Writeup 2

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Three sets of designs were generated. The main differences between these three sets of designs are the relationship between the allocation of Trays to Runs and Tags. The first set of desiges has Trays intentionally confounded with Tags.

# Tray effects are confounded with Tag effects

The initial allocation is presented below

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 114 | 115 | 116 | 117 |
| 1 | 1Aa | 1Aa | 2Ga | 2Ga |
| 2 | 1Bb | 1Bb | 2Hb | 2Hb |
| 3 | 1Cc | 1Cc | 2Ic | 2Ic |
| 4 | 1Da | 1Da | 2Ja | 2Ja |
| 5 | 1Eb | 1Eb | 2Kb | 2Kb |
| 6 | 1Fc | 1Fc | 2Lc | 2Lc |

load("designTag2.Rdata")  
  
length(designTag1.list)

## [1] 2000000

avePlantEffs <- as.numeric(sapply(designTag1.list, function(x) x$avePlantEff ))  
  
trtDFs <- as.numeric(sapply(designTag1.list, function(x) x$trtDF) )  
  
resDFs <- as.numeric(sapply(designTag1.list, function(x) x$resDF))  
  
aveTrtEffs <- as.numeric(sapply(designTag1.list, function(x) x$aveTrtEff) )  
  
#########################################################################  
  
sum(avePlantEffs == 1)/2000000

## [1] 0.000146

table(trtDFs[avePlantEffs == 1])

##   
## 1 2   
## 15 277

table(round(resDFs))

##   
## 2 3 4 5 6 7 8   
## 8 1180 22253 205745 1556631 207204 6979

table(round(resDFs[avePlantEffs == 1 & trtDFs == 2]))

##   
## 2 3 4 5 6   
## 6 72 146 50 3

which(avePlantEffs == 1 & trtDFs == 2 & resDFs >= 6)

## [1] 564531 854022 1701196

aveTrtEffs[which(avePlantEffs == 1 & trtDFs == 2 & resDFs >= 6)]

## [1] 0.8571429 0.9375000 0.8571429

displayDes(designTag1.list[[854022]]$design)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 114 | 115 | 116 | 117 |
| 1 | 1Aa | 1Da | 2Hb | 2Ic |
| 2 | 1Cc | 1Bb | 2Lc | 2Ga |
| 3 | 1Fc | 1Eb | 2Kb | 2Ja |
| 4 | 1Eb | 1Fc | 2Ja | 2Kb |
| 5 | 1Bb | 1Cc | 2Ga | 2Lc |
| 6 | 1Da | 1Aa | 2Ic | 2Hb |

summaryAovTwoPhase(  
 designTag1.list[[854022]]$design,  
 blk.str1 = "Tray/Plant",  
 blk.str2 = "Run",  
 trt.str = "Tag + Trt"  
)

## $ANOVA  
## DF e Tray(mPlant) Tray Run  
## Between Run   
## Between Tray(mPlant)   
## Trt 2 1 2 0 4   
## Within Tray.mPlant 3 1 0 0 4   
## Within Run   
## Between Tray   
## Tag 1 1 2 12 0   
## Between Tray(mPlant)   
## Trt 2 1 2 0 0   
## Residual 6 1 2 0 0   
## Within Tray.mPlant   
## Tag 2 1 0 0 0   
## Residual 7 1 0 0 0   
##   
## $Fixed  
## $Fixed$EF  
## eff.Tag eff.Trt  
## Between Run   
## Between Tray(mPlant)   
## Trt 1/16   
## Within Tray.mPlant   
## Within Run   
## Between Tray   
## Tag 1   
## Between Tray(mPlant)   
## Trt 15/16   
## Within Tray.mPlant   
## Tag 1   
##   
## $Fixed$Coef  
## Tag Trt   
## Between Run   
## Between Tray(mPlant)   
## Trt 1/2   
## Within Tray.mPlant   
## Within Run   
## Between Tray   
## Tag 6   
## Between Tray(mPlant)   
## Trt 15/2  
## Within Tray.mPlant   
## Tag 6

rm(designTag1.list)  
gc()

## used (Mb) gc trigger (Mb) max used (Mb)  
## Ncells 526776 28.2 72371552 3865.1 75353700 4024.4  
## Vcells 8956967 68.4 322580239 2461.1 360104071 2747.4

