

Different credible intervals

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Here are the two different credible intervals. The wider one is the prediction interval, accounting for both the uncertainty in the parameter value and the measurement error of individual trees' production. The narrower one is the credible interval around the predicted value, accounting only for the uncertainty in the parameter value but no uncertainty in individual trees' production.

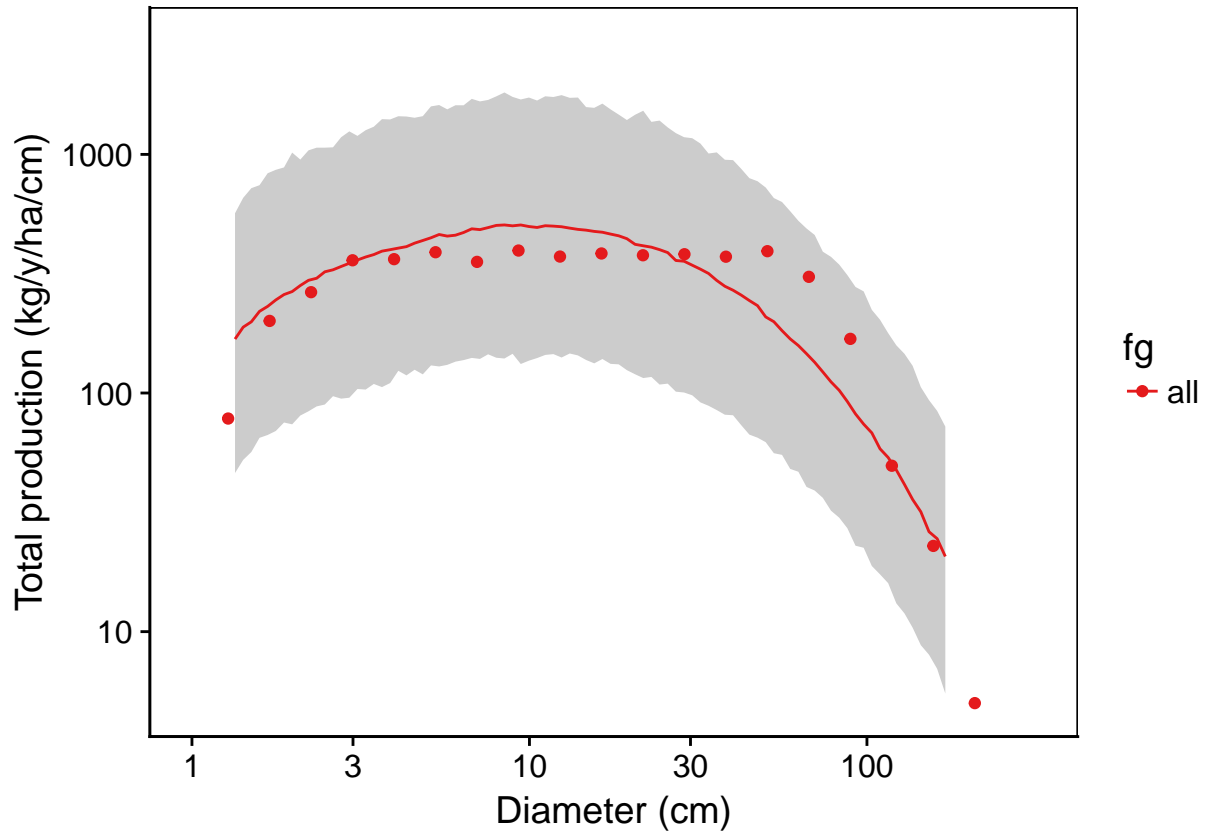
```
fp <- 'C:/Users/Q/google_drive/ForestLight/data/data_forplotting_12apr2018'

# Read all the csus in directory.
for (i in dir(fp, pattern = '.csv')) {
  n <- gsub('.csv','',i)
  assign(n, read.csv(file.path(fp, i), stringsAsFactors = FALSE))
}
```

