



European Cooperative Programme for Plant Genetic Resources (ECPGR)

AEGIS section extracted from
Technical Report of ECPGR Phase VIII
(January 2009 – November 2012)

**(Prepared for the 13th Steering Committee meeting,
4-7 December 2012 Vienna, Austria)**

4.2. AEGIS

Major achievements during the period 2009-2012 are summarized below.

4.2.1. Memorandum of Understanding and Associate Member agreements

By the end of October 2012 the 32 countries listed below (and also in Box 1 above) had returned the signed Memorandum of Understanding (MoU) to Bioversity International. A total of 46 AEGIS Associate Membership Agreements between institutions holding *ex situ* accessions and the respective National Coordinators were concluded in 19 AEGIS member countries. The respective numbers are included in brackets behind the corresponding member countries below.

AEGIS member countries: Albania, Azerbaijan (2), Belarus (9), Belgium (1), Bosnia and Herzegovina, Bulgaria (1), Croatia (1), Cyprus (1), Czech Republic (8), Denmark, Estonia (3), Finland, Georgia (1), Germany (3), Hungary (1), Iceland, Ireland, Latvia, Lithuania, Montenegro, The Netherlands (2), Norway, Poland, Portugal, Romania (1), Slovakia (1), Slovenia (5), Sweden (1), Switzerland (1), Turkey (1), Ukraine and the United Kingdom (3).

4.2.2. European Collection

- a. A “simplified” procedure for the selection of European Accessions was adopted and several Working Groups produced lists of candidate accessions for inclusion in the European Collection.
- b. The first 61 garlic accessions were included in the European Collection in December 2011 through their acceptance of the conditions for their long-term conservation and continued availability by the German and Czech National Coordinators. These accessions were flagged in EURISCO as the first European Accessions.
- c. Recently, IPK, Germany offered approximately 20 000 accessions of its crop collections that had been identified as unique German accessions or Most Appropriate Accessions maintained at IPK for consideration by the respective WGs for their inclusion in the European Collection. CGN, The Netherlands indicated their intention to take a similar approach.
- d. As the procedures for selecting European Accessions vary among WGs, an overview of the current status of the identification and selection process of accessions for the European Collection for all WGs is provided in Annex I, Table 1.

4.2.3. AEGIS Quality System (AQUAS)

- a. The template for an operational genebank manual which had been developed by the Secretariat was tested by NordGen, Sweden and IPK, Germany, approved by the AEGIS Advisory Committee and posted on the AEGIS Web site:
http://aegis.cgiar.org/fileadmin/www.aegis.org/FOR_WEB_FINAL/Template_final240910.pdf.
So far three AEGIS Associate Members (IPK and JKI, Germany and CGN, The Netherlands) have completed the manual.
- b. As the process of revising the FAO “Genebank Standards” coincided with the AEGIS process, it was agreed with the SC to use, if possible, the revised FAO Genebank Standards rather than developing new ones. Thus, ECPGR experts and the Secretariat participated in the process (expert consultations and commenting on drafts) to revise and/or develop new standards for the following three components: 1) orthodox seed germplasm, 2) field genebanks and 3) *in vitro* cultures and cryopreservation. This resulted in a final draft document “Revision of the draft genebank standards for PGRFA” to be discussed by the Intergovernmental Technical Working Group on PGRFA at its Sixth Session (14-16 November 2012, Rome) (<http://www.fao.org/agriculture/crops/core-themes/theme/seeds-pgr/itwg/6th/en/>).
- c. Considering the fact that several Working Groups had already initiated the development of crop-specific standards prior to the revision of the general genebank standards, a harmonization process of the crop-specific and general standards has become necessary. This process is currently ongoing. The current status varies among the WGs, as summarized in Annex I, Table 2.

4.2.4. Safety-duplication Policy

Under the guidance of the AEGIS Advisory Committee, the Secretariat drafted a “Safety-duplication Policy” for the accessions that will be included in the European Collection. This document was circulated in November 2012 to the SC for approval.

