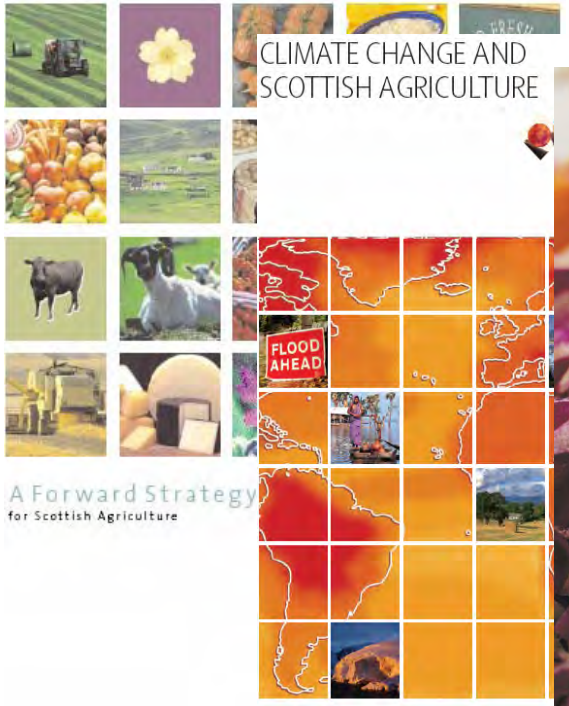
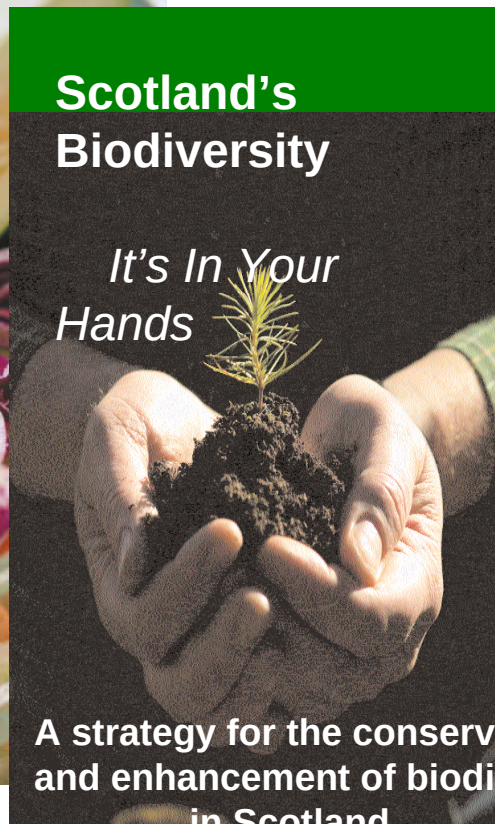
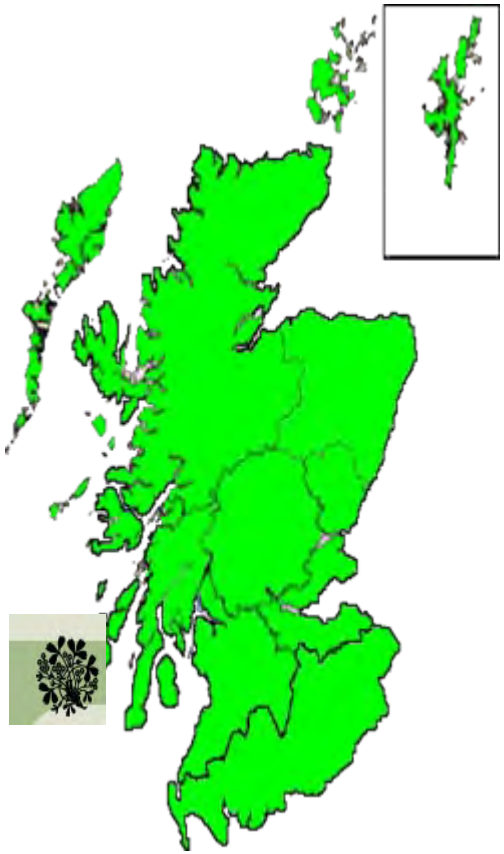
Drivers of Policy Related Research

