

# Multinational Approach for Conserving the European Genetic Resources of Currants and Gooseberry

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Photos: T. Hietaranta  
MTT Photo Archive

## ***RIBES* species**

### **Black and Red currants, Gooseberry**

- some species grow wild in Northern Europe
- have long growing and breeding history
- high number of cultivars and local races
- national gene banks and collections available
- Northern Europe is the leading production area



# RIBESCO

## - Core Collection of Northern European Gene Pool of *Ribes*

A multi-national network to improve

- the level of characterisation (phenotypic and DNA-level)
- the level of documentation
- to establish a core collection
  - ✓ with the most important part of the collections
  - ✓ with optimal genetic diversity
  - ✓ to be preserved with special care and double collections

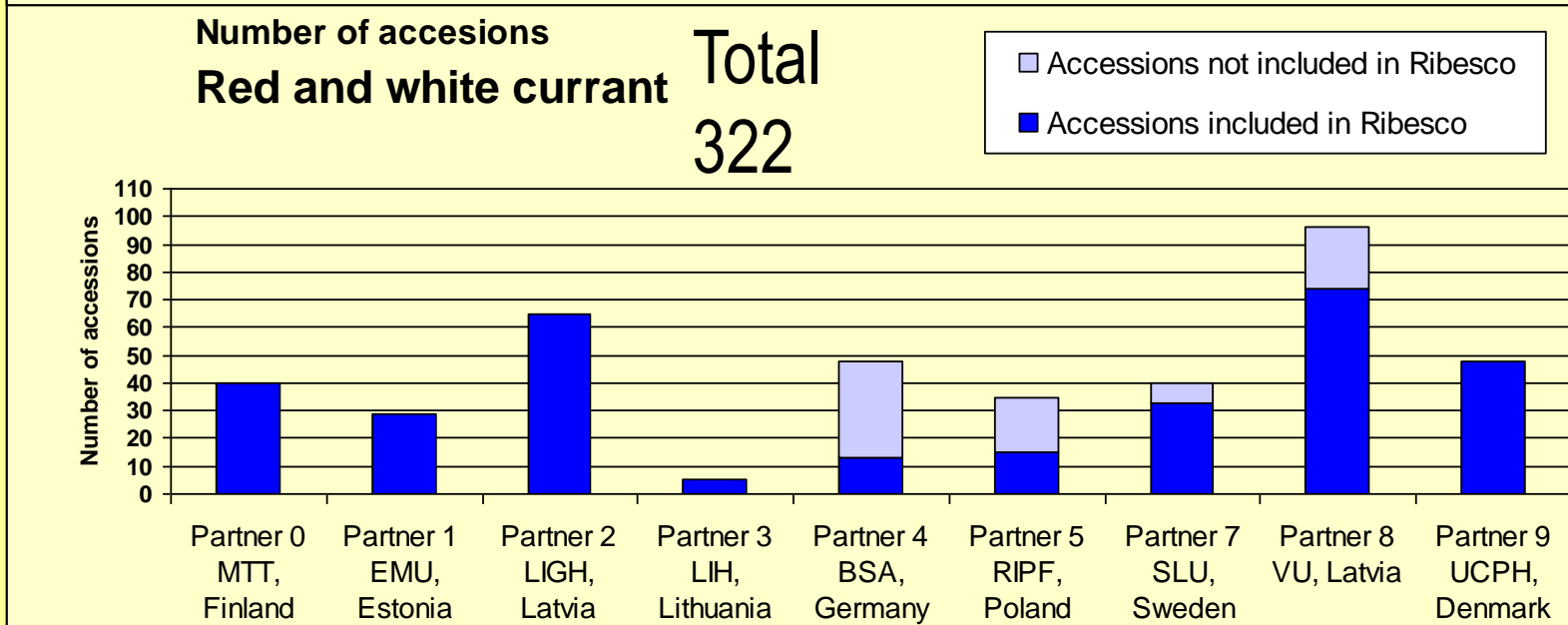
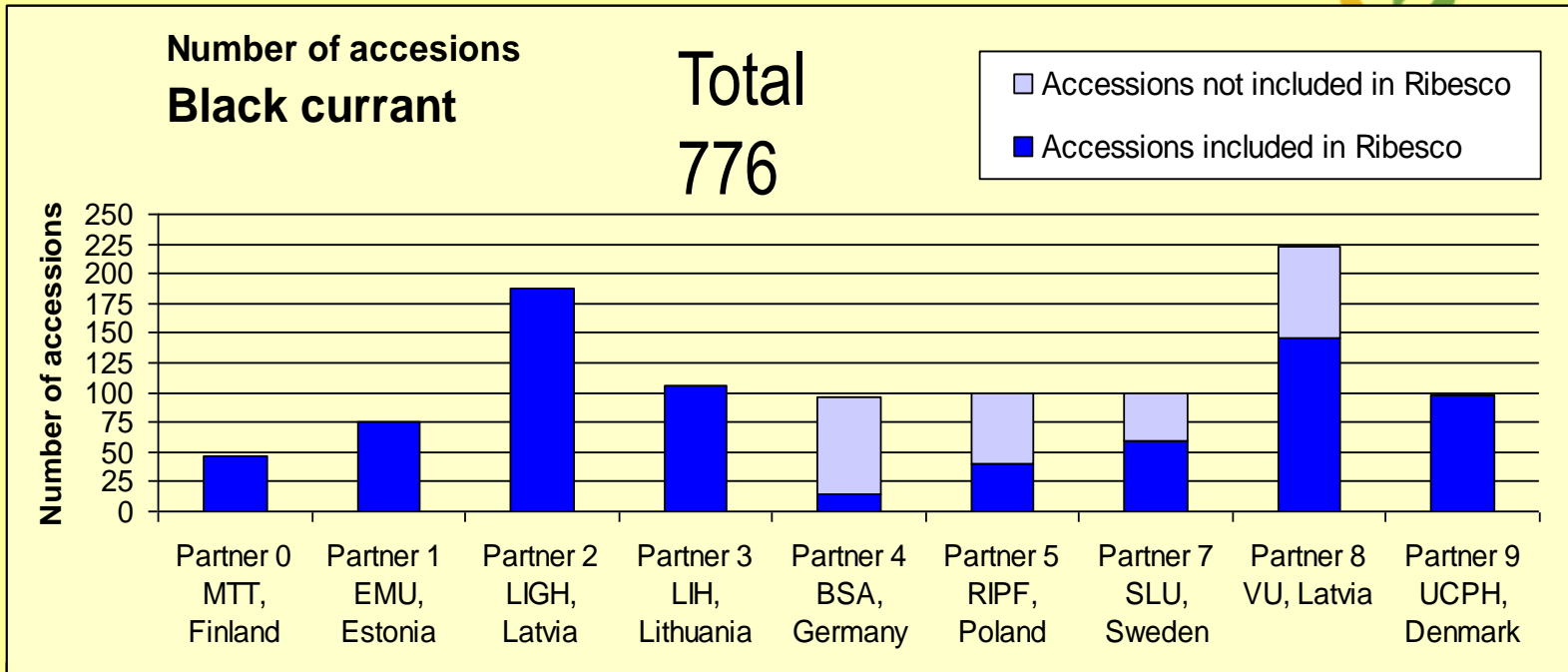


