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## Statistical Model, Multiple Trials

$$y_{ijk} = \mu + \alpha_i + \beta_j + \theta_{ij} + \rho_{jk} + e_{ijk} \tag{1}$$

plot assessment is the sum of

- grand mean
- *i*<sup>th</sup> treatment
- $j^{th}$  trial
- *i*<sup>th</sup> treatment x trial interaction
- $k^{th}$  block in  $j^{th}$  trial
- experimental error

## **Decomposition of Interaction**

- Simple additivity
- List item
- Proportional to product of main effects (Tukey 1949)
  - $\circ \ \ heta_{ij} = \lambda lpha_i eta_j + e_{ij}$
  - In this case,
  - $\circ$   $e_{ij}$  is a lack of fit random variable, while l is a fixed effect that is determine by the specific combinations of treatments and trials.
  - This would suggest that, if were to repeat a series of experiments with similar (perhaps identical) treatments and similar environments, we would