

# Funding for potato research at the James Hutton Institute



The James  
**Hutton**  
Institute

Glenn Bryan

# Global Challenges (UN and FAO)

**Population of 8.3 billion by 2030 (UN)**

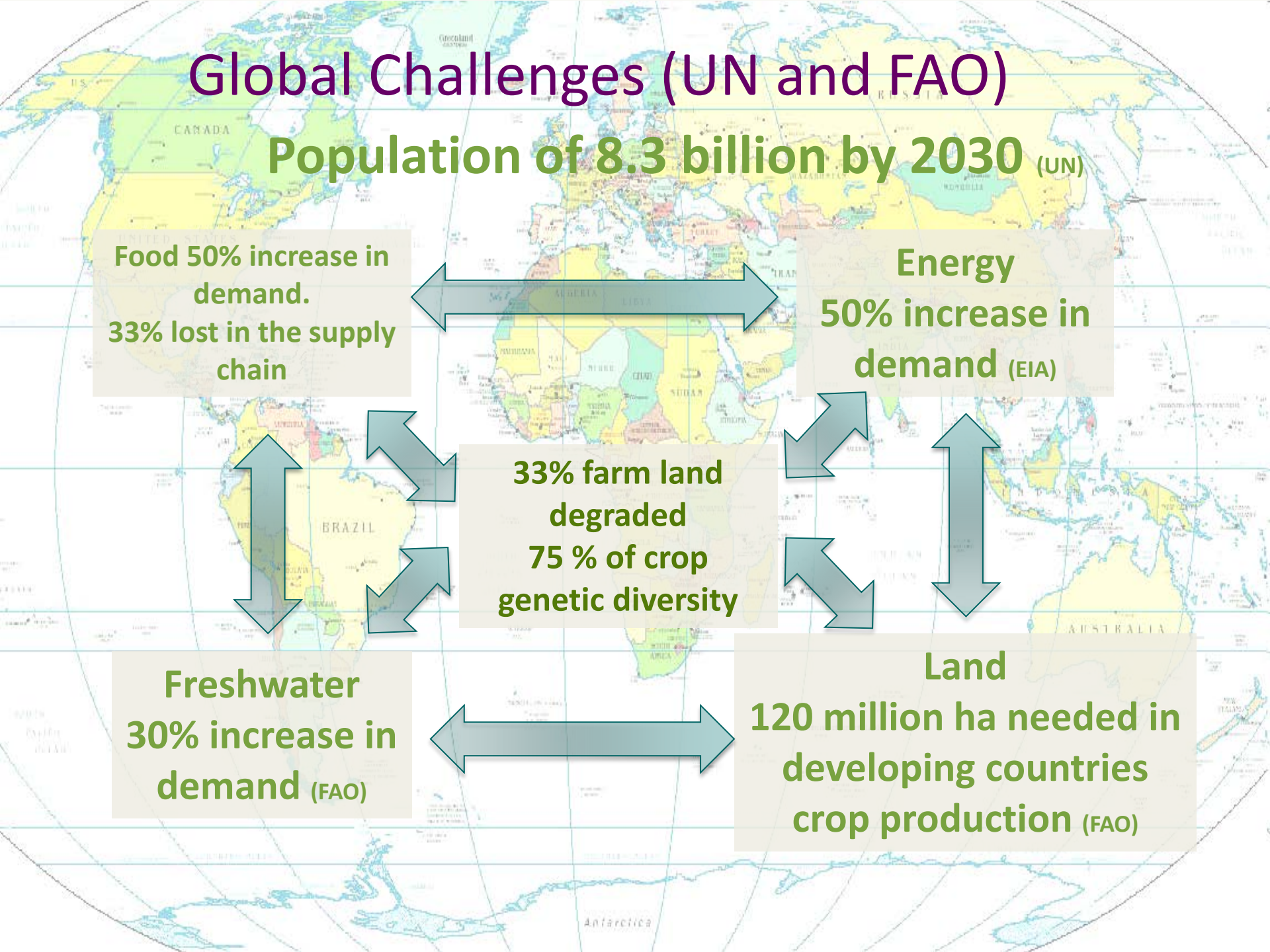
**Food 50% increase in demand.  
33% lost in the supply chain**

