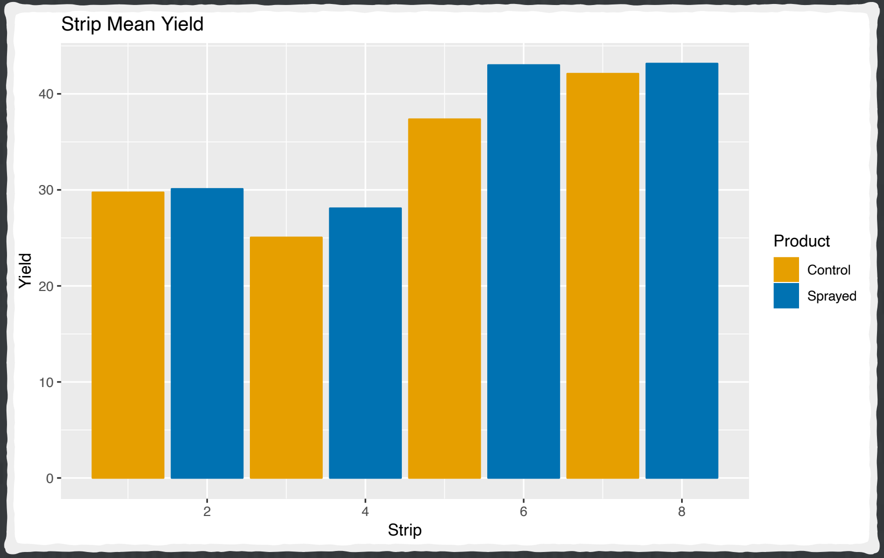
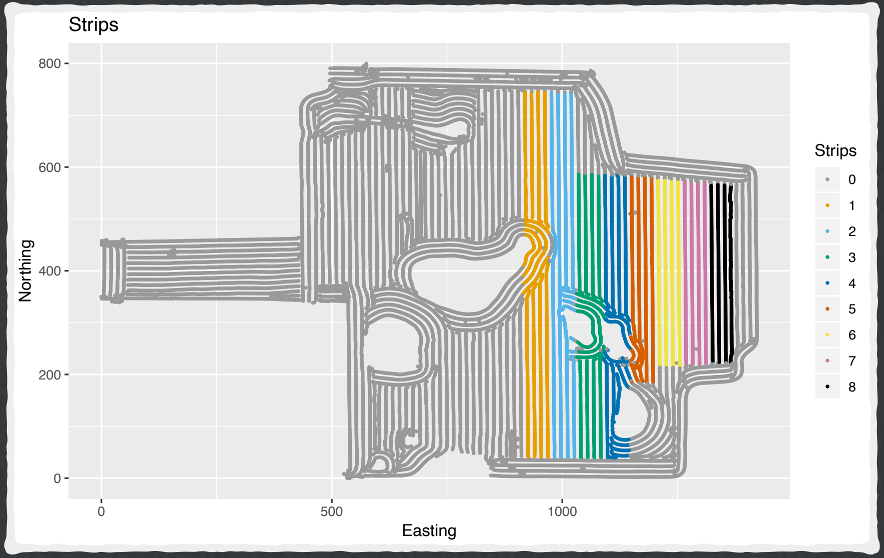
Likelihood Ratio (Naive)





- We state two hypothesis:

