Scott Farm Data

Simon Woodward, DairyNZ 2017

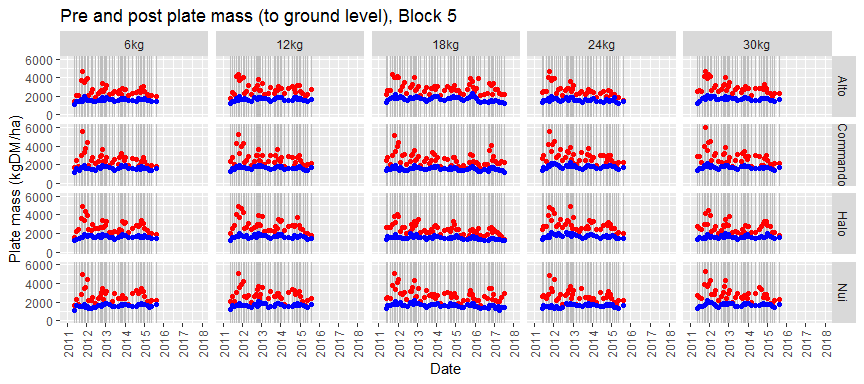
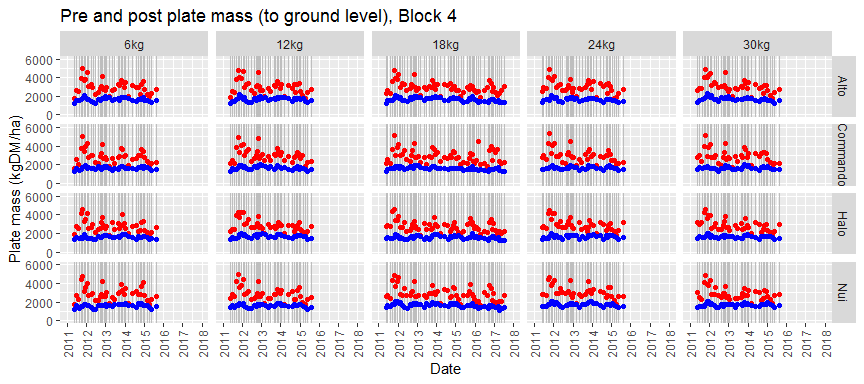
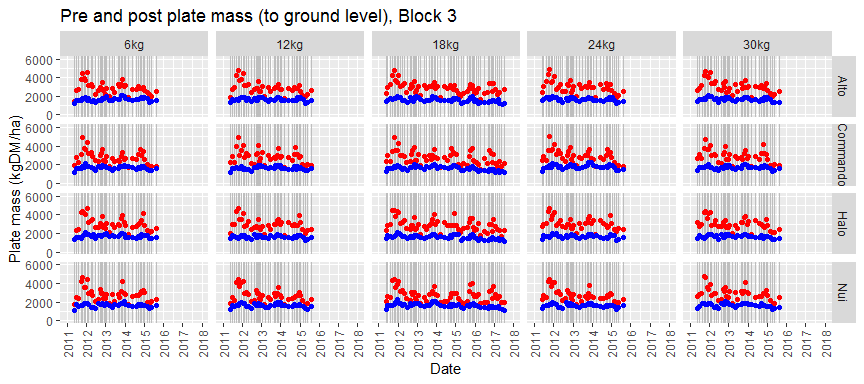
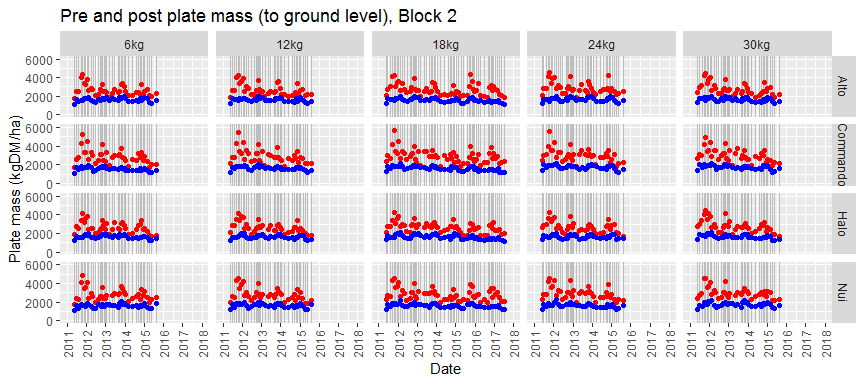
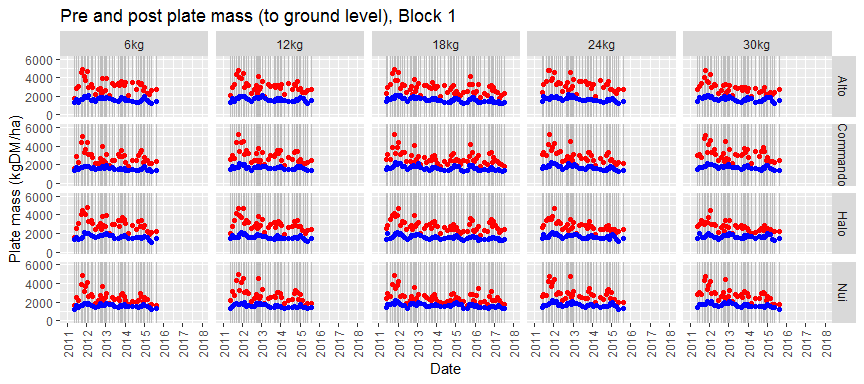
## Scott Farm Data

# file name  
file\_name <- 'FD1004 Data For Modelling.xlsx'  
  
# seed rates in order  
seed\_rate\_levels <- c('6kg', '12kg', '18kg', '24kg', '30kg')

## Rising Plate Meter

Average pre-graze mass = 2854

Average post-graze mass = 1651

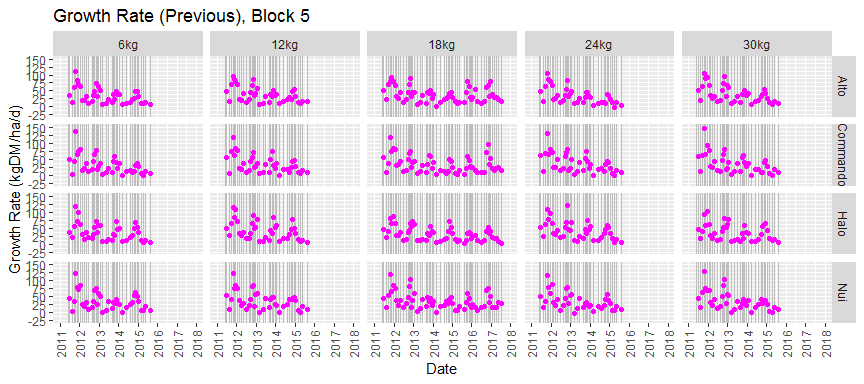
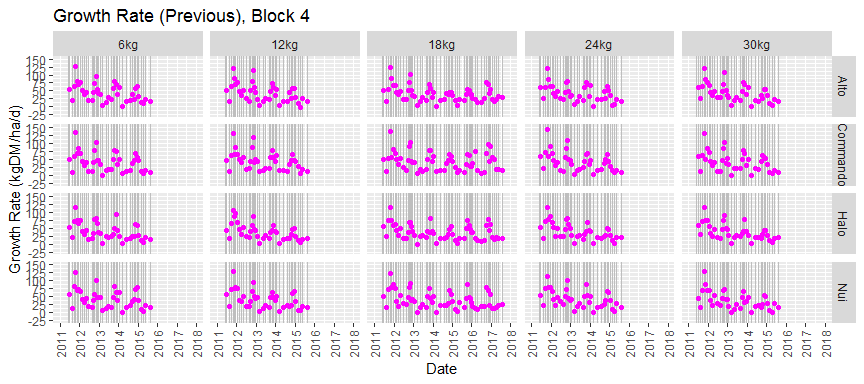
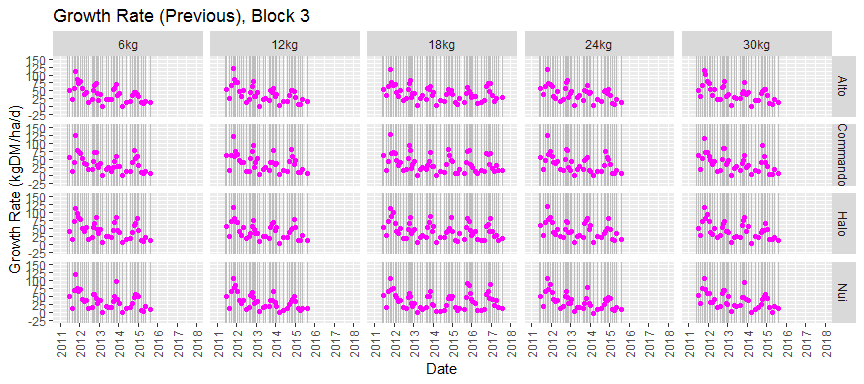
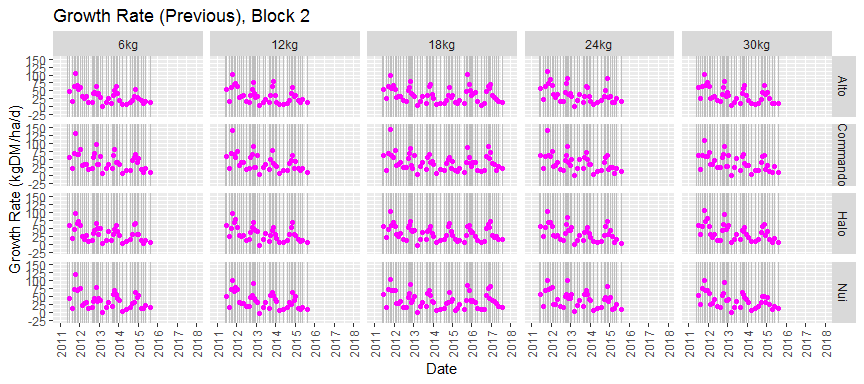
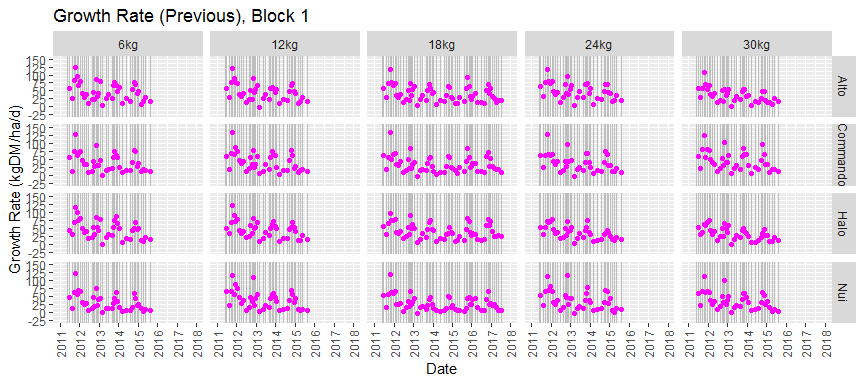


