



# Establishment and operation of the European Collection with an emphasis on vegetatively propagated *Allium*

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**Seventh meeting of the ECPGR *Allium* Working Group  
Perea, Thessaloniki, Greece, 6-8 September 2011**

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# 0. Introductory notes

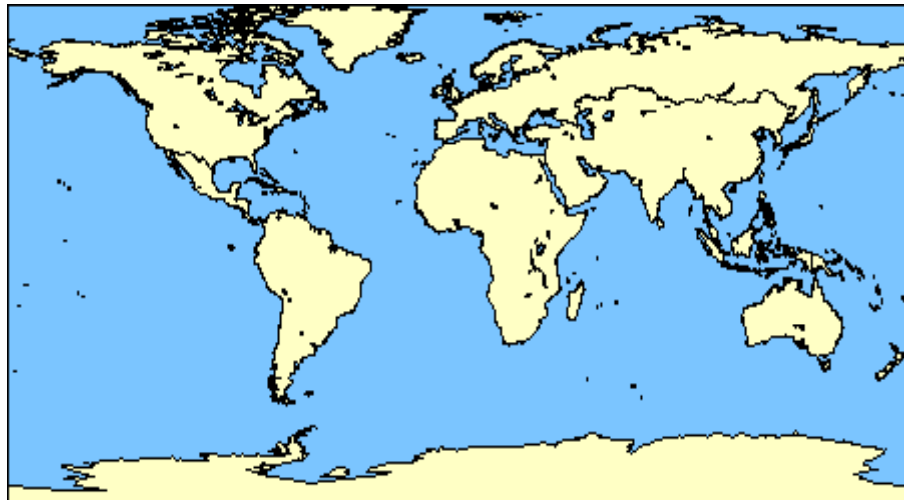


- Thanks for invitation, on behalf of Secretariat
- From an AEGIS perspective the *Allium* Working Group is exemplary:
  - a) Pro-active in developing AEGIS elements
  - b) Using a mix of funding opportunities that all contribute to this goal (ECPGR WG and costing study; EU GENRES; AEGIS Grant)
  - c) Trying to upscale results
- Chance to interact with scientists

# 1. Background to AEGIS



## ■ Worldwide



- About **1,800** genebanks/collections
- Approx. **7.5 million** accessions
- Estimated **25 – 30% unique**
- Approx. **30,300 *Allium*** accessions held in **81 countries** (WIEWS, 2011)

## ■ Europe



- App. **625** genebanks/germplasm coll.
- > **2.47 M** accessions (SOWII, 2010)
- **35-50% unique** (estimate based on EURISCO data)
- Approx. **16,400 *Allium*** accessions
- Held in **77 genebanks; 32 countries**

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(WIEWS 2011)

# Background: legal



- **CBD (1993 – a new ABS “Nagoya Protocol”)**
  - Commitment by countries to conserve biodiversity and to provide access (PIC and mutual agreed terms)
- **GPA (1996 – now being updated)**
  - Increase the efficiency of conservation activities
  - Establishment of a rational global conservation system
  - Reduce unnecessary duplication of efforts and accessions
- **ITPGRFA (2004 – implementation underway)**
  - Enhance national commitments and international cooperation
  - Establishment of Multilateral System (MLS)
  - AEGIS seen as contributing to its implementation (thus, extending the scope to non-Annex I like *Allium*)

# Background: ECPGR



- European Cooperative Programme for Plant Genetic Resources (ECPGR)
  - Since 1980; Europe wide; most major crops/groups covered
- ECPGR Crop Working Groups (incl. *Allium*):
  - Reported on difficulties in proper PGR maintenance:
    - ✓ lack of long-term conservation facilities
    - ✓ insufficient safety-duplication
    - ✓ regeneration backlogs
  - Discussed options for sharing conservation responsibilities in Europe already in 1998

# Model Crops



- **Seed propagated** material – annual
- **Annex I crops** of ITPGRFA

■ ***Avena***

**selfing**



■ ***Brassica***

**outcrossing**



- 
- **Vegetatively** propagated material – biennial and perennial
  - **Non Annex I** of ITPGRFA

■ ***Allium***  
**(Veg. propag.)**



■ ***Prunus***



## 2. 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
4. Feasibility studies for 4 model crops conducted (2004-2008)
5. Strategic framework policy guide agreed (2008)
6. Memorandum of Understanding (MOU) developed and currently signed by 26 countries