## Participants:

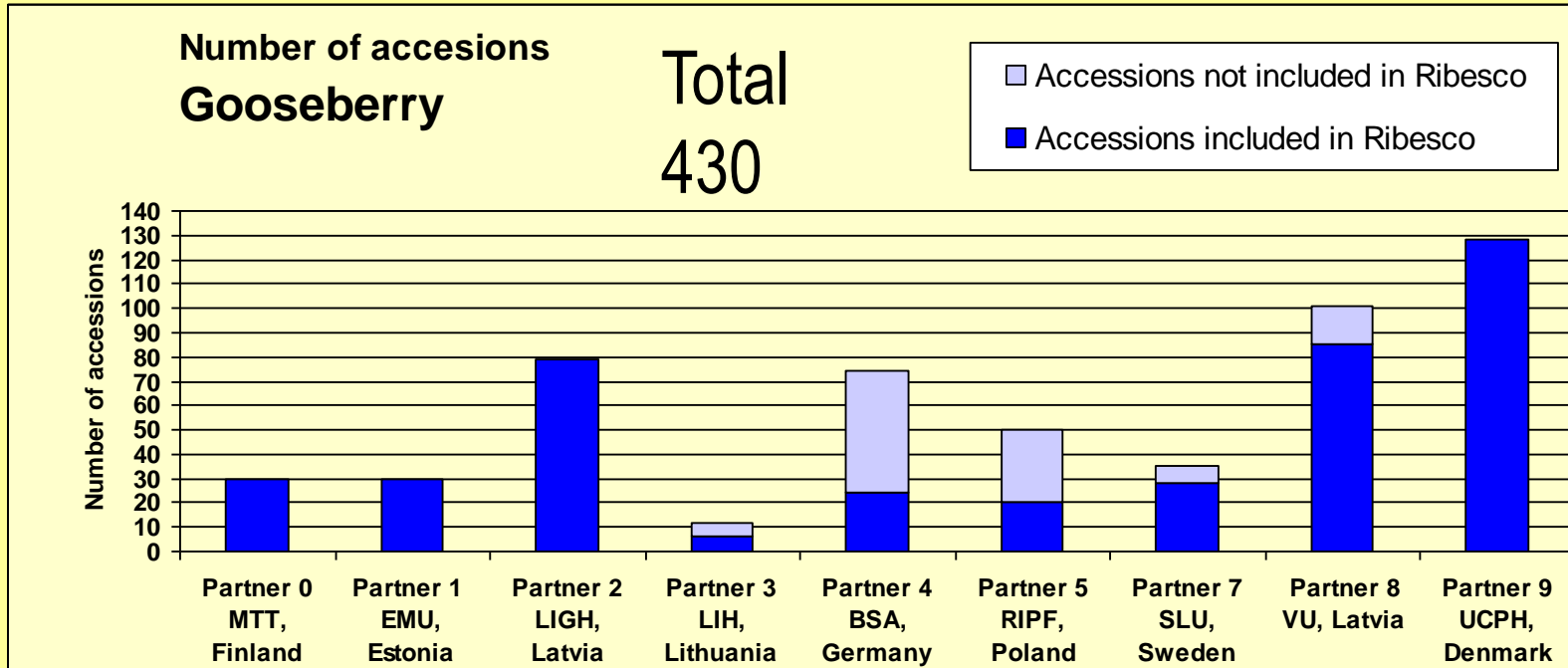
- MTT Agrifood Research Finland, Finland
- Estonian University of Life Sciences, Estonia
- Research Institute of Pomology and Floriculture, Poland
- Swedish University of Agricultural Science, SLU, Sweden
- Vilnius University, Lithuania
- Lithuanian Research Centre for Agriculture & Forestry, Lithuania
- Federal Office of Plant Varieties, Germany
- Latvian State Institute of Fruit Growing, Latvia
- University of Copenhagen, Denmark