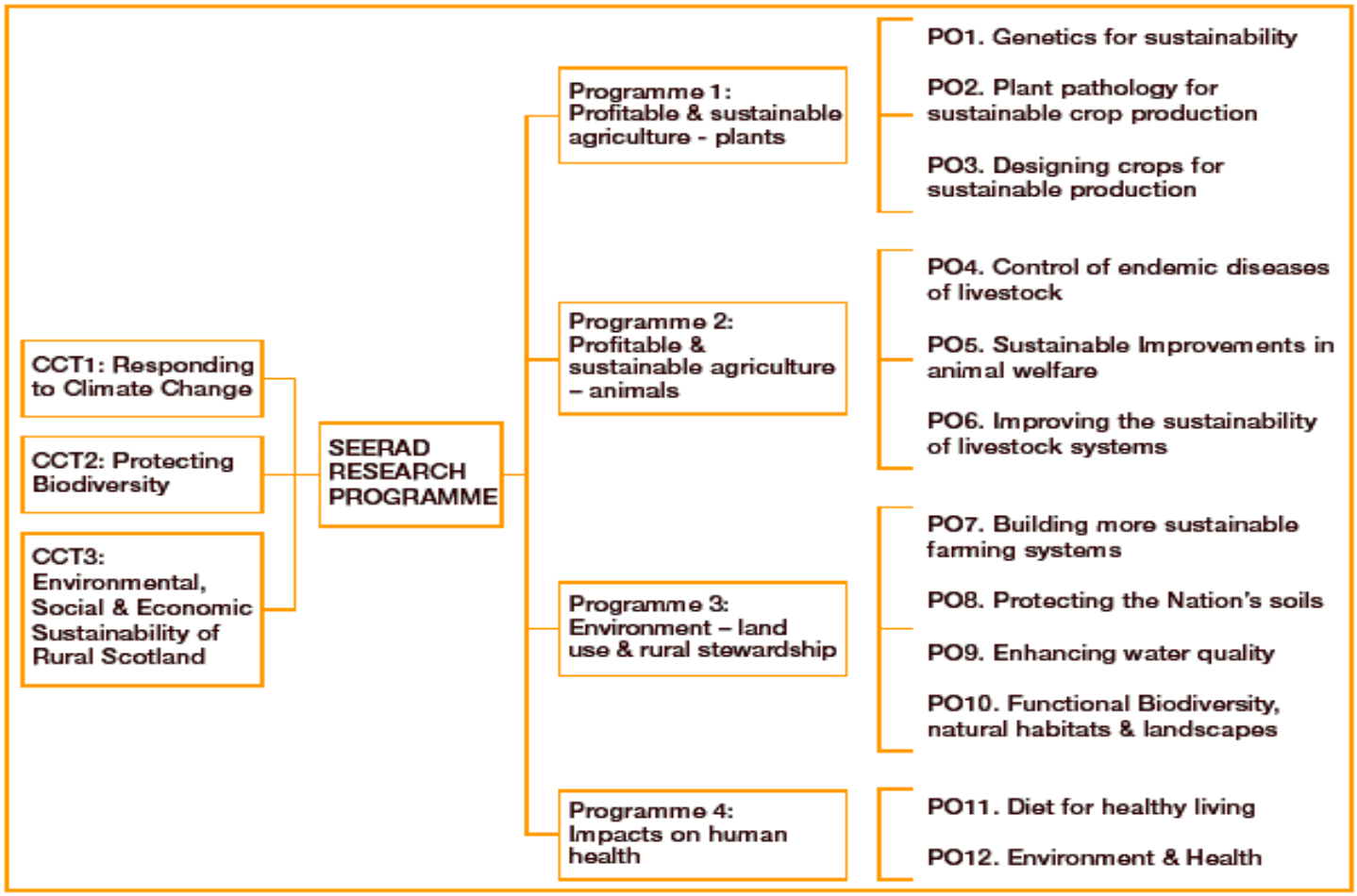




A Research Strategy for Scotland



Scottish Government Commissioned Research 2006-2001



Programme 1: Objectives

Objective 1: Genetics for Sustainability

Identify and exploit novelty in genetic resources for the benefit of end-users.

Objective 2: Plant Pathology for Sustainable Crop Production

Develop and deliver tools which improve plant health.

Objective 3: Designing Crops for Sustainable Production

Develop and deliver tools and knowledge to improve crop management in an environmentally-sustainable way.

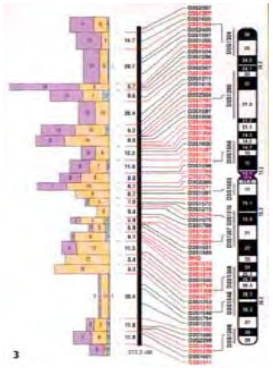
Programme 1: Work Packages

Work Package	Leader	
1.1 Barley Genetics	Bill Thomas	SCRI
1.2 Potato Genetics	John Bradshaw	SCRI
1.3 Soft Fruit Genetics & Pathology	Rex Brennan	SCRI
1.4 Barley Pathology	Simon Oxley	SAC
1.5 Potato Pathology	Ian Toth	SCRI
1.7 Sustainable Crop Systems	Geoff Squire	SCRI