**Energy  
50% increase in demand (EIA)**

**33% farm land degraded  
75 % of crop genetic diversity**

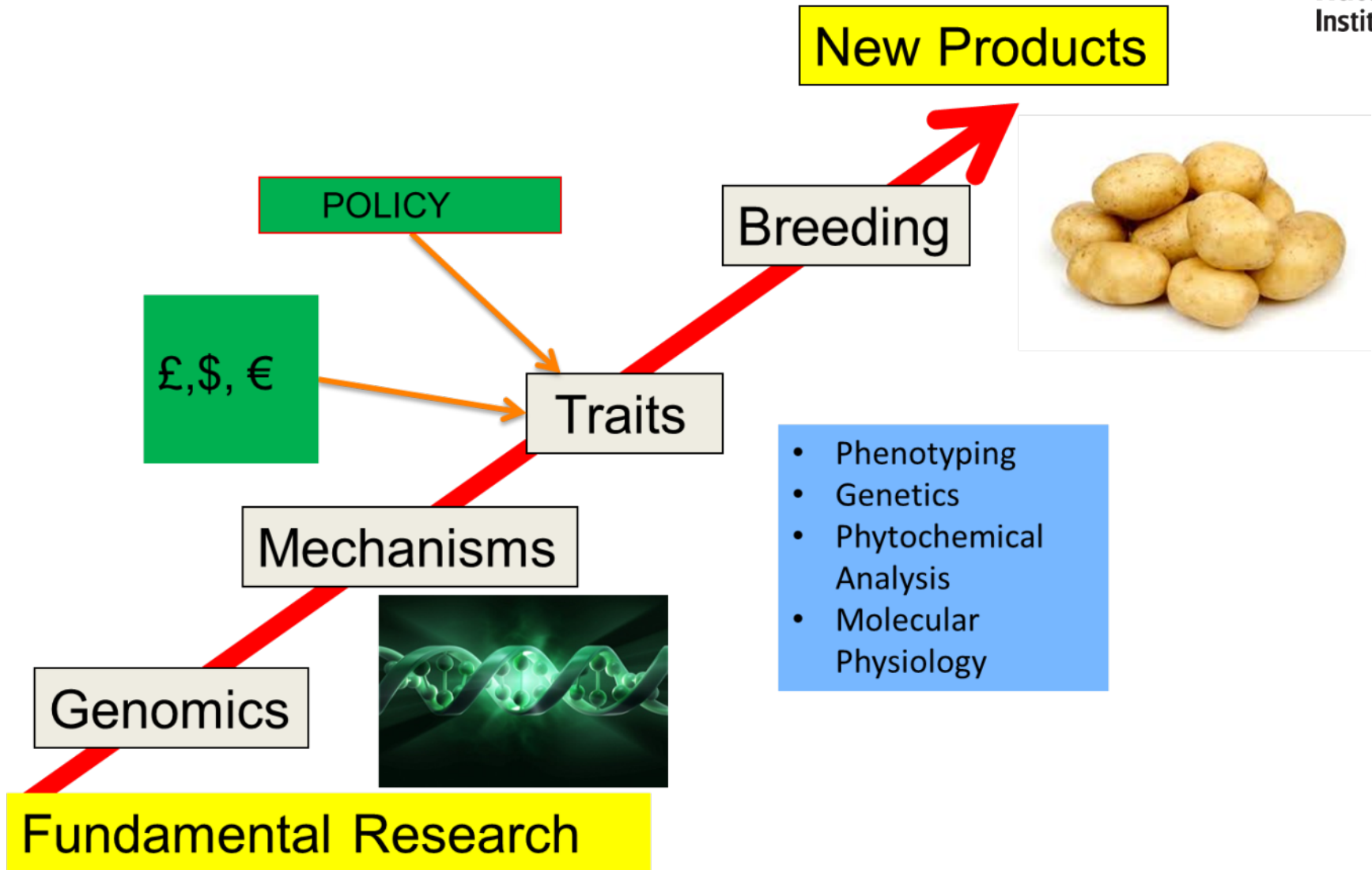
**Freshwater  
30% increase in demand (FAO)**

