

# Report of a Working Group on Grain Legumes

Fifth Meeting, 7-8 May 2013, Novi Sad, Serbia  
L. Maggioni, M. Ambrose and E. Lipman







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**Bioversity International** is the only global non-profit research organization that places the use and conservation of agricultural biodiversity in smallholder farming systems at the centre of its work. Bioversity is a member of the Consultative Group on International Agricultural Research (CGIAR) Consortium, a global association of public and private members to create a food secure future.

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**The European Cooperative Programme for Plant Genetic Resources (ECPGR)** is a collaborative programme among most European countries aimed at contributing to national, sub-regional and regional programmes in Europe to rationally and effectively conserve *ex situ* and *in situ* Plant Genetic Resources for Food and Agriculture and increase their utilization. The Programme, which is entirely financed by the member countries, is overseen by a Steering Committee composed of National Coordinators nominated by the participating countries and a number of relevant international bodies. The Coordinating Secretariat is hosted by Bioversity International. The Programme operates through nine networks in which activities are carried out through a number of permanent working groups or through ad hoc actions. The ECPGR networks deal with either groups of crops (cereals; forages; fruit; oil and protein crops; sugar, starch and fibre crops; vegetables) or general themes related to plant genetic resources (documentation and information; *in situ* and on-farm conservation; inter-regional cooperation). Members of the working groups and other scientists from participating countries carry out an agreed workplan with their own resources as inputs in kind to the Programme.

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Modern bean variety, *Phaseolus vulgaris* L. var. 'Balkan'. Courtesy of © M. Vasić, Institute of Field and Vegetable Crops, Novi Sad, Serbia.

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## SUMMARY REPORT OF THE MEETING

### Introduction

The fifth meeting of the Working Group on Grain Legumes of the European Cooperative Programme for Plant Genetic Resources (ECPGR) was held during 7-8 May 2013 in Novi Sad, Serbia. It was organized in collaboration with the Institute of Field and Vegetable Crops, Novi Sad.

Mike Ambrose, Chair of the Working Group (WG), opened the meeting. The fifth meeting of the WG had been scheduled for April 2010 in Turkey, but it had to be cancelled at the last minute due to restricted travel following the volcanic eruption in Iceland. The meeting was therefore rescheduled just before the end of Phase VIII of ECPGR. This is a time of changes for the Programme, requiring fresh plans to adapt to the new course of the ECPGR. Also, this will be the last meeting to be organized with the entire WG according to the format followed since inception. This meeting was therefore an important occasion to learn about members' experiences and explore how best the Group could organize itself operationally in the future without meetings and prepare for the future mode of operation of the ECPGR. Considering the message from the Steering Committee (SC) that the WGs need to focus on very specific areas, M. Ambrose proposed to identify crop-specific interest groups to create areas of common interest and to deal with substantial issues in the sub-groups. Highlights of the meeting included the initiative for *A European Genebank Integrated System* (AEGIS), the genebank standards and the Central Crop Databases (CCDBs). M. Ambrose thanked the local organizers, specifically Aleksandar Mikić, who played a pivotal role in the preparation of the meeting, but was unfortunately not able to join the Group.

The participants briefly introduced themselves, their affiliation and main crop of interest.

The draft agenda was approved, with the proposal to allow time for discussing possible projects for the future.

### ECPGR and the Working Group on Grain Legumes

#### **Update on the ECPGR**

Lorenzo Maggioni, ECPGR Coordinator, updated participants on the status of the ongoing Phase VIII (2009-2013) of the ECPGR Programme. The budget of the Grain Legumes WG and its planned use were presented. He reported on the status of development of the European Plant Genetic Resources Catalogue (or European Internet Search Catalogue, EURISCO) which contains a total of 145 808 grain legumes accession data. The participants were informed about the steps leading to Phase IX of the ECPGR, following the Programme's Independent External Review of July 2010. Phase IX (2014-2018) will be launched with new objectives, a new operational structure and a total budget of € 2.5 million. Subsequent to the tender, the Secretariat will be moved to Bonn, Germany, where it will be hosted by the Global Crop Diversity Trust, while EURISCO will be moved to the Leibniz Institute of Plant Genetics and Crop Plant Research (IPK) in Gatersleben, Germany.<sup>1</sup> L Maggioni then presented the new goal and objectives of the ECPGR, as agreed by the SC in Bratislava, Slovakia, in December 2010. The main changes in the mode of operation of the ECPGR in the next Phase were also explained to the Group. These include the elimination of Networks and the confirmation of existing Working Groups, which would now be composed of pools of

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<sup>1</sup> Update at time of publication: Owing to the decision of the Trust in November 2013 to withdraw its offer, the move of the Secretariat to Bonn is no longer scheduled.

experts rather than country representatives. Proposals for activities in line with ECPGR objectives will be evaluated and approved every 6 months, with each activity typically not exceeding € 15 000 and the participation of 12 members. A system of country quota system will be maintained.

The main challenges in the future will be the uncertain or reduced financial commitment of a few countries in Phase IX and effective operation of the Secretariat in the new environment according to a new ECPGR mode of operation still to be tested and implemented. Opportunities were seen in the European Collection becoming the focus for the regional state of the art of *ex situ* conservation (including capacity building). Endorsement by the National Coordinators of *in situ* and on-farm conservation concepts, currently under preparation, will strengthen collaboration in this area. Phase IX is expected to lead to further development of EURISCO to better serve the needs of the WGs. The other expected outcome is a strengthening of dialogue and collaboration with the European Commission (EC) and germplasm users.

In reply to questions, L. Maggioni clarified a few concepts expressed in his presentation:

- Sub-regional networks within the ECPGR can reinforce the sense of community by enabling countries to participate in and benefit from regional collaboration.
- Categories of users to be involved in a more intense dialogue include breeders, researchers, farmers and curators of botanic gardens.
- The role of the WG Chairs will need to be revised since they will have the additional responsibility of keeping the WGs together in the absence of regular meetings and will have to coordinate submission of proposals for activities to be funded by the ECPGR under a competitive scheme.

