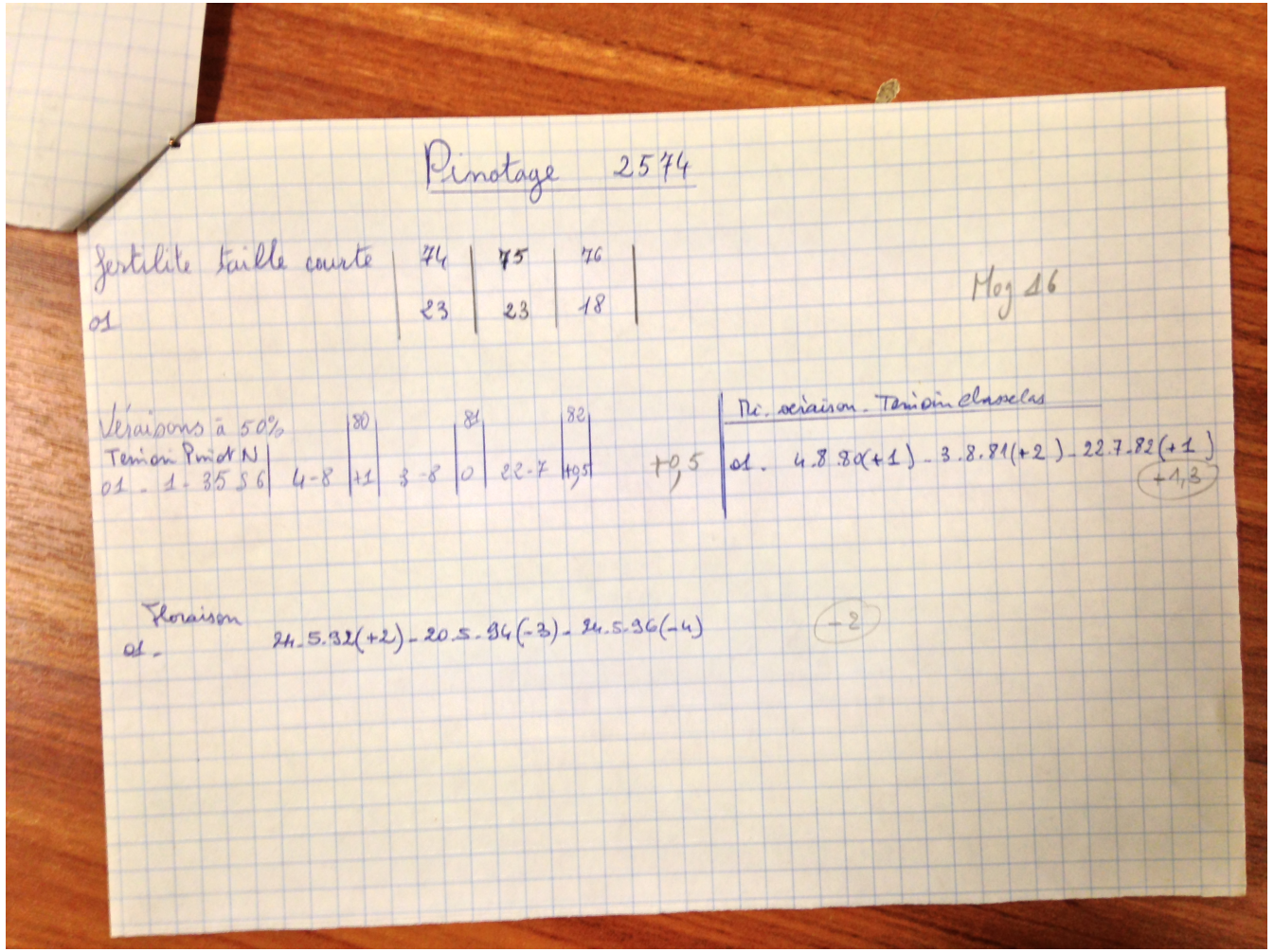
Duration of interphenophases in winegrapes

Domaine de Vassal

- Research vineyard in France
- Plant many varieties and clones for experiments and data collection
- Vines are planted for 5 years
- Except Chasselas