# Establishment and milestones of AEGIS



7. Agreement on development of quality management system; AQUAS discussion paper
8. Agreement on selection requirements for European Accessions and selection criteria for MAAs
9. 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
10. EUROGENEBANK proposal to FP7 Research Infrastructure Call; met threshold but not selected
11. preparations started to develop a new proposal (Plant Gene Access) for 2012 Call

### 3. Key components of AEGIS

1. A **Strategic Framework** for the Implementation of a European Genebank Integrated System - A Policy Guide
2. Formal **agreement** with countries (MOU) and institutions within countries (Associate Membership)
3. **European Collection** (details later)
4. **Quality management system** (generic and crop specific standards; template for development of genebank manuals; reporting, monitoring and capacity building)



# Key components of AEGIS



## 5. EURISCO as information portal for European Collection



### 35\*. AEGIS Status

(AEGISSTAT)

The coded status of an accession with regard to the European Genebank Integrated System (AEGIS).

Provides the information, whether the accession is conserved for AEGIS.

0 – not part of AEGIS

1 – part of AEGIS

If the AEGIS status is unknown, the field stays empty

## 6. Dedicated AEGIS website:

<http://aegis.cgiar.org/home.html>



## A European Genebank Integrated System

AEGIS &gt; About AEGIS

 Search

### About AEGIS

- > Objectives
- > Benefits
- > European Collection
- > Role of Members
- > Role of Associate Members
- > AQUAS
- > Relationship of AEGIS with ECPGR
- > AEGIS and the Treaty
- > Latest news

### Membership

### Structure

### Implementation

### Documents

### About AEGIS



The AEGIS initiative is the brain child of the European Cooperative Programme for Plant Genetic Resources (ECPGR)<sup>1</sup>. At the present time, plant genetic resources for food and agriculture (PGRFA) in Europe are conserved in some 500 institutions scattered over more than 40 European countries. While coordination of activities is carried out within the framework of the ECPGR and the ECPGR Crop Working Groups, each genebank basically operates on its own, providing for the conservation of a full range of crop germplasm important for agriculture in the area it serves.

With this in mind, the countries of the European region believe that there is a need to improve coordination and share responsibilities with respect to the conservation of, management of and access to PGRFA in Europe by setting up AEGIS.

The legal mechanism for establishing AEGIS is the Memorandum of Understanding (MoU) entered into by eligible countries of the region and the European Commission. The MoU sets out their commitments as full Members of AEGIS and the main lines of AEGIS. To be eligible for membership, the countries listed must be members of ECPGR, and either Contracting Parties to the Treaty or otherwise willing to make PGRFA under their jurisdiction available under the conditions of the Treaty.

The MoU comes into force on its signature by **at least 10 eligible countries**. The MoU is supplemented by a series of Associate Member Agreements for the individual genebanks that wish to become part of AEGIS.

The **Associate Member Agreements** is entered into by the genebanks with the ECPGR National Coordinator for the country concerned, who undertakes to work with the genebank in implementing AEGIS, and who is ultimately responsible for overseeing the genebank's compliance with its obligations under the agreement.

<sup>1</sup> ECPGR was founded in 1980 on the basis of the recommendations of the United Nations Development Programme (UNDP), the Food and Agriculture Organization of the United Nations (FAO) and the Genebank Committee of the European Association for Research on Plant Breeding (EUCARPIA). It is a collaborative Programme among most European countries, aimed at facilitating the long-term conservation on a cooperative basis of plant genetic resources in Europe and their increased utilization. The Programme, which is entirely financed by the participating countries and is coordinated by a Secretariat at Bioversity International, operates through broadly focused Networks dealing with groups of crops or general themes related to plant genetic resources.

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### RELATED INFORMATION



The International Treaty

### Highlights

#### EUROGENEBANK PROPOSAL SUBMITTED

In response to the Seventh Framework Programme call FP: INFRA-2010-1.1.7, Plant Genetic Resources Centres, Bioversity International has coordinated the preparation of the project proposal **EUROGENEBANK**.