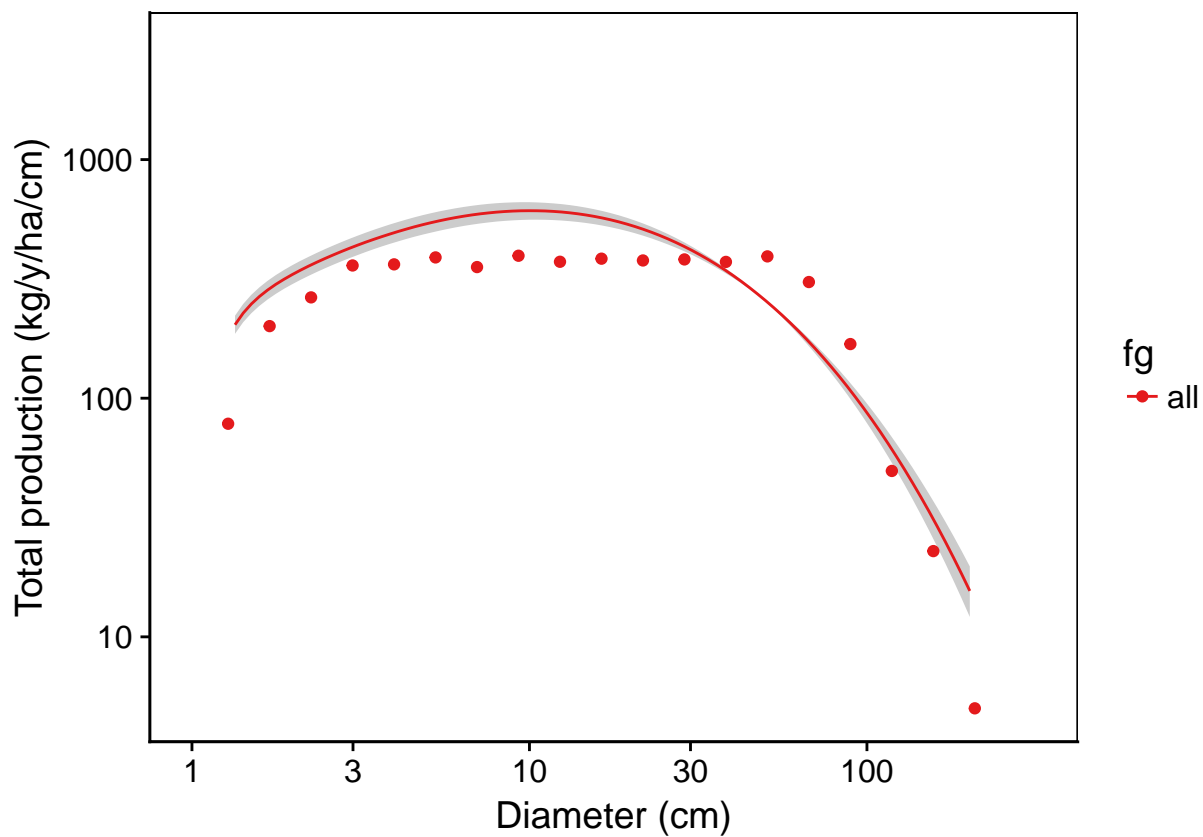
The data in google drive have been updated to include the prediction interval and the fitted value interval. Here is how you can plot them. No change was made to the plotting code, only to the data input. The only change that needs to be made is to specify the `predat` argument. It is `pred_totalprod` and `pred_indivprod` for the prediction intervals for total and individual production, and `fitted_totalprod` and `fitted_indivprod` for the fitted value intervals.

As an example I plotted the two intervals for all trees' total production in 1990 and functional group 1's individual production in 1990. The prediction interval is wide enough to show that our fit does support energy equivalence if the individual variation is properly accounted for. The prediction interval could be a flat line until the very largest individuals are reached. Note finally that the prediction interval looks a little wavy due to sampling error in the MCMC that was used to fit the model.