- Chasselas is continually grown as the baseline variety
- Phenology is measured relative to Chesselas
- If budbreak for Chasselas is April 15, then
  - April 15 = 0
  - April 14 = -1
  - April 16 = +1



Question:

- Has the duration of interphenophases changed since the 1980s?
- If so, does the change differ between varieties?
- Interphenophase = time between phenophases (budburst to flowering)

Model

Duration.predicted ~ N(mu, e)

$mu = a_{var} + B*year$

$a_{var} \sim N(mu_{var}, sigma_{var})$

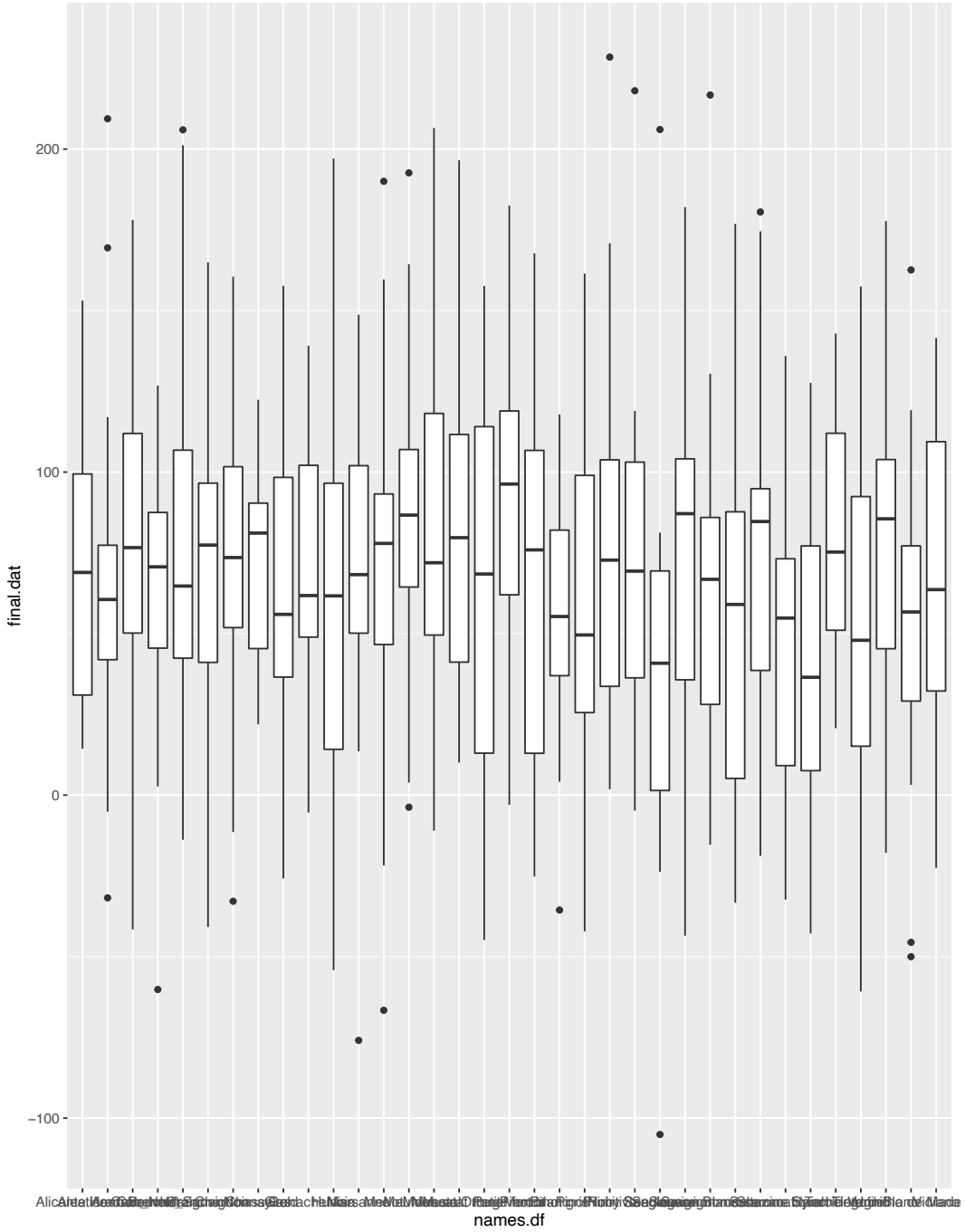
$B \sim N(mu_B, sigma_B)$

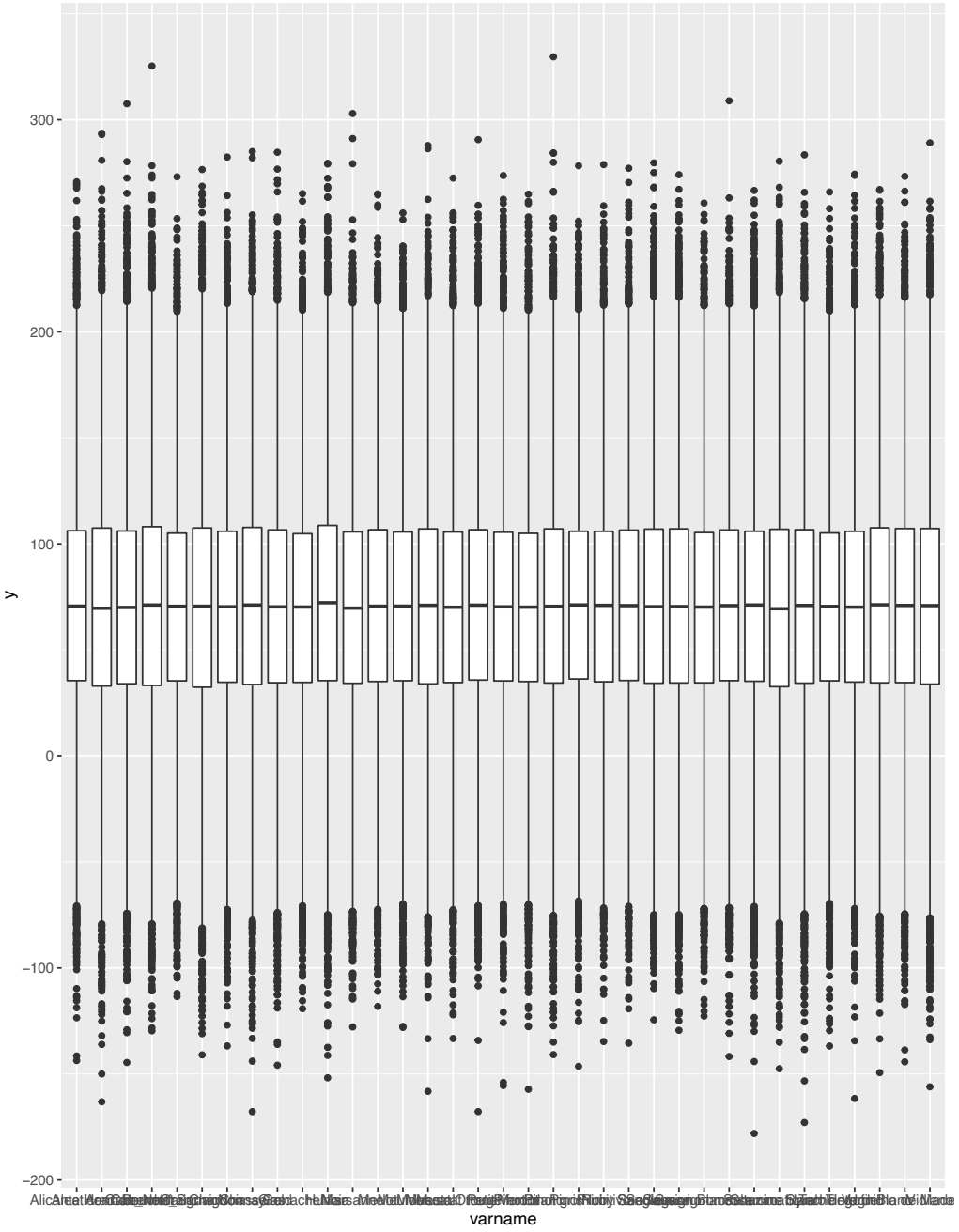
$e \sim U(0, 20)$

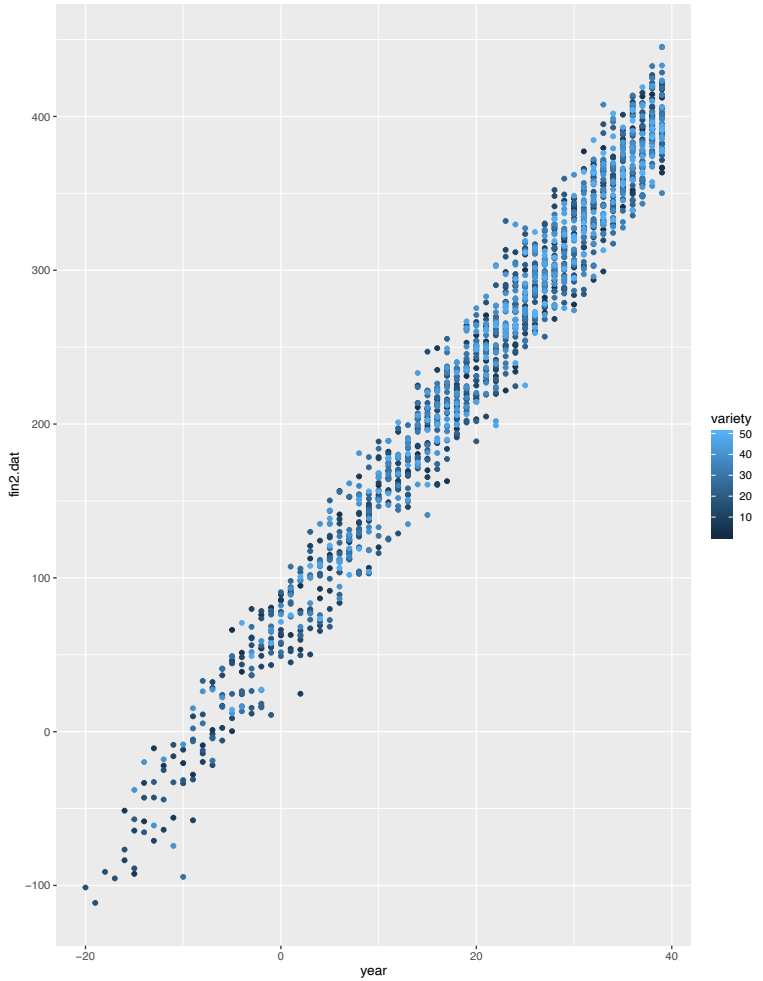
Written as an equation:

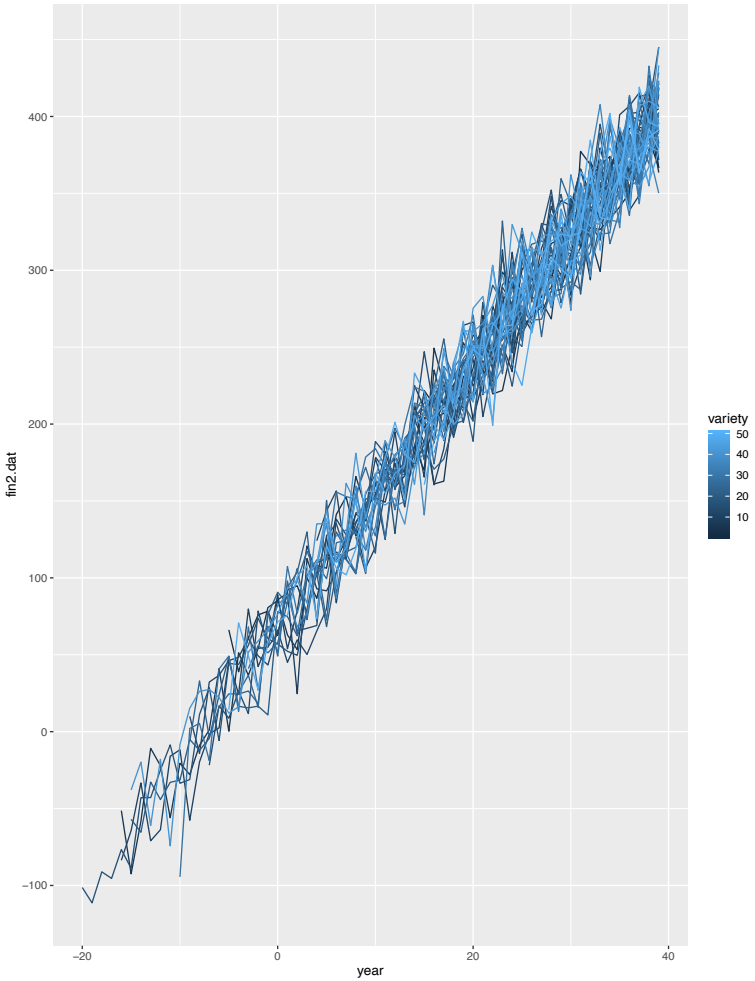
$Duration.predicted = a_{var} + B*year + e$