The proposal was submitted on **3 December 2009**. For more information on the submitted proposal, [click here](#)



[http://aegis.cgiar.org/about\\_aegis.html](http://aegis.cgiar.org/about_aegis.html)

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# AEGIS Member countries



## Member countries

The following countries have signed the MoU:



1. **Albania** (6 May 2009)
2. **Azerbaijan** (16 July 2009) - Associate Members
3. **Bosnia and Herzegovina** (19 May 2010)
4. **Bulgaria** (2 December 2009) - Associate Members
5. **Croatia** (2 December 2009) - Associate Member
6. **Cyprus** (15 September 2009) - Associate Member
7. **Czech Republic** (23 July 2009)
8. **Denmark** (22 February 2010)
9. **Estonia** (22 May 2009) - Associate Members
10. **Finland** (2 December 2009)
11. **Georgia** (18 May 2009) - Associate Member
12. **Germany** (9 September 2009) - Associate Members
13. **Iceland** (22 February 2010)
14. **Ireland** (22 July 2009)
15. **Lithuania** (12 October 2010)
16. **Montenegro** (16 December 2010)
17. **The Netherlands** (28 May 2009) - Associate Members
18. **Norway** (17 August 2009)
19. **Poland** (17 May 2010)
20. **Portugal** (20 November 2009)
21. **Romania** (14 April 2010)
22. **Slovakia** (16 June 2009)
23. **Slovenia** (21 September 2009) - Associate Members
24. **Switzerland** (27 May 2009) - Associate Member
25. **Ukraine** (30 April 2009)
26. **United Kingdom** (18 June 2010) - Associate Member

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## 4. The European Collection



- The European Collection will consist of **dispersed accessions** ('unique and/or important'), maintained by genebanks as a virtual collection
- Through signing the **MOU** countries accept responsibilities for **long-term conservation** and **availability of EA**, 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

# Selecting European Accessions



- Main players are **Crop Working Groups** and **Countries**
- Simplified **selection procedure** to identify European Accessions, including MAAs, available
- **Selection Requirements** have been approved by the Steering Committee (see later)
- No precise **definition** of MAA exists (as **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

# General principles of European Accessions



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



# General principles of European Accessions (cont.)



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

# Selection Requirements

**Need all to be fulfilled/met**



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).

# 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) duplicate 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

# MAAs: 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)

# MAAs: simplified selection procedure - 1



1. WGs (or delegates) to **elaborate a list** from 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** (e.g.: Avena, Brassica, Forages, etc., see AEGIS web site)
  - All selected accessions must meet “selection requirements”
  - Not worry about “governmental control” (*at this stage*)
  - Mainly focus on genetic uniqueness and/or importance
  - Can exclude categories, such as: “hybrids”, “unknown accessions”
  - Not a “core collection” (*as some groups/individuals have thought*)

## MAAs: simplified selection procedure - 2



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 NCs for consideration of possible inclusion in the European Collection

# MAAs: simplified selection procedure - 3



5. NC, in close consultation with the holding institute(s), indicates to WG **whether or not proposed accessions can be included in European Collection**
  - Accessions proposed by the WG that are accepted by the country for inclusion, can be **flagged in EURISCO** as AEGIS Accessions (*by NFP*)
  - WG looks for **alternative accessions** for those not confirmed by NC and seeks acceptance for inclusion by a different holder

# MAAs: Selection Criteria

## Proposal Allium WG



According to **Allium WG** (2008) for shallot and garlic:

**Essential:** Molecular fingerprinting

**Other useful criteria:**

- Material with known origin
- Presence of passport data
- Health status
- Morphological characterization data
- Agronomic evaluation data

—▶ **CAN THESE NOW BE APPLIED TO DRAFT A FIRST LIST OF EUROPEAN ACCESSIONS ?**



# 5. AQUAS – AEGIS quality system – technical elements



1. **Operational genebank manual** – all AEGIS Associate Members; based on **genebank template** (finalized – AEGIS web site)
2. **Generic operational standards** – Secretariat (cooperation with FAO; inputs into draft also by ECPGR members; **discussed at Commission in July; US and Canada develop new version that includes evaluation standards; FAO requested for standards or guidelines on FGB and cryo; end of process in 2012?**)
3. **Agreed minimum crop specific technical standards** – all WGs (complementing generic standards); **decision to be made**
4. **Quality management system procedures** – Secretariat; all WGs; Associate Members:
  - a. record keeping
  - b. reporting
  - c. **monitoring (not policing, but guiding and advisory approach)**

## Crop specific standards - steps



- Working Groups are invited to initiate process of **crop specific technical standards**
- Develop workplan of next steps
- Agreed to complement generic standards (!??)
- Routine operations that require standards:
  - **Collecting / Acquisition**
  - **Regeneration / Propagation**
  - **Drying and other preparatory steps**
  - **Storage / field genebank / *in vitro* – cryo maintenance**
  - **Seed quality and viability monitoring**
  - **Distribution**
  - **Characterization and evaluation**