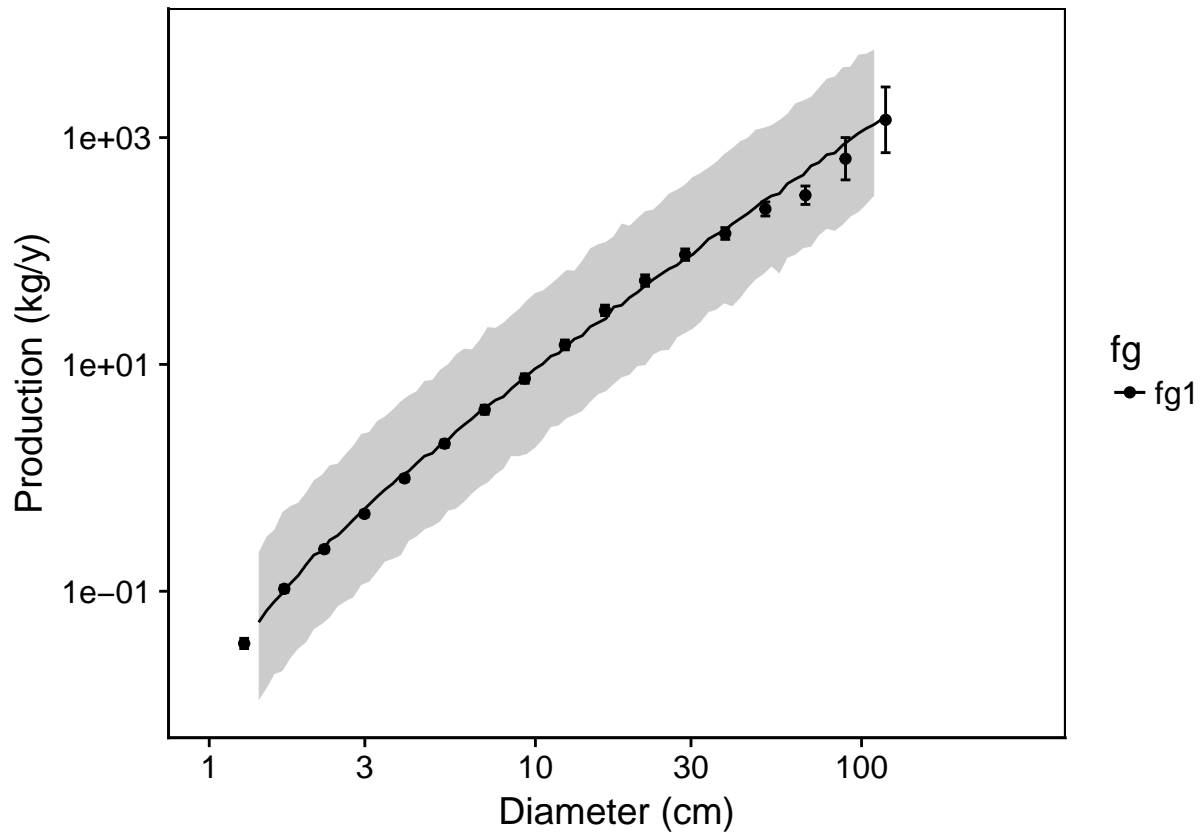
```
plot_totalprod(year_to_plot = 1990,
  fg_names = c('all'),
  model_fit_density = 'weibull',
  model_fit_production = 'powerlawexp',
  y_limits = c(5, 3000),
  y_breaks = c(10, 100, 1000),
  preddat = pred_totalprod)
```



```
plot_totalprod(year_to_plot = 1990,
  fg_names = c('all'),
  model_fit_density = 'weibull',
  model_fit_production = 'powerlawexp',
  y_limits = c(5, 3000),
  y_breaks = c(10, 100, 1000),
  preddat = fitted_totalprod)
```



```
plot_prod(year_to_plot = 1990,
          fg_names = c('fg1'),
          model_fit = 'powerlawexp',
          y_limits = c(0.01, 7000),
          y_breaks = c(0.1, 10, 1000),
          error_quantiles = c('ci_min', 'ci_max'),
          average = 'mean',
          color_names = 'black',
          preddat = pred_indivprod)
```



```
plot_prod(year_to_plot = 1990,
          fg_names = c('fg1'),
          model_fit = 'powerlawexp',
          y_limits = c(0.01, 7000),
          y_breaks = c(0.1, 10, 1000),
          error_quantiles = c('ci_min', 'ci_max'),
          average = 'mean',
          color_names = 'black',
          preddat = fitted_indivprod)
```