## Tray effects are confounded with Run effects

The initial allocation is presented below

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 114 | 115 | 116 | 117 |
| 1 | 1Aa | 1Aa | 1Bb | 1Bb |
| 2 | 1Cc | 1Cc | 1Da | 1Da |
| 3 | 1Eb | 1Eb | 1Fc | 1Fc |
| 4 | 2Ga | 2Ga | 2Hb | 2Hb |
| 5 | 2Ic | 2Ic | 2Ja | 2Ja |
| 6 | 2Kb | 2Kb | 2Lc | 2Lc |

load("designRun1.Rdata")  
  
length(designRun1.list)

## [1] 2000000

avePlantEffs <- as.numeric(sapply(designRun1.list, function(x) x$avePlantEff ))  
  
trtDFs <- as.numeric(sapply(designRun1.list, function(x) x$trtDF) )  
  
resDFs <- as.numeric(sapply(designRun1.list, function(x) x$resDF))  
  
aveTrtEffs <- as.numeric(sapply(designRun1.list, function(x) x$aveTrtEff) )  
  
#########################################################################  
  
sum(avePlantEffs == 1)

## [1] 3304

sum(avePlantEffs == 1)/2000000

## [1] 0.001652

table(trtDFs[avePlantEffs == 1])

##   
## 0 1 2   
## 1 124 3179

table(round(resDFs))

##   
## 1 2 3 4 5 6 7   
## 969 19553 122880 414380 1426254 15922 42

table(round(resDFs[avePlantEffs == 1 & trtDFs == 2]))

##   
## 1 2 3 4 5   
## 660 245 2103 163 8

which(avePlantEffs == 1 & trtDFs == 2 & resDFs >= 5)

## [1] 441577 567094 869104 944150 1357108 1559250 1740533 1746306

aveTrtEffs[which(avePlantEffs == 1 & trtDFs == 2 & resDFs >= 5)]

## [1] 0.7845395 0.5454545 0.7845395 0.6136364 0.8705357 0.7648026 0.7648026  
## [8] 0.7845395

displayDes(designRun1.list[[1357108]]$design)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 114 | 115 | 116 | 117 |
| 1 | 1Cc | 1Fc | 1Bb | 1Aa |
| 2 | 1Eb | 1Da | 1Da | 1Eb |
| 3 | 1Aa | 1Bb | 1Fc | 1Cc |
| 4 | 2Hb | 2Ga | 2Kb | 2Ic |
| 5 | 2Ja | 2Lc | 2Lc | 2Ja |
| 6 | 2Ic | 2Kb | 2Ga | 2Hb |

summaryAovTwoPhase(  
 designRun1.list[[1357108]]$design,  
 blk.str1 = "Tray/Plant",  
 blk.str2 = "Run",  
 trt.str = "Tag + Trt"  
)

## $ANOVA  
## DF e Tray(mPlant) Tray Run  
## Between Run   
## Between Tray 1 1 2 12 4   
## Between Tray(mPlant)   
## Trt 2 1 2 0 4   
## Within Tray.mPlant 2 1 0 0 4   
## Within Run   
## Between Tray(mPlant)   
## Tag 1 1 2 0 0   
## Trt 2 1 2 0 0   
## Residual 5 1 2 0 0   
## Within Tray.mPlant   
## Tag 2 1 0 0 0   
## Residual 8 1 0 0 0   
##   
## $Fixed  
## $Fixed$EF  
## eff.Tag eff.Trt  
## Between Run   
## Between Tray   
## Between Tray(mPlant)   
## Trt 3/32   
## Within Tray.mPlant   
## Within Run   
## Between Tray(mPlant)   
## Tag 1   
## Trt 195/224  
## Within Tray.mPlant   
## Tag 1   
##   
## $Fixed$Coef  
## Tag Trt   
## Between Run   
## Between Tray   
## Between Tray(mPlant)   
## Trt 3/2,1/2   
## Within Tray.mPlant   
## Within Run   
## Between Tray(mPlant)   
## Tag 6   
## Trt 15/2,13/2  
## Within Tray.mPlant   
## Tag 6

rm(designRun1.list)  
gc()

## used (Mb) gc trigger (Mb) max used (Mb)  
## Ncells 530662 28.4 69508689 3712.2 86885862 4640.3  
## Vcells 8975097 68.5 310256342 2367.1 384060095 2930.2