Work Package Strands

Barley Genetics	Plant Technology & Breeding; Genetics & Marker Development; Biodiversity; Gene Discovery; Platform Technologies; Socio Economics.
Barley Pathology	Epidemiology; Diversification; Tolerance & escape; Induced resistance; Gene targets; Toolkits; Socio-economics
Potato Genetics	Potato Genetics; Germplasm Collections; Pre-Breeding; Blight & PCN Resistance; Quality & Nutritional traits; Socio-economics
Potato Pathology	Disease Resistance for Sustainable Crops; Pathogen Genomics and Diversity; Pathogens in Managed Ecosystems; Imaging; Socio - economics
Soft Fruit Genetics & Pathology	Breeding & Genetics; Molecular Genetics; Pathology & Entomology; High Health Stocks; Nutritional Factors;Socio-economics
Sustainable Crop Systems	Biodiversity & function in plants; Biophysical resilience of ecosystems Synthesis, modelling and prediction

Barley Genetics

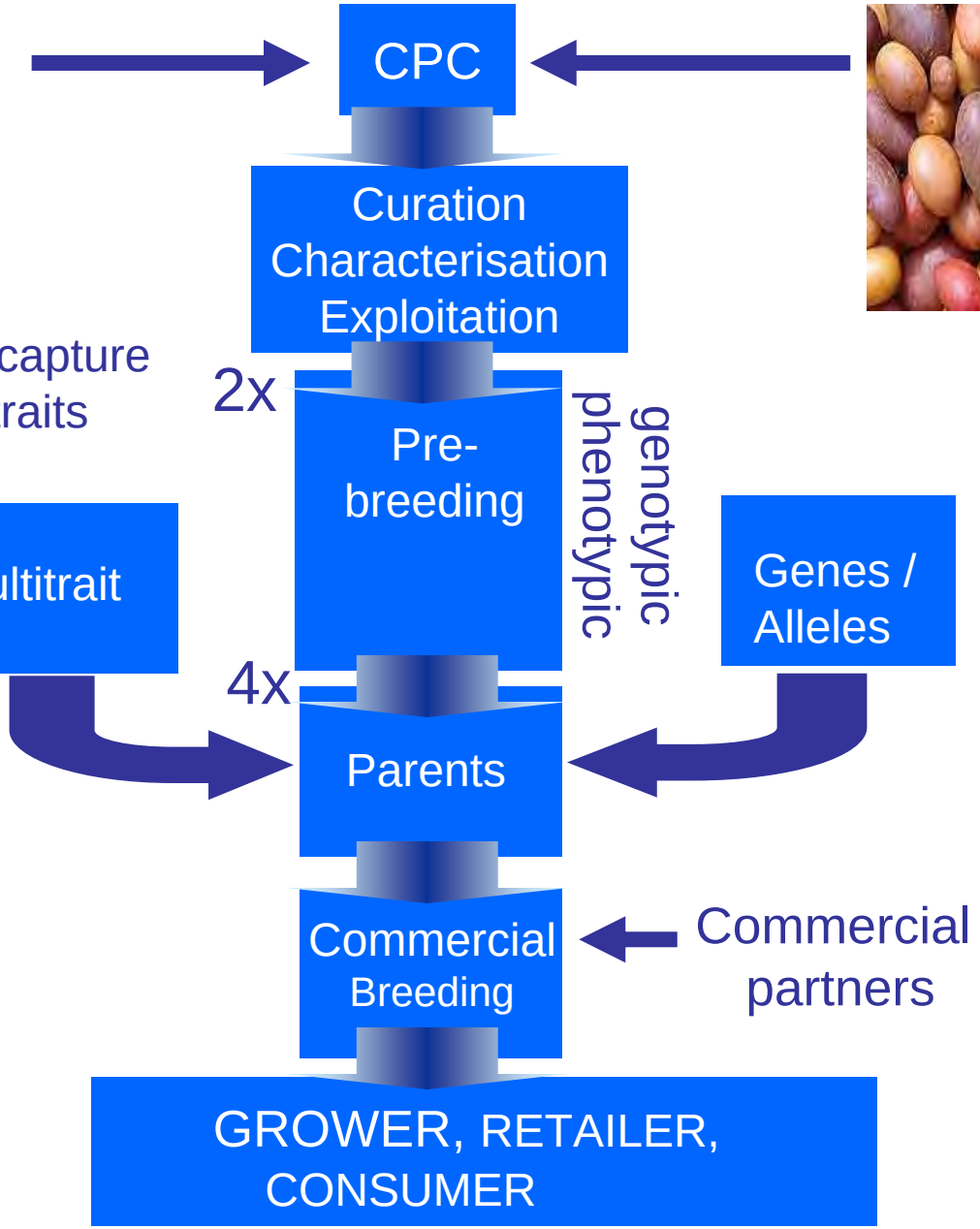


- Plant development (inflorescence)
- Biotic and abiotic stress
- Product quality (principally malting quality).
- Functional diversity associated with priority traits
- Multi-functional elite mapping populations: variation
- Diverse landraces for novel disease resistance
- Bioinformatics

Combining genotypic and phenotypic information in a predictive manner.