  $H_1 : y_{ij} = \mu + \rho_j + e_{ij}$

  $H_2 : y_{ij} = \mu + \rho_j + \tau_i + e_{ij}$

- The linear models are then

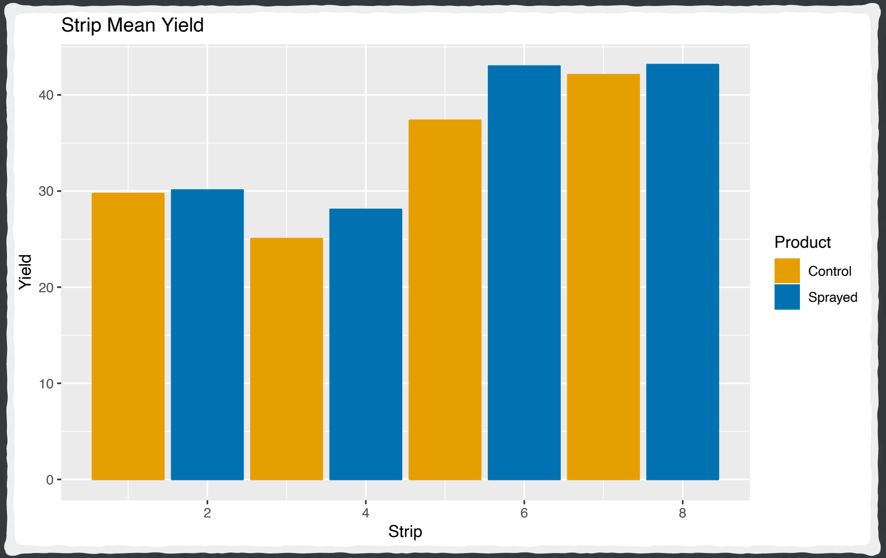
  $H_1 : y = X\beta_1; \beta_1 = \{\mu, \rho_1, \ldots, \rho_m\}$

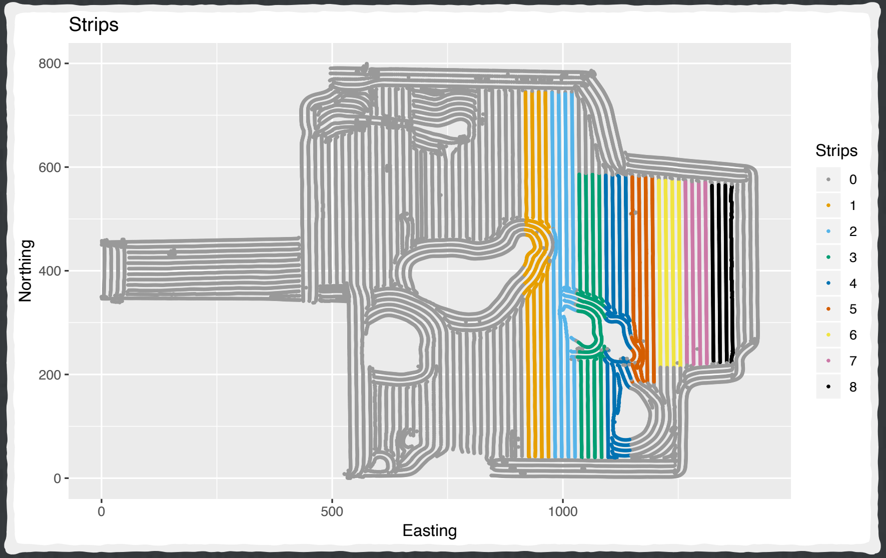
  $H_2 : y = X\beta_2; \beta_2 = \{\mu, \rho_1, \ldots, \rho_m, \tau_i\}$

  - or

    $\beta_1 = \beta_2 \,|\, \tau = 0$

Likelihood Ratio (Naive)





- We can test this by calculating the log-likelihood for two models

- ```
  > H1.lm <- lm(Yield ~ Block,
  data=meansEqual.dat)
  > H2.lm <- lm(Yield ~ Block + Product,
  data=meansEqual.dat)
  > logLik(H1.lm)
  'log Lik.' -29.18457 (df=5)
  > logLik(H2.lm)
  'log Lik.' -28.61411 (df=6)
  > logLik(H2.lm)-logLik(H1.lm)
  'log Lik.' 0.5704535 (df=6)
  > exp(logLik(H2.lm)-logLik(H1.lm))
  'log Lik.' 1.769069 (df=6)
  ```
  ```