An update on the Establishment of A European Genebank Integrated System

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Second Meeting of the ECPGR Working Group on Vitis, 18-20 September 2012, Institut für Rebenzüchtung, Geilweilerhof, Siebeldingen, Germany
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• Introductory notes
• Establishment and milestones of AEGIS
• Key components of AEGIS
• AEGIS membership (MoU and Associate Membership)
• The European Collection: principles; requirements and criteria; selection procedure; role of players; achievement
• AEGIS Quality System (AQUAS), including genebank manual, technical standards and safety-duplication policy
• AEGIS Competitive Grant Scheme
• Plant Gene Access FP7 project proposal

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• Appreciated to have a chance to discuss AEGIS with you!
• *Vitis* WG has expressed interest to contribute to AEGIS, but has had little chance and opportunity to start implementing it
• I hope that through this meeting good progress can be made!
• Due to importance for SC, it is proposed to elaborate especially on the selection procedures of European Accessions and on AEGIS Quality System (AQUAS) elements
• Yesterday we heard already some matters that are of significant interest/importance to AEGIS
• Please do not hesitate to interrupt if things are unclear or you have a different view!
Establishment and milestones of AEGIS

1. ECPGR SC decision to initiate establishment of AEGIS in 2006
2. AEGIS Advisory Committee appointed
3. ECPGR Secretariat (incl. AEGIS Coordinator) to coordinate
5. Strategic framework policy guide agreed (2008)
6. Memorandum of Understanding (MoU) developed and currently signed by 32 countries and 46 Associate Member institutes (August 2012)
7. Agreement on development of quality management system; AQUAS discussion paper

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8. Agreement on selection requirements for European Accessions and selection criteria for Most Appropriate accessions (MAAs)

9. Template for preparation of genebank manual agreed; first genebanks have uploaded their manual

10. Competitive Small Grant Scheme:
- First Call: 18 proposals received and 3 awarded;
- Second Call published October last year;
  12 proposals received; 5 selected and funded

11. EUROGENEBANK proposal to FP7 Research Infrastructure 2010 Call; met threshold but not selected

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12. New proposal (Plant Gene Access) submitted to 2012 FP7 Research Infrastructures Call; met threshold, not selected

13. European Collection formally established (12 Dec. 2011) and ongoing discussion on best procedure

14. Draft AEGIS safety-duplication policy developed; being considered by AEGIS Advisory Committee
Key components of AEGIS

2. Formal agreement with countries (MoU) and institutions within countries (Associate Membership)
3. European Collection
4. Quality management system (generic and crop-specific standards; template for development of genebank manuals; reporting, monitoring and capacity building) (...)

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Key components of AEGIS (cont.)

5. EURISCO as information portal for European Collection

6. Dedicated AEGIS Web site:
   
   http://aegis.cqiar.org/home.html

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1. Albania (06 May 2009)
2. Azerbaijan (16 July 2009) - Associate Members
3. Belarus (02 November 2011) - Associate Members
4. Belgium (01 June 2012) - Associate Members
5. Bosnia and Herzegovina (19 May 2010)
6. Bulgaria (02 December 2009) - Associate Members
7. Croatia (02 December 2009) - Associate Members
8. Cyprus (15 September 2012) - Associate Members
9. Czech Republic (23 July 2009) - Associate Members
10. Denmark (22 February 2010)
11. Estonia (22 May 2009) - Associate Members
12. Finland (02 December 2009)
13. Georgia (18 May 2009) - Associate Members
14. Germany (05 November 2009) - Associate Members
15. Hungary (22 November 2011) - Associate Members
16. Iceland (22 October 2010)
17. Ireland (22 July 2009)
18. Latvia (01 June 2012)
19. Lithuania (12 October 2010)
20. Montenegro (16 December 2010)
21. Netherlands (28 May 2009) - Associate Members
22. Norway (17 August 2009)
23. Poland (17 May 2010)
24. Portugal (20 November 2009)
25. Romania (14 April 2010) - Associate Members
26. Slovakia (17 June 2009) - Associate Members
27. Slovenia (21 September 2009) - Associate Members
28. Sweden (31 May 2011) - Associate Members
29. Switzerland (27 July 2009) - Associate Members
30. Turkey (14 November 2011) - Associate Members
31. Ukraine (30 April 2009)
32. United Kingdom (18 June 2010) - Associate Members
• **46** Associate Membership agreements received
• As a result of recent Plant Gene Access proposal development process **2** new AEGIS Member countries and **23** new AMAs had joined!