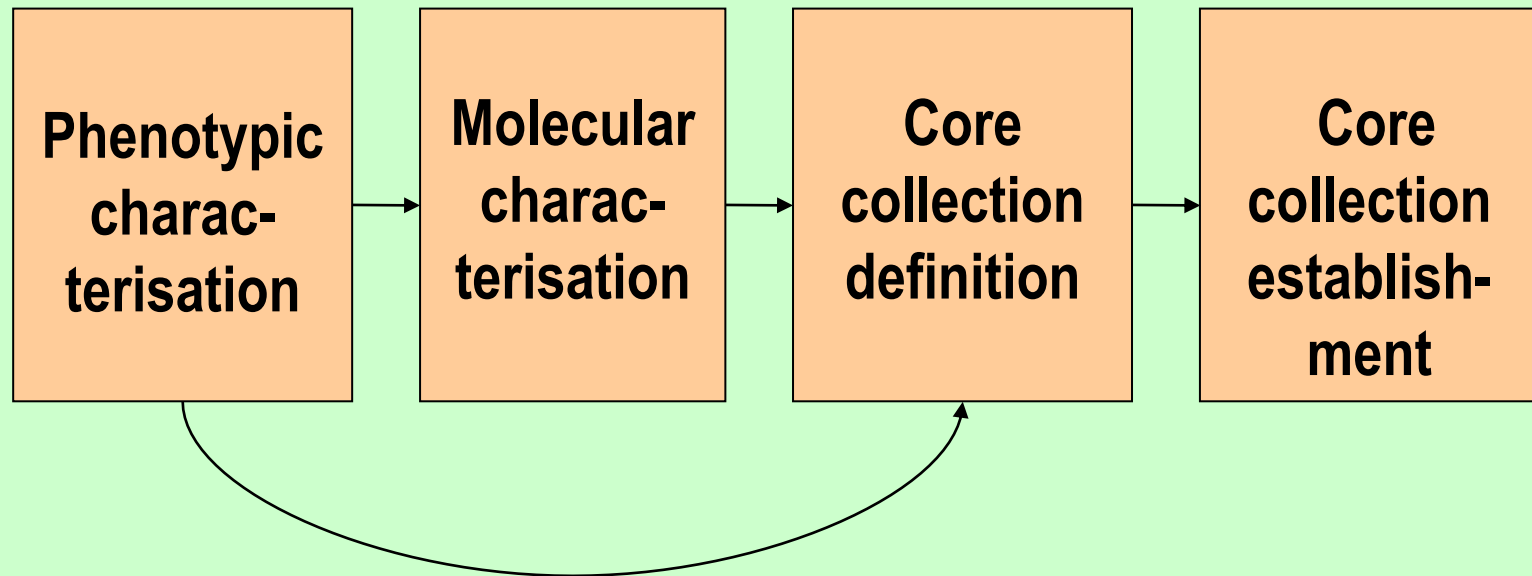
# RIBESCO accessions



# RIBESCO accessions



## The structure of the project



# Phenotypic characterisation



- accessions conserved in *ex situ* collections
- common defined descriptors (EU Community Plant Variety Office CPVO; UPOV)
- phenological, morphological and agronomic characters
- some fruit quality analyses



# Database



The ECP/GR *Ribes* and *Rubus* Database  
Vilnius University Botanical Garden, Kairenu 43, LT-2040 Vilnius, Lithuania  
Tel: +370 2 317944 Fax: +370 2 317429



Webmaster: [Dr. Darius Ryliskis](#)

Database manager: [Dr. Darius Ryliskis](#)

The *Ribes* database contains 2824 records of *Ribes* accessions held in 11 countries, namely Czech, Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Romania, Sweden and U.K. in the meantime.

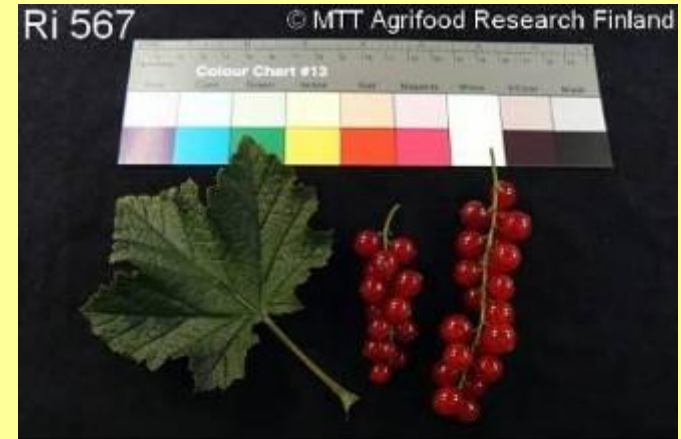
The *Rubus* database contains 665 records of *Rubus* accessions held in 6 countries, namely Poland, Czech, Germany, Lithuania, Romania and Sweden (Nordic Gene Bank) in the meantime.

[Download Ribes](#)

[Download Rubus](#)

Page last updated 19 May 2010.

- passport data
- photos (810 files linked)
- phenotypic characterisation data



## Molecular characterisation

- to estimate the genetic relationships among accessions
- microsatellite SSR marker technology
- to provide a suggestion for an optimal core collection with maximum amount of the genetic variation
- to uncover trueness-to-type of cultivars and duplicated accessions



# Molecular characterisation

## Step 1. Standardising and calibrating analysis methods in the participating laboratories

- 6 published black currant SSR markers
- 4 new SSR markers developed for red currants and gooseberries
- Leaf material of standard cultivars from one single source (5 blackcurrants, 3 red currants and 1 or 3 gooseberry)

