Taper Functions for poplar plantations

Contents

General scope

Assessment of poplar profiles sensitivity against plantation density and competition anisotropy

Setup and fetch the data

```
library(tidyverse)
library(magrittr)
library(ggplot2)
source("ReadData.R", echo = T)
```

```
##
## > urlfolder<- 'https://raw.githubusercontent.com/NuoroForestrySchool/Data/master/TaperData/2018Popla
##
## > file <- c("expData.csv")
##
## > urlfile <- paste0(urlfolder, file)
##
## > dsin<-read.csv(urlfile)
```

Compute diameters

(directly, not through Radius)

```
cooX <- dsin %>% select(-Y, -Z) %>% spread(id_lato, X) %>%
  rename(
    xe1 = interfila_piena,
    xe2 = interfila_vuota,
    xa1 = intrafila_alto,
    xa2 = intrafila_basso
  )

cooY <-
  dsin %>% select(-X, -Z) %>% spread(id_lato, Y) %>%
  rename(
    ye1 = interfila_piena,
```

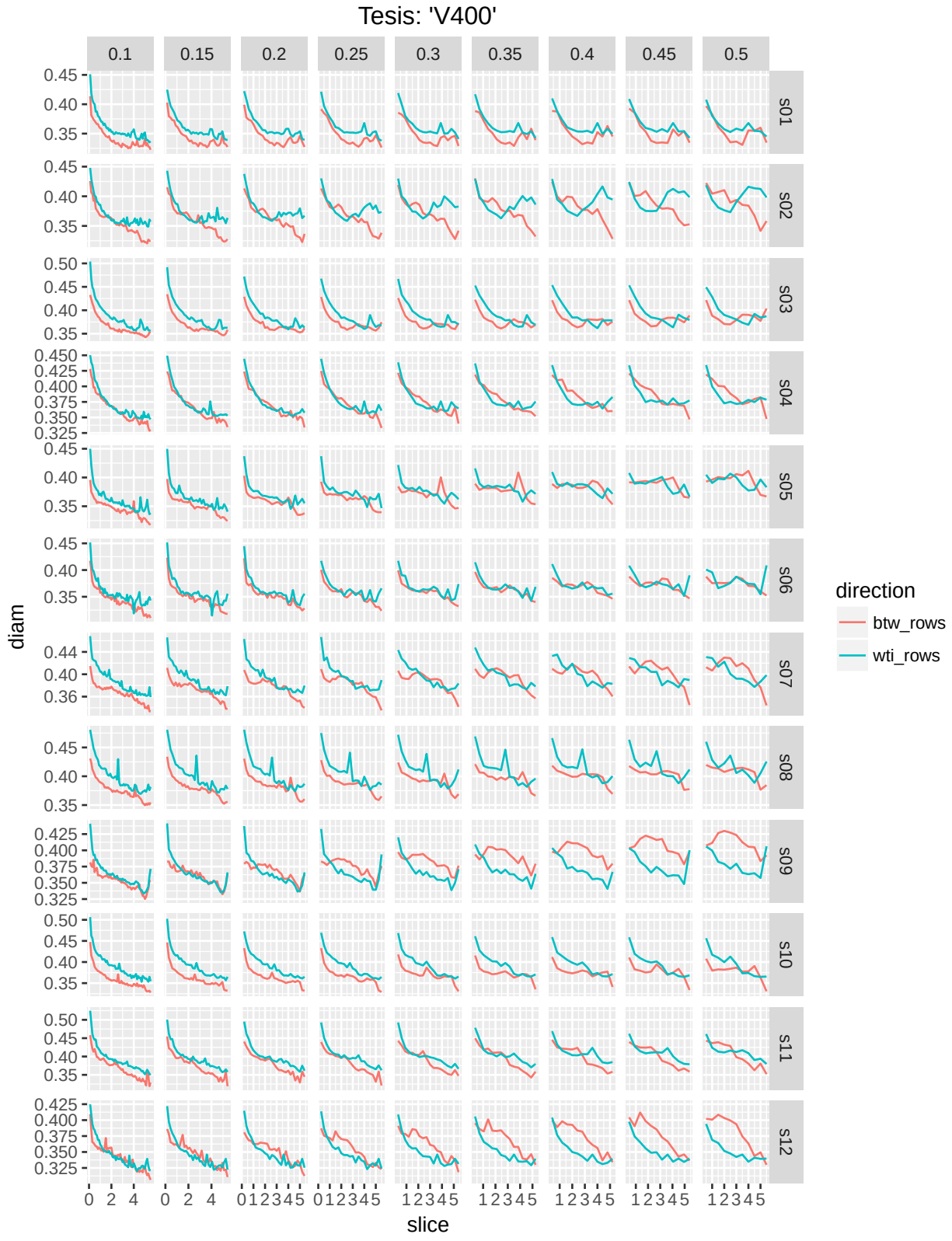
```
    ye2 = interfila_vuota,
    ya1 = intrafila_alto,
    ya2 = intrafila_basso
  )

Diameters <- cooX %>%
  full_join(cooY) %>%
  mutate(btw_rows = sqrt((xe1 - xe2) ^ 2 + (ye1 - ye2) ^ 2),
         wti_rows = sqrt((xa1 - xa2) ^ 2 + (ya1 - ya2) ^ 2)) %>%
  select(-xe1,-xe2,-xa1,-xa2,-ye1,-ye2,-ya1,-ya2) %>%
  gather(direction, diam,-tesi,-length_toppo,-treid,-slice)
```

```
## Joining, by = c("tesi", "length_toppo", "treid", "slice")
```