• Recorded Associate Members per country:

<table>
<thead>
<tr>
<th>Country</th>
<th>Associate Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azerbaijan</td>
<td>(2)</td>
</tr>
<tr>
<td>Belarus</td>
<td>(9)</td>
</tr>
<tr>
<td>Belgium</td>
<td>(1)</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>(1)</td>
</tr>
<tr>
<td>Croatia</td>
<td>(1)</td>
</tr>
<tr>
<td>Cyprus</td>
<td>(1)</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>(8)</td>
</tr>
<tr>
<td>Estonia</td>
<td>(3)</td>
</tr>
<tr>
<td>Georgia</td>
<td>(1)</td>
</tr>
<tr>
<td>Germany</td>
<td>(3)</td>
</tr>
<tr>
<td>Hungary</td>
<td>(1)</td>
</tr>
<tr>
<td>Netherlands</td>
<td>(2)</td>
</tr>
<tr>
<td>Romania</td>
<td>(1)</td>
</tr>
<tr>
<td>Slovakia</td>
<td>(1)</td>
</tr>
<tr>
<td>Slovenia</td>
<td>(5)</td>
</tr>
<tr>
<td>Sweden</td>
<td>(1)</td>
</tr>
<tr>
<td>Switzerland</td>
<td>(1)</td>
</tr>
<tr>
<td>Turkey</td>
<td>(1)</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>(3)</td>
</tr>
</tbody>
</table>

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Content:
1. General aspects and principles of European Collection
2. How are accessions selected: selection requirements and selection criteria
3. The process of selecting
4. Formal responsibilities expected from partners
5. Progress until today, including its formal establishment
General aspects:

- The European Collection will consist of dispersed accessions, i.e. a virtual European genebank.
- Through signing the MoU countries accept responsibilities for long-term conservation and availability of European Accessions, and to:
  - Conserve/manage according to quality standards
  - Conservation/management strategies for each crop needs to be prepared by respective Crop WG/NCG and approved by SC.
General Principles for European Accessions

- AEGIS Members have discretionary rights to propose European Accessions;
- Proposed European Accessions must meet the agreed selection requirements;
- European Accessions must be free from any third party obligations or restrictions;
- SMTA to be used for the transfer of Annex I crops;
- Transfer of Non-Annex I material registered as European Accessions to be under the terms and conditions of the SMTA with explanatory note.

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General Principles for European Accessions (cont.)

- Management Standards for European Collection to be proposed for each crop genepool by respective ECPGR Crop Working Group and approved by ECPGR Steering Committee;
- Associate Members of AEGIS to perform all selected activities according to agreed standards;
- Public domain accession-level information, as well as non-confidential characterization and evaluation data, to be made available;
- Each European Accession to have identified safety-duplicate stored under the same or better conditions than the original.

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Selection requirements

1. Material under the management and control of the governments of member countries and their associate members, in the public domain and offered by the associate members for inclusion into AEGIS.

2. Genetically unique within AEGIS, to the best available knowledge (i.e. genetically distinct accessions; assessment based on available data and/or on the recorded history of the accession).

3. Plant genetic resources for food and agriculture as defined in the International Treaty as well as medicinal and ornamental species.

4. European origin or introduced germplasm that is of actual or potential importance to Europe (for breeding, research, education or for historical and cultural reasons).

