Workshop 9.4a: Split-plot designs

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February 7, 2017
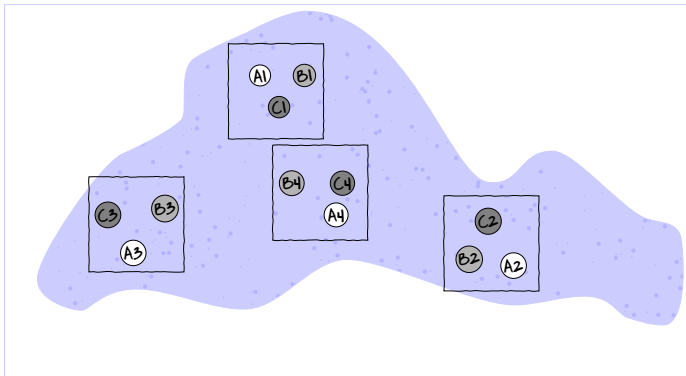
Table of contents

1. Split-plot designs

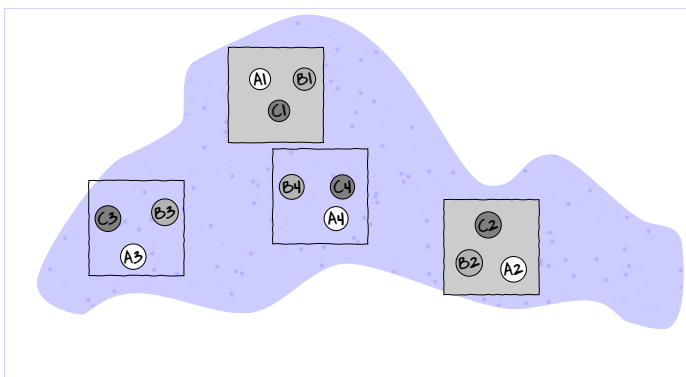### 1.1. Split-plot design

RCB

Split-plot

1.2. Split-plot design

Factor A (Main between block treatment factor) – ○or⬤
Factor C (Main within block treatment factor) – ▨or□or⬛

Factor B (blocking factor)

Factor A (Main between subject treatment factor) – □or
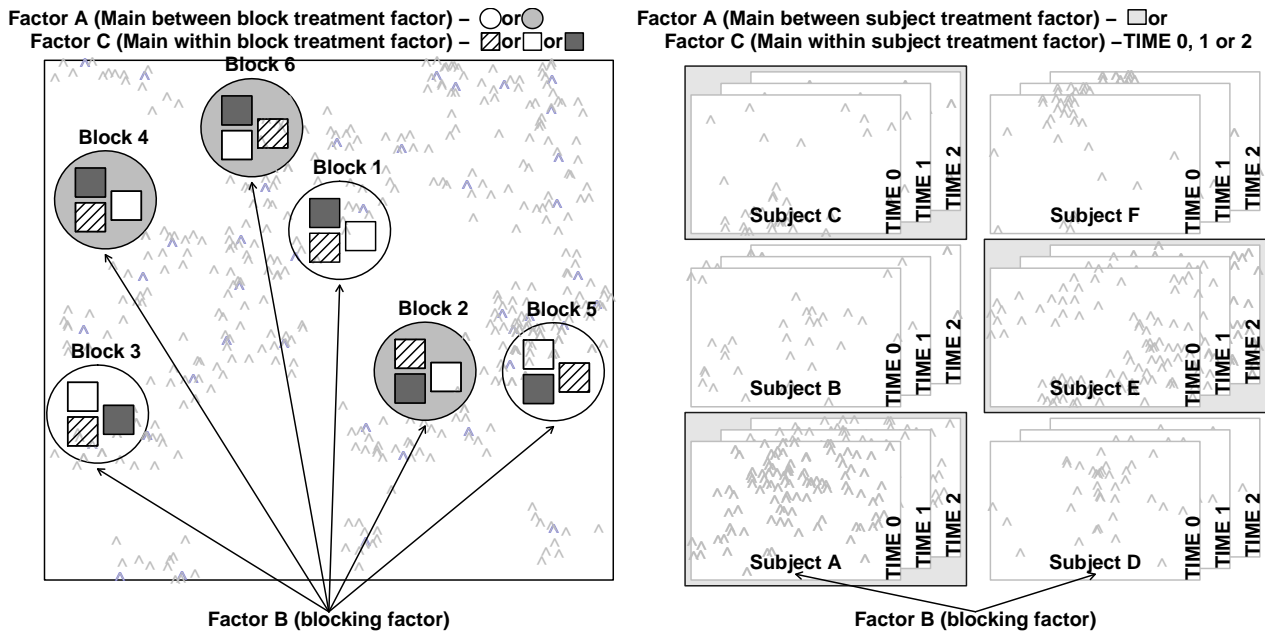Factor C (Main within subject treatment factor) –TIME 0, 1 or 2

Factor B (blocking factor)

1.3. Split-plot design

Combination of nested and randomized block designs

$$y_{ijkl} = \mu + \alpha_i + \underbrace{\beta_{j(i)}}_{} + \gamma_k + \alpha\gamma_{ik} + \underbrace{\beta\gamma_{j(i)k}}_{\text{Randomized block component}} + \varepsilon_{ijkl}$$

(Nested component)

$$Abund_{ijkl} = Base + Shade_i + Block_{j(i)} + Treat_k +$$
$$Shade : Treat_{ik} + Block : Treat_{j(i)k} + \varepsilon_{ijkl}$$

1.4. Assumptions

- Normality and Homogeneity of variance
    - appropriate level of replication

- Independence
    - spatial/temporal autocorrelation
    - sphericity

- Design balance (SS)
- Block by within-block interactions

2. Worked examples

2.0. Worked examples