

# Crop Plant Trait Ontology Workshop

Luke Ramsay



The James  
**Hutton**  
**Institute**

# Inflorescence structure



The James  
**Hutton**  
Institute

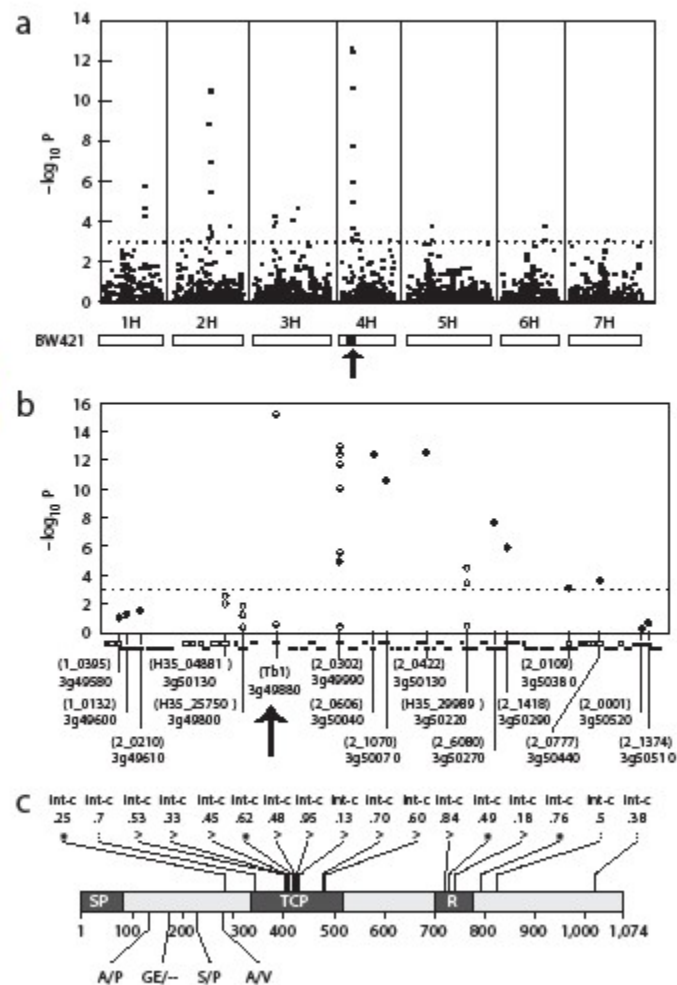
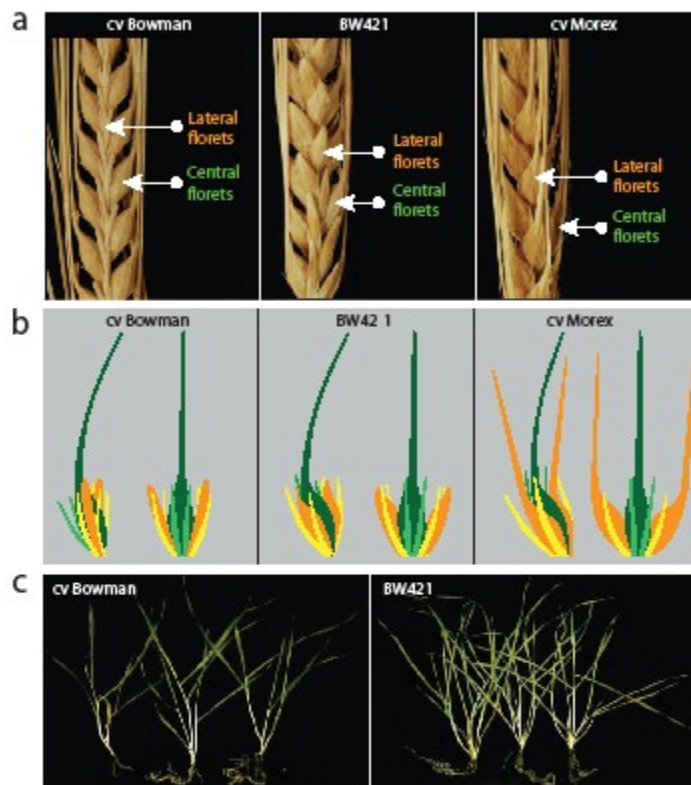


