

warmXtrophic practice

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First Flower

Here, I'll be trying to show the average date of first flower between ambient and warmed plots with and without insecticide treatment from 2015-2018. First, read in the data from the Google spreadsheet.

```
for (package in c('tidyverse', 'googledrive', 'googlesheets4')) {  
  if (!require(package, character.only=T, quietly=T)) {  
    install.packages(package)  
    library(package, character.only=T)  
  }  
}
```

```
data <- read_sheet("1jrfrZ0g0lyFkvaMjQzjSf5P9rXf82voVaKVGXp-4G1w")
```

Then, group the data to only contain data from the KBS site before 2019 (there is no 2019 or 2018 data in the original file). After that, group the data to show the average first flower date for each of the given treatment groups.

```
means <- data %>%  
  filter(Site == "kbs") %>%  
  group_by(Year, Site, state, insecticide) %>%  
  summarize(First.flower = mean(suppressWarnings(as.numeric(First.flower)), na.rm = TRUE)) %>%  
  filter(!is.nan(First.flower))
```

Plot the data

```
override.shape <- c(16, 16, 17, 17)  
p <- ggplot(means, aes(x = Year, y = as.Date(First.flower, origin="1900-01-01"),  
  shape = state, col = interaction(insecticide, state))) +  
  geom_point(size = 3) +  
  geom_line() +  
  labs(y = "Date of First Flower", color = "Treatment",  
    shape = "Treatment") +  
  theme_light()  
  
p + scale_x_continuous(breaks = c(2015.0, 2016.0, 2017.0)) +  
  guides(colour = guide_legend(override.aes = list(shape = override.shape))) +  
  scale_shape(guide = FALSE)
```