4.2.5. Competitive Grant Scheme

Eight projects granted through two calls of the AEGIS Competitive Grant Scheme have been or are being implemented. The current status and, where applicable, major results of the projects are summarized in Annex I, Table 3.

4.2.6. Project proposals

a. Two project proposals (EUROGENEBANK and Plant Gene Access) were prepared and submitted to the Seventh Framework Programme of the EU (Research Infrastructures – Support to existing research infrastructures – Integrating Activities) in 2009 and 2011 respectively. In both proposals more than 30 partners were involved in an effort coordinated by the Secretariat. Whereas both proposals met the threshold set by the EU, they were not selected for funding.

A number of project proposals including AEGIS-relevant aspects were successfully submitted to EU funding schemes and were implemented by WG members (GENRES projects on *Allium*, *Avena*, Leafy vegetables and *Vitis*; COST action on *Vitis*, etc.) (see above, Section 4.1.1).

4.2.7. Web site

The AEGIS Web site (<http://aegis.cgiar.org/home.html>) was revised and kept up-to-date. The growth of the European Collection is displayed in real time, thanks to a “routine” establishing an automatic connection with EURISCO. Visits to the Web site are monitored. Data for the period June 2011–October 2012 are shown in Fig. 1.

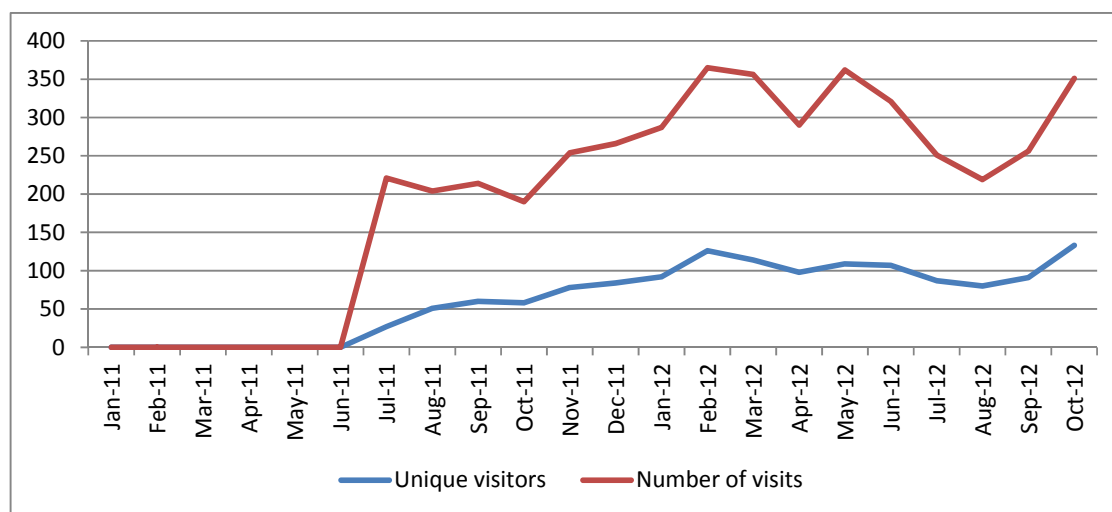


Fig. 1. Visits to the AEGIS Web site, period June 2011 to October 2012.

4.2.8. Concluding remarks and outlook

- Most countries became members of AEGIS through the signature of the MoU. The others have not indicated that they would not join AEGIS, but the process is delayed by slow decision-making procedures. The process of concluding Associate Membership Agreements is also slow in many countries and will require continued attention.
- The process of selecting accessions for the European Collection is an evolving process. It turned out that the original proposed procedure was not well understood and thus, a simplified procedure was developed and agreed. The recent initiative by IPK, Germany to offer several accessions has given a boost to the process. However the exercises carried out to select candidate European Accessions have shown that the accession-level passport data, on which the selection is based, are often a limiting factor; data completeness and quality must therefore be improved. WGs also encountered difficulties in receiving confirmations/responses from individual collection holders with respect to the identified candidate European Accessions. The Secretariat is closely following

the selection process, regards it as one of the highest priorities and engages in assisting WGs where necessary and meaningful.