Importance of genetic diversity

- Disease resistance
- Abiotic Stress
- Water and nutrient capture
- Quality & Nutrition traits



And options for Approaches used…

Potato Genetics

Soft Fruit Genetics & Pathology

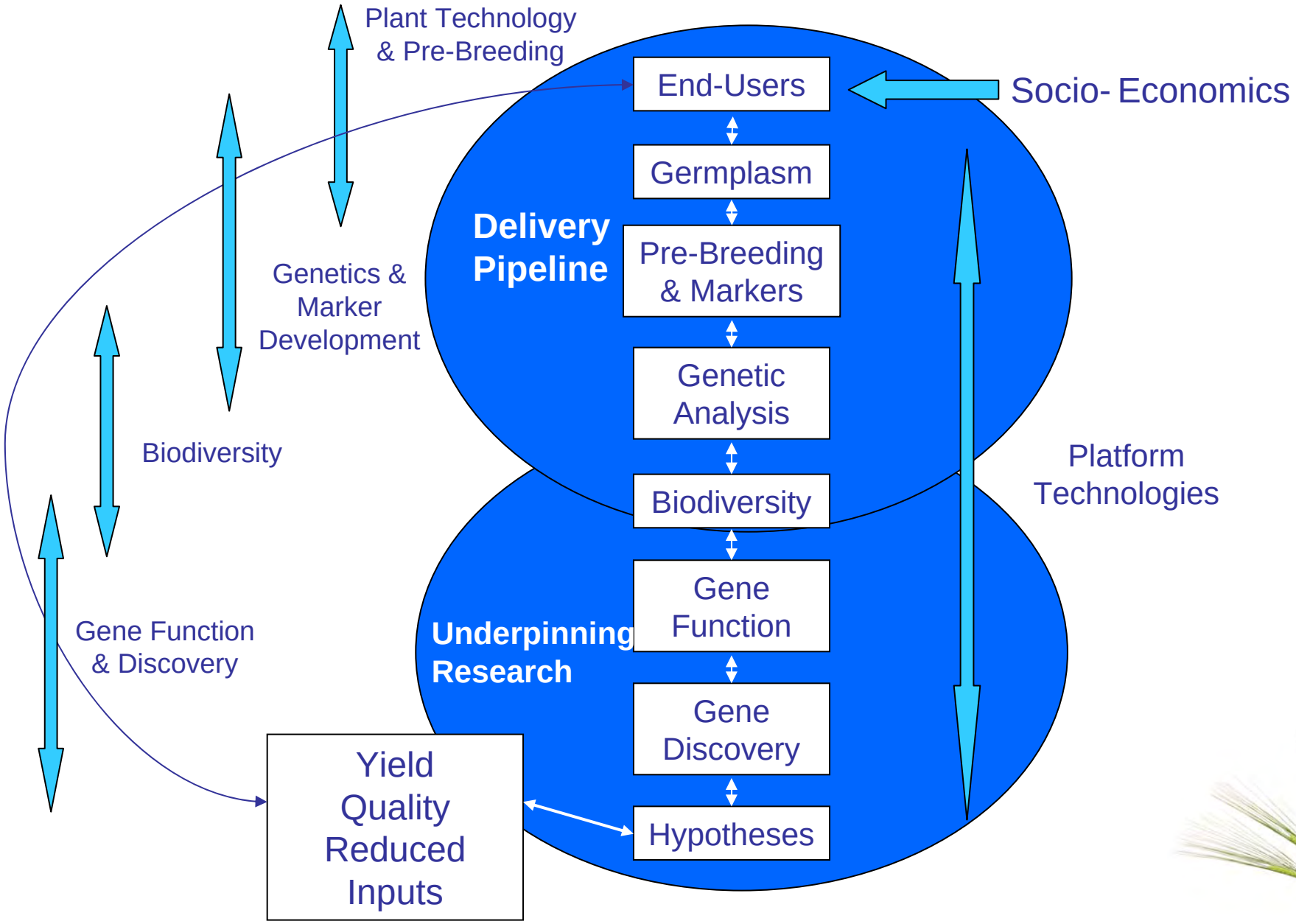
Integration of pathology, genetics and fruit quality research in *Rubus* and *Ribes*-