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Selection Criteria

To sort out duplicates ➔ MAA

- Need to be agreed by each WG for their specific crop(s)
- Used when deciding which accession to accept among two or more (quasi) duplicates or similar accessions/genotypes (i.e. MAAs)
- WGs to decide if any of these criteria have prevalence over the others, or that the selection should be the result of a combination of two or more criteria
- Example of ‘draft’ selection criteria to allow the selection of the MAAs from a group of (quasi) duplicates – see next slide

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Suggested “generic” Selection Criteria

1. Maintained in “country of origin”
2. A known origin (collected and/or bred; pedigree data!?)
3. Comprehensiveness of passport information
4. Number of regeneration/multiplication cycles (Do we know?)
5. Health status (i.e. is the germplasm disease free?)
6. Existence of morphological/molecular characterization data
7. Existence of (agronomical) evaluation data
8. Validated accession name (particularly relevant for perennial clonal crops where the same name can be attributed to different accessions; history of individual accessions is important; special attention to be paid to synonyms and homonyms)

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1. WGs (or delegates) to elaborate a list of candidate European Accessions for a crop “pool”, as documented either in EURISCO and/or in CCDB, regardless MoU, Associate members, offers from countries…→ LIST OF CANDIDATE ACCESSIONS

2. Agree on selection procedure (examples: Cucurbits, Daucus, Forages, Prunus, see also AEGIS Web site)
   - All selected accessions must meet “selection requirements”
   - Not worry (too much) about “governmental control”
   - Mainly focus on genetic uniqueness
   - Could exclude categories, such as: “hybrids”, “unknown accessions”
   - Not a “core collection”

(...)
3. Selection criteria (crop-specific) are used to select MAAs among “duplicates” (also considerations of management practices)

4. WG sends list with candidate accessions to respective National Coordinators for consideration of possible inclusion in the European Collection

5. NC, in close consultation with the holding institute(s), indicates to WG whether or not proposed accessions can be included in European Collection

(…)
6. **Accessions accepted** by the country and subsequently by the WG for inclusion in the European Collection should be flagged in EURISCO as AEGIS accessions upon instructions of NC and implemented by the EURISCO National Focal Point.

7. In case candidate accessions were not accepted by a given country, WG looks for alternative accessions not confirmed by NC and seeks acceptance for inclusion by a different holder.

8. **Alternative**: a genebank or country identifies all accessions maintained in the institute/country that originated in the country and/or are likely unique and offer these to AEGIS.
European Collection
Responsibilities of WG + members

Summary of process in Germany (IPK) of the alternative approach as mentioned in point 8 of simplified procedure:

Accessions of all crops and selected according to the criteria below have been offered to AEGIS as candidate accessions

1. Accessions that originated in Germany
2. Accessions collected by German or Austrian collectors before 1945 (this might not be of relevance to non-German and Austrian genebanks)
3. Accessions collected by IPK staff; in the case of collecting missions after 1993 – when CBD entered into force – only those accessions that have been collected under a material transfer agreement
4. Material collected by “alien missions” and donated to IPK. This would specifically apply if IPK is the only maintainer of such material.
5. Other material not conserved in other genebanks.

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Main players are Crop Working Groups and Countries.

A simplified selection procedure to identify European Accessions, including MAAs, available.

Selection Requirements have been approved by the Steering Committee (see later).

No precise definitions of European Accessions and MAAs exist (i.e. they are the result of a process and thus might vary from crop to crop!)

The Selection Criteria have been discussed by the model crop groups, without much divergence of opinion (see later).

A WG agreement on Selection Criteria will be required for each crop or crop group.

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The European Collection

Has now been formally established and will hopefully steadily grow!