- The discussions and related activities on general and crop-specific standards were boosted by the FAO coordinated process of updating the Genesbank Standards. In general, WGs seem to be willing to adopt the FAO standards with some crop-specific additions or modifications. This means a significant step forward with the establishment of AQUAS.
- Based on the achievements obtained through the eight projects funded by the AEGIS Grant Scheme (with two projects still outstanding), it can be concluded that competition for funds to carry out specific projects has been effective and that it provides an element of flexibility that allows a more focused and priority-driven approach in implementing the AEGIS agenda.
- The development of two AEGIS-related project proposals, through a wide partnership involving more than 30 scientists/institutes for each proposal, provided new conceptual insights for future work and pointed out weaknesses related to the large size of the network, such as: not all partners from the entire ECPGR membership can be selected; existing ECPGR Network structures can only play a subordinate role in the project; not all project-relevant technical/scientific expertises are represented in ECPGR; the collaboration between ECPGR and plant breeders is not very strong and formal collaboration with botanic gardens does not exist; the expectation from the EU to timely deliver significant outputs places a heavy responsibility on the coordinating organization to select partners that have the reputation of delivering.
- In view of the progress made with the AEGIS establishment and start of operation, compliments should be addressed to all partners involved, considering that most of the related activities had to be carried out as in-kind contributions during a period of financial constraints.

Annex I. Major achievements of AEGIS during the period 2009-2012

Table 1. Current development status of the establishment of the European Collection by ECPGR Working Groups (November 2012)	5
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AEGIS section extracted from
 TECHNICAL REPORT OF ECPGR PHASE VIII (STATUS NOVEMBER 2012)

Table 1. Current development status of the establishment of the European Collection by ECPGR Working Groups (November 2012)

Network/ Working Group	Agreed procedures to select European Accessions	Concrete plans how to select accessions exist	First selection of possible candidate accessions	Tentative list, prepared by WG, of candidate European Accessions for acceptance by countries	Offers by countries under discussion by WGs	Flagged European Accessions in EURISCO	Remarks
Cereals							
<i>Avena</i> (<i>AEGIS model crop</i>)	Detailed procedure agreed. Selection criteria established.				137		Ad hoc meeting to select European Accessions had to be postponed.
Barley	Agreed procedure to select candidate accessions with focus on country of origin.				1595		
Wheat	Selection criteria for candidate European Accessions established.			First set of 107 accessions proposed for flagging. Additional lists of accessions for flagging within 2012 planned.	1386		WG members invited to identify genetically unique accessions in their genebanks by end 2013.
Forages							
Forages	Agreed procedure			10 485 candidate European Accessions of 10 forage species/groups selected	5807		Selection of candidate accessions a continuing process

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Fruit							
<i>Malus/Pyrus</i>	All WG members to identify 'most obvious' candidate European Accessions in their collection, using a to-be-prepared form. After analysis list of candidate accessions will be prepared (March 2013).						Selection criteria are 'originated in country' and having been validated as true to type.
<i>Prunus</i> (<i>AEGIS model crop</i>)	Procedure discussed. Selection criteria established.		1483 unique cherry accessions identified				
<i>Vitis</i>	An agreed procedure for selecting European Accessions			Tentative list of almost 2500 autochthonous accessions identified.			Important role of Vitis Database in selection process.
Oil and Protein Crops							
Grain Legumes				36 Czech pea accessions	3525		WG had so far no opportunity to discuss AEGIS implementation.

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Sugar, Starch and Fibre Crops							
<i>Beta</i>	Selection criteria to identify MAAs agreed. Agreement to include <i>Beta</i> Core Collection Accessions and those used by French AKER project.			International <i>Beta</i> Database Manager will lead process to identify specific accessions for flagging before end 2012.	394		Agreement to also include accessions of threatened species and accessions collected in genetic reserves.
Fibre Crops					286		WG needs more time to digest AEGIS requirement. Not fully convinced of value of European Collection. Some legal issues hamper European Hemp Collection.