### **The Chair's report**

Mike Ambrose summarized the achievements and activities of the WG:

- Publication of two refereed papers:
  - Suso MJ, Vishnyakova M, Ramos Á, Duc G, Ambrose M. 2011. [An International Survey on State of the Art of Grain Legume Management in Gene Banks](#). *Journal of Agricultural Science and Technology B* 1:975-981.
  - Jing R, Ambrose MA, Knox MR, Smykal P, Hybl M, Ramos Á, Caminero C, Burstin J, Duc G, van Soest LJM, Świącicki WK, Pereira MG, Vishnyakova M, Davenport GF, Flavell AJ, Ellis THN. 2012. [Genetic Diversity in European \*Pisum\* Germplasm Collections](#). *Theoretical and Applied Genetics* 125(2):367–380. DOI 10.1007/s00122-012-1839-1.
- Maintenance of nine European Central Crop Databases:
  - *Cicer* Database
  - *Glycine* Database
  - *Lathyrus* Database<sup>2</sup>
  - *Lens* Database
  - *Lupinus* Database
  - *Phaseolus* Database
  - *Pisum* Database
  - *Vicia faba* Database
  - *Vigna* Database.

Details are posted on the [dedicated web page](#) of the ECPGR website.

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<sup>2</sup> Now discontinued, see page 8.



- Focus role for Grain Legumes genetic resources in Europe.
- Responses to ECPGR Steering Committee on operational performance.

The Chair considered that the organization of this meeting towards the end of Phase VIII of the ECPGR offers an opportunity to plan ahead into the next Phase. To improve operational effectiveness, he proposed the establishment of crop-specific interest groups to assist in the preparation of project proposals, coordinate exchange of information, support the CCDBs in the AEGIS activities, promote emergency actions, etc. The groups will serve as contact and reference points. Members signed up for the different groups of interest, and coordinators were selected (see Table 1). The list forms a starting point; other members interested to lead and participate can also join in.

**Table 1.** Crop-specific interest groups

<b>Crop</b>	<b>Coordinators</b>	<b>Members</b>
<i>Cicer</i>	S. Kratovalieva (MKD) and another to be confirmed	O. Bezougla (UKR), I. Huňády (CZE), V. Kirian (UKR), A. Pallides (CYP), S. Petrova (BGR), E. Tuğay Karagül (TUR)
<i>Lathyrus</i>	To be confirmed	V. Kirian (UKR), A. Pallides (CYP), S. Petrova (BGR), W. Rybiński (POL), S. Silenko (UKR), M. Vasić (SRB)
<i>Lens</i>	L. de la Rosa (SPA)	I. Huňády (CZE), V. Kirian (UKR), L. Kobyzeva (UKR), M. Perez de la Vega (SPA), E. Tuğay Karagül (TUR), M. Vasić (SRB)
Lupin	B. Ruge-Wehling (DEU)	G. Duc (FRA), I. Huňády (CZE), S. Petrova (BGR) W. Święcicki (POL), M. Yauseyenko (BLR)
Peanut	S. Kratovalieva (MKD) and R. Hovav (ISR)	
<i>Phaseolus</i>	V. Meglič (SLO) and M. Vasić (SRB)	O. Bezougla (UKR), C. Brezeanu (ROU), I. Huňády (CZE), W. Kainz (AUT), V. Kirian (UKR), S. Kratovalieva (MKD), A. Sudaric (HRV), E. Tuğay Karagül (TUR)
<i>Pisum</i>	Küllü Annamaa (EST) and Mike Ambrose (GBR)	G. Carlsson (SWE), G. Duc (FRA), I. Huňády (CZE), H. Känkänen (FIN), L. Kobyzeva (UKR), A. Pallides (CYP), M. Perez de la Vega (SPA), S. Petrova (BGR), G. Poulsen (DNK), S. Solberg (NordGen), W. Święcicki (POL), E. Tuğay Karagül (TUR)
Soybean	To be confirmed	I. Huňády (CZE), L. Kobyzeva (UKR), L. Narits (EST), G. Poulsen (DNK), A. Sudaric (HRV), E. Tuğay Karagül (TUR)
<i>Vicia faba</i>	E. Tuğay Karagül (TUR)	M. Ambrose (GBR), G. Carlsson (SWE), G. Duc (FRA), I. Huňády (CZE), H. Känkänen (FIN), V. Meglič (SVN), L. Narits (EST) S. Petrova (BGR), G. Poulsen (DNK), M. Vasić (SRB)
<i>Vigna</i>	To be confirmed	O. Bezougla (UKR), C. Brezeanu (ROU), E. Tuğay Karagül (TUR)

Note: Emails of members who do not belong to the ECPGR WG:

Poland: Wojciech Rybiński (curator of *Lathyrus* collection): wryb@igr.poznan.pl

Ukraine: Olga Bezougla (curator of *Phaseolus*, *Vigna* and *Cicer* collections): ncpgru@gmail.com

Viktor Kirian (legume collection maintained in the Ustyimivka Experimental Station): uds@kremen.ukrtel.net / udsr@ukr.net

Sergiy Silenko (curator of *Lathyrus* collection): uds@kremen.ukrtel.net

### Workplan

The coordinators of the *Cicer*, *Lathyrus*, Soybean and *Vigna* interest groups are to be identified by end 2013. The Chair will follow-up on the nominations with the support of the ECPGR Secretariat.

## Update on AEGIS

L. Maggioni presented the major milestones and the key components of AEGIS, including the Memorandum of Understanding (MoU) and the Associate Membership Agreement (AMA), which underpin membership to AEGIS. Thirty-three countries signed the MoU and 51 genebanks signed AMAs with their respective National Coordinators. L. Maggioni briefly described the main elements of the AEGIS Quality System (AQUAS).

Special attention was paid to the European Collection, consisting of dispersed accessions (“unique and/or important”) that had been identified and approved as European Accessions by the holding countries; these are maintained by genebanks as a decentralized collection. At the time of the meeting, the Collection included 11 524 accessions, mainly from the Dutch and German genebanks. A legally binding MoU is signed by countries that accept the responsibility for long-term conservation and management of the European Accessions in accordance with agreed quality standards and the condition to make this material available to users.

A simplified selection procedure for the European Accessions is being used by a number of WGs. Applying the selection requirements that each European Accession has to fulfil, the WG first compiles a list for a given crop from the entire pool of accessions maintained in European genebanks, using the data available in EURISCO and the corresponding Central Crop Database (CCDB). In case two or more accessions identified as candidate European Accessions turn out to be duplicates, crop-specific selection criteria – to be defined by each WG – are used for identifying the Most Appropriate Accessions (MAAs) among that group of potential duplicates. Alternatively, candidate European Accessions can be directly identified by the WG member countries with a focus on genetically unique accessions that have their origin in the respective countries and that are offered for inclusion in the European Collection. The accessions selected and accepted for inclusion in the European Collection have to be flagged in EURISCO as AEGIS Accessions by the EURISCO National Focal Point.