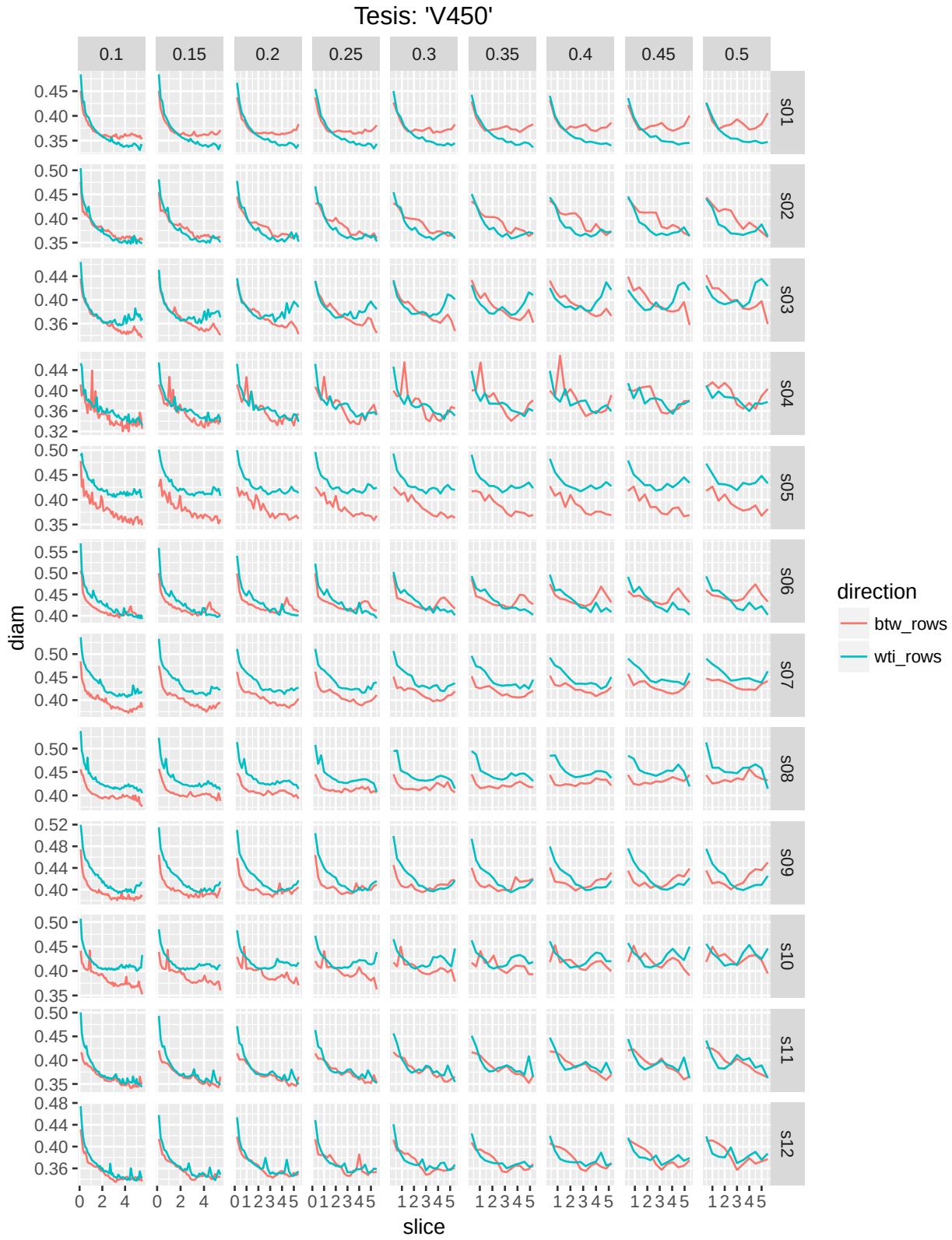
Plot all profiles

```
gl <- Diameters %$%
  levels(tesi) %>%
  map(
    ~ Diameters %>%
      filter(tesi == .x) %>%
      ggplot(aes(slice, diam)) +
      geom_line(aes(color = direction)) +
      facet_grid(treid ~ length_toppo, scales = "free") +
      ggtitle(paste0("Tesis: '", .x, "'")) +
      theme(plot.title = element_text(hjust = 0.5))
  )
print(gl)
```