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<table>
<thead>
<tr>
<th>Species</th>
<th>European accessions</th>
<th>Holding genebanks</th>
<th>Countries of origin</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Allium sativum</em> L.</td>
<td>143</td>
<td>IPK, Germany (61)</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CRI, Czech Rep. (82)</td>
<td></td>
</tr>
</tbody>
</table>

http://aegis.cgiar.org

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Preliminary designation of European Accessions (September 2011)

<table>
<thead>
<tr>
<th>Crop</th>
<th>Accessions in European databases</th>
<th>Accessions selected for European Collection</th>
<th>% European Accessions from total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrot cultivars</td>
<td>2948</td>
<td>1281</td>
<td>43%</td>
</tr>
<tr>
<td>Sweet cherry</td>
<td>2731</td>
<td>1483</td>
<td>54%</td>
</tr>
<tr>
<td>Poa sp.</td>
<td>&gt; 5000</td>
<td>3443</td>
<td>68%</td>
</tr>
<tr>
<td>Brassica rapa</td>
<td>3618</td>
<td>2170-2822</td>
<td>60—78%</td>
</tr>
</tbody>
</table>

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AQUAS (AEGIS Quality System) – technical elements

1. Operational genebank manual – all AEGIS Associate Members; based on genebank template (template finalized – AEGIS Web site; so far three manuals received)

2. Generic operational standards – Secretariat (cooperation with FAO; inputs into draft also by ECPGR members; discussed at Commission in July 2011; standards for non-orthodox species on field genebank and *in vitro/cryopreservation* drafted (more details later)

3. Agreed minimum crop-specific technical standards – all WGs (complementing generic standards, when necessary)

4. Quality management system procedures – Secretariat; all WGs; Associate Members (still to be developed):
   a. record keeping
   b. reporting
   c. monitoring (not policing, but guiding and advisory approach)

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AQUAS (AEGIS Quality System) – principles

Quality assurance based on the following:

– Say what you do
– Do what you say
– Let an independent body check that you do what you say
– Correct and improve what you say you do
AQUAS (AEGIS Quality System) – principles

- Consensus
- Agreed minimum standards
- Capacity building
- As little bureaucratic as possible
- Monitoring system (not policing, but guiding and advisory approach)
AEGIS Grant Scheme (8 projects)

2010
1. Assessment of Unique Material in the European Collections of Umbellifer Crops
2. Towards comprehensive pea germplasm management for future use
3. Cryopreservation of young inflorescence bases in bolting garlic

2011
1. Establishment of the European Forages Collection
2. “PGR Duplicate Finder" a software package to assist in the identification of putative duplicates in germplasm databases
3. Improving the prerequisites for a European rye collection
4. Identification of old potato clones having unreliable variety name by means of fingerprinting using microsatellite (SSR)
5. Brassica selection criteria for the identification of the MAAs relate to the Brassica oleracea of Iberian collection

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Theme on *Plant Genetic Resources Centres*

- The ECPGR Steering Committee endorsed/recommended the ECPGR Secretariat to coordinate the preparation of a project proposals
- Submission completed: 23 November 2011
- Budget: ca. Euro 10 million; 34 partners
- Threshold was met, but no funding provided
- ECPGR invited by FP7 to provide proposal for topic in Horizon 2020 scheme (October 2012)

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Plant Gene Access
(12 Work Packages)

1. Project management (ECPGR)
2. Access to the European Collection (ECPGR)
3. Access to PGR information (Bioversity)
4. Quality assurance (MTT, Finland)
5. Establishing the European Collection (INRA, France)
6. Establishing a knowledge base (CRI, Czech Republic)
7. Upgrading management of PGR Information (CGN, The Netherlands)
8. Research to improve services (Warwick, UK)
9. Strengthening genebank services through genotyping (IPK, Germany)
10. Identify and rescue endangered resources (NordGen, Sweden)
11. Capacity building (KIS, Slovenia)
12. Partnership with industry (Plantum, The Netherlands)

PROJECT WEBSITE: http://aegis.cgiar.org/documents/

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Thank you for your attention!