Objectives of this presentation

Overview of two European FP projects

1. PGR Forum
   - Aims and products

2. PGR Secure
   - Aims
   - Background
   - Workpackages
   - Partners
   - Products

3. How will I / my country benefit
PGR Forum: Overview

- An EC Framework 5 funded Thematic Network

- European forum to debate catalogues and methodologies associated with the conservation of crop wild relatives, with a focus on *in situ* conservation

AIM: To provide a European forum for the assessment of taxonomic (species) and genetic (molecular) diversity of European crop wild relatives and develop appropriate methodologies that can be applied to conserve this diversity
European crop wild relative catalogue and database

- Web-enabled ‘PGR Forum Crop Wild Relative Catalogue for Europe and the Mediterranean’
Data structure and documentation methodology

- Crop Wild Relative Information System (CWRIS)

Genetic erosion and genetic pollution assessment methodology


- 12 papers by 36 authors
- Covering:
  - Risk assessment and gene flow
  - Genetic erosion and pollution
  - Molecular approaches to genetic assessment
  - Case studies for forage plants, grassland, cotton, fruit and forest trees

- 49 papers by 128 authors

- Covering:
  1. Crop wild relative conservation and use: an overview
  2. Establishing inventories and conservation priorities
  3. Threat and conservation assessment
  4. Genetic erosion and genetic pollution
  5. In situ conservation
  6. Ex situ conservation
  7. Information management
  8. Gene donors for crop improvement
  9. Use of crop wild relatives and underutilized species
  10. Global issues in crop wild relative conservation and use
Population *in situ* management and monitoring methodology


- 7 papers by 16 authors
- Covering:
  1. Introduction
  2. Genetic reserve location and design
  3. Genetic reserve management
  4. Population monitoring methodologies for the *in situ* genetic conservation of CWR
  5. Population and habitat recovery techniques
  6. Complementary *in situ* / *ex situ* strategies
  7. Final consideration
Improved access to European crop wild relative data via web site

- www.pgrforum.org
Increased national European CWR capacities

- Crop wild relative newsletter
- Various methodologies and case studies are either published or in the process of publication on the website / journals
- CWR public and professional awareness raised
- Stimulation of National PGR Programme in CWR related activity, e.g. selection of 5 ‘top’ CWR reserves in Ireland and the UK
PGR Secure: CWR Inventory

Nigel Maxted
Project Submission

- Reference in call text:
  - “Starting from a systematic assessment of crop wild relatives and local varieties genetic resources in Europe .... identify relevant management interventions to secure and improve the in-situ and ex-situ conservation of crop wild relatives and local varieties”

- Submission - 16th Jan 2009
- Reviewers comments – 12th May 2010
- Project Negotiation 1st Sept 2010
- Start – 1st March 2011
- €4,000,000 (€3,000,000 from EC)
PGR Secure: Full partners

- **Full title:**

  *Novel characterization of crop wild relative and landrace resources as a basis for improved crop breeding*

<table>
<thead>
<tr>
<th>Participant no.</th>
<th>Participant organization name</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>University of Birmingham</td>
<td>UK</td>
</tr>
<tr>
<td>2</td>
<td>Dienst Landbouwkundig Onderzoek</td>
<td>NL</td>
</tr>
<tr>
<td>3</td>
<td>Bioversity International</td>
<td>IT</td>
</tr>
<tr>
<td>4</td>
<td>Universita Degli Studi Di Perugia</td>
<td>IT</td>
</tr>
<tr>
<td>5</td>
<td>JuliusKühn-Institut bundesforschungsinstitut fur Kulturpflanzen</td>
<td>DE</td>
</tr>
<tr>
<td>6</td>
<td>Nordiskt Genresurscenter</td>
<td>SE</td>
</tr>
<tr>
<td>7</td>
<td>Maa- ja Elintarviketalouden Tutkimuskeskus</td>
<td>FI</td>
</tr>
<tr>
<td>8</td>
<td>Universidad Rey Juan Carlos</td>
<td>ES</td>
</tr>
<tr>
<td>9</td>
<td>ServiceXS BV</td>
<td>NL</td>
</tr>
<tr>
<td>10</td>
<td>University of Nottingham</td>
<td>UK</td>
</tr>
</tbody>
</table>
The concept of **PGR Secure** is to:

a. improve breeders’ use of conserved CWR / LR diversity
b. enhance CWR / LR diversity availability through the systematic conservation of CWR and LR species and genetic diversity.