- Germplasm collections. High health stocks
- Genetic and phytochemical characteristion of mapping populations

  Disease resistance and diagnostics
  Bud dormancy
  Quality/nutritional value (e.g. vit C, antioxidants, bioactives)

- Potential for extended season and research underpinning protective cropping
- Crop protection strategies: semio-chemicals
- Links to commercially funded breeding programmes

Crop Improvement Approaches


Plant Technology & Pre-Breeding
Genetics & Marker Development
Biodiversity
Gene Function & Discovery
End-Users
Germplasm
Pre-Breeding & Markers
Genetic Analysis
Biodiversity
Delivery Pipeline
Gene Function
Gene Discovery
Hypotheses
Underpinning Research
Socio- Economics
Platform Technologies
Yield
Quality
Reduced Inputs

Barley Pathology

Epidemiology

Diversification

Mixtures

Scaling

Disease tolerance & escape

spore transfer
infection
disease load impact

Induced resistance (D)

Mixtures

elicitors

Gene targets

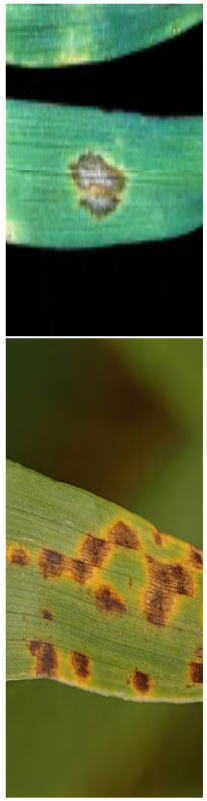
Economic modelling and analysis (H)

Risk decisions tools (F)

Disease management outputs

Genetic requirements for durable resistance outputs

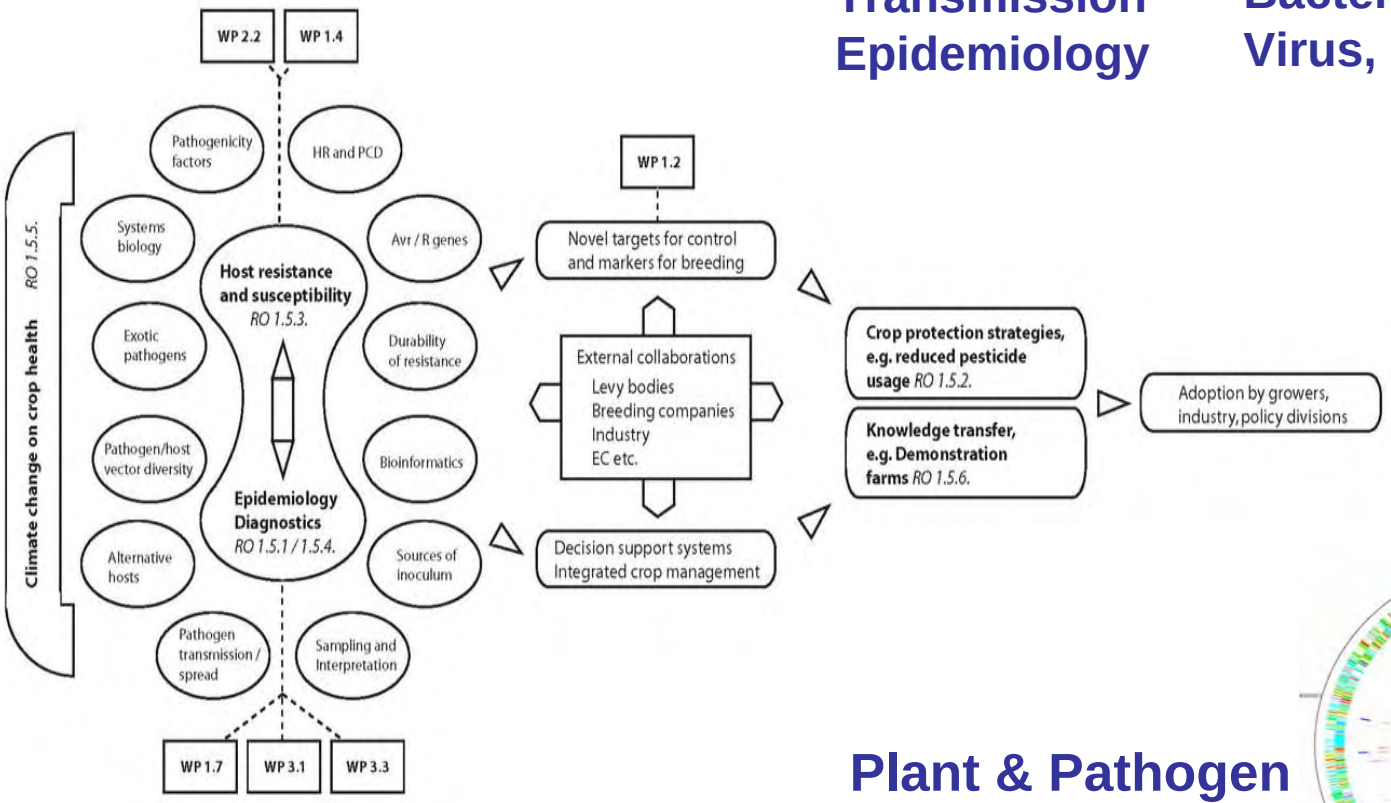
Sustainable solutions KT (H)