## Rising Plate Meter Growth Rate

### Assumptions

* Growth rate calculated from RPM data and assumed constant between grazings.

Average growth rate = 39

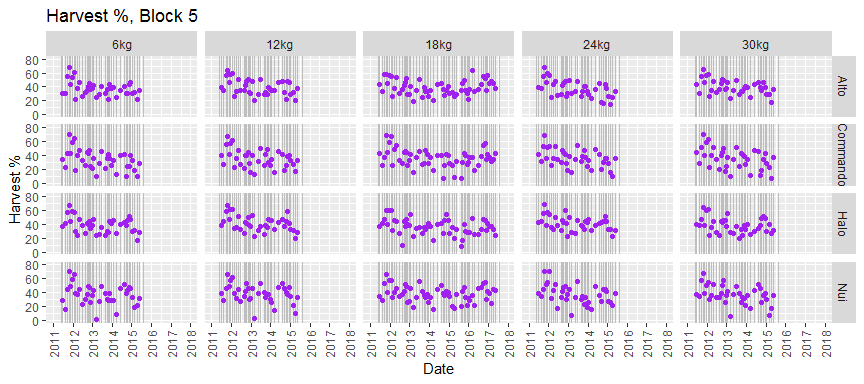
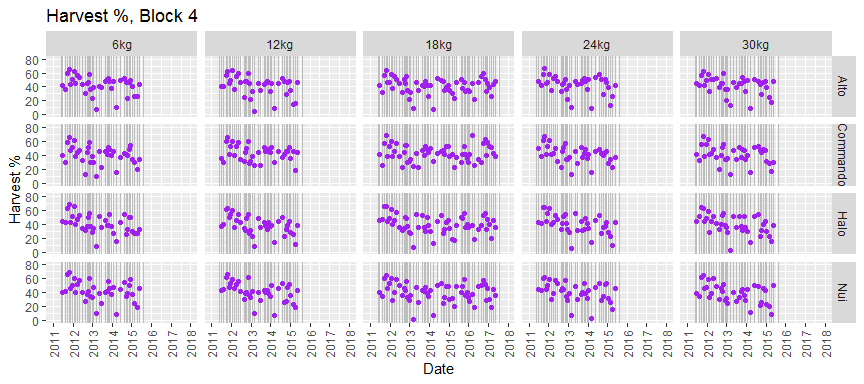
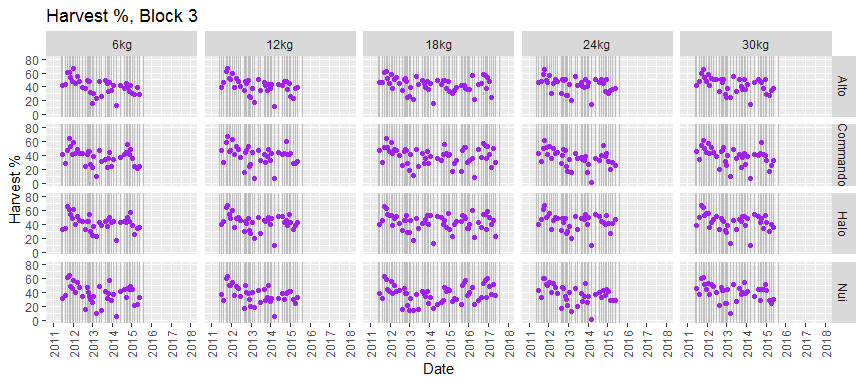
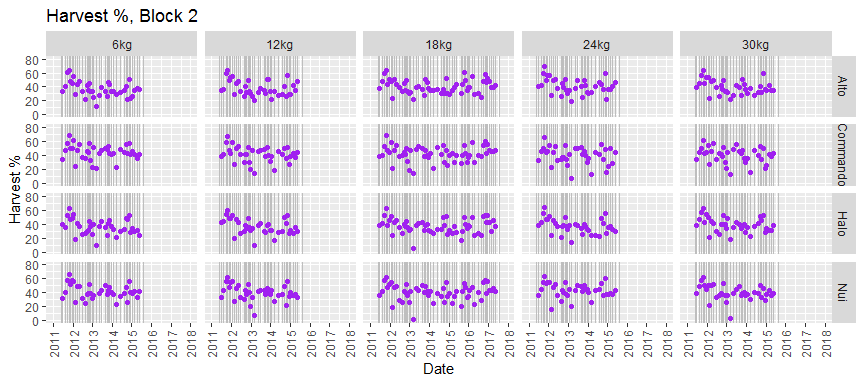
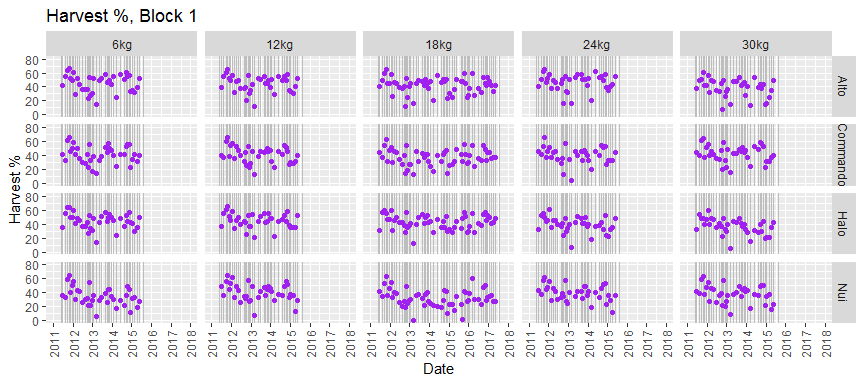