## Discussion

Gert Poulsen remarked that each genebank should check at country level whether the resources and authority needed for this undertaking were in place before signing the AEGIS Associate membership.

M. Ambrose asked whether it would be realistic for DB managers to analyse data to identify lists of accessions to be included in the European Collection and suggested that volunteers could take lead in this process.

The response of the Group was generally positive. Criteria for the initial selection of European Accessions were:

- Country of origin (to be the same as that of the holding genebank)
- Sample status (starting with cultivars, since they have names and are therefore easier to distinguish as unique)
- Accession name (needs to be present).

The Group was reminded that the Centre for Genetic Resources, The Netherlands (CGN) had developed “Duplicate Finder,” a software to help in the identification of unique accessions, which is available online (<http://documents.plant.wur.nl/cgn/pgr/aegisdf>).

The Group agreed on the following workplan:

### Workplan

- W. Kainz will launch the process with both *Phaseolus* and *Vigna*, starting with cultivars since they have names and are therefore easier to distinguish as unique. After a preliminary analysis, he will contact all the identified maintainers with a proposal to include the given accession in the European Collection (**by the end of summer 2013**);
- W. Święcicki will do the same for *Lupinus* (**by end June 2014**);
- M. Ambrose will do the same for *Pisum* (**by end 2013**);
- G. Duc will do the same for *Vicia faba*, with a reservation regarding the time schedule (to be reviewed before the end of 2013).
- E. Tuğay Karagül will check whether it is possible to analyse the *Lens* database (**by end 2013**).
- The Secretariat agreed to help formulate a letter for contacting the partners, when requested.

### AEGIS Quality System (AQUAS)

#### **Brief overview of AQUAS**

L. Maggioni explained the principles of the AEGIS Quality System (AQUAS). They include the need for consensus, agreement on minimum standards, acknowledged need for capacity building, minimum bureaucracy and establishment of a monitoring system. Elements of AQUAS include: a template to be compiled by each associate member as its current operational genebank manual, generic and crop-specific operational standards to be agreed by the WG, an AEGIS safety-duplication policy, an AEGIS distribution policy (in preparation<sup>3</sup>) and a reporting and monitoring mechanism (in preparation).

#### **Overview of the draft FAO Genebank Standards**

S. Kratovalieva presented an overview of the [Genebank Standards for Plant Genetic Resources for Food and Agriculture](#), endorsed by the XIVth Regular Session of the FAO Commission in April 2013. The standards relate to conservation of orthodox and non-orthodox seeds and vegetatively propagated plants.

She summarized the agreed standards for the ten sections in which the document is divided: 1. Acquisition, 2. Seed drying and storage, 3. Viability monitoring, 4. Regeneration, 5. Characterization, 6. Evaluation, 7. Documentation, 8. Distribution, 9. Safety duplication and 10. Security/personnel.

She suggested that the standards could be further elaborated by the WG, specifically for the wild species, covering the following areas:

1. Acquisition (size of seed samples)
2. Viability monitoring (difficulties due to the nature of seeds)
3. Regeneration or multiplication (condition, sample size, special handling)
4. Characterization and evaluation (descriptors)
5. Distribution (size of seed samples).

### Discussion

Members were informed that local genebank manuals, based on the provided template, were under development at the John Innes Centre (JIC, UK), at the Estonian Crop Research Institute and at the Nordic Genetic Resources Centre (NordGen, Sweden).

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<sup>3</sup> Update at time of publication (December 2013): the document, now entitled *Guidelines for Distribution of Material from the European Collection*, is pending final approval by the Steering Committee.

It was clarified that the genetic integrity requirement refers to each single accession and not to the collection as a whole.

Phytosanitary aspects were highlighted as being particularly critical for grain legumes because of the incidence of viral and bacterial infections and the high cost of disease eradication. The associated costs of acquiring such certificates were noted. Given the new economic climate, these costs would inevitably have to be passed gradually on to recipients;

Considering the different germplasm import and export rules, the Group was asked to reflect on a strategy to help deal with these issues. The *Vitis* WG, for example, is developing a simplified protocol for the movement of propagation material across countries within and outside the EU, which will be submitted to the European Central Phytosanitary Service.

M. Ambrose stressed the importance of developing standards for the viability and sample size of mutation stocks that require special attention (e.g. pea) as an addendum to the general standards of other materials.

Regarding the number of seeds to be supplied when distributing autogamous grain legumes, M. Perez de la Vega thought that 30 seeds should suffice, although for outbreeding species it would be more questionable.

G. Poulsen thought that the FAO standards for the number of individuals to be used for regeneration were too general since they depended on the sample status and that the WG should set a guideline.

S. Kratovalieva suggested that minimum distances between plants during regeneration should be suggested more precisely for both self- and cross-pollinated species.

The occurrence of variable rates of outcrossing in predominantly autogamous legumes was also considered. M. Ambrose reminded the Group that the Task Force that looked at regeneration procedures had captured experiences and recommendations in the paper by Suso et al. (2011) mentioned earlier (page 2).

The Task Force also hoped to collect information from various genebanks on the rate of outcrossing and on pollinators, flora morphology and wild species.

### **Recommendations**

- The Group agreed that crop-specific standards would need to be developed and “groups of interest” should be established to lead this task (see below, thematic interest group 3, “AEGIS Quality System”).
- The Group recommended that the Associate Member genebanks complete their genebank manuals based on the AEGIS template as soon as possible.

### **Workplan**

- Mike Ambrose will circulate members’ experiences about regeneration standards compiled in the paper by Suso et al. (2011), and will propose a standard for endorsement by the WG (**by end November 2013**).

## Grain Legume European Central Crop Databases: progress reviews and relationship with AEGIS

Database Managers reported on the progress made for each Grain Legume European Central Crop Database (CCDB) in terms of current status and accessibility.

Presentations available online are preceded by an asterisk (\*).

### **Arachis**

The Database Manager was unable to attend the meeting and no information was received.<sup>4</sup>

### **Cicer**

The Database Manager was unable to attend the meeting and no information was received.

### **Glycine**

The Database Manager was unable to attend the meeting and no information was received.

### **\* Lens**

*E. Tuğay Karagiül, on behalf of L. Aykas*

The database was last updated in 2010, mainly by retrieving data from EURISCO. It contains data on 8095 accessions. Data quality needs to be improved: for example, only 20% of the data is georeferenced and 23% of the accessions are of unknown status. Several examples of identification of duplicates were given, which also shows the difficulty of data analysis due to imprecise or missing county of origin, accession names, donor institute, etc.