**Land  
120 million ha needed in developing countries crop production (FAO)**





# Potato Trait Research





# Research activities

Genetics

Physiology

Pathology

Nutrition

Breeding

Agronomy



- Research objectives are designed to be relevant to both UK and global industry/stakeholders etc
- SG policy, AHDB strategy, EU etc
- Climate change and sustainability are important drivers



# Translational pipeline



Genomes



Fresh

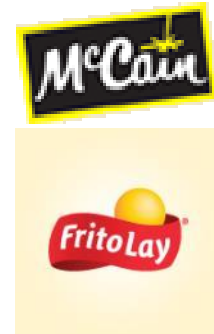
Collaborative breeding

Genotyping, phenotyping

Varietal selection

Variety

Environment (+SPS)



Processing

U  
S  
P



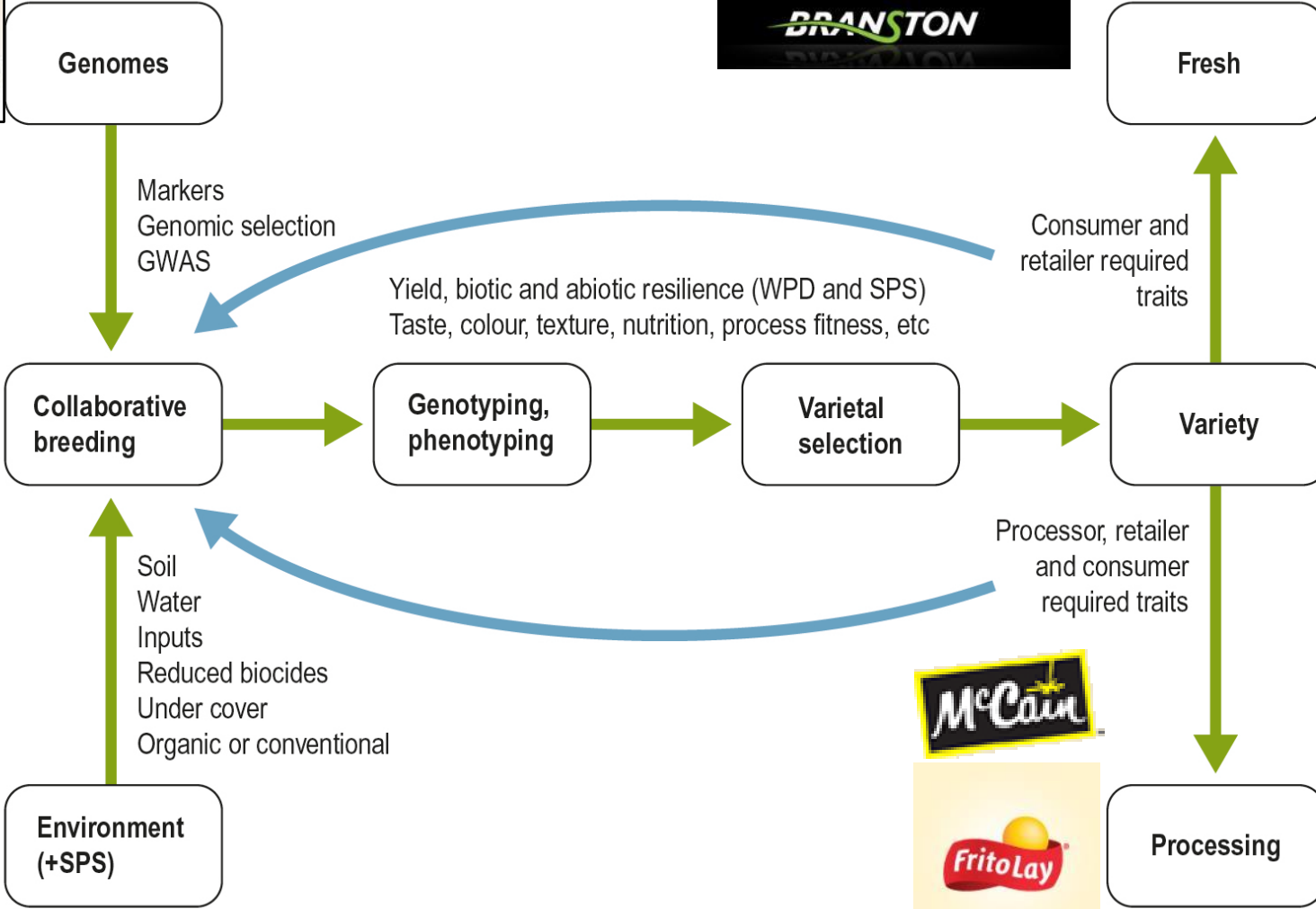
Markers  
Genomic selection  
GWAS

Yield, biotic and abiotic resilience (WPD and SPS)  
Taste, colour, texture, nutrition, process fitness, etc

Consumer and retailer required traits

Soil  
Water  
Inputs  
Reduced biocides  
Under cover  
Organic or conventional

Processor, retailer and consumer required traits





# Funding sources



....and other industrial partners and funding agencies



# Main funding types

- RESAS
  - £50 M/year to MRPs
- Innovate UK/AgriTech Catalyst
  - Requires ‘in kind’ funding at various levels, Industry or academic led
  - Hutton extremely successful
- BBSRC/RCUK
  - basic science questions (genomes, mechanisms etc) with increasing emphasis on delivery to industry and society
  - can be partially industrially funded (e.g. IPA, BBSRC LINK)
- BBSRC Horticulture and Potato Initiative (now closed)
  - Hutton involved in 3 of 4 projects in Round 1
- EU
  - 2016 programme available – many opportunities for industry (esp. SMEs)



# Blackleg Research Proposal (*Pectobacterium* spp.)

Contamination of high grade potato seed stocks by *Pectobacterium* species and the effects of sulphuric acid treatment on pathogen spread

**See field demo today!**

Funders (£300K over 3 years)



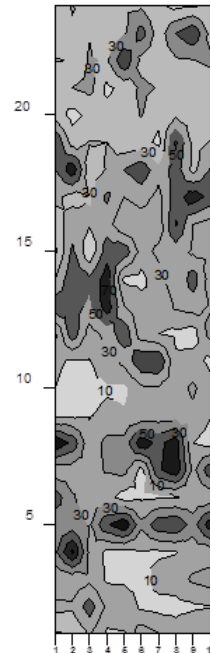
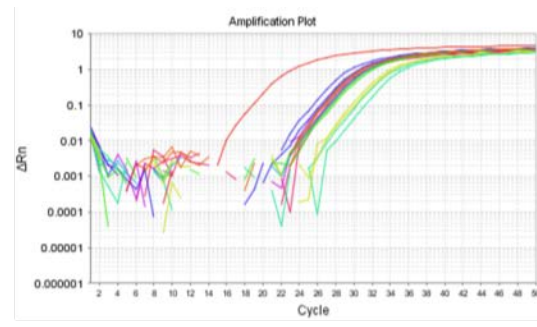
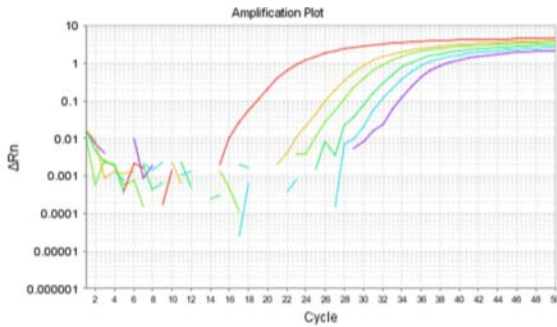
Science and Advice for  
Scottish Agriculture (SASA)





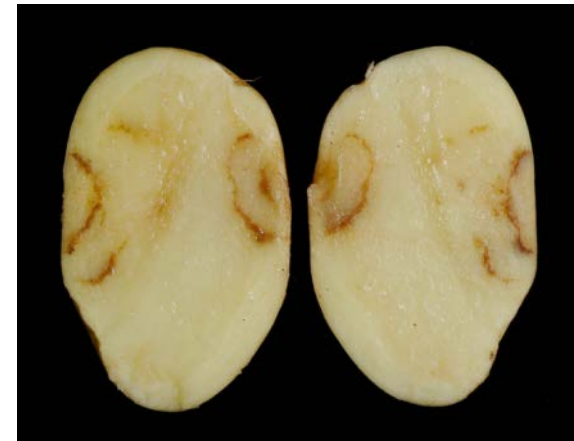
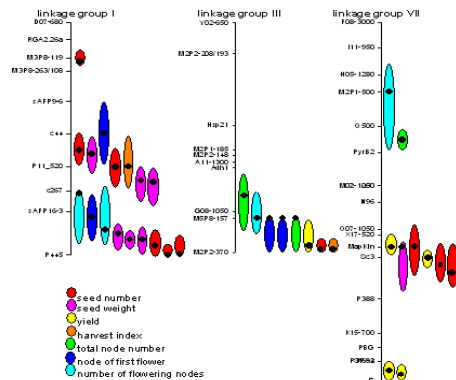
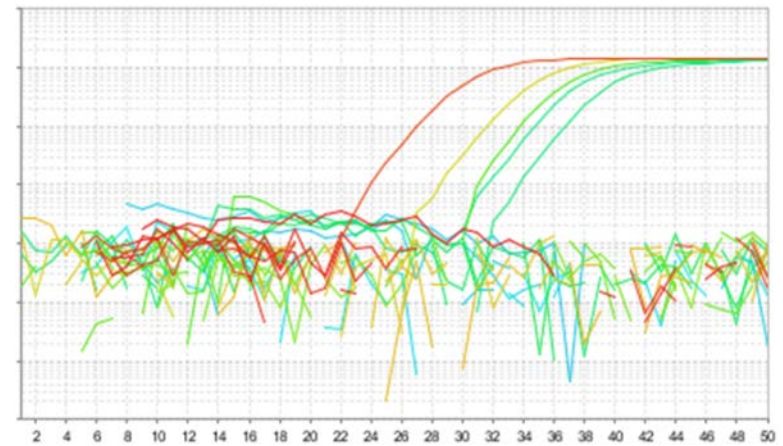


# Strategies for quantifying and controlling free living nematode populations and consequent damage by tobacco rattle virus to improve potato yield and quality





# Strategies for controlling FLN





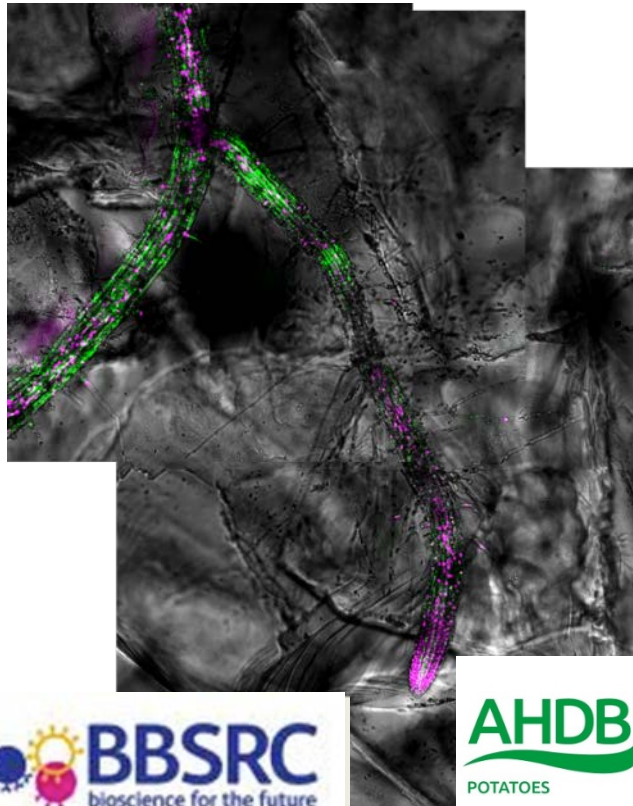
## BBSRC HAPI Project: Controlling dormancy and sprouting in potato and onion

- Genetic basis of tuber dormancy in potato
- Identification of comparative expression markers of meristem dormancy in potato and onion
- Integrative biology of dormancy and sprouting, and development of predictive markers
- Translation to commercial use

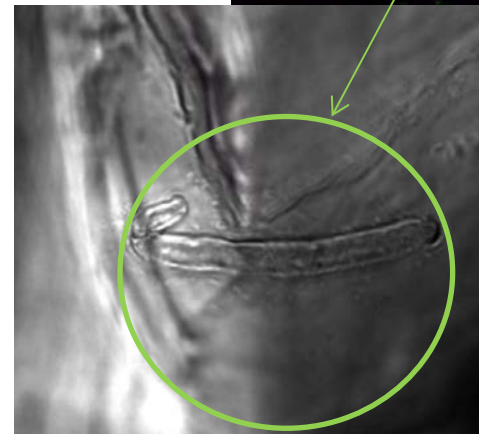
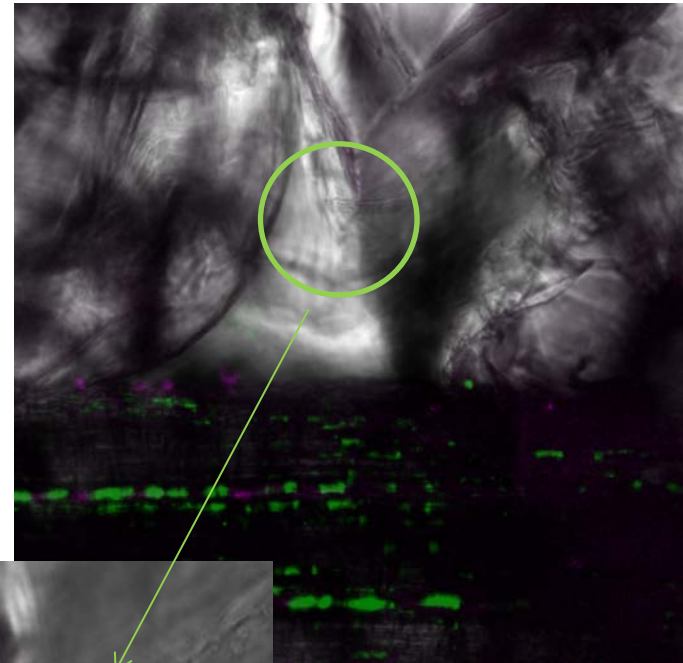
### Industry linkages



# BBSRC HAPI: Establishing biofumigation as a sustainable pesticide replacement for control of soil-borne pests and pathogens in potato and horticultural crops



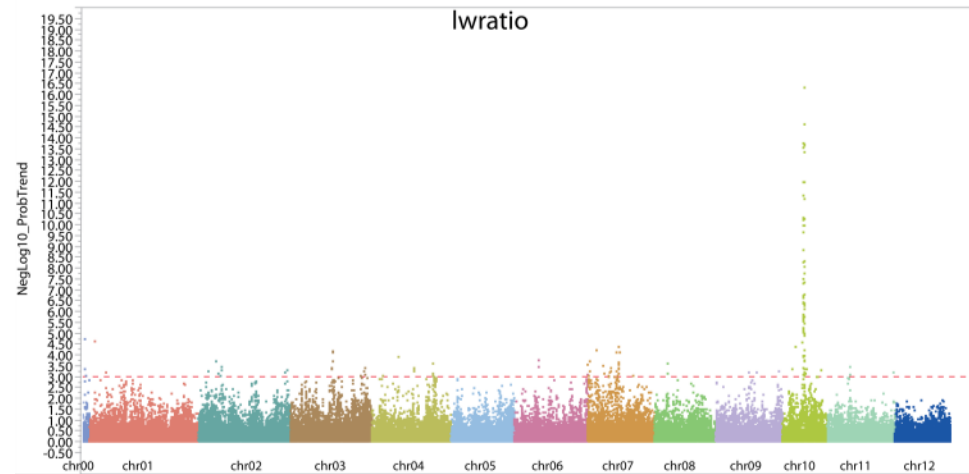
Roots moving through transparent soil



Nematode approaching a root – improving the imaging of transparent nematodes is part of the project's aims

# Genome-wide association study

- ~300+ varieties genotyped with >200,000 markers
- Evaluated for >20 traits at two sites for two years
- Many marker/trait associations with relevance to breeding
- Exploitation plans under discussion



Technology Strategy Board  
Driving Innovation

cygnet  PB





## New funding ideas

- Hutton scientists **always** happy to discuss ideas for new projects that address industry-relevant issues
- James Hutton Limited can assist with identifying other potential partners and financial management for SMEs
- Please engage with us at an early stage!
- Now my colleagues will talk about two areas of research that we would like to take forward