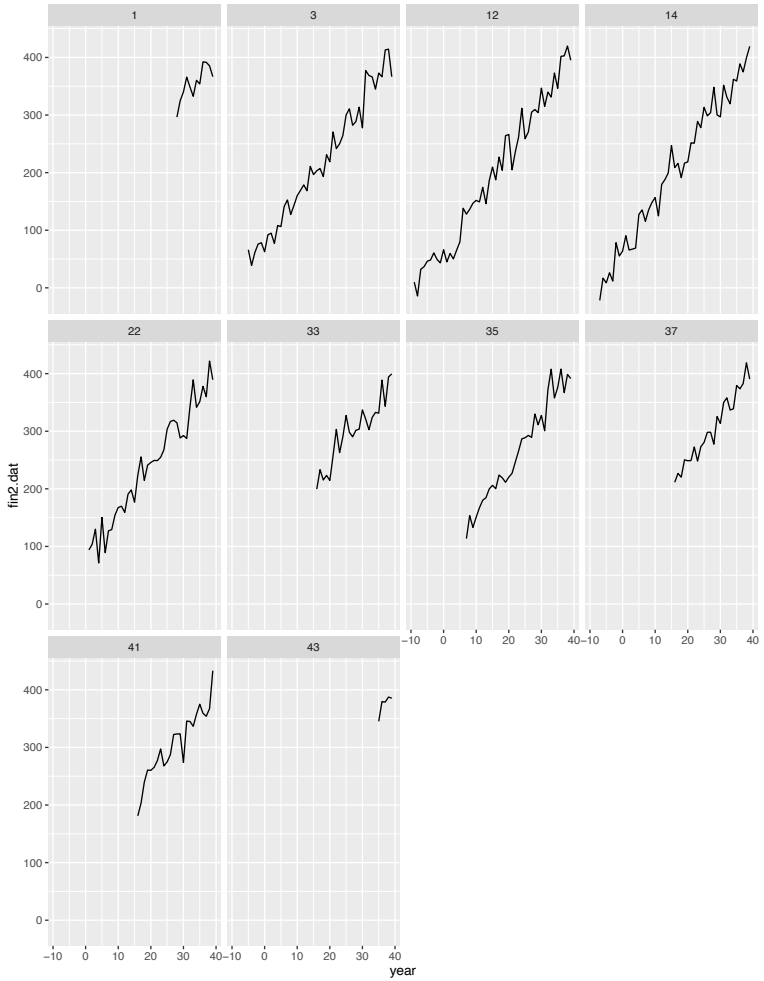
- **So each variety has unique intercept but will only draw one value from beta's distribution so all varieties have same slope (for now).**