## Step 2. Running analyses

864 accessions: 400 blackcurrants, 202 red currants, 242 gooseberries

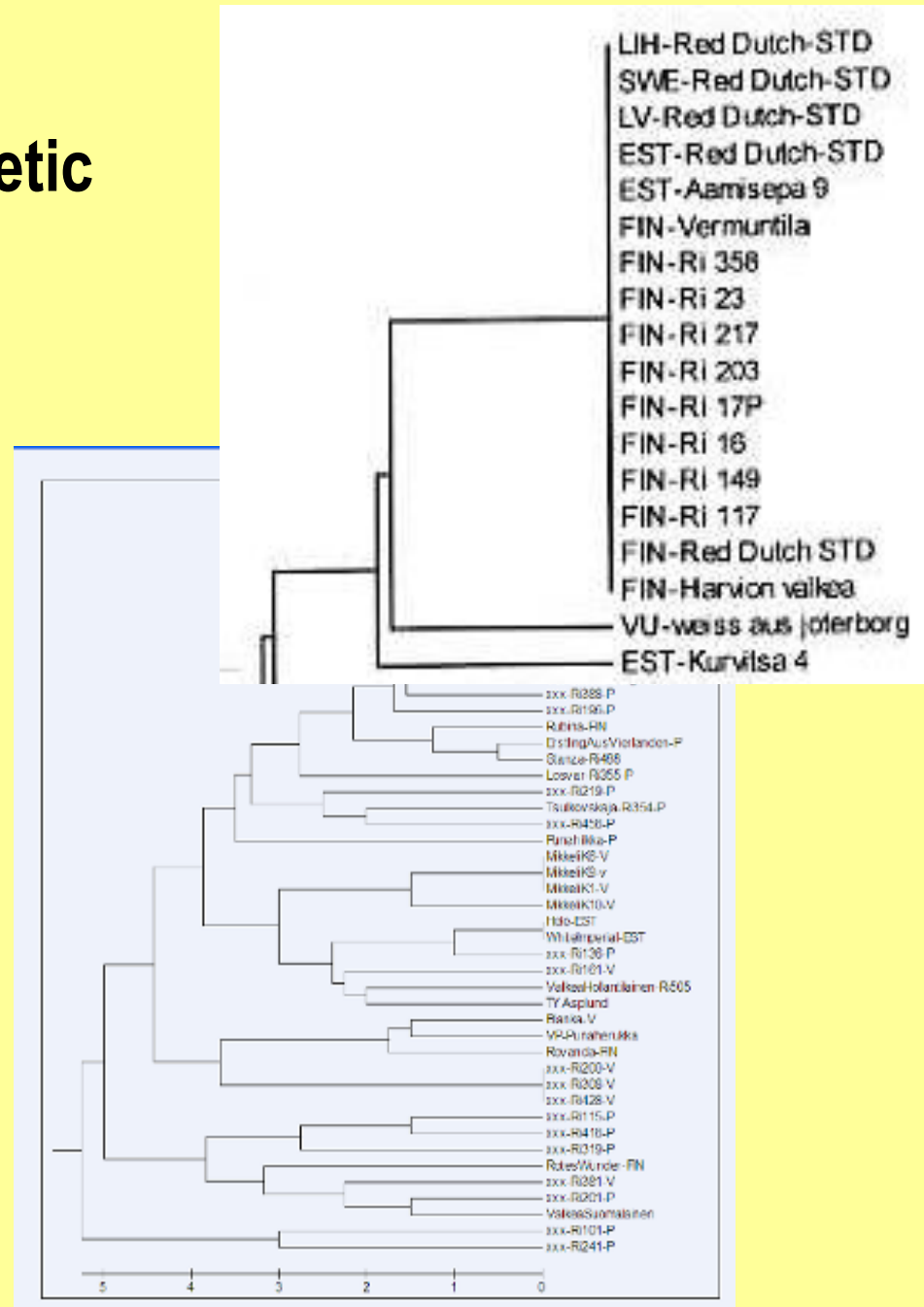
Major part done by Dr. Kadri Järve, Tallinn Technical University

# Step 3. Combining results & calculating estimates of genetic relationships

Some difficulties:

- obtaining good quality DNA from *Ribes* was challenging
- standardising of results not completely possible, amount of variation somewhat over-estimated in the combined results ( additional alleles)