Priorities for future development of the database are improvement of data quantity and quality, web page development, improvement of characterization and evaluation data delivery by the WG members, and identification of possible duplicates.

The database indicates that safety duplication is far from complete (information is available on 1046 accessions). No information is available on the multiplication of accessions.

Members believed that crop-specific data analysis can be carried out more easily using the Central Crop Database than EURISCO, although EURISCO has been the main source of data.

### **Discussion**

M. Perez de la Vega was surprised to see that *L. odemensis* hardly figures in the collections (only 3 accessions listed in the database) since it contains useful traits, such as disease resistance, for breeding. He also pointed out that *L. montbretii* is not an accepted name but a synonym of *Vicia montbretii*.

### **Lathyrus**

G. Duc indicated that no information had been received from the Database Manager, Daniel Combes, and that he would follow up.<sup>5</sup>

### **\* Lupinus**

*W. Święcicki*

The idea for a World *Lupinus* Database was presented for the first time at the

<sup>4</sup> It was confirmed after the meeting that no data from other countries had been received by the Database Manager and therefore the European *Arachis* Database could not be developed.

<sup>5</sup> Update at time of publication: Daniel Combes has retired and the French *Lathyrus* collection has been moved to the Conservatoire Botanique National de Bagnères de Bigorre (BP 70315, 65203 Bagnères de Bigorre cédex; tel 0033 5 59407966; [contact@cbnmpm.fr](mailto:contact@cbnmpm.fr)). The maintenance of the *Lathyrus* Database has not been continued after the retirement of D. Combes.

Vth International Lupin Conference at Poznań, Poland (1988). The European Lupin Genetic Resources Database was created following the First Meeting of the ECPGR Working Group on Grain Legumes in Copenhagen, Denmark (1995). The first version of the common database for World *Lupinus* collections was presented at the IXth International Lupin Conference at Klink, Germany (1999). An updated version was prepared for the XIIIth International Lupin Conference at Poznań (2011).

The Database currently records a total of 13 964 accessions from 13 centres in 10 countries (8 European countries contributing 57% of the data; USA for New World lupins and Australia for data from collecting missions). Old world lupins represent 76% of the records (10 663 accessions). Lupin crops represent 71% of the records (*L. albus*, *L. angustifolius*, *L. luteus* and *L. mutabilis*). South American lupins are not represented in the database.

A comparison of the world distribution of lupins and the contents of the database shows some gaps in coverage. Collecting missions are urgently needed for wild lupins, e.g. *L. digitatus* and *L. pincei*. There is no accession of *L. somaliensis*.

### **Discussion**

A question was raised concerning phytosanitary problems.

A severe disease (*Colletotrichum lupini*) was reported to have appeared in the 1990s, probably imported from South America, which destroyed lupin crops in Germany, Poland, Belarus and other areas.

This disease risk is not managed in any special way, other than inspecting plants in the field. The disease is transmitted by the seed surface and it disappears after 3-4 years in storage.

Earlier, fungicides were used since the genetic source of resistance was not known. Then Australian breeders identified the resistance gene in *L. angustifolius*. At present, phytopathological tests for mass screening are routinely used in breeding programmes. Progress in resistance breeding is less advanced for *L. luteus* and *L. albus*.

B. Ruge-Wehling informed the Group that breeders in Germany also found resistance in *L. angustifolius* and are working with molecular markers to locate the relevant gene(s).

### **\* Phaseolus**

W. Kainz

The *Phaseolus* Database contains over 46 000 records, including more than 1000 characterization data and 585 photos. Among the problems faced is the difficulty in obtaining data from members. EURISCO therefore becomes an essential data source, but downloading from EURISCO is problematic, and it is impossible to acquire characterization data. A very large number of accessions (nearly 6000) are of unknown origin.

### **Discussion**

Participants were surprised to note the small number of *P. coccineus* accessions.

An example of good cooperation within the WG surfaced during the discussion when it was revealed that an institute in Austria is the only site conserving a well characterized old French accession.

Participants acknowledged that photographs (pods with three stages of maturity on grey background) show the characters better than any description.

### **\* Pisum**

M. Ambrose

The database was revised and updated in 2013. Although the current version includes the USDA database, EURISCO will be used for database updates in the future, given that funds

will be allocated to it. This will simplify the updating process and help saving time and resources.

The ECPGR *Pisum* Database contains details of holdings in 43 collections from 26 European countries; it comprises a total of 32 503 entries. These mainly represent cultivars and landraces, but also a significant number of wild samples and genetic stocks. An analysis of frequency of names revealed repetition of some names and of the term 'local' in different languages. No new entries were introduced in the top 50 list of duplicate names from materials released during the 1990s or early 2000s. This shows that there was extensive duplication of material in the 1970s but it has significantly decreased in recent years, perhaps as a result of self-regulation and a wider appreciation of the sharing of responsibility and effort.

In collaboration with the Global Crop Diversity Trust, M. Ambrose undertook gap analysis of *Pisum* using the database and found that some pea material is under-represented.

#### \* *Vicia faba*

*G. Duc*

The ECPGR *Vicia faba* Database was compiled as an Excel file in 2007 and posted on the ECPGR website. It contains data for 12 475 accessions from 28 collections.

During 2013-15, the database will be updated with verified passport data of old and new collections, as well as addition of phenotypic data when available. The database will be prepared for adding molecular markers data. It will need a host website, one option being that of the existing [LegumBase](#).

#### Discussion

The Group agreed on the use of the LegumBase website, as long as the ECPGR data are clearly highlighted.

#### **Central Crop Databases and EURISCO**

L. Maggioni presented a few slides on the comparison between CCDBs and EURISCO for each grain legume crop. He highlighted that a number of accessions in the *Lens*, *Lupinus*, *Phaseolus* and *Vicia faba* Databases had no known institute code.

#### Discussion

M. Ambrose requested the DB Managers to list the points of difference between EURISCO and their DB. The information will be useful for evaluating them in the wider ongoing discussions of the two systems. It will thus be easier to decide on the suggestions to be made for the upcoming Documentation and Information Network meeting.

#### Workplan

- All Grain Legume Database Managers should provide the Chair with a short report indicating the points of difference between EURISCO and their respective databases. The information will be used for deciding on suggestions to be made to the Documentation and Information Network about the continued relevance of the CCDBs and their relationship with EURISCO (**before end 2013**).

## National collections

Country representatives provided an update of the status of their national collections. Presentations available online are preceded by an asterisk (\*).

### **Belarus:** Mikhail Yauseyenka

The collection includes 560 lupin, 220 bean, 146 soybean, 63 vetch, 43 faba bean and 61 other crops accessions.