To achieve these dual goals the project has four research themes:

i. Novel characterization techniques
ii. CWR and LR conservation
iii. Improved breeder use
iv. Informatics
## PGR Secure: Workpackages

<table>
<thead>
<tr>
<th>Workpackage</th>
<th>Task</th>
<th>Objective</th>
<th>Performance/Research Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WP1: Phenomics and genomics</strong></td>
<td>1.1</td>
<td>High throughput phenotyping</td>
<td>Approx. 350 accessions or subsets (EPG) characterized</td>
</tr>
<tr>
<td></td>
<td>1.2</td>
<td>Metabolomics</td>
<td>Metabolite content of 125 accessions determined</td>
</tr>
<tr>
<td></td>
<td>1.3</td>
<td>Next generation sequencing</td>
<td>15 plants/genotypes characterized</td>
</tr>
<tr>
<td></td>
<td>1.4</td>
<td>Transcriptomics</td>
<td>Data on gene expression in 24 accessions</td>
</tr>
<tr>
<td></td>
<td>1.5</td>
<td>Identification of candidate genes</td>
<td>Candidate genes identified</td>
</tr>
<tr>
<td><strong>WP2: Informatics</strong></td>
<td>2.1</td>
<td>Trait Information Portal</td>
<td>Trait Information Portal developed</td>
</tr>
<tr>
<td></td>
<td>2.2</td>
<td>Predictive characterization</td>
<td>Target in situ populations/ex situ accessions of Avena, Beta, Brassica and Medicago CWR and LR for novel characterization using FIGS methodology</td>
</tr>
<tr>
<td><strong>WP3: Crop wild relative conservation</strong></td>
<td>3.1</td>
<td>European and national CWR checklist</td>
<td>Generation of Europe-wide national CWR checklists and consensus European inventory</td>
</tr>
<tr>
<td></td>
<td>3.2</td>
<td>Exemplar national CWR conservation strategies</td>
<td>Generation of national CWR inventory for Finland, Spain and other countries with baseline ecogeographic dataset</td>
</tr>
<tr>
<td></td>
<td>3.3</td>
<td>European CWR priority gene pool conservation strategy</td>
<td>Strategy published with priority CWR in situ and ex situ actions</td>
</tr>
<tr>
<td></td>
<td>3.4</td>
<td>European CWR generic conservation strategy</td>
<td>Generic strategy for European CWR conservation actions</td>
</tr>
<tr>
<td><strong>WP4: Landrace conservation</strong></td>
<td>4.1</td>
<td>European LR inventories</td>
<td>Generation of Europe-wide national LR inventories and consensus European inventory</td>
</tr>
<tr>
<td></td>
<td>4.2</td>
<td>Exemplar national LR conservation strategies</td>
<td>Generation of national CWR inventory for Finland, Italy and other countries with baseline ecogeographic dataset</td>
</tr>
<tr>
<td></td>
<td>4.3</td>
<td>European LR priority gene pool conservation strategy</td>
<td>Strategy published with priority LR in situ and ex situ actions</td>
</tr>
<tr>
<td></td>
<td>4.4</td>
<td>European LR generic conservation strategy</td>
<td>Generic strategy for European LR conservation actions</td>
</tr>
</tbody>
</table>
# PGR Secure: Workpackages

<table>
<thead>
<tr>
<th>Workpackage</th>
<th>Task</th>
<th>Objective</th>
<th>Performance/Research Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>WP5: Engaging the user</td>
<td>5.1</td>
<td>Identifying European stakeholders in breeding and conservation</td>
<td>Georeferenced list of European breeders, breeding institutes, and gene banks as well as a web based map showing the distribution and type of breeding activities</td>
</tr>
<tr>
<td>community</td>
<td>5.2</td>
<td>SWOT analysis of breeders' and conservationists’ needs to promote CWR and LR use</td>
<td>Comprehensive report analysing the use of CWR and LR by stakeholders</td>
</tr>
<tr>
<td></td>
<td>5.3</td>
<td>Create partnerships between CWR and LR conservationists and breeders in Europe</td>
<td>List of meetings/workshops to enhance the development of new partnerships between the European PGRFA stakeholders</td>
</tr>
<tr>
<td>WP6: Dissemination and</td>
<td>6.1</td>
<td>Website for PGR Secure</td>
<td>Project website with its corporate image created</td>
</tr>
<tr>
<td>training</td>
<td>6.2</td>
<td>Web-enabled Europe-wide inventories of CWR/LR diversity</td>
<td>Europe-wide inventories of CWR/LR diversity uploaded to the project website</td>
</tr>
<tr>
<td></td>
<td>6.3</td>
<td>Web-enabled Trait Information Portal</td>
<td>Trait Information Portal published online and disseminated via project website</td>
</tr>
<tr>
<td></td>
<td>6.4</td>
<td>Publications</td>
<td>Newsletters, scientific and trade journals papers, conference presentations, and other communication tools uploaded in the project website</td>
</tr>
<tr>
<td></td>
<td>6.5</td>
<td>Workshops and training</td>
<td>Workshops held and report on workshops published on website</td>
</tr>
<tr>
<td></td>
<td>6.6</td>
<td>Dissemination conference</td>
<td>Dissemination conference proceedings published</td>
</tr>
<tr>
<td>WP7: Management</td>
<td>7.1</td>
<td>Administrative management</td>
<td>Project reports, ensuring financial probity and meeting milestone and deliverable deadlines</td>
</tr>
<tr>
<td></td>
<td>7.2</td>
<td>Communication management</td>
<td>Ensure communication between partners and project productions reach the maximum audience</td>
</tr>
</tbody>
</table>
## PGR Secure: Workpackages