final.dat
200
100
0
−100
names.df


y
300
200
100
0
−100
−200
varname

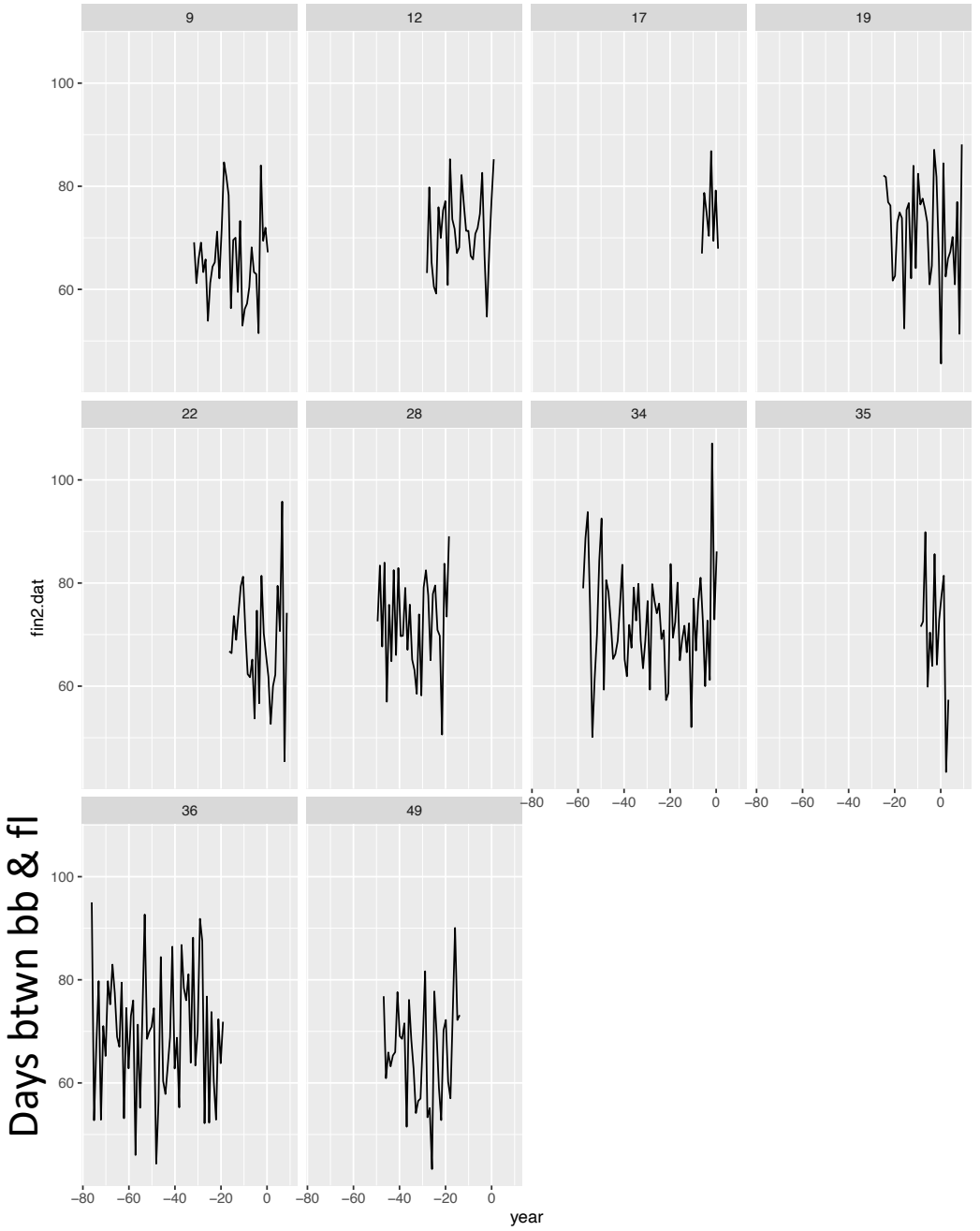

fin2.dat
year
variety
50
40
30
20
10


fin2.dat
year
variety
50
40
30
20
10


1
3
12
14
22
33
35
37
41
43
fin2.dat
year

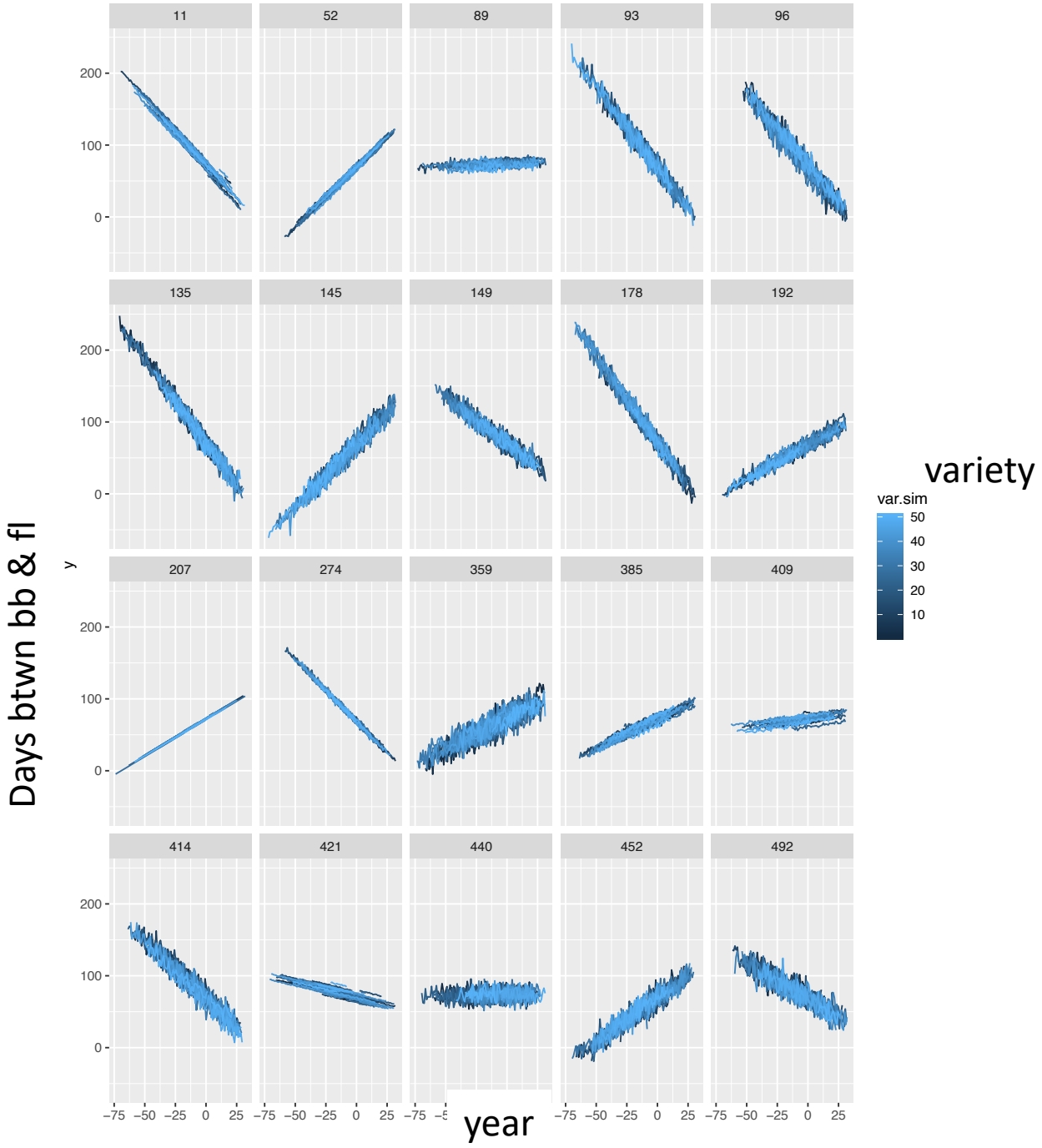