### \* **Bulgaria:** Sofia Petrova

The national collection of grain legume crops is maintained at the Institute for Plant Genetic Resources, Sadovo, and it includes more than 10 000 accessions, of which about 50% are conserved in long-term conditions. The largest collections are those of *Pisum*, *Phaseolus* and *Vicia*. The highest proportion of Bulgarian accessions, including wild species, can be found in the *Vicia* collection. The *Arachis* collection is also important since Bulgaria is the largest producer of peanuts in Europe.

Collecting still continues; 150 accessions (mainly *Vicia faba* and *Phaseolus*) were collected in the past two years. Wild relatives are also collected, particularly those of *Cicer*, *Lathyrus*, *Pisum* and *Vicia*. Evaluation is carried out as part of resistance breeding programmes. The Institute collaborates with farmers for on-farm conservation.

### \* **Czech Republic:** Miroslav Hochman

The total number of accessions in the Czech grain legume collection is 4875, the largest collections being those of *Pisum* (2363) and *Phaseolus* (1134).

Three institutions maintain the Czech grain legumes collection:

1. AGRITEC, Research, Breeding & Services, Ltd., Šumperk (*Pisum*, *Vicia*, *Phaseolus*, *Glycine*, *Lupinus*, *Lens* and *Cicer*)
2. Research Institute of Crop Production, Prague, workplace Olomouc (*Pisum*, *Vicia faba* and *Phaseolus* used as vegetables).
3. Research Institute for Fodder Crops, Ltd. Troubsko (*Lupinus*, *Vicia*, *Cicer* and *Lathyrus* as fodder legumes).

Passport and evaluation data are available from the national information system [EVIGEZ](#). The entire collection of pea germplasm was analysed with molecular markers and is divided into nine clusters.

The Czech programme collaborates with the Department of Leguminous Crops of the N. I. Vavilov Research Institute of Plant Industry (VIR), St. Petersburg, Russian Federation. The aim is to collect seed samples and information on the genetic resources of the genus *Pisum*, to verify and validate newly acquired knowledge through field tests and molecular analysis and to create a line with defined properties for use in research and breeding work.

### \* **Estonia:** Külli Annamaa

The mandate of the Estonian plant genetic resources (PGR) programme is to conserve germplasm mainly of Estonian origin. Therefore only a small collection of approximately 250 accessions of grain legumes is maintained in the genebank. The main species conserved is *Pisum sativum* (80%), followed by *Phaseolus* and *Vicia faba*. Almost half the collection is made up of advanced cultivar accessions; the other half includes accessions of breeding lines.

Passport data, germination and storage information of all accessions are maintained in the data management system SESTO (hosted by NordGen), through which data in EURISCO are updated regularly.



Characterization and evaluation of field pea varieties of Estonian origin were carried out during 2010-12. Field trials for the description of garden pea accessions started in 2013.

Foreign accessions of chickpea, field pea, lentil and soybean requested from various genebanks were tested in field experiments for research and breeding.

**\* Finland:** Hannu Känkänen

Grain legume accessions (79 *Pisum sativum* and 32 *Vicia faba*) of Finnish origin are conserved at NordGen in Alnarp, Sweden.

With a view to enhance the competitiveness and self-sufficiency of Finnish agriculture, research focuses on more effective ways for utilizing the potential of nitrogen fixation through improved farming practices and new legume species. Ongoing studies examine the quality of faba bean as food and feed.

**\* France:** Gérard Duc

The Genetic Resource Centre for grain legumes, UMR Agroécologie, at INRA-Dijon maintains pea, faba bean and lupin collections. The pea collection comprises a core collection (93 accessions from 35 countries), a reference collection (372 accessions, mainly cultivated forms, which have been genotyped with simple sequence repeats (SSRs), retrotransposons and single-nucleotide polymorphisms (SNPs), a national collection (260 publicly available accessions) and a base collection (2900 accessions). A research collection with recombinant inbred lines and mutants is also maintained.

The *Vicia faba* collection is a base collection composed of about 1500 accessions, including mutants (50) and near isogenic lines (30). This material is mainly of European origin. The collection is of recognized international interest. Regeneration is carried out in insect-proof cages with manual self-pollination. The collection is used for research programmes with international partners; molecular characterization is under way within the framework of the national PEAMUST project.

The *Lupinus* collection contains about 600 accessions, mostly *Lupinus albus*, and is focused on Mediterranean countries.

Genebank data are available from [LegumBase](#).

The ECONET project funded by the French government established a Balkan-French collaborative network for collecting, phenotyping and evaluation of faba bean and pea.

A phenotyping platform for freezing hardiness was set up at the INRA research station at Chau-des-prés in the Jura mountains and a high throughput phenotyping platform at INRA-Dijon.

**\* Israel:** Ran Hovav

The new Israeli Gene Bank is a nuclear bomb-proof facility at the Agricultural Research Organization (ARO), Volcanic Center in Bet Dagan. The collection can be interactively searched online at <http://igb.agri.gov.il/main/search.pl>.

The peanut collection includes over 700 varieties from across the world and more than 3000 large size mutants. This germplasm is used in peanut breeding for disease resistance, improvement of shell colour, nutritional quality and yield under water stress.

The chickpea collection includes more than 300 accessions from more than 30 countries and an ethylmethanesulfonate (EMS) mutant population. It is used in chickpea breeding for resistance to abiotic and biotic stress, nutritional quality, yield and suitability to mechanical harvesting.

**\* Macedonia FYR:** Suzana Kratovalieva

The grain legume collection is maintained at the Agricultural Institute of the University Ss. Cyril and Methodius in Skopje. Following 39 collecting expeditions that took place

between 2008 and 2013 in Macedonia FYR, the collection has increased from 49 to 253 accessions. Eight legume crops are represented, with a high proportion of *Phaseolus* and *Cicer* accessions. The collection is documented in an Excel database, including characterization and evaluation data. Photographs are also included in the database.

**\* Nordic countries:** Gert Poulsen

The genebank of the Nordic countries at NordGen in Alnarp, Sweden, has a mandate to conserve only Nordic material. The *Pisum* collection includes a total of 2917 accessions, of which 1310 are of Nordic origin. The remaining accessions are classified as “Rejected”, which means that they are not actively maintained.