*H. distichum* Two-rowed barley  
barley



*H. hexastichum* Six-rowed  
barley

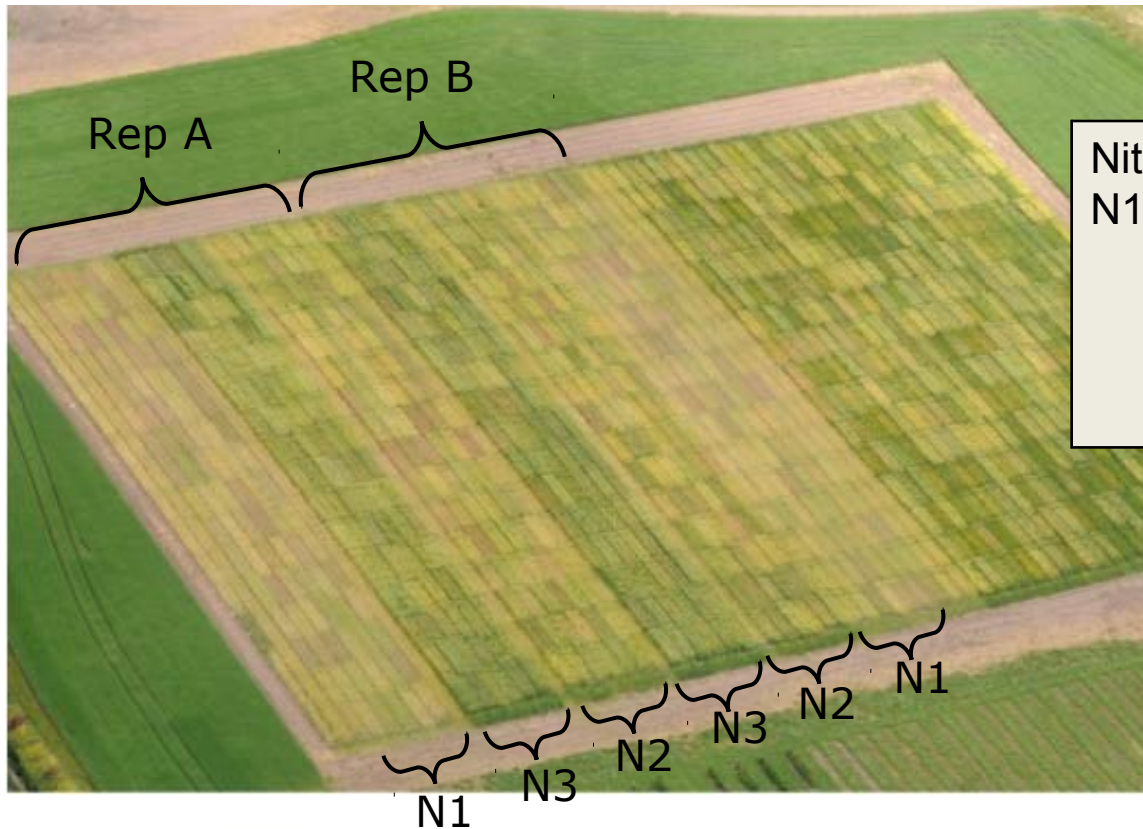
# Inflorescence structure



# Nitrogen Use Efficiency



The James  
**Hutton**  
Institute



Nitrogen rates:  
N1 : no nitrogen applied  
N2 : N available = 1/3 of  
N3  
N3 : N available to obtain  
optimum yield at a site

Traits: Phenology assessments for GS 31, GS 61 and GS 87  
Electrical capacitance  
GS 61: Fertile shoot.plants<sup>-1</sup>, Above ground biomass, Straw N content  
GS 87: Yield components: Plants.m<sup>-2</sup>; Fertile shoots.plant<sup>-1</sup>; grains.ear<sup>-1</sup>; thousand grain weight; Harvest index; Grain N content, Straw N content

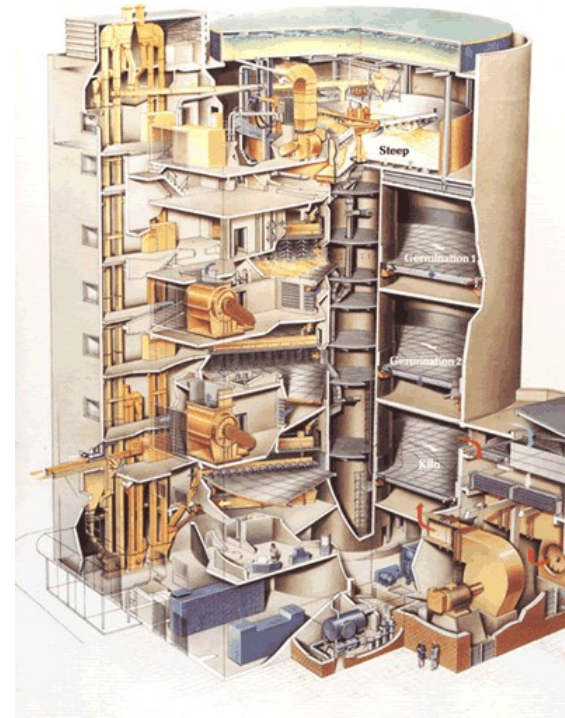


# Malting Quality

One of main end uses of barley

Malting quality –complex phenotype

Grain protein level, malt extract %, wort-soluble protein, diastatic power,  $\alpha$ -amylase activity, wort  $\beta$  glucan, etc.



The James  
**Hutton**  
Institute

Micro-malting in breeding/testing – proof on larger scale (variety recommendation)

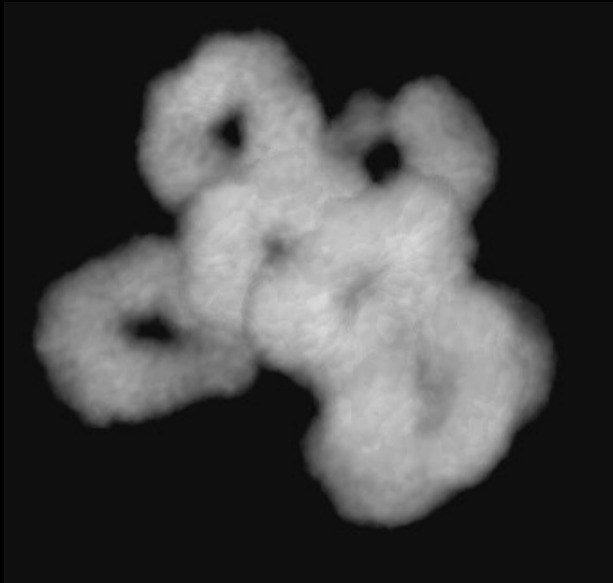
Ultimately it's an end-user defined trait

Further traits 'Processability' in brewhouse etc.

# Recombination Frequency

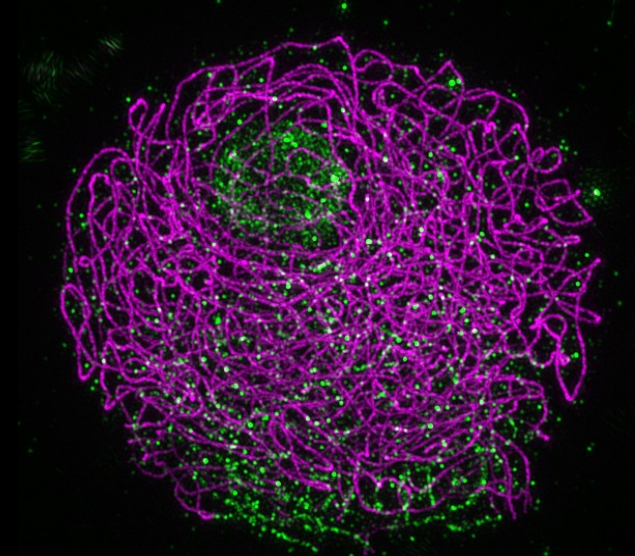
Interest in manipulating recombination distribution and frequency in barley

Interrelationship of pairing/cross-overs/synapsis



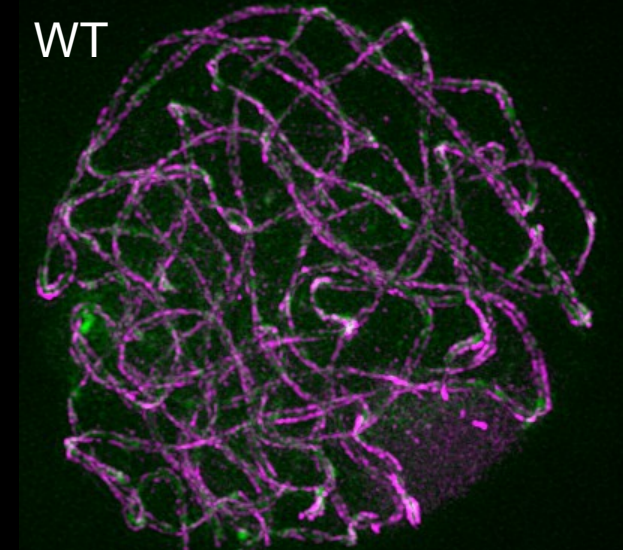
Metaphase I seven ring bivalents

WT



Zyp1 ASY1

WT



Zyp1 ASY1