## Tray effects are orthogonal to Runs and Tag effects

The initial allocation is presented below

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 114 | 115 | 116 | 117 |
| 1 | 1Aa | 2Ga | 1Aa | 2Ga |
| 2 | 2Hb | 1Bb | 2Hb | 1Bb |
| 3 | 1Cc | 2Ic | 1Cc | 2Ic |
| 4 | 2Ja | 1Da | 2Ja | 1Da |
| 5 | 1Eb | 2Kb | 1Eb | 2Kb |
| 6 | 2Lc | 1Fc | 2Lc | 1Fc |

load("designRunTag.Rdata")  
  
length(designRunTag.list)

## [1] 2000000

avePlantEffs <- as.numeric(sapply(designRunTag.list, function(x) x$avePlantEff ))  
  
trtDFs <- as.numeric(sapply(designRunTag.list, function(x) x$trtDF) )  
  
resDFs <- as.numeric(sapply(designRunTag.list, function(x) x$resDF))  
  
aveTrtEffs <- as.numeric(sapply(designRunTag.list, function(x) x$aveTrtEff) )  
  
sum(avePlantEffs == 1)

## [1] 352

sum(avePlantEffs == 1)/2000000

## [1] 0.000176

table(trtDFs[avePlantEffs == 1])

##   
## 0 1 2   
## 2 37 313

table(round(resDFs))

##   
## 1 2 3 4 5 6 7   
## 23 2342 33486 252896 1688151 23033 69

table(round(resDFs[avePlantEffs == 1 & trtDFs == 2]))

##   
## 1 2 3 4 5   
## 6 103 30 170 4

which(avePlantEffs == 1 & trtDFs == 2 & resDFs >= 5)

## [1] 673808 1079938 1347216 1505960

aveTrtEffs[which(avePlantEffs == 1 & trtDFs == 2 & resDFs >= 5)]

## [1] 0.7500000 0.5237069 0.5965909 0.5965909

displayDes(designRunTag.list[[673808]]$design)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 114 | 115 | 116 | 117 |
| 1 | 1Aa | 2Hb | 1Cc | 2Ga |
| 2 | 2Kb | 1Fc | 2Ja | 1Da |
| 3 | 1Bb | 2Ic | 1Eb | 2Lc |
| 4 | 2Hb | 1Aa | 2Ga | 1Cc |
| 5 | 1Fc | 2Kb | 1Da | 2Ja |
| 6 | 2Ic | 1Bb | 2Lc | 1Eb |

summaryAovTwoPhase(  
 designRunTag.list[[673808]]$design,  
 blk.str1 = "Tray/Plant",  
 blk.str2 = "Run",  
 trt.str = "Tag + Trt"  
)

## $ANOVA  
## DF e Tray(mPlant) Tray Run  
## Between Run   
## Between Tray(mPlant)   
## Trt 1 1 2 0 4   
## Residual 1 1 2 0 4   
## Within Tray.mPlant 3 1 0 0 4   
## Within Run   
## Between Tray 1 1 2 12 0   
## Between Tray(mPlant)   
## Tag 1 1 2 0 0   
## Trt 2 1 2 0 0   
## Residual 5 1 2 0 0   
## Within Tray.mPlant   
## Tag 2 1 0 0 0   
## Residual 7 1 0 0 0   
##   
## $Fixed  
## $Fixed$EF  
## eff.Tag eff.Trt  
## Between Run   
## Between Tray(mPlant)   
## Trt 1/4   
## Within Tray.mPlant   
## Within Run   
## Between Tray   
## Between Tray(mPlant)   
## Tag 1 1/6   
## Trt 3/4   
## Within Tray.mPlant   
## Tag 1   
##   
## $Fixed$Coef  
## Tag Trt   
## Between Run   
## Between Tray(mPlant)   
## Trt 2   
## Within Tray.mPlant   
## Within Run   
## Between Tray   
## Between Tray(mPlant)   
## Tag 6 4/3   
## Trt 37055/4759,41488/8501  
## Within Tray.mPlant   
## Tag 6

table(designRunTag.list[[673808]]$design$Tag, designRunTag.list[[673808]]$design$Trt)

##   
## a b c  
## 114 1 3 2  
## 115 1 3 2  
## 116 3 1 2  
## 117 3 1 2

rm(designRunTag.list)  
gc()

## used (Mb) gc trigger (Mb) max used (Mb)  
## Ncells 530785 28.4 66760340 3565.4 86885862 4640.3  
## Vcells 8977950 68.5 298051614 2274.0 384060095 2930.2