Estimates of genetic relationships could be provided



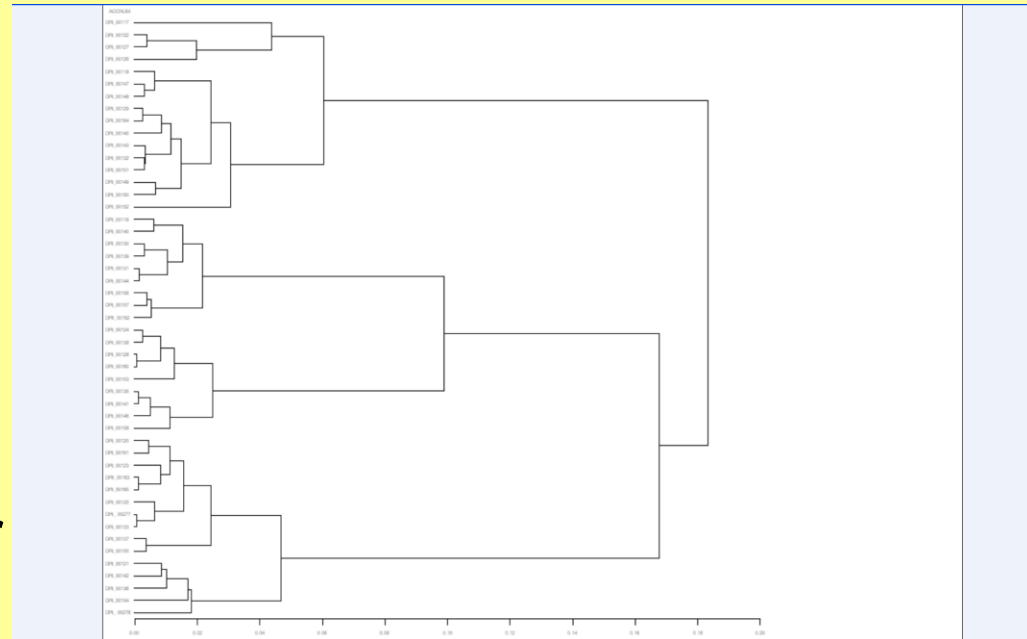
# Defining Core collection

1. Defining the target number of accessions in the core collection.
2. Selecting accessions important from the national point of view (historical or present value, rareness, etc.)
3. Selecting accessions important for breeding and cultivation (resistance to stress, yield quality, etc.)



4. Assuring that  $\geq 10\%$  of genotypic variability is selected by using molecular marker analysis results

5. Assuring that  $\geq 10\%$  of phenotypic variability is selected by using the cluster analysis dendrograms of field evaluation data



At present 289 accessions (21%) selected to the core collection.

# Establishing Core collections

## Field collections

Problem: Black currant reversion virus (BRV) infection

- virus indexing & eradication



**Insect-proof greenhouses**

## In vitro collections

- red currant problematic: need of frequent subculturing
- virus elimination
- for cryopreservation

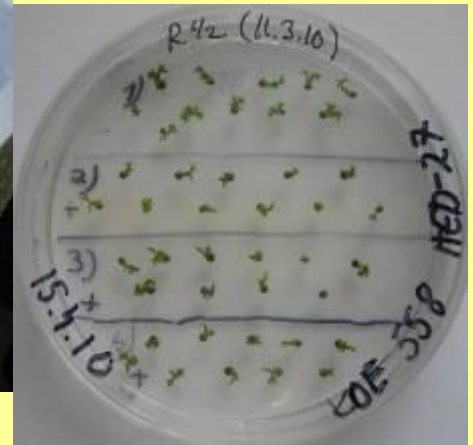
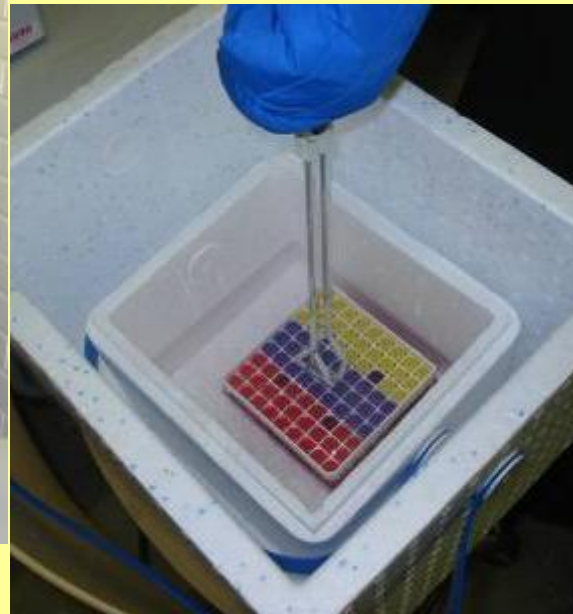