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Medicinal and Aromatic Plants	Agreement to work on European Collection. No follow up action.				816		<i>Origanum</i> project could provide data for selecting candidate accessions.
Potato		Protocol being developed, using SSR markers	500		497		Protocol for identification of duplicates/ mislabelled accessions being finalized
Vegetables							
<i>Allium</i> (AEGIS model crop)	Yes				98	143 Poland to flag their accessions.	Workplan for seed- propagated <i>Allium</i> accessions. First list of wild spp.
<i>Brassica</i> (AEGIS model crop)	Agreed selection procedure was tested for <i>B. rapa</i> but insufficient data available to complete process.				1638		
Cucurbits	Agreement to use newly updated Cucurbits database to search for candidate accessions.				214 (DEU) 1064 (BUL)		

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Leafy Vegetables	First lists for lettuce and spinach generated following agreed procedure, including identifying duplicates. Thereafter chicory and minor leafy vegetables will follow.				444		+ 281 minor leafy vegetables; DuplicateFinder used.
Solanaceae		Yes	155 wild tomatoes; 168 wild <i>Capsicum</i> ; 246 <i>Physalis</i> ; 11 <i>Cyphomandra</i> ; 13 Pepino	2506 <i>Capsicum</i> ; 4756 tomato; 696 <i>Solanum</i> spp.; 4 <i>Cyphomandra</i> ; 42 <i>Physalis</i>	1262		
Umbellifer Crops	Workflow for selection of candidate accessions developed for carrots. Methodology agreed.		1415 carrot accessions selected. Need cross-checking and confirmation and to be extended to landraces and CWRs.		546		In 2013 Apiaceae
Other crops					1006		Minor crops
Total number of accessions offered by: Germany					Approx. 20 000		

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Table 2. Current development status of the establishment of general and crop-specific genebank standards by ECPGR Working Groups (November 2012)

Network/ Working Group	General standards drafted, developed prior to the FAO process	General standards harmonized with FAO general standards	Crop-specific standards drafted without harmonization with FAO general standards	Crop-specific standards drafted and harmonized with FAO general standards	Crop-specific standards for specific operations (see remarks)	Remarks
Cereals						
<i>Avena</i> (<i>AEGIS model crop</i>)			Draft quality minimum standards for routine operations developed; number of issues need to be resolved.			Ad hoc meeting to proceed with process had to be postponed.
Barley	Task Force formed to draft protocols for species specific maintenance of wild <i>Hordeum</i> spp and cultivated barley.		Development of crop- specific minimum standards planned for May 2012.			
Wheat					Protocols for specific routine management of wild species planned by mid 2012.	No need for crop- specific standards in addition to FAO standards.
Forages						
Forages			Minimum standards for regeneration			

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Fruit						
<i>Malus/Pyrus</i>				Agreement to use FAO standards for field genebanks as basis for deciding whether any crop- specific standards are needed.		
<i>Prunus</i> (<i>AEGIS model crop</i>)			Minimum technical standards prepared.			
<i>Vitis</i>	WG agreed with draft safety-duplication policy and specified desirable approach for <i>Vitis</i> .					FAO standards for non-orthodox seeds and clonally propagate plants agreeable with a few additions.
Oil and Protein Crops						
Grain Legumes						WG had so far no opportunity to discuss AEGIS implementation.