New for April 7

Examples of simulated data



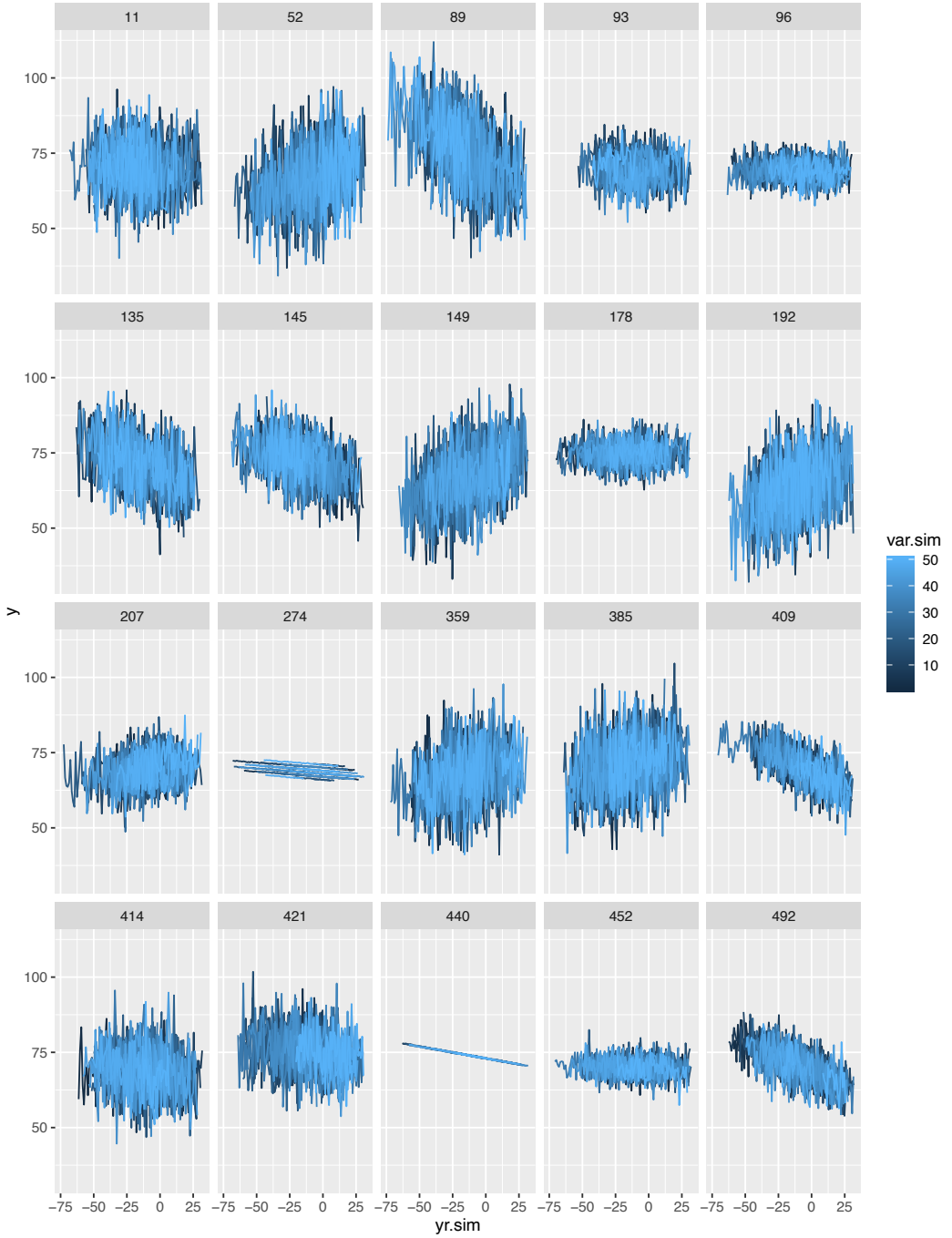
Priors

- a.mu ~ N(70, 5)
- a.sigma ~ U(0, 5)
- B.mu ~ N(0, 1)
- B.sigma ~ U(0, 1)
- E ~U(0, 10)



Prior

- a.mu ~ N(70, 2)
- a.sigma ~ U(0,2)
- B.mu ~ N(0, 0.1)
- B.sigma ~ U(0, 0.1)
- E ~ U(0, 10)



questions

- Need to fix the year so it does not go to -80. Something to do with the start year needing to be late enough so the count down does not go lower than -24
- Need to constrain variation - Make error smaller? Slope? Intercept sigma?