



THE UNIVERSITY
of EDINBURGH



Biotechnology and
Biological Sciences
Research Council



THE ROYAL
SOCIETY

Day 4

Spatial variation and genotype by environment interaction

Design of plant breeding field trials

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Lecture overview

1. Design of plant breeding field trials ←

- Fundamental concepts of experimental design
- Classical and model-based designs

2. Linear mixed models for plants

- Complex residual variance structures
- Spatial variation

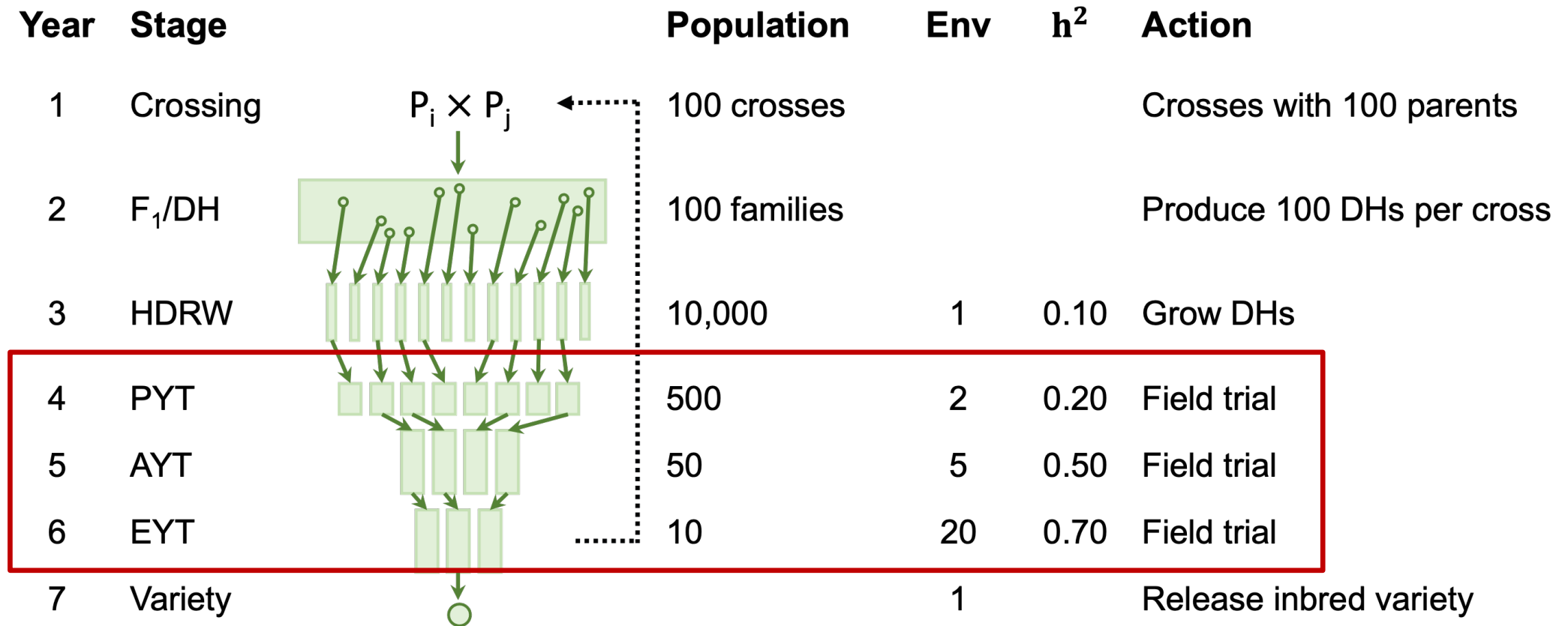


Design of plant breeding field trials

Outline

- **Background**
- **Fundamental concepts of experimental design**
 - Randomisation
 - Replication
 - Blocking
- **Classical and model-based designs**

Plant breeding – a series of tests + selections



Plant breeding field trials

- **Formally designed comparative field experiments**

Plant breeding field trials



Source: Crop Circle Consulting and Research

Plant breeding field trials



Source: R.C. Gaynor

Plant breeding field trials



Source: R.C. Gaynor

Plant breeding field trials



Source: not R.C. Gaynor

Plant breeding field trials



Source: B. Ovenden

Comparative field experiments

- **Field layout**

- Field columns and rows
- Plot lengths and widths
- Number of rows per plot and seed rate

- **Experimental design**

- Allocation of treatments to plots

