
## Narrikup :36 2016-02-17:36 S6:36 3rd Qu.:0.3000 3rd Qu.:3   
## Woogenellup:36 2016-03-15:36 S7:36 Max. :2.0000 Max. :3   
## Depth bur\_total\_weight\_g bur\_no\_subSample bur\_weight\_subSample\_g  
## Above:108 Min. : 0.03 Min. : 1.0 Min. : 0.030   
## Below:108 1st Qu.: 2.99 1st Qu.:50.0 1st Qu.: 1.725   
## Median : 19.58 Median :50.0 Median : 2.700   
## Mean : 31.48 Mean :46.8 Mean : 2.782   
## 3rd Qu.: 42.36 3rd Qu.:50.0 3rd Qu.: 3.377   
## Max. :272.20 Max. :98.0 Max. :25.120   
## seed\_weight\_g Seedskg\_ha   
## Min. :0.0050 Min. : 0.50   
## 1st Qu.:0.5215 1st Qu.: 41.92   
## Median :0.9995 Median : 181.99   
## Mean :0.9364 Mean : 450.20   
## 3rd Qu.:1.2777 3rd Qu.: 653.37   
## Max. :2.2950 Max. :2573.60

df\_seedYS6 <- df\_seedY %>%  
 #filter(SowingD=="2015-06-24")  
 #filter(SowingD=="2015-07-28")  
 #filter(SowingD=="2015-09-15")  
 #filter(SowingD=="2015-11-05")  
 filter(SowingD=="2016-02-17")  
 #filter(SowingD=="2016-03-15")  
  
#data transformation many possibilities but logit worked well, however little difference between real and transformed numbers   
  
#-------------------------------------------------  
# anova   
file <- df\_seedYS6  
  
  
file.subset <- file   
  
head(file.subset)

## Cultivar SowingD SowTreat sample\_area\_m2 Block Depth  
## 1 Denmark 2016-02-17 S6 0.13 1 Above  
## 2 Denmark 2016-02-17 S6 0.13 1 Below  
## 3 Monti 2016-02-17 S6 0.13 1 Above  
## 4 Monti 2016-02-17 S6 0.13 1 Below  
## 5 Woogenellup 2016-02-17 S6 0.13 1 Above  
## 6 Woogenellup 2016-02-17 S6 0.13 1 Below  
## bur\_total\_weight\_g bur\_no\_subSample bur\_weight\_subSample\_g seed\_weight\_g  
## 1 8.86 50 1.76 0.737  
## 2 1.28 50 1.28 0.385  
## 3 36.68 50 1.88 0.676  
## 4 4.77 50 2.70 0.499  
## 5 2.09 59 2.09 0.704  
## 6 2.26 57 2.26 0.529  
## Seedskg\_ha  
## 1 285.39423  
## 2 29.61538  
## 3 1014.55319  
## 4 67.81282  
## 5 54.15385  
## 6 40.69231

summary(file.subset)

## Cultivar SowingD SowTreat sample\_area\_m2 Block   
## Antas :6 2015-06-24: 0 S1: 0 Min. :0.13 Min. :1   
## Denmark :6 2015-07-28: 0 S2: 0 1st Qu.:0.13 1st Qu.:1   
## Leura :6 2015-09-15: 0 S3: 0 Median :0.13 Median :2   
## Monti :6 2015-11-05: 0 S4: 0 Mean :0.13 Mean :2   
## Narrikup :6 2016-02-17:36 S6:36 3rd Qu.:0.13 3rd Qu.:3   
## Woogenellup:6 2016-03-15: 0 S7: 0 Max. :0.13 Max. :3   
## Depth bur\_total\_weight\_g bur\_no\_subSample bur\_weight\_subSample\_g  
## Above:18 Min. : 0.080 Min. : 7.00 Min. : 0.0800   
## Below:18 1st Qu.: 0.920 1st Qu.:35.00 1st Qu.: 0.8725   
## Median : 1.955 Median :50.00 Median : 1.4450   
## Mean : 4.454 Mean :44.06 Mean : 2.1228   
## 3rd Qu.: 3.505 3rd Qu.:50.00 3rd Qu.: 2.1050   
## Max. :36.680 Max. :85.00 Max. :25.1200   
## seed\_weight\_g Seedskg\_ha   
## Min. :0.0080 Min. : 0.6154   
## 1st Qu.:0.1358 1st Qu.: 10.1154   
## Median :0.3135 Median : 27.1538   
## Mean :0.3431 Mean : 92.1360   
## 3rd Qu.:0.4690 3rd Qu.: 65.7032   
## Max. :0.8450 Max. :1014.5532

#ANOVA  
my.anova <- aov(Seedskg\_ha ~ Cultivar + Block, data = file.subset)  
  
summary(my.anova)

## Df Sum Sq Mean Sq F value Pr(>F)   
## Cultivar 5 525351 105070 3.693 0.0104 \*  
## Block 1 20367 20367 0.716 0.4044   
## Residuals 29 825093 28451   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Then use multiple comparisons of means

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

## $statistics  
## Mean CV MSerror LSD  
## 92.13596 183.0725 28451.48 199.1746  
##   
## $parameters  
## Df ntr t.value alpha test name.t  
## 29 6 2.04523 0.05 Fisher-LSD Cultivar  
##   
## $means  
## Seedskg\_ha std r LCL UCL Min  
## Antas 26.17031 15.79168 6 -114.66737 167.0080 9.8461538  
## Denmark 69.49442 107.94811 6 -71.34326 210.3321 4.7261146  
## Leura 16.55809 19.16090 6 -124.27959 157.3958 0.6153846  
## Monti 358.72042 392.69630 6 217.88274 499.5581 18.7692308  
## Narrikup 59.26999 46.85832 6 -81.56769 200.1077 10.1538462  
## Woogenellup 22.60256 20.41089 6 -118.23512 163.4402 1.6153846  
## Max  
## Antas 47.15746  
## Denmark 285.39423  
## Leura 53.11777  
## Monti 1014.55319  
## Narrikup 107.10000  
## Woogenellup 54.15385  
##   
## $comparison  
## NULL  
##   
## $groups  
## trt means M  
## 1 Monti 358.72042 a  
## 2 Denmark 69.49442 b  
## 3 Narrikup 59.26999 b  
## 4 Antas 26.17031 b  
## 5 Woogenellup 22.60256 b  
## 6 Leura 16.55809 b