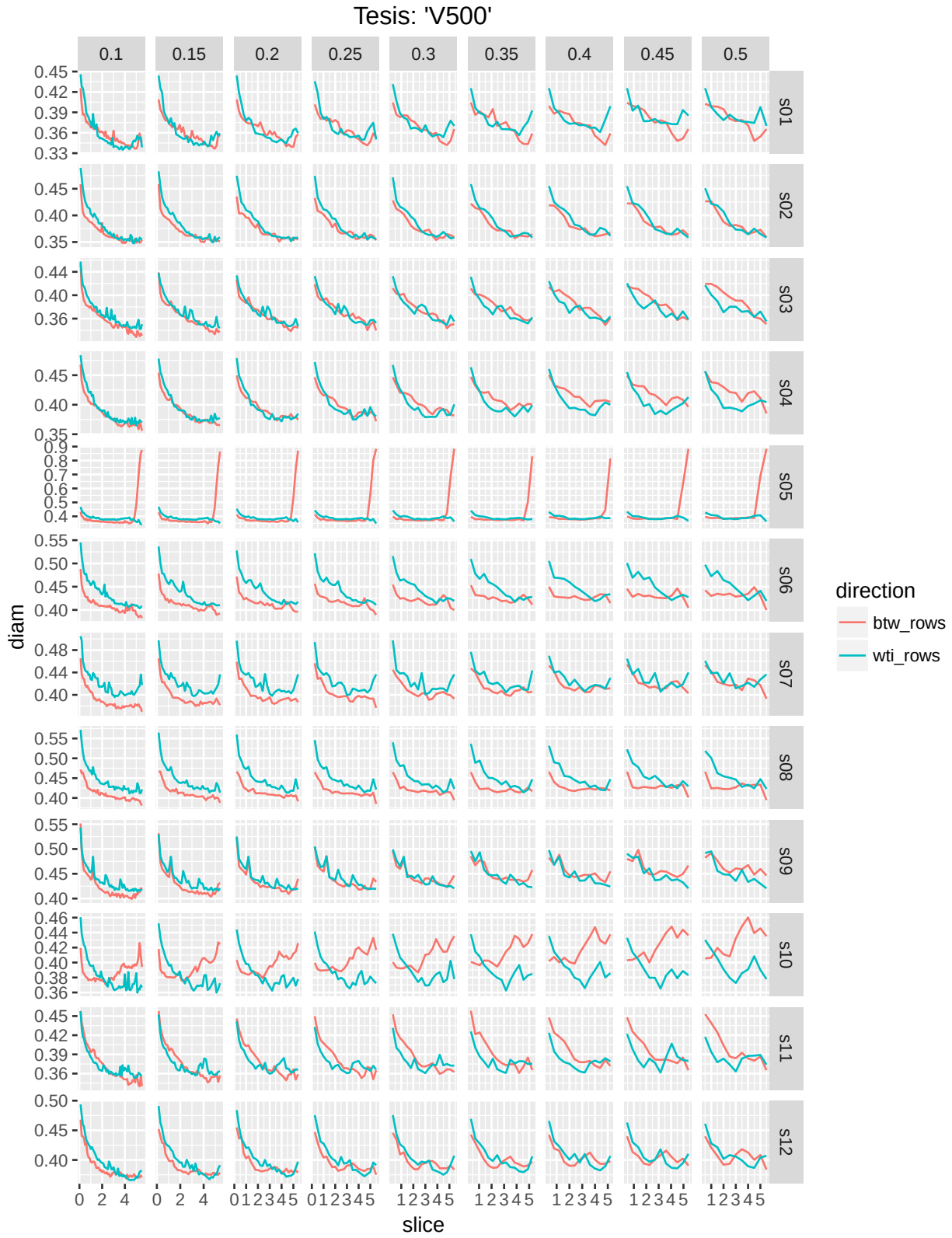
```
## [[1]]
```


Tesis: 'V400'
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
s01
s02
s03
s04
s05
s06
s07
s08
s09
s10
s11
s12
diam
slice
direction
btw_rows
wti_rows

```
##
## [[2]]
```


Tesis: 'V450'
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
s01
s02
s03
s04
s05
s06
s07
s08
s09
s10
s11
s12
diam
slice
direction
btw_rows
wti_rows

##
[[3]]


Tesis: 'V500'
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
s01
s02
s03
s04
s05
s06
s07
s08
s09
s10
s11
s12
diam
slice
direction
btw_rows
wti_rows