# Cryopreservation

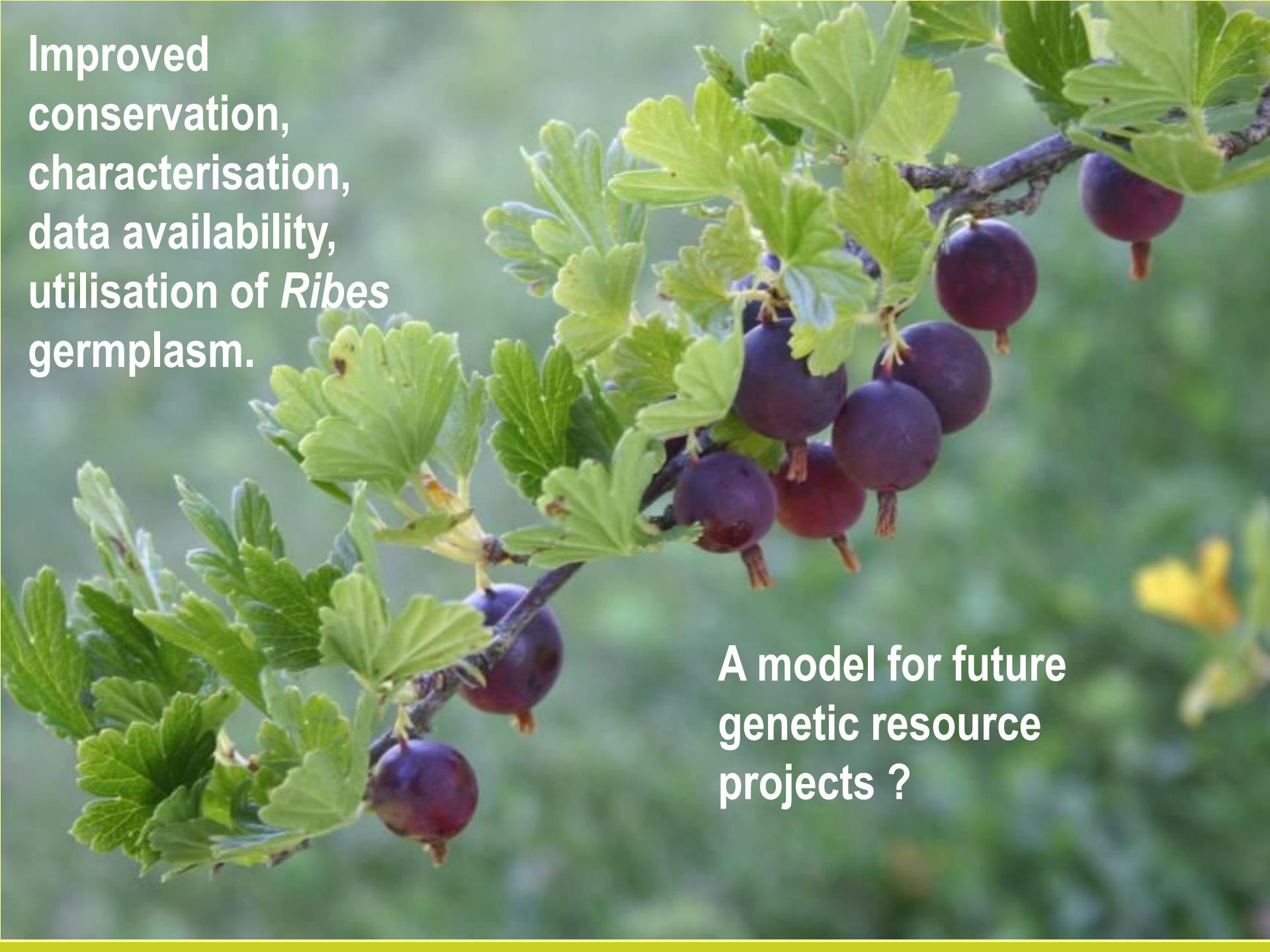


- meristems
- dormant buds
- "cryotherapy" possible



Improved  
conservation,  
characterisation,  
data availability,  
utilisation of *Ribes*  
germplasm.

A model for future  
genetic resource  
projects ?





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