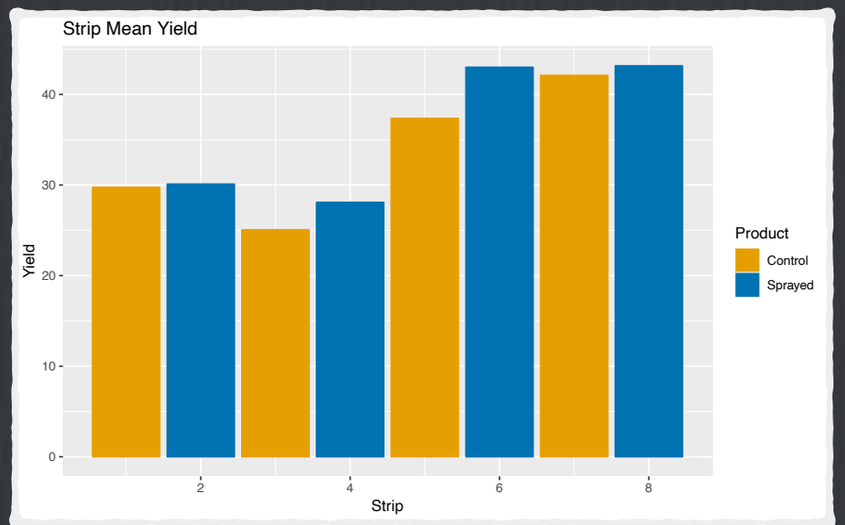
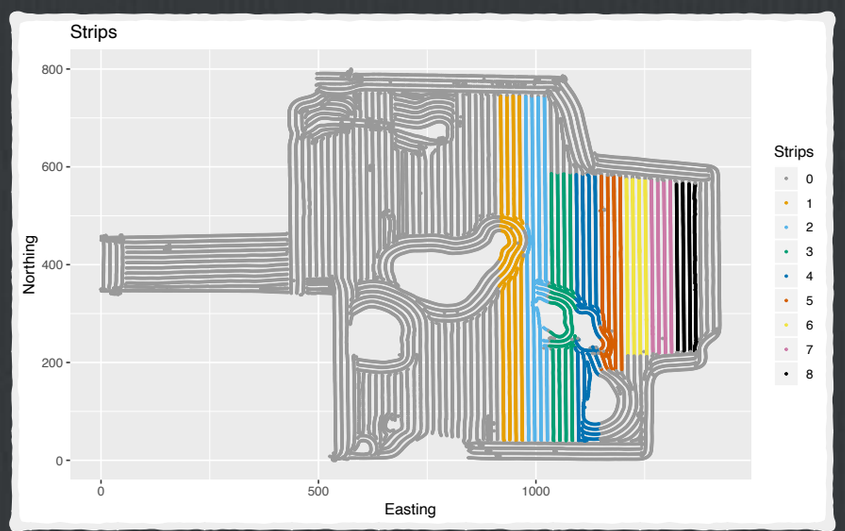
Likelihood Ratio Test





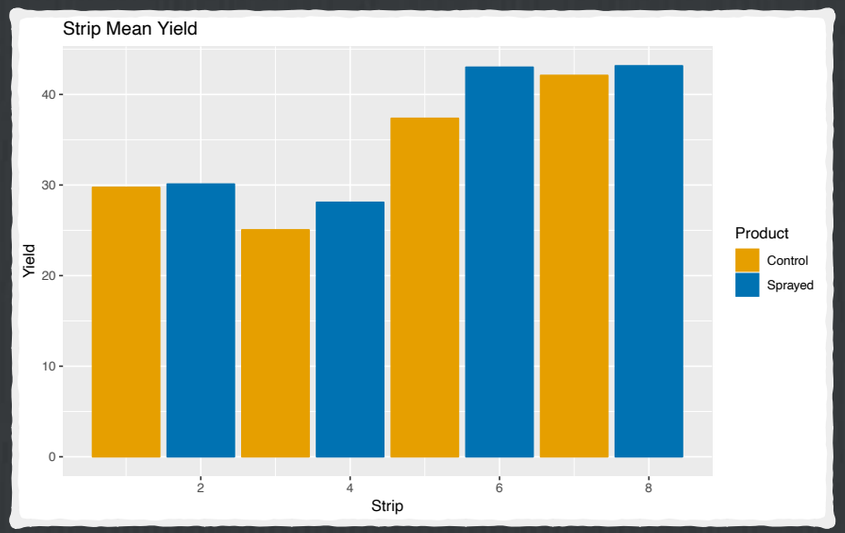
- A likelihood ratio test statistics is written as

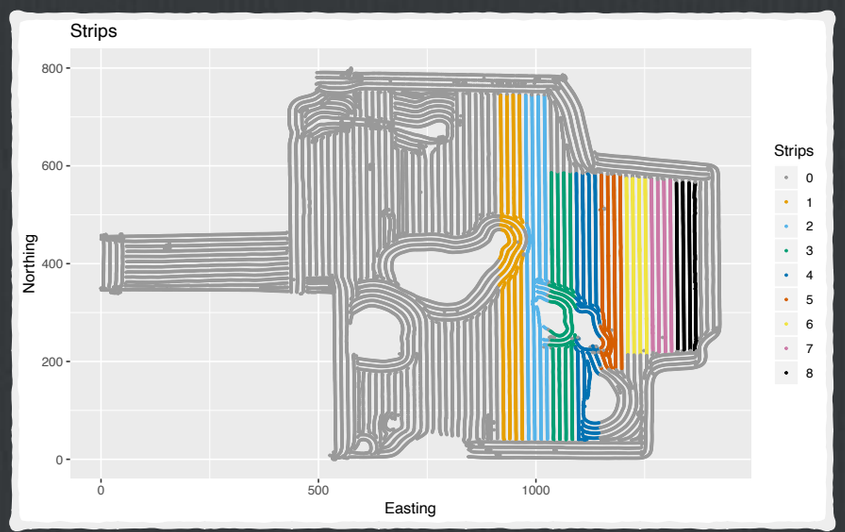
$$LR = -2\left(\ell_1 - \ell_2\right)$$

approaches a χ^2 distribution, so sometimes this is used as a null hypothesis test:

```
> lrtest(H1.lm,H2.lm)
      Likelihood ratio test
Model 1: Yield ~ Block
Model 2: Yield ~ Block + Product
   Df  LogLik Df  Chisq Pr(>Chisq)
1   5 -29.185
2   6 -28.614  1 1.1409     0.2855
```

Modeling a Trend by Position





- Next, consider the trend models

$$H_1 : y_{ij} = \beta_0 + \beta_1 E_{ij} + \tau_i + e_{ij}$$

$$H_2 : y_{ij} = \beta_0 + \beta_1 E_{ij} + \beta_2 E_{ij}^2 + \tau_i + e_{ij}$$

$$H_3 : y_{ij} = \beta_0 + \beta_1 E_{ij} + \ldots + \beta_3 E_{ij}^3 + \tau_i + e_{ij}$$

$$H_4 : y_{ij} = \beta_0 + \beta_1 E_{ij} + \ldots + \beta_4 E_{ij}^4 + \tau_i + e_{ij}$$