



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

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# 0. Introductory notes

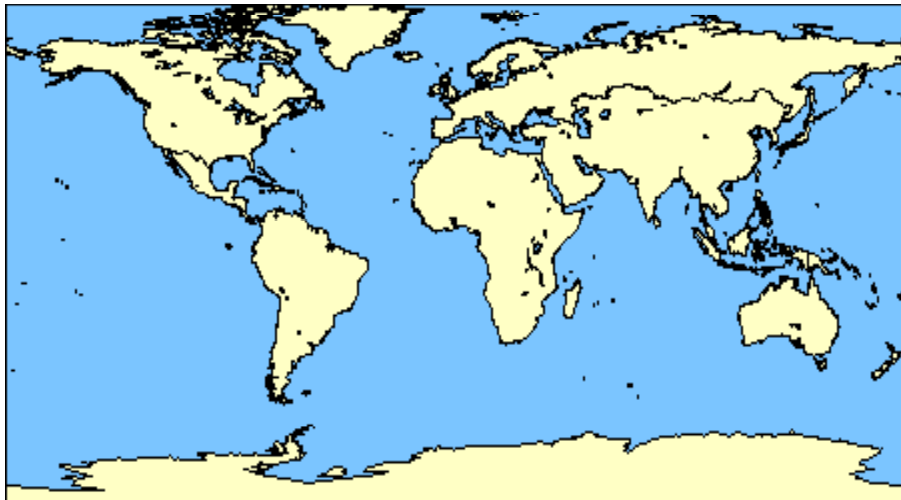


- Appreciation of being invited
- From an AEGIS perspective the *Allium* Working Group is exemplary:
  - a) Pro-active in developing AEGIS elements
  - b) Using a mix of funding opportunities that all contribute to this goal (ECPGR WG and costing study; EU GENRES; AEGIS Grant)
  - c) Trying to upscale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

# 1. Background to AEGIS



## ■ Worldwide



- About **1,800** genebanks/collections
- Approx. **7.5 million** accessions
- Estimated **2 million unique**
- Approx. **30,300 Allium** accessions held in **81 countries** (WIEWS, 2011)

## ■ Europe



- App. **625** genebanks/germplasm coll.
- **> 2 million** accessions
- **30-40% unique** (estimate)
- Approx. **16,400 Allium** accessions
- Held in **77 genebanks; 32 countries**

# 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



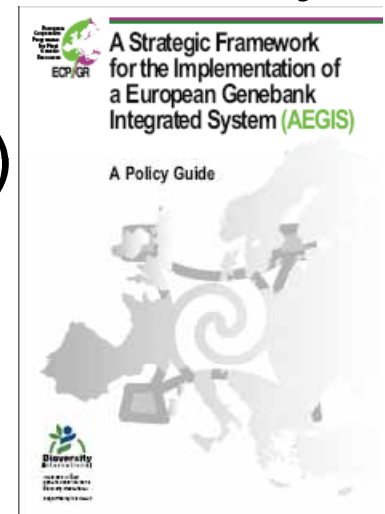
# Establishment and milestones of AEGIS



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
10. **EUROGENEBANK** proposal to **FP7 Research Infrastructure Call**; met threshold but not selected for funding; consideration to re-submit 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** (contains identified and by countries agreed MAAs for each crop; in public domain; readily available)
4. **Generic and crop specific standards; template** for development of **genebank manuals**



# Key components of AEGIS



5. Quality management system (reporting; monitoring; capacity building)
6. 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

7. Dedicated AEGIS website:



## A European Genebank Integrated System



AEGIS > 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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## 4. The European Collection



- European Collection will consist of **selected and designated** dispersed European Accessions (EAs)
- Through signing **MOU** countries accept responsibility for **long-term conservation** and **availability of EA**
- EAs conserved/managed according to agreed **technical standards, including safety duplication** (generic and crop specific)
- **Conservation/management strategies** for each crop to be prepared by respective Crop WG/NCG and approved by SC

# The European Collection



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

# 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



- 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 considerations has **prevalence** over the others, or that the selection should be the result of a **combination of two or more** criteria



# MAAs: Selection Criteria



## Suggested Selection Criteria (a reminder):

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: Selection criteria



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
- Agronomic evaluation

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

# MAAs: simplified selection procedure



1. WGs to develop **crop specific selection criteria** for identification of the Most Appropriate Accessions (MAAs) (selection among “duplicates”)
2. WGs (or delegates) to elaborate a list from a crop “pool” of **candidate accessions** , as documented either in EURISCO and/or in CCDB, regardless MoU, Associate members, etc.
3. **All selected accessions** must meet Selection Requirements (WG should mainly focus on genetic uniqueness)
4. **Selection Criteria** are used to select among duplicates (also considerations of management practices)

# MAAs: simplified selection procedure



5. **WG sends list with candidate accessions to respective NCs** for consideration of possible inclusion in the European Collection
  - Also inviting the country to check if any other accessions conserved in country could be included in European Collection
  
6. **NC, in close consultation with the holding institute(s), and as the national focal point,** 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
  - WG looks for alternative accessions not confirmed by NC and seeks acceptance for inclusion by a different holder

## 5. AQUAS – AEGIS quality management system



- Development of a **quality management system**, including generic and crop operational standards, reporting and monitoring
- **Discussion paper** endorsed by SC; on the AEGIS website
- Template for **operational genebank manual** prepared and Secretariat will request AEGIS member genebanks to develop their manual
- Draft of **generic genebank standards**: collaboration with FAO; draft was available for comments until 16 Feb.

# AQUAS – AEGIS quality management system



- The Working Groups are requested to develop a **detailed workplan of the next steps of the development process of the crop specific standards**
- 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 (**now to be updated?**)
- Phytosanitary standards:
  - Lower level (without virus elimination)
  - Higher level (with virus elimination) – only for important material

# AQUAS – crop specific standards



- Do they need adjustments (**already 3 years old**)?
- Are they complete for all operations (**i.e. other than cryopreservation activities**)?
- Define a **workplan** to develop and agree on all the required technical standards for the *Allium*
- Can the crop specific standards **for garlic/shallot** be **confirmed and formally agreed** by the Group?



## 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 (**EURALLIVEG**)
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)! (**EURALLIVEG**)
6. Formal **long-term conservation commitments** of countries essential! (**AEGIS!**)

# Concluding comments



7. It is assumed that you know already the **European *Allium* Accessions** (at least from the participating institutes) (not only for garlic but also other species?)
8. How would you consider to deal with situation if more **accessions will be added** to European Collection (?)
9. Did you already develop **all** the **technical standards** for both, field genebank as well as cryo/*in vitro* and all the crops?
10. **Maybe we can revisit some of these points at the end of workshop?**



Thank you!

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