<table>
<thead>
<tr>
<th>WP</th>
<th>WP content</th>
<th>Species covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Phenomics, genomics, transcriptomics</td>
<td><em>Brassica, Medicago</em></td>
</tr>
<tr>
<td>2</td>
<td>Trait characterization information and predictive characterization</td>
<td>All European CWR and LR diversity with characterization data for <em>Avena, Beta, Brassica, Medicago</em></td>
</tr>
<tr>
<td>3</td>
<td>Crop wild relative (CWR) conservation</td>
<td>All European CWR</td>
</tr>
<tr>
<td>4</td>
<td>Landrace (LR) conservation</td>
<td>All European LR diversity, with emphasis on <em>Avena, Beta, Brassica, Medicago</em></td>
</tr>
<tr>
<td>5</td>
<td>Meeting breeders’ needs</td>
<td>All European crops</td>
</tr>
<tr>
<td>6</td>
<td>Dissemination and training</td>
<td>All European crops</td>
</tr>
<tr>
<td>7</td>
<td>Management</td>
<td>–</td>
</tr>
</tbody>
</table>
PGR Secure: Impact
PGR Secure: Links

• National links
  – National PGR Programme
  – National PA Network
  – National or nationally based breeding companies

• European links
  – EUCARPIA network (http://www.eucarpia.org/).
  – ECPGR crop networks and 53 European Central Crop Databases ECCDB
  – ECPGR In situ and On-farm Conservation Network
  – ECPGR Documentation and Information Network
  – EC GenRes such as AEGRO projects (http://aegro.bafz.de/)
  – European based breeding companies

• International links
  – International agencies: Global Environment Facility, the Food and Agriculture Organization of the United Nations, the Global Crop Diversity Trust and Bioversity International
  – Specific projects e.g. Global Crop Diversity Trust supported Gap Analysis Project
  – IUCN Species Survival Commission Crop Wild Relative Specialist Group
  – FAO commissioned ‘Establishment of a global network for the in situ conservation of crop wild relatives: status and needs’
  – Other bilateral projects e.g. SAIN UK/China supported project ‘Conservation for enhanced utilization of crop wild relative diversity for sustainable development and climate change mitigation’
  – International based breeding companies
PGR Secure: what about me?

- Major existing resources:
  - PGR Forum European and national catalogues of CWR diversity (17,495 sp. in Europe)
  - EURISCO ex situ holding of CWR (NB. CWR are 5.6% of total germplasm holdings and represent 1,095 CWR species 6.3% of total CWR)
  - ECPGR In situ and On-farm members / EURISCO In Situ National Focal Points
  - Methodological experience (Ireland, Portugal, Switzerland and UK)
PGR Secure: what about me?

Methodology:

1. ECPGR Secretariat Contact ECP/GR national coordinator for each European country and ask for assistance in preparation of national CWR / LR conservation strategy, remind them that ECPGR In situ and On-farm members / EURISCO In Situ National Focal Points have already been nominated.

2. Provide them with PGR Forum national catalogues of CWR diversity.
PGR Secure: what about me?

Methodology (cont.):

3. Workshop for National Focal Points (Sept / Oct 2011) to discuss:
   a. Revision / modification of national CWR inventories.
   b. Collating of desirable additional data set and making data available e.g. distribution.
   c. Inventory prioritisation
   d. Gap analysis
   e. Production of national CWR conservation strategies
   f. Baseline assessment of CWR extinction / genetic erosion
   g. Use of national CWR inventory
PGR Secure: what about me?

Methodology (cont.):

4. National Focal Point Implementation (Sept / Oct 2011) to discuss:

5. Partially funded case study country studies:
   a. CWR – Finland and Spain
   b. LR – Finland and Italy

6. Used to formulate National and European CWR / LR conservation strategies (WP3 and WP4)
PGR Secure: what about me?

• WP5: Engaging the user community

• Workshops
  – SWOT analysis of breeders’ and conservationists’ needs to promote CWR and LR use
  – Comprehensive report analysing the use of CWR and LR by stakeholders
Conclusion

- CWR diversity is a critical resource for future food security and human well being – breeders need breadth of diversity!

- There are weak links between the gene bank managers – plant breeders – farmers

- Improving these links is vital if farmers are to maintain or enhance production

- Some tools to help improve these links already exist

- Enhanced use is as important as conservation itself — through use comes sustainability of conservation and use