# AQUAS – Crop specific standards – the general process



- The Working Groups are requested to develop a **detailed workplan**
- As per the AQUAS Discussion Paper it is foreseen that the **Secretariat** provides **specific comments** and the **AEGIS Advisory Committee** “**across species**” **comments** on the draft **crop specific standards**
- the **Steering Committee** approves the standards

# AQUAS – garlic and shallot specific standards (2008)



- Field genebank collection (of most frequently requested accessions):
  - 40 clonal plants derived from one mother bulb; **more?**
- *In vitro* culture (for medium-term storage):
  - protocols defined
- Cryopreservation:
  - to be developed for shallot;
  - EURALLIVEG protocol for garlic (**to be updated?**)
- Phytosanitary standards:
  - Lower level (without virus elimination)
  - Higher level (with virus elimination) – only for important material

## 6. Some legal considerations

1. Legally binding **agreement** between all partners, i.e. the **Collective MOU** (already 26 concluded!)
2. **Associate Membership agreements** concluded between NC and collaborating institutes that will hold European Accessions or will provide other services
3. In case AEGIS countries have **not (yet) ratified IT**, we can still move forward with AEGIS as long as countries **accept AEGIS principles!**
4. Type of **MTA** to be used by AEGIS? —▶ **SMTA**  
(**proposed for Annex I and non-Annex I species; for Non-Annex I species with footnote**)

# Some legal considerations



5. All forms of a genetic resource (incl. DNA samples!) should be exchanged for agricultural use with SMTA
6. Importance of phytosanitary/quarantine considerations when exchanging germplasm
7. Germplasm accessions to be exchanged with pertinent information
8. Other?

## 7. Concluding comments



1. Due to high management costs **identification of duplicates** has high priority
2. **Passport and characterization data** might not be sufficient to identify duplicates —▶ molecular tools! (**EURALLIVEG?**)
3. Cryopreservation requires good **infrastructure** and specialized staff —▶ “centralization” of conservation (**EURALLIVEG!**)
4. Important to maintain **good links with field genebanks** for cryopreserved accessions —▶ networking essential! (?)
5. Consequently, **clear protocols** (i.e. minimum technical standards)!
6. Formal **long-term conservation commitments** of countries essential! (**AEGIS!**)

# Concluding comments



7. How would you consider to deal with the situation if more and 'new' **accessions will be added** to European Collection (?)
8. Any other questions that you might have?  
**If so, contact the Secretariat for advice**



# FP7 Research Infrastructure 2012 call - text



**Plant Genetic Resources Centres.** *A project under this topic should aim at integrating **and facilitating access to** the key European research infrastructures for holding genetic resources from crops **and wild plants**. It would cover **native seed banks**, gene and DNA banks and germplasm collections as well as related data resources. It will facilitate **access to expertise and tools for the genotyping of accessions** and will devise methods to maximize the utility of the collections for the identification of useful mutations in genes relevant to breeding.*

# FP7 Research Infrastructure 2012 call – text (cont.)



*The project will also develop activities for **the identification and rescue of endangered resources**. It should **develop the necessary collaborations inside Europe with the plant phenotyping infrastructures and outside Europe, towards a global sharing of available resources**.*

# PLANT GENE Access proposal



- The ECPGR Steering Committee endorsed/recommended the **ECPGR Secretariat** to coordinate the preparation of a project proposals
- Publication of the call: **20 July 2011**
- Expected submission deadline: **23 November 2011**
- Expected budget: ca. **Euro 10 million**
- Kick-off meeting with WP leaders: **Maccarese, 25-27 May**
- **Partners still to be defined**
- **WP leaders can be approached!**

# PLANT GENE Access proposal

## List of WPs



1. Coordination (J. Engels, ECPGR)
2. Access to germplasm (L. Maggioni, ECPGR)
3. Access to PGR information (S. Dias, Bioversity)
4. Quality assurance (M. Veteläinen, Finland)
5. European Collection (NN, Spain ?)
6. Knowledge base (I. Faberova, Czech Republic)
7. Documentation (Th. van Hintum, The Netherlands)
8. Joint Research (C. Allender, UK)
9. Genotyping (NN, Germany or Italy??)
10. Endangered resources (M. Rasmussen, NordGen)
11. Capacity building (Jelka Sustar-Vozlic, Slovenia)



Thank you!