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Sugar, Starch and Fibre Crops						
<i>Beta</i>	Protocol on 'seed increase' was already agreed some time ago and will be checked on its validity by curators before end 2012.				Guidelines for multiplication of <i>Beta nana</i> need to be developed.	Proposal made to adopt the FAO standards for orthodox seeds as well as the crop-specific seed increase protocol
Medicinal and Aromatic Plants	Agreement to adopt quality standards for conservation.				Protocol for use of insects for pollination during regeneration in technical isolation; Descriptors for priority spp.	
Vegetables						
<i>Allium</i> (<i>AEGIS model crop</i>)					Recommendations for field maintenance of shallot and garlic; Protocols for <i>in vitro</i> and cryopreservation of garlic; Phytosanitary standards adopted	

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<i>Brassica</i> (AEGIS model crop)	Summary of current practices for routine genebank operations available. Draft general standards prepared.		Draft minimum standards prepared			
Cucurbits	General guidelines for regeneration, processing and storage agreed in 2011.					
Leafy Vegetables	Inventory of genebank operations established for lettuce and spinach				Minimum standards are planned to be developed on basis of inventory.	Progress hampered by cancelled meeting.
Solanaceae		FAO standards for orthodox seeds adopted.			Minimum protocols for seed regeneration and storage.	No need for more stringent standards
Umbellifer Crops					Proposal for crop-specific minimum standards made; final agreement by WG outstanding.	Regeneration; long-term conservation

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Table 3. Achievements of the projects that have been granted funds from the AEGIS Competitive Grant Scheme (November 2012)

Project title	Coordinating institute	Major achievements	Remarks
Towards comprehensive pea germplasm management for future use	Agritec Plant Research, Czech Republic	<ul style="list-style-type: none"> • Pea core collection of 34 accessions (out of 166) Czech and Slovak origin using morphological and molecular data • Methodology to use different types of data in selecting core collection accessions 	
Cryopreservation of young inflorescence bases in bolting garlic for germplasm storage	Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Germany	<ul style="list-style-type: none"> • New cryopreservation method using unripe inflorescences as a new source of garlic organs • Method to combine ripe bulbils and unripe inflorescences allows to speed up the cryopreservation procedures 	
Establishment of the European Forages Collection	MTT AgriFood Research, Finland	<ul style="list-style-type: none"> • ECPGR/AEGIS workshop agreed on procedure to select candidate European Accessions. • A list of 10 485 candidate accessions of 10 forages species/groups was created for confirmation. • A number of issues related to EURISCO were identified for solution by ECPGR and EURISCO. 	
Assessment of Unique Material in the European Collections of Umbellifer Crops, University of Warwick, United Kingdom	University of Warwick, United Kingdom	<ul style="list-style-type: none"> • 1281 advanced cvs carrot acc. selected as candidate European Accessions • 252 breeding material carrot acc. selected as well • Third list of possible duplicates for which info is lacking to select MAAs 	

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Table 3. Achievements of the projects that have been granted funds from the AEGIS Competitive Grant Scheme (November 2012) (cont.)

Project title	Coordinating institute	Major achievements	Remarks
“PGR Duplicate Finder”, a software package to assist in the identification of putative duplicates in germplasm databases	Centre for Genetic Resources (CGN), The Netherlands	<ul style="list-style-type: none"> • Software tool developed to support the identification of duplicates and of MAAs • User manual (short version) 	
Improving the prerequisites for a European rye collection	Nordic Genetic Resource Centre (NordGen)		Progress report received. Final report expected end of 2012.
Identification of 240 old potato clones having unreliable variety name by means of fingerprinting using 12 microsatellite (SSR) markers to assist in setting up the AEGIS collection for potato	Centre for Genetic Resources (CGN), The Netherlands		Project has been granted a no-cost extension until the end of 2012 in order to complete analyses.
<i>Brassica</i> selection criteria for the identification of the MAAs: relate to the <i>Brassica oleracea</i> of Iberian collection	Banco Português de Germoplasma Vegetal, INRB, Portugal	<ul style="list-style-type: none"> • Project concluded and final report submitted. • A selection procedure combining ITS and SSR data with germinability and seed stock levels was implemented • A first list of 42 genetically diverse candidate European Accessions of <i>Brassica oleracea</i> of Iberian origin (out of 100 pre-selected ones) was generated. • Use of molecular data in cluster analysis in fine-tuning the selection of <i>B. oleracea</i> accessions for European Collection and in identifying duplicates had worked well. 	