NordGen also conserves the Stig Blixt pea mutant collection (3309 accessions). Accessions of this collection were recently classified in different categories. NordGen has confirmed the responsibility for maintaining 1653 accessions (448 type lines, 703 Nordic materials and 502 special purpose material). The remaining accessions have insufficient or no information (458) or have been classified as duplicate holdings (1198) and may be “rejected”. However, “duplicate holdings” are not duplicate accessions, but duplicate alleles. These accessions may therefore be valuable and could be conveniently repatriated to their countries of origin.

**Discussion**

M. Ambrose informed the Group that discussion has already started between JIC and NordGen to formalize an agreement concerning responsibility for conservation of genetic stocks.

**Recommendation**

NordGen should check what is effectively available and provide information so that the material can be repatriated to the countries of origin. This material has been characterized to a large extent and can be the subject of a research activity of the Grain Legumes WG in the future.

**\* Poland:** Wojciech Świącicki

The Polish grain legumes collection contains 10 998 accessions covering the following genera: *Phaseolus* (3049 accessions), *Pisum* (2913), *Vicia* (1748), *Lupinus* (1234), *Glycine* (1122), *Lathyrus* (350), *Vicia* (224), *Ornithopus* (125), *Lens* (119) and *Cicer* (114). All accessions are conserved in long-term storage at the Plant Breeding and Acclimatization Institute (IHAR) in Radzików. In addition, *Lupinus* and *Pisum* genetic resources are maintained, multiplied and characterized as active collections at the Plant Experiment Station in Wiatrowo and those of *Lathyrus* at the Institute of Plant Genetics in Poznań. For the *Pisum* collection, which also covers Stig Blixt type lines for known genes and alleles, the accession genotype is described according to the chromosome map.

**\* Romania:** Creola Brezeanu

A table showing the taxonomic composition of the grain legumes collection and the number of samples added to the collection since 2007 was provided after the meeting.

**\* Slovenia:** Vladimir Meglič

The grain legumes collection maintained at the Agricultural Institute of Slovenia contains more than 1000 accessions, mainly of *Phaseolus vulgaris*.

The Institute participates in the collaborative SEELEGUMES project (*Sustainable preservation of indigenous South East European legumes and their traditional food and feed products*) of ERA.NET. One of the activities of the project is to organize expeditions for collecting information on landraces and their use.

Research projects were also carried out to evaluate faba bean and *Lathyrus* accessions and to analyse the genetic diversity of the *Phaseolus* bean germplasm originating from five south-eastern European countries.

**\* Spain:** Marcelino Perez de la Vega

Accessions in the Spanish grain legume collections, spread across 16 institutions, number nearly 25 000, of which more than 14 000 are documented in the national database. About 50% of the accessions are duplicated in the base collection, while 25% are present in two active collections. The total number of accessions of each legume crop and the respective countries of origin were given in the presentation. The majority of the accessions are of Spanish origin. The *Phaseolus* collection has a large representation of landraces. Recently, wild *Lens* samples collected in Spain were added to the collection.

**\* Turkey:** Eylem Tuğay Karagül

Between 1966 and 2006, a total of 6734 accessions of grain legume genetic resources were collected in Turkey, mainly bean, chickpea and lentil. In the past six years (2006-2012), additional 1327 accessions were collected, 1379 were regenerated and 576 were characterized (235 *Vigna unguiculata*, 225 *Vicia faba* and 116 *Cicer arietinum*).

Ongoing research projects on grain legume genetic resources in Turkey mainly focus on morphological and molecular characterization, diversity studies and breeding of beans and chickpea.

**\* Ukraine:** Viktor Kirian

The collection of grain legume crops (13 crops, 104 species) of the National Centre for Plant Genetic Resources is distributed across nine scientific and breeding institutions. The collection comprises 20 138 accessions (5204 bean, 3700 pea, 2864 soybean, 2642 chickpea, 2109 lupin, 1268 grass pea, 1018 lentil, 910 vetch, 294 faba bean, 123 cow pea and 6 *Dolichos*). The majority of the accessions represent cultivars (36%), landraces (30%) and breeders' lines (27%). During the past 20 years, 31 collecting expeditions were organized (including 14 international) and more than 4000 grain legume samples were gathered. Accessions imported from abroad are tested at the quarantine nursery of Ustymivka.

The system of the National Centre for Plant Genetic Resources of Ukraine annually evaluates 25 000-30 000 accessions for a complex of economically valuable and biological traits and indexes. At the same time, about 5000 accessions (300 grain legumes) are transmitted from the genebank to Ukrainian institutions to be used for scientific, breeding and educational programmes.

In January 2013, 14 598 samples of grain legumes (11 crops, 70 species) were incorporated in the base collection in Kharkiv (National vault). This represents about 70% of the total number of samples in the collection of the National Centre of Plants Genetic Resources.

Compiling of passport data is in progress: data for 13 858 accessions of ten grain legume crops (chickpea, cowpea, faba bean, grass pea, kidney bean, lentil, lupin, pea, soybean and vetch) from 12 scientific organizations were included in EURISCO.

Future planned activities include the enrichment of the national collection with new accessions, improvement of the national documentation system, study of the accessions for valuable breeding traits, creation of basic, feature-based, special, educational and other collections, increasing the number of accessions preserved for the long-term at the National Vault and providing material for use in breeding, scientific research, educational and other programmes.

## Inter-regional cooperation

### ***Global Crop Diversity Trust: Expert Group meetings on crop wild relatives of grain legume crops and the Trust's continuing online survey***

(Update by M. Ambrose)

The Trust's initiative on crop wild relatives aims to conduct a gap analysis, followed by further collecting and pre-breeding. The initiative seeks diversity which is currently missing in the genebanks. An expert group meeting on *Pisum* is scheduled for October 2013, probably at JIC; it will evaluate the gap analysis and focus on pre-breeding.

## Proposed new operational structure for the Working Group

M. Ambrose briefed the Group on the changes expected for the next Phase of the ECPGR.

Henceforth, full WG meetings will be replaced by meetings and actions of small groups (maximum 12 participants), which require small amounts of funding. The WG will thus effectively exist as a virtual entity only. WGs will need to compete for funds and prepare proposals addressing ECPGR priority objectives. This change will challenge the sense of community that the WG has developed and which has motivated ECPGR membership until now. In what ways can this sense of community without full WG meetings be maintained? The terms of reference for the WG Chair will change as the level of coordination required is likely to grow. How can this more demanding role be managed more effectively? Both the Secretariat and the WGs will have to adopt new working methods.

In response to these new challenges, the following rationale for the Grain Legumes WG and proposal for a new operational structure and areas of interest were outlined.

### ***Rationale for the Grain Legumes WG***

- To be the focal point within the ECPGR for grain legume (GL) PGR issues in an extended Europe
- To serve as the network of interest for GL in interactions with other organizations (Europe and beyond)
- To foster links between research and breeding communities
- To build capacity within the European region
- To be the focal point for emergency actions and resolution of issues for GL PGR in Europe.

### ***Grain Legumes WG proposal for a new operational structure***

- WG Chair and Vice-Chair to be responsible for high-level management, supported by the leaders of crop-specific and thematic interest groups
- Co-opting and mentoring of new WG members for taking over the Chair and Vice-Chair roles
- Regular review of workplan progress
  - 6 monthly, by objective
- Regular short progress report to WG members
  - AEGIS, CCDBs, other initiatives
- Forming and maintaining crop-specific interest groups
  - 2 coordinators
  - interest groups do not meet, so there is no limit to membership

- Forming of thematic interest groups
  - 2 coordinators
  - smaller size (issue of balance)
- WG member web pages to become effectively a European Grain Legumes GR portal and notice board
  - photographs, short biographies, link to GL collections and topics of interest, news of upcoming meetings.

### **Proposed areas for thematic interest groups**

1. Grain legumes in sustainable agricultural systems
2. Exchange of germplasm for evaluation in different environments with the objective of screening for diseases, pests, abiotic stress, cold, heat, drought
3. AEGIS Quality System.

### **Discussion**

L. Maggioni alerted the Group that the projects need to be compatible with ECPGR objectives.

G. Poulsen asked about follow-up on progress on AEGIS, to which M. Ambrose replied that key focal points will be needed to ensure follow-up. These focal points may have to approach specific people and will need support and prompting by the Secretariat.

G. Duc remarked that the WG will have to adapt its work to the Terms of Reference that will be developed by the Steering Committee for Phase IX.

M. Ambrose went round to members, requesting them to sign up to thematic interest groups they would like to participate in, so as to assess the level of interest and support. The results of this survey are presented in Table 2. Other areas of interest can be added.

**Table 2.** Thematic interest groups and coordinators

<b>Thematic interest group</b>	<b>Coordinators</b>	<b>Members</b>
1. Grain legumes in sustainable agricultural systems	G. Carlsson G. Duc	H. Känkänen S. Kratovalieva V. Meglič L. Narits S. Solberg W. Święcicki E. Tuğay Karagül M. Yauseyenka
2. Exchange of germplasm for evaluation in different environments for screening	L. Kobyzeva S. Kratovalieva A. Pallides E. Tuğay Karagül	C. Brezeanu V. Meglič S. Petrova B. Ruge-Wehling
3. AEGIS Quality System	W. Kainz V. Meglič	M. Ambrose

## **Thematic Interest Groups**

### **Thematic Interest Group 1: Grain legumes for sustainable agricultural systems**

G. Duc and G. Carlsson offered the presentations summarized below as inputs for the definition and launching of the thematic interest group on “Grain legumes for sustainable agricultural systems”.

**Which criteria should be used for assessing the value of accessions for the ecosystem?**

*G. Duc*

The agricultural ecosystem is at the centre of several interactions with the wider natural ecosystem. It can be affected by several ecosystem services and disservices, just as it can generate other services and disservices. A survey of scientific literature on the role of annual legume cultivars in ecosystem services shows that very few papers are dedicated to this subject (only 880 out of 18 000 published on annual grain legumes between 2008 and 2012). Moreover, it is not clear which specific traits can be listed as indicators of ecosystem services as in the case of organic farming, sustainability, biodiversity, food security, etc.

A dedicated expert group on “criteria for ecosystem services” was proposed. A number of questions would be relevant for such a group:

- Which targeted zones and cropping systems to focus on?
- Which important criteria to use?
- Which phenotyping tools to use?
- Which would be the reference genotypes to characterize environment services?
- How to exploit GxE interactions?
- How to identify phenotyping platforms?

Considering the numerous legume species for different uses (grain, forage, services) it was also proposed to change the name of the WG from “Grain Legumes Working Group” to “Annual Legumes Working Group”.

**Use of grain legume genetic resources for diversification of cropping systems**

*G. Carlsson*

Legumes provide a number of benefits that make them very suitable for sustainable agricultural systems:

- protein-rich foods and feeds, and N-rich green-manures
- biologically fixed nitrogen to the legume host and the entire agro-ecosystem
- building of soil fertility owing to C and N sequestration
- biofuels, fuelwood, pharmaceuticals, industrial chemicals
- diversification of crop rotations and reduction in the pesticide requirement
- potential to reduce fossil energy use and emissions of greenhouse gases in production systems
- prevention of soil erosion by strip intercropping.

A number of obstacles are known to limit the increase in cultivation and use of legumes:

- insufficient market demand
- unpredictable variations in yield
- political decisions
- tradition (preference for traditional cereal systems).

The thematic group on “Grain legumes for sustainable agricultural systems” could collaborate with genetic resource managers and agricultural scientists. The following questions could be used as a starting point:

1. How to explore genebank collections for important traits in cropping systems? Traits such as efficient nitrogen fixation, genotype-specific interactions with rhizobia, stress tolerance (drought, nutrient deficiency, etc.), disease resistance.
2. Which organizations would take the responsibility for such evaluations?
3. How to achieve diversification of cropping systems, based on genebank collections, in order to promote preventive strategies?

4. Could question 3 embody a strategy towards *in situ* conservation and use of genetic resources?

Potential research questions about grain legume genetic resources and sustainability of cropping systems can include:

1. Are high-diversity (species and varieties) legume-dominated cropping systems more resource efficient (land, nutrients, water) and sustainable (yield stability, food security, environmental impact, economy) than low-diversity cereal-dominated cropping systems?
2. Would easily accessible information about trait diversity in grain legume genetic resources attract growers and consumers, and increase the market demand for grain legumes?

The examples of a German legumes expert forum and a Swedish network for legumes research were quoted as models:

- [The Legumes Expert Forum. Science, economy and society – making ecosystem services from legumes competitive. A research strategy of the German Agricultural Research Alliance.](#)
  - [Legumes for sustainable agriculture \(LegSA\).](#)
- LegSA is a network for research on legume-based production systems.

### Discussion

In the ensuing debate, a few members expressed reservations of the just described sustainable agriculture cropping system approach, should it only rely on unbred genebank material. They affirmed that breeding is the main solution for crop production and that starting with unbred genetic resources is very time-consuming and not realistic for companies operating in the global market.

Other members thought that a diversity of approaches, where breeding is not the only solution, should be taken into consideration. Breeding has not addressed all the needs; for example, there is almost no ongoing breeding work for the northern areas. Even though current economic parameters, registration rules, and intensive agriculture are limiting approaches based on diversified cropping systems, there is also a changing trend, which recognizes the environmental value of grain legume varieties. Moreover, new tools have accelerated breeding for new ideotypes; they also allow new combinations of traits, such as adaptation to mixed cropping systems. Large companies would be open to investing in diversified ideotypes. Finally, breeders are not the only players responsible for innovation of cropping systems, farmers also make their own choices.

The Group also discussed whether the WG should be renamed. Several suggestions were considered: “annual legumes”, “food and feed legumes”, addition of a sub-title to the current name “grain legumes”. The Group eventually agreed to retain the current name.

### **Thematic Interest Group 2: Exchange of germplasm for evaluation in different environments for screening**

A. Pallides indicated that Cyprus provides a good location for drought- and salinity-tolerance screening; for disease-resistance screening, however, the material would have to be sent to other locations. He suggested that the WG could create the opportunity for exchange of material for evaluation and create an online feedback facility on its web page.

G. Duc appreciated this proposal and suggested establishing a reference collection to show existing variation.

Members of the following countries expressed their availability for participating in this initiative:

**Turkey:** sending faba bean for cold resistance and testing for *Fusarium* wilt and chickpea anthracnose.

**Cyprus:** testing spring legumes for salinity and high-temperature tolerance.

**NordGen:** testing short-season varieties in the north.

**Romania:** testing *Phaseolus* and *Vigna* under very hot summer and low rainfall climatic conditions, both in organic and conventional farming conditions.

**Germany:** screening lupin for anthracnose.

**Belarus:** complex research work on the lupin collection for early ripening, alkaloid content and tolerance to anthracnose and *Fusarium*.

**Poland:** testing lupins for low alkaloid content.

G. Duc and G. Carlsson pointed out that each evaluation should be done under low nitrogen conditions; whether the tests have to be carried out with or without inoculation should be clarified.

M. Ambrose indicated that supporting soil with inoculation is not a requirement in the UK, but foreign varieties may not recognize local rhizobia ecotypes, as in the case of Afghan peas that carry the *Sym2* gene that codes for race specificity, making them unable to recognize European rhizobia strains.

G. Duc said that at evaluation stage, it is not known if pea accessions recognize rhizobia or not. Considering the size of the evaluation, it is not practical to manage soil conditions. The first condition is to test under low nitrogen; sub-sampling can then be carried out step by step.

M. Ambrose offered to send non-nodulating pea lines to act as indicators of the nitrogen status of the soil.

### **Workplan**

- The coordinators of the thematic interest groups are expected to translate the underlying concepts of each theme into practical actions, which will be implemented through project proposals and/or proposed activities to be funded through the new ECPGR operational framework (**to be prompted by the WG Chair at the onset of ECPGR Phase IX**).
- Regarding Thematic Group 2, the Chair will send an email requesting details on the availability of each country for screening, which crops and under which conditions, as well as which crops each country can send to others for testing (**by end 2013**).
- M. Ambrose and G. Duc will look into the features that need to be included on the Grain Legumes WG website (**by end November 2013**).



## **Conclusion**

### ***Election of Chair and Vice-Chair***

Mike Ambrose had been Chair of the WG since its formation in 1995, but could no longer stay on as Chair; however, he agreed to continue together with Gérard Duc, playing an advisory and mentoring role to help during the transition to ECPGR Phase IX.

It was agreed that M. Ambrose would remain as a Chair for another year, during which he would mentor a successor to be found through nominations by email (**task for the Secretariat after finalization of the report**).

Gérard Duc was re-confirmed as Vice-Chair.

### ***Closure of the meeting***

M. Ambrose thanked the local organizers, the Vice-Chair, the ECPGR Secretariat and all the participants for their active involvement.

The meeting would be the last of this type. It had been held at the right stage, when timely plans can be laid for a changing ECPGR system.



## APPENDICES

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## Appendix I. Workplan

Activities	Responsibility	Deadline
<b>Crop-specific interest groups</b>		
Identify the coordinators of the <i>Cicer</i> , <i>Lathyrus</i> , Soybean and <i>Vigna</i> interest groups	Chair, with support of ECPGR Secretariat	By end 2013
<b>AEGIS: selection of MAAs</b>		
Start the process with cultivars, since they have names and are therefore easier to distinguish as unique. Carry out a preliminary analysis, and then contact all the identified maintainers with a proposal to include the given accession in the European Collection.  <i>Phaseolus</i> and <i>Vigna</i> <i>Lupinus</i> <i>Pisum</i> <i>Vicia faba</i>	W. Kainz W. Świącicki M. Ambrose G. Duc	End of summer 2013 End of summer 2013 End of 2013 (Time schedule to be reviewed before the end of 2013)
Check whether it is possible to analyse the <i>Lens</i> database.	E. Tuğay Karagül	End of 2013
Help formulate a letter for contacting the partners, when requested.	ECPGR Secretariat	(Upon request)
<b>AEGIS Quality System (AQUAS)</b>		
Circulate members' experiences about regeneration standards compiled in the paper by Suso et al. (2011), propose a suggested standard for endorsement by the WG	M. Ambrose	End November 2013
<b>Databases</b>		
Provide the Chair with a short report indicating the points of difference between EURISCO and their respective databases. The information will be used for deciding on suggestions to be made to the Documentation and Information Network about the continued relevance of the CCDBs and their relationship with EURISCO	Grain Legume Database Managers	Before end 2013
<b>Thematic interest groups</b>		
Translate the underlying concepts of each theme into practical actions, which will be implemented through project proposals and/or proposed activities to be funded through the new ECPGR operational framework  (For Thematic Group 2)	Leaders of the thematic interest groups, upon prompt from WG Chair	At the onset of ECPGR Phase IX
Send an email requesting details on the availability of each country for screening, which crops, under which conditions, as well as which crops each country can send to others for testing.	Chair	End of 2013
Look into the features that need to be included on the Grain Legumes WG website.	M. Ambrose and G. Duc	End November 2013

## Appendix II. Acronyms and abbreviations

AEGIS	A European Genebank Integrated System
AMA	Associate Membership Agreement ( <i>for AEGIS</i> )
AQUAS	AEGIS Quality System
ARO	Agricultural Research Organization, Israel
CCDB	Central Crop Database
CGN	Centre for Genetic Resources, The Netherlands
EC	European Commission
ECPGR	European Cooperative Programme for Plant Genetic Resources
EMS	Ethylmethanