1. Duration of interphenophases in winegrapes

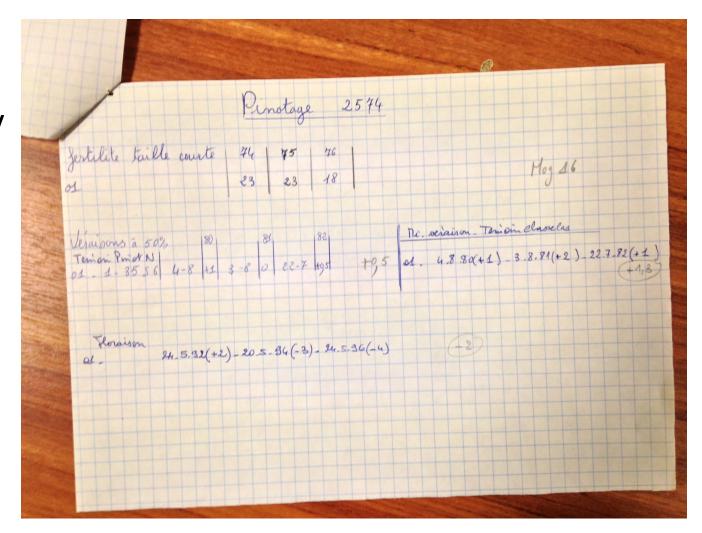
2. Domaine de Vassal

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



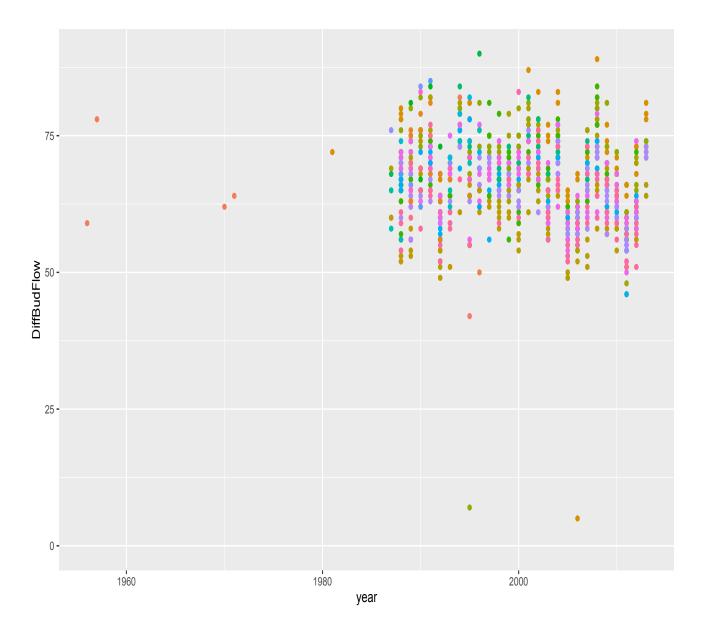
3. The data:

- 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



4. The data:

- Data years 1956 2013
- Hinge year for model = 1980
 - Earliest start year for simulated data will be 1961
 - Years in simulated data count down from the start year



5. Questions:

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

6. Model: Single Slope

Duration.predicted $\sim N(mu, e)$ $mu = a_{var} + B*year$ $a_{var} \sim N(mu_{var}, sigma_{var})$ B = -0.2 $e \sim U(0, 20)$

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).

7. Model: Variety Slope

Duration.predicted $\sim N(mu, e)$ $mu = a_{avar} + B_{bvar}^* year$ $a_{avar} \sim N(mu_{avar}, sigma_{avar})$ $B_{bvar} \sim N(mu_{bvar}, sigma_{bvar})$ $e \sim U(0, 20)$

Written as an equation:

Duration.predicted = $a_{avar} + B_{bvar} * year + e$

• So each variety has unique intercept and unique slope.