## Rising Plate Meter Harvest %

### Assumptions

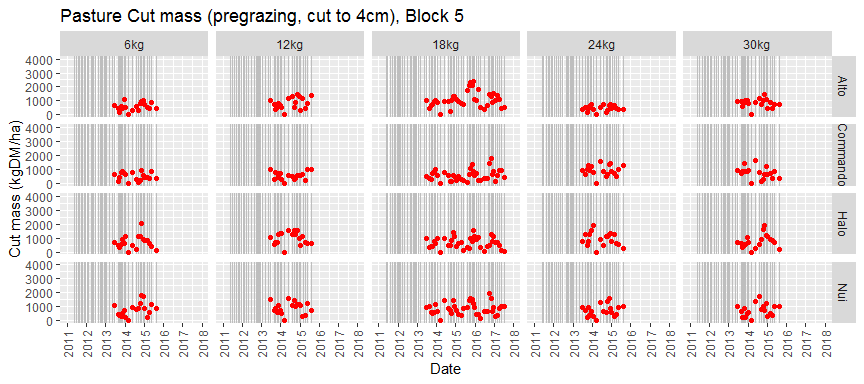
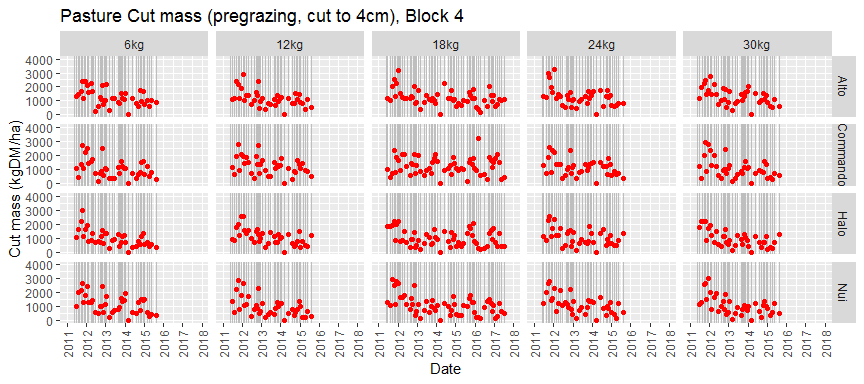
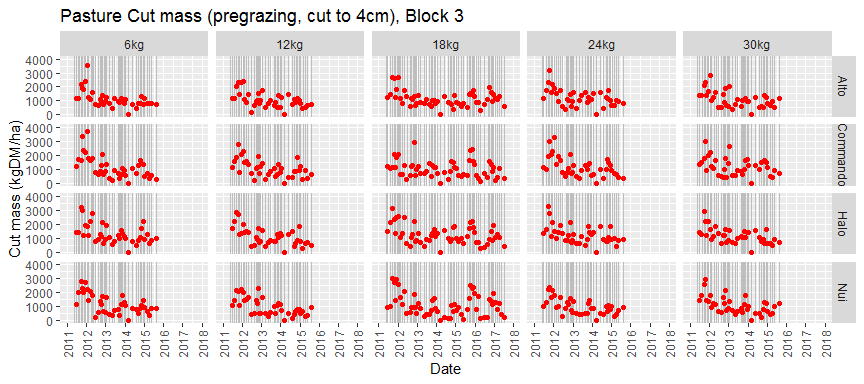
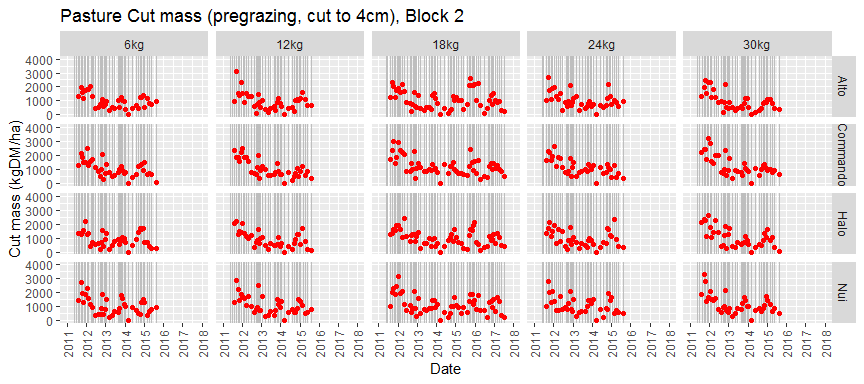
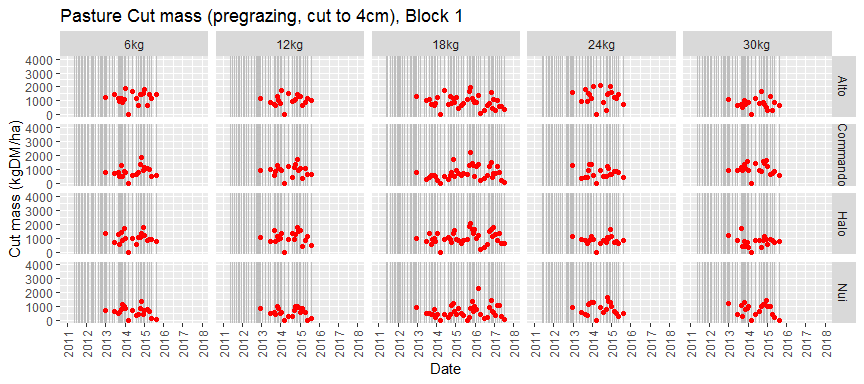
* Assume no pasture growth between pre and post RPM.

Average harvest % = 40



## Pasture Cut Mass

Average cut mass = 1030

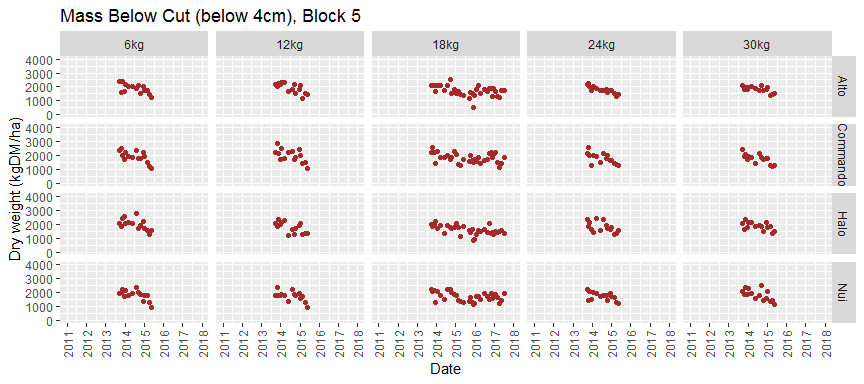
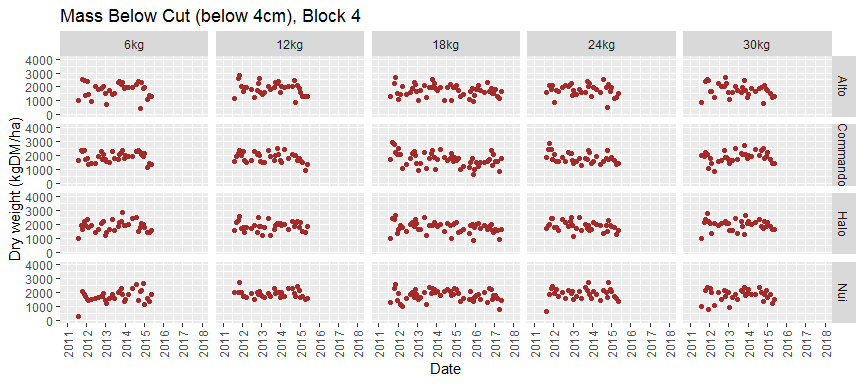
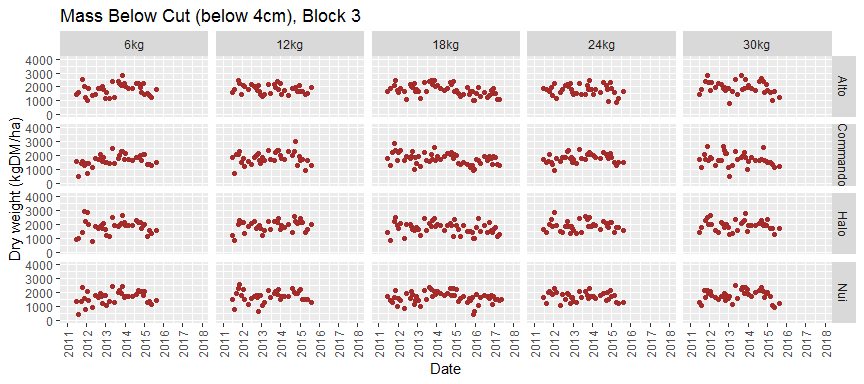
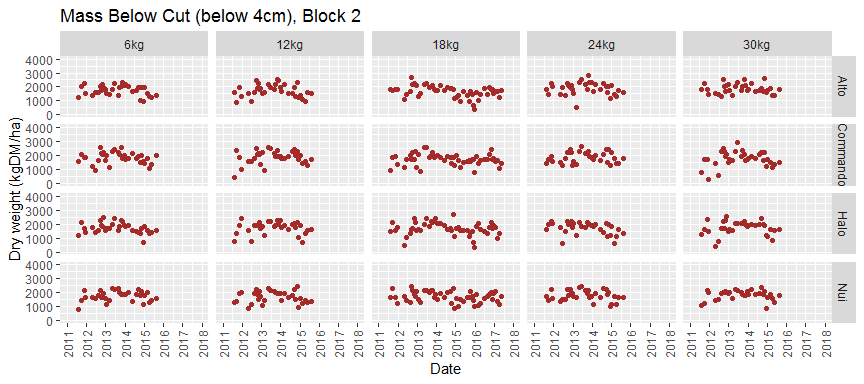
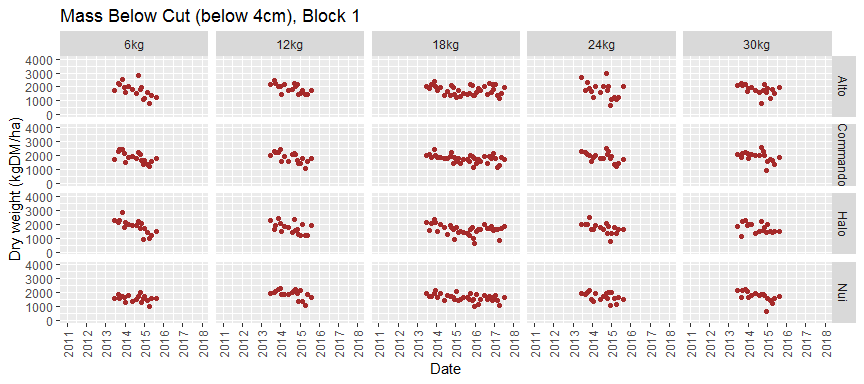


## Estimate Mass Below Cutting Height

### Assumptions

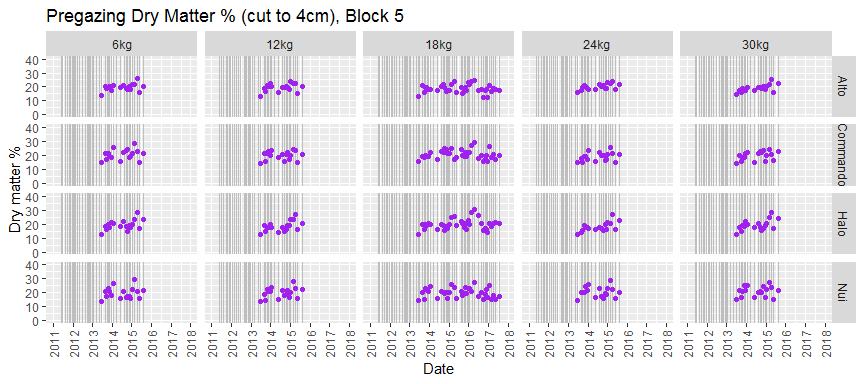
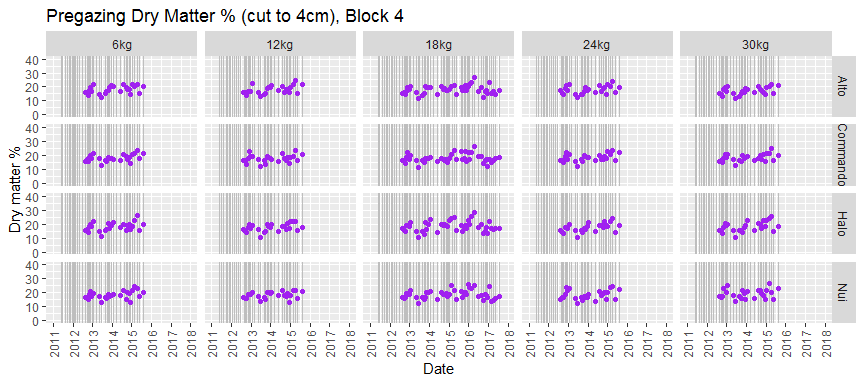
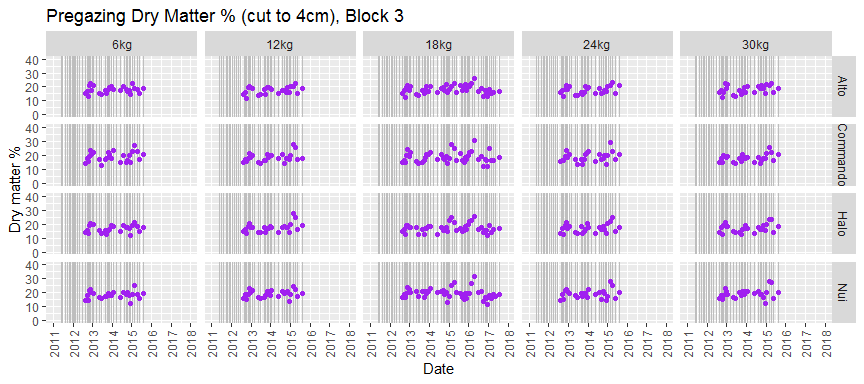
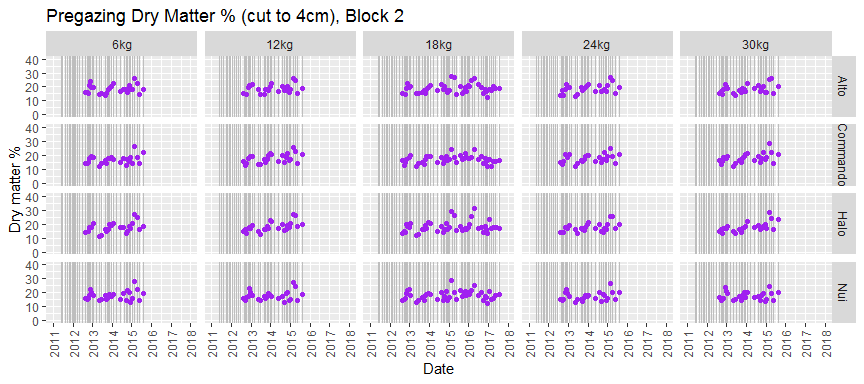
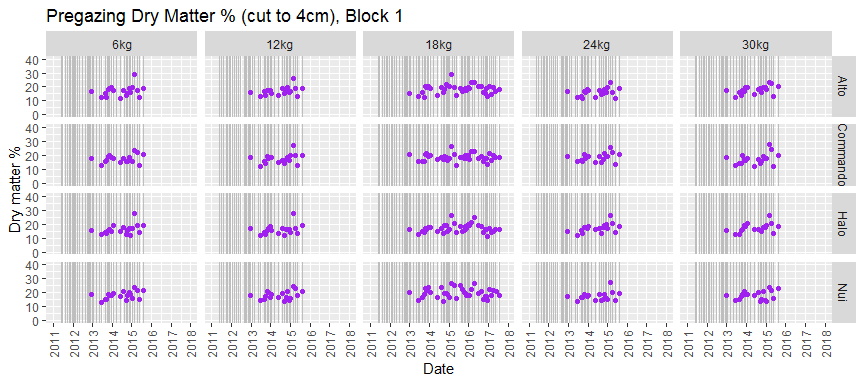
* Total mass at cutting assumed to be equal to pregraze RPM.

Average mass below cutting estimate = 1783



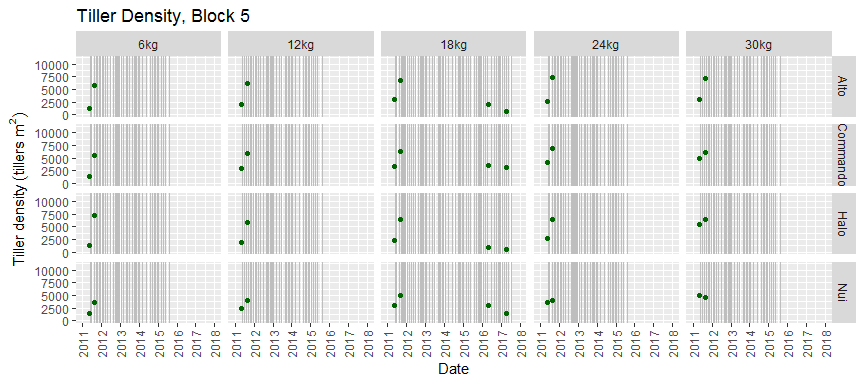
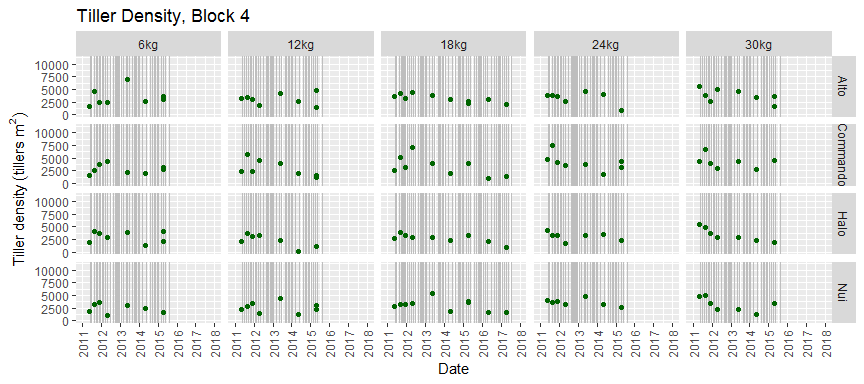
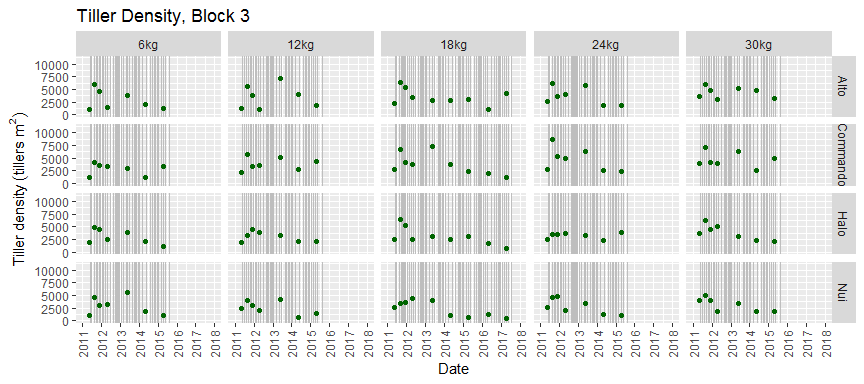
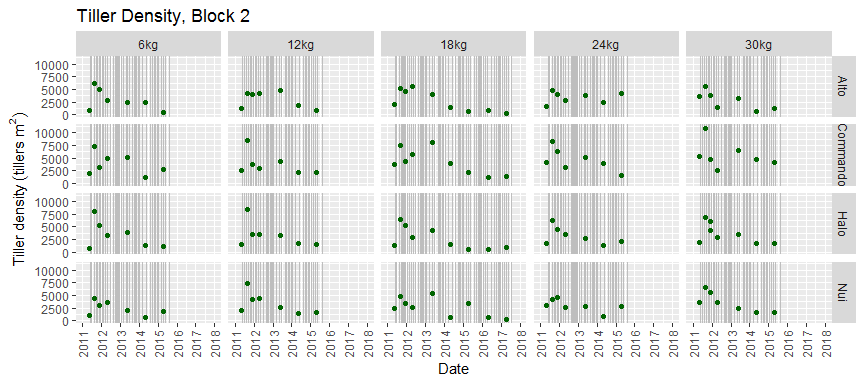
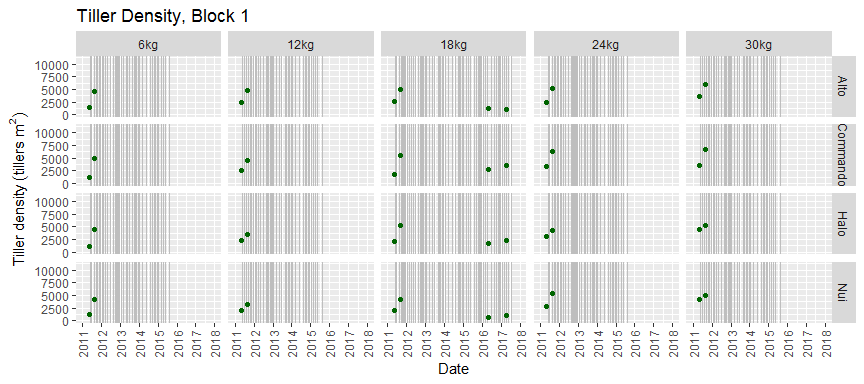
## Pasture Cuts DM%

Average cut dry matter % = 18

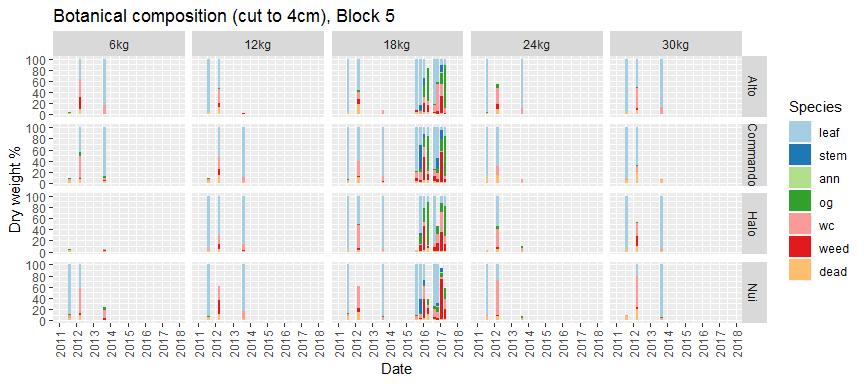
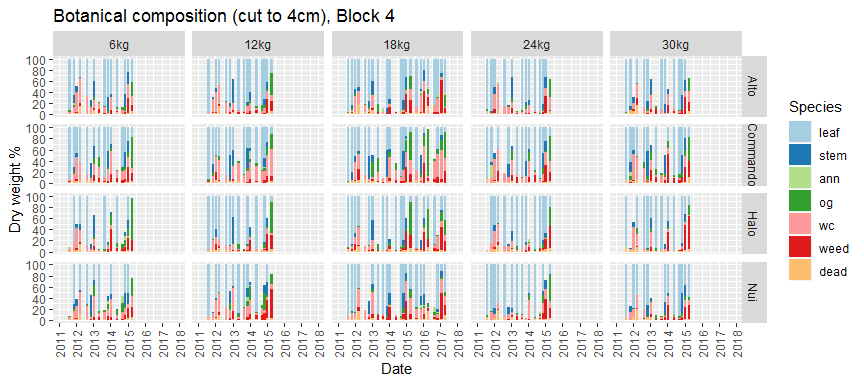
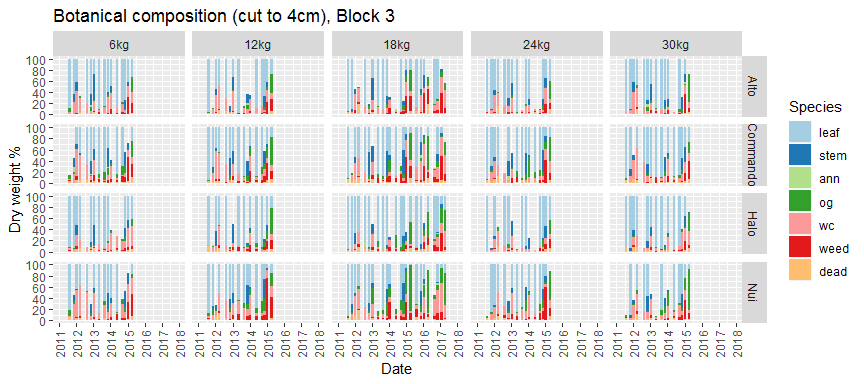
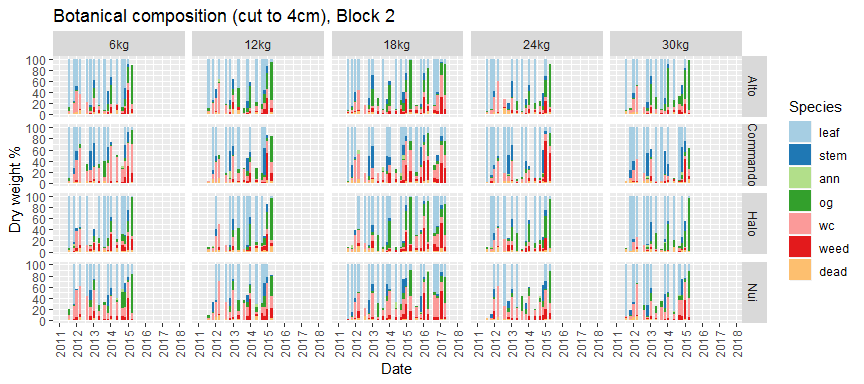
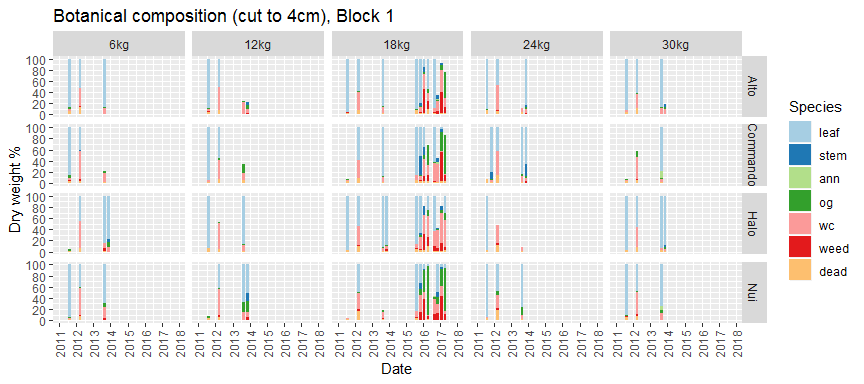


## Tiller Density

Average tiller density = 3364



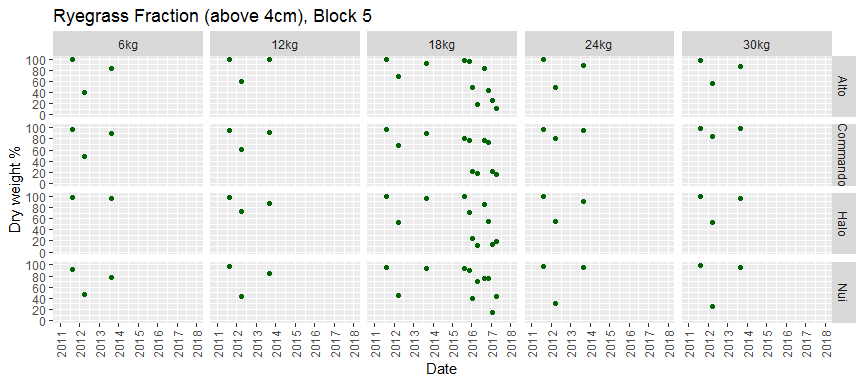
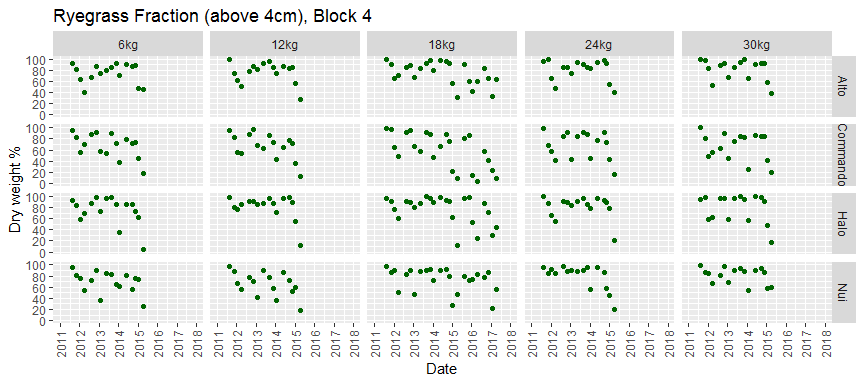
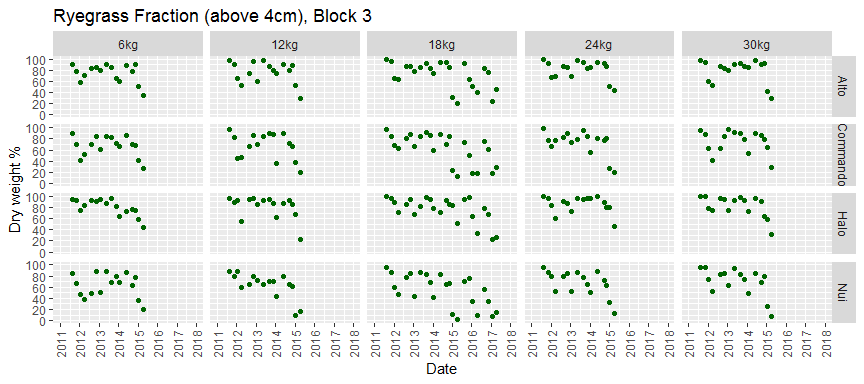
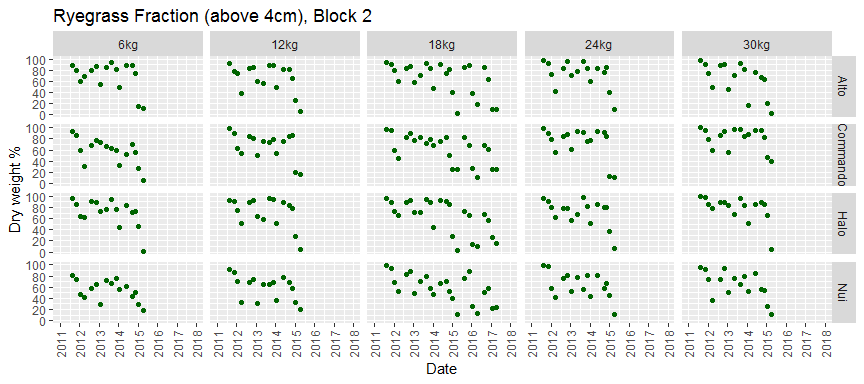
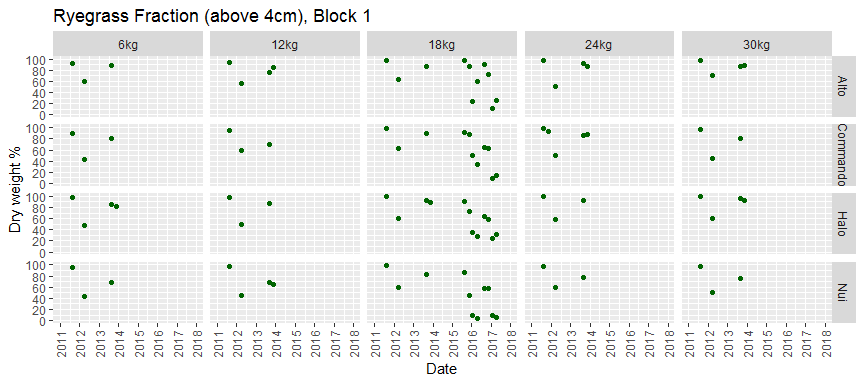
## Botanical Composition



## Ryegrass Fraction

### Assumptions

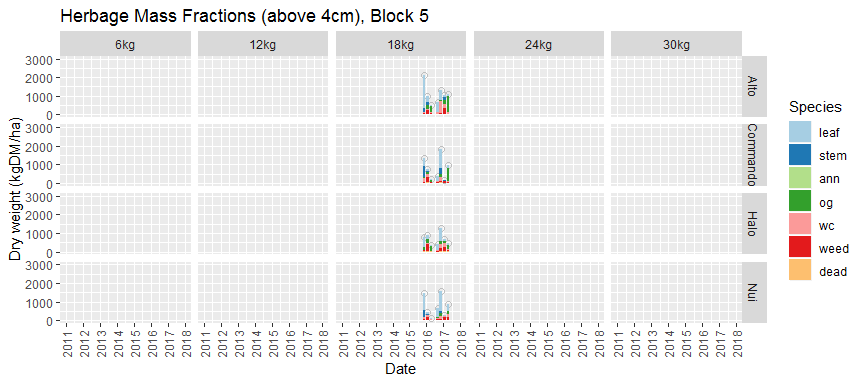
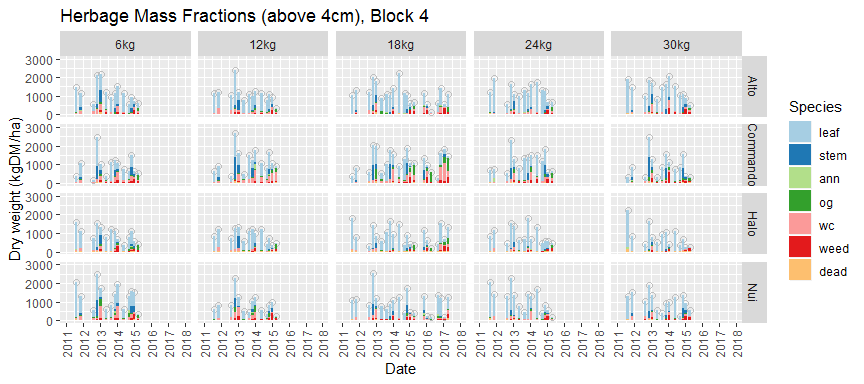
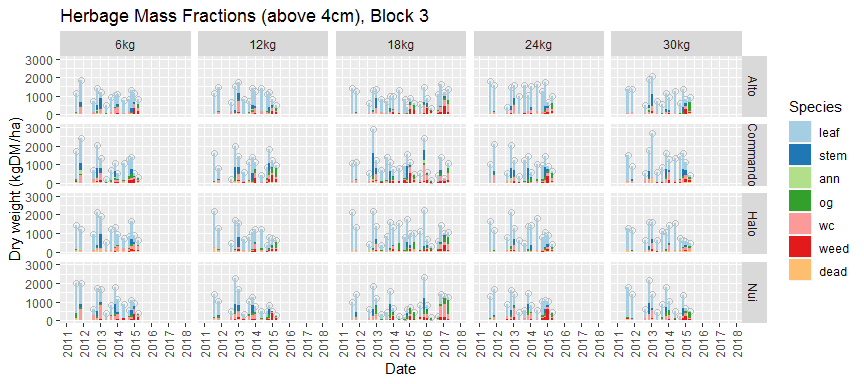
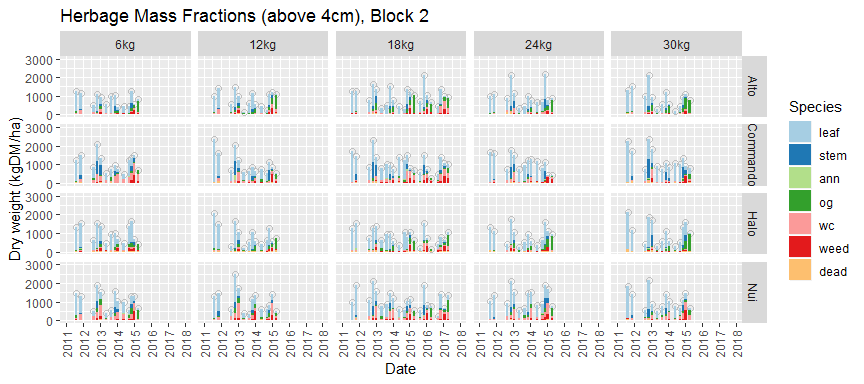
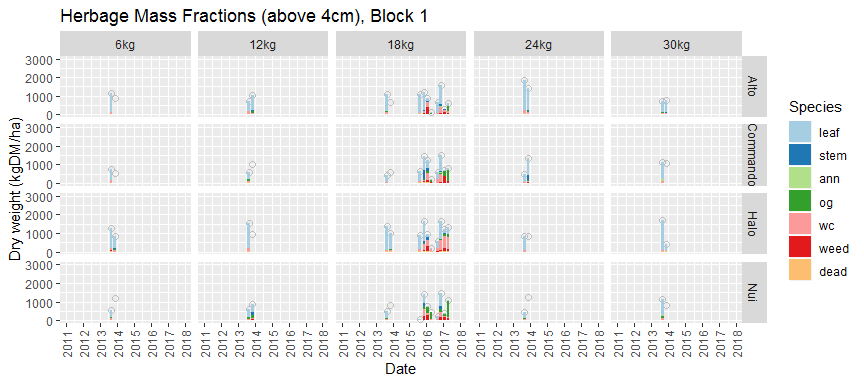
* Ryegrass fraction calculated on green mass only.



## Estimate Botancial Mass

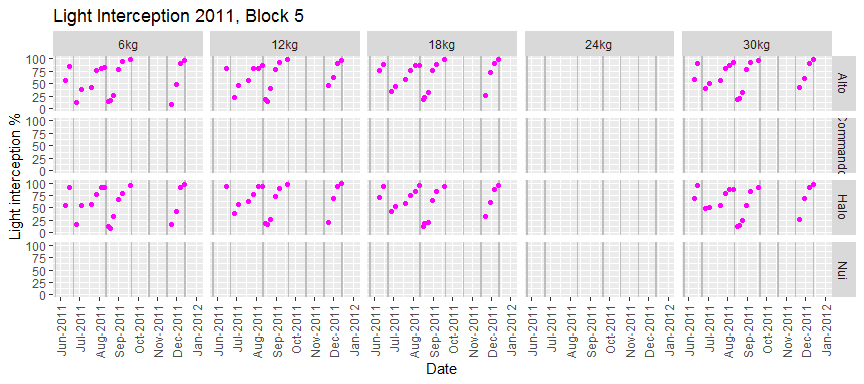
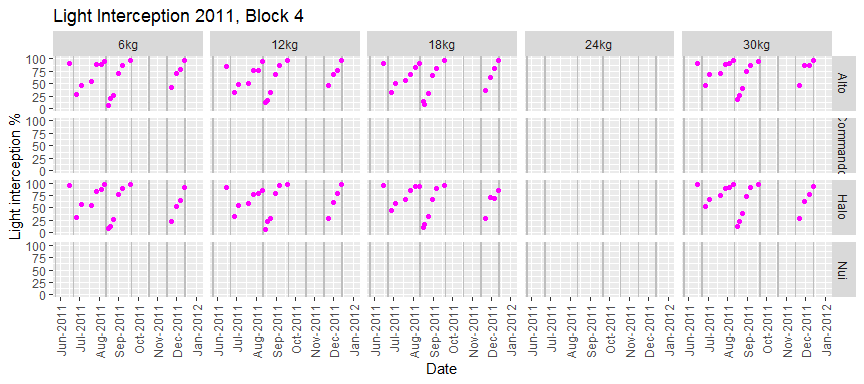
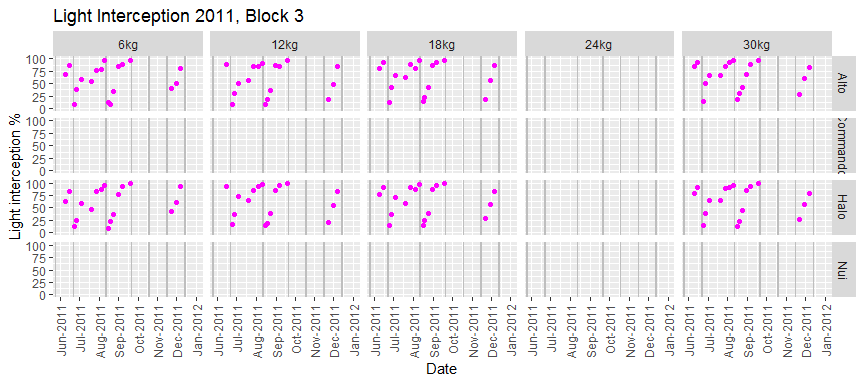
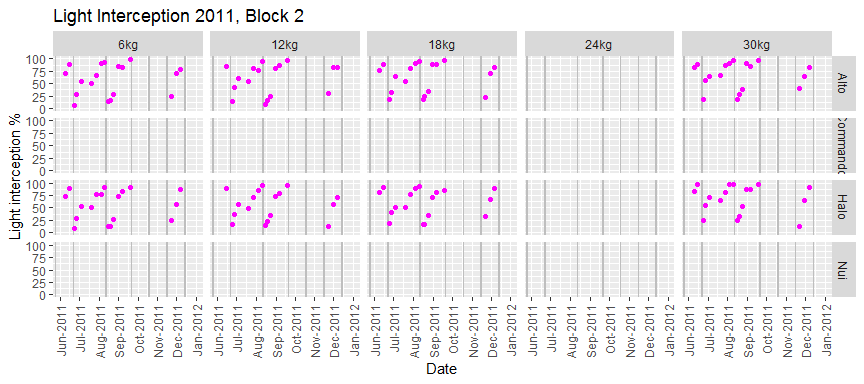
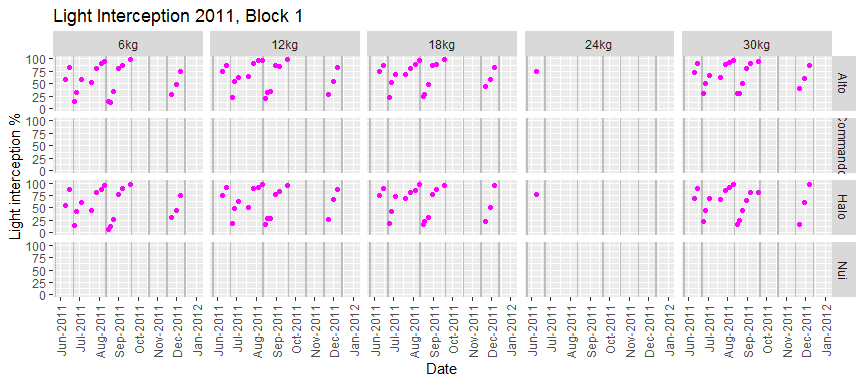
### Assumptions

* Total mass at botanical date assumed to be equal to pregraze RPM.
* Botanical composition below cutting height estimated from Tozer data.



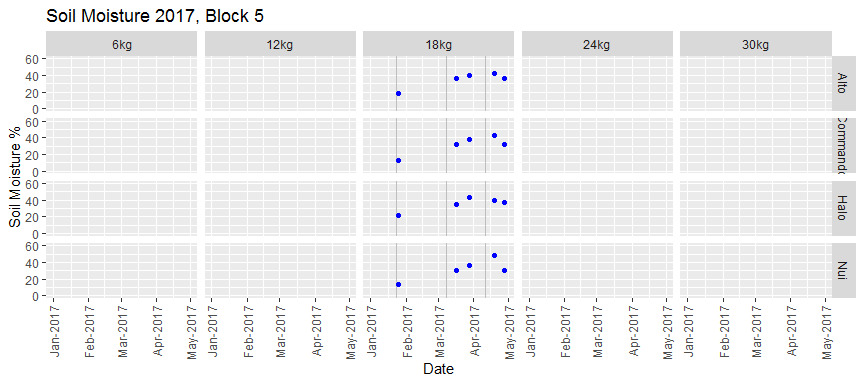
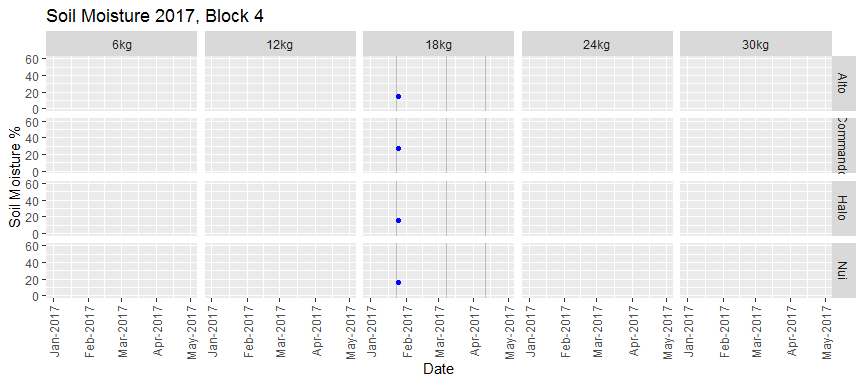
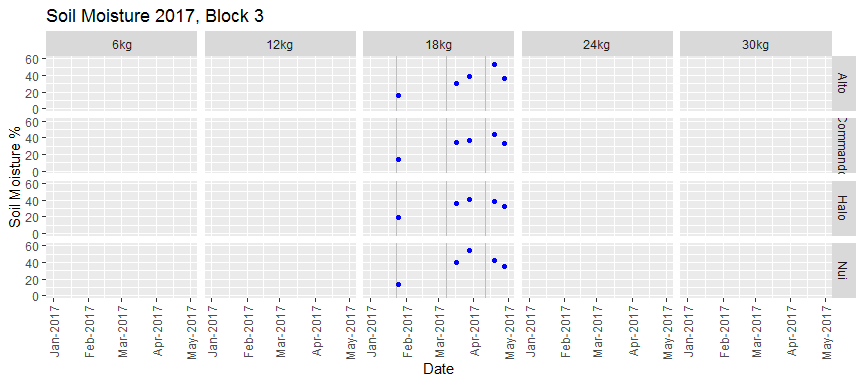
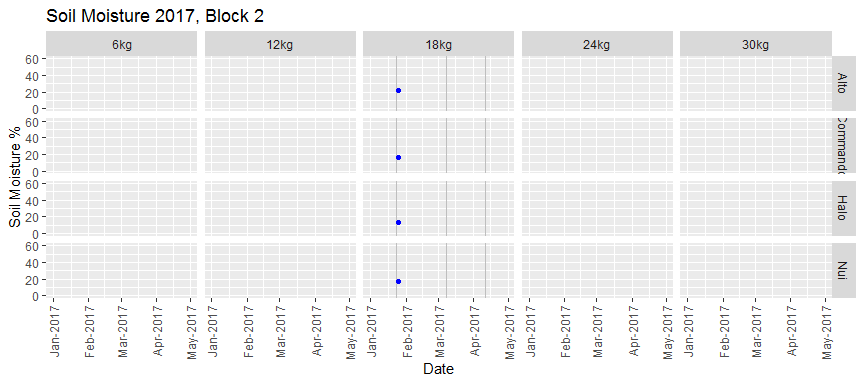
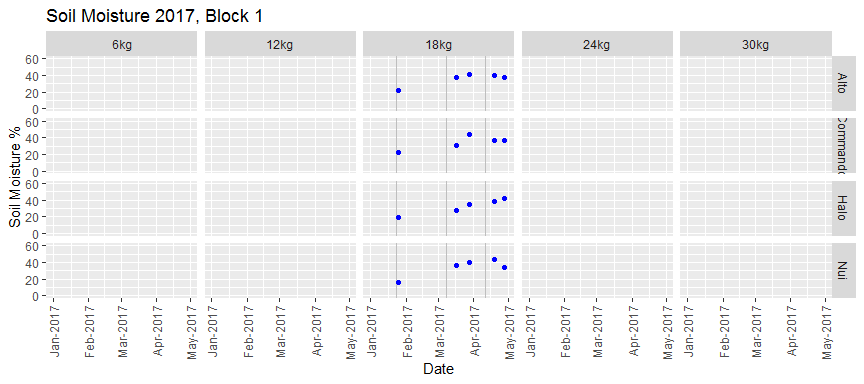
## Light Interception

Average light interception = 63



## Soil Moisture

Average soil moisture = 32



## Write Harvest Dates

# choose data  
acultivar <- 'Alto' # only Alto and Halo have light interception data  
aseed\_rate <- '18kg'  
calib\_start <- ymd("20110101") # period for data weight = 1  
calib\_end <- ymd("20140531") # period for data weight = 1  
ablock <- 3  
  
for (ablock in c(2,3,4)) { # loop through data sets  
  
# write harvest dates and harvest % for selected series  
file\_name <- paste("harvest\_Scott\_", ablock, ".txt", sep="")  
data\_h <- data\_rpm %>%  
 select(block, seed\_rate, cultivar, year\_grazed, doy\_grazed, harv) %>%  
 filter(block == ablock & seed\_rate==aseed\_rate & cultivar==acultivar) %>%  
 drop\_na()  
days\_harvest <- matrix(as.integer(-1), nrow=100, ncol=3) # up to 100 harvests  
days\_harvest[1:nrow(data\_h),] <- c(data\_h$year\_grazed, data\_h$doy\_grazed, data\_h$harv)  
write.table(days\_harvest, file=file\_name, row.names=FALSE, col.names=FALSE, sep='\t')  
  
# write calibration data  
file\_name <- paste("data\_calibration\_Scott\_", ablock, ".txt", sep="")  
  
# collect the data in this list  
data\_c <- vector("list", 6)   
  
# pre and post mass (but this includes other species!)  
# temp <- data\_rpm %>%  
# select(block, seed\_rate, cultivar, mass\_pre, year\_pre, doy\_pre,   
# mass\_post, year\_post, doy\_post) %>%  
# filter(block==ablock & seed\_rate==aseed\_rate & cultivar==acultivar)   
# data\_c[[1]] <- with(temp, tibble(var='DM', year=year\_pre,   
# doy=doy\_pre, data=mass\_pre/10) %>% drop\_na())  
# data\_c[[2]] <- with(temp, tibble(var='DM', year=year\_post,   
# doy=doy\_post, data=mass\_post/10) %>% drop\_na())  
  
# ryegrass tillers  
temp <- data\_till %>%  
 select(block, seed\_rate, cultivar, mean\_tillers, date) %>%  
 filter(block==ablock & seed\_rate==aseed\_rate & cultivar==acultivar)   
data\_c[[3]] <- with(temp, tibble(var='TILTOT', year=year(date),   
 doy=yday(date), data=mean\_tillers, sd=400, type="sd",  
 weight=ifelse(((date>=calib\_start)&(date<=calib\_end)), 1, 0)) %>% drop\_na())  
  
# ryegrass mass (total or above cutting height? depending on definition of yield\_bot)  
temp <- data\_bm %>%  
 rename(date = date\_cut) %>%  
 select(block, seed\_rate, cultivar, leaf, stem, leaf\_below, stem\_below, yield\_bot, below, date) %>%  
 filter(block==ablock & seed\_rate==aseed\_rate & cultivar==acultivar)   
data\_c[[4]] <- with(temp, tibble(var='CLV', year=year(date),   
 doy=yday(date), data=leaf/100\*yield\_bot/10\*0.45+leaf\_below/100\*below/10\*0.45,   
 sd=10, type="sd",  
 weight=ifelse(((date>=calib\_start)&(date<=calib\_end)), 1, 0)) %>% drop\_na())  
data\_c[[5]] <- with(temp, tibble(var='CST', year=year(date),   
 doy=yday(date), data=stem/100\*yield\_bot/10\*0.45+stem\_below/100\*below/10\*0.45,   
 sd=4, type="sd",  
 weight=ifelse(((date>=calib\_start)&(date<=calib\_end)), 1, 0)) %>% drop\_na())  
  
# light interception (but this includes all species!)  
# temp <- data\_li %>%  
# select(block, seed\_rate, cultivar, li, date) %>%  
# filter(block==ablock & seed\_rate==aseed\_rate & cultivar==acultivar)   
# data\_c[[5]] <- with(temp, tibble(var='LINT', year=year(date),   
# doy=yday(date), data=li) %>% drop\_na())  
  
# soil moisture  
temp <- data\_sm %>%  
 select(block, seed\_rate, cultivar, mean\_sm, date) %>%  
 filter(block==ablock & seed\_rate==aseed\_rate & cultivar==acultivar)   
data\_c[[6]] <- with(temp, tibble(var='WCL', year=year(date),   
 doy=yday(date), data=mean\_sm, sd=2, type="sd",  
 weight=1) %>% drop\_na())  
  
# bind list and write file  
data\_calib <- bind\_rows(data\_c)  
data\_calib <- arrange(data\_calib, var, year, doy)  
write.table(data\_calib, file=file\_name, row.names=FALSE, col.names=FALSE, sep='\t', quote=FALSE)  
  
} # end data set loop