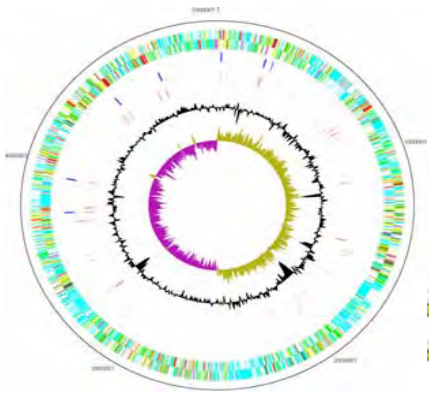
Potato Pathology

Resistance
Pathogenicity
Transmission
Epidemiology

Potato Cyst Nematode
Late Blight
Bacteria (Erwinia)
Virus, Aphid

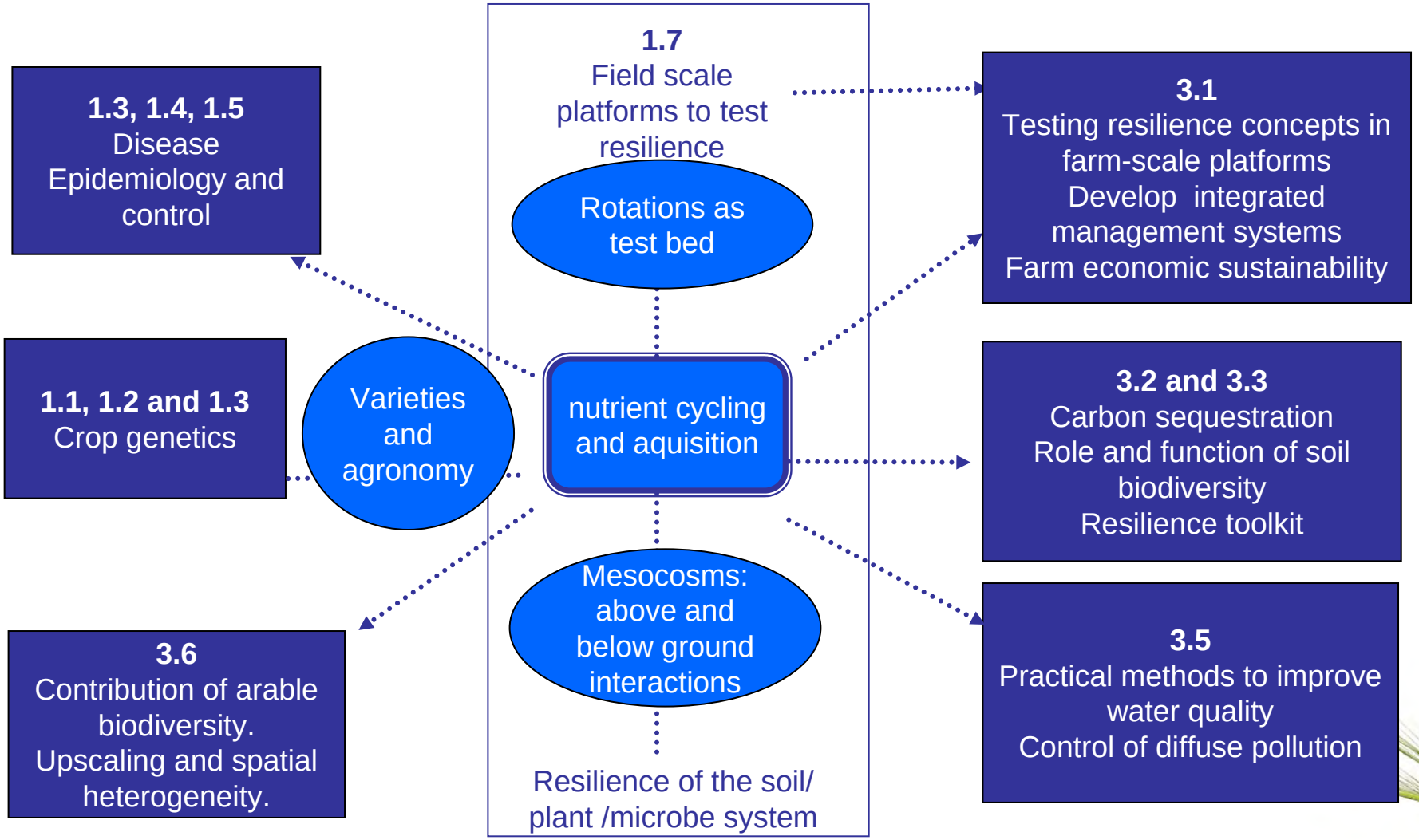


Plant & Pathogen Genomics



Sustainable Crop Systems

(Links to Other Work Packages)



Socio economics

Sustainable systems. Impact analysis

Targeted crop improvement, modified environment management.
e.g. extent of any trade-off between yield and its impact on biodiversity.
Societal preference for future research e.g. GMOs

Supply Chain Analysis

Emerging requirements for domestic and international markets.
Varietal development: implications of the business environment

.

Resilience

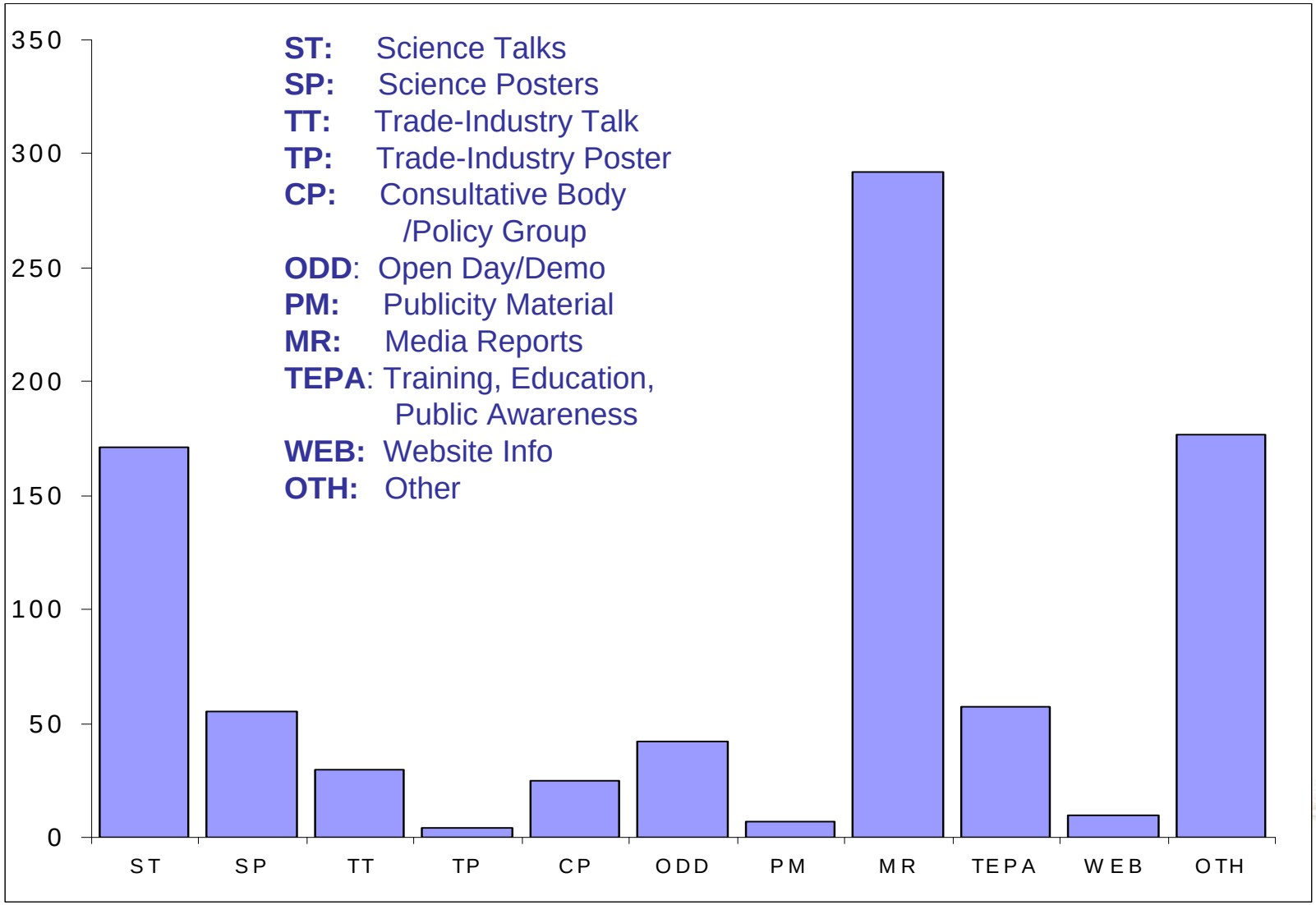
Economics associated with resilience of cropping systems

Gearing, Environmental Services, Climate change

Cross Cutting Themes

- Emerging pathogens
- Epidemiology
- Models, Decision Support Systems
- KT, grower awareness
- Germplasm collections
- Genotypes
- Genotype X Environment Interactions
- Above and below ground diversity
- Plant- soil interface
- Biodiversity
- Taxonomic vs functional diversity
- Resource acquisition, cycling
- System resilience
- Scaling: field to landscape
- Socio economics

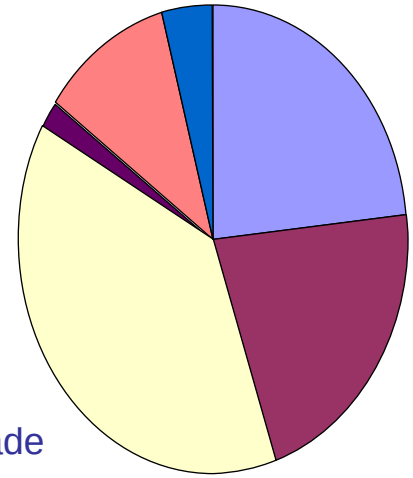
Knowledge Transfer Activities 2006-2007



Commodity Events 2006

Cereals Solutions

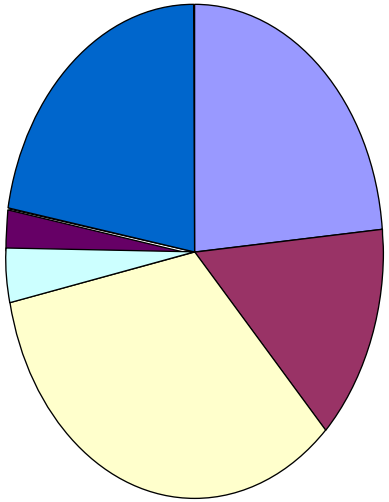
Total in attendance	69
Registered visitors	49
Unregistered visitors	20



- Grower
- Advisor
- Research
- Processor
- Agrochemical Trade
- Machinery Manufacturer
- Other

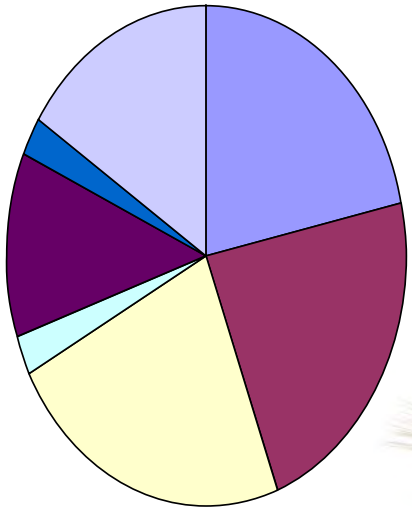
Fruit for the Future

Total in attendance 88



Potatoes in Practice

Total in attendance	530
Registered visitors	406
Marquee Stand holders	60
Machinery exhibitors	20
Field plot exhibitors	54



LEAF
Linking Environment And Farming

SAC & SCRI

Leaf Innovation Centres

Integrated Farm Management

Affordable Food in Harmony with the Environment.
Linking Consumers and Farmers

Roly Puzey, LEAF Farms Liaison Manager:

"Most farmers went away from these events with some practical and inexpensive ways to improve on their farming practices. Many said that the 'hands on' approach to the events was really helpful and they valued the breadth of topics that were covered – there was something for everyone"

Programme Advisory Group

- **Prof. Janet Bainbridge (Chair)**
- **Prof. John Porter :** Agro Ecology, Copenhagen University
- **Douglas Morrison :** Farmer, HGCA committee member
- **Prof Bill Mckelvey** : CEO, SAC
- **Dr. Peter Millard** : Macaulay Institute
- **Jim McNicol:** BioSS
- **Susan Gallagher**: RERAD
- **Prof. Peter Gregory**: CEO, SCRI
- **Prof. Howard Davies:** (Prog. 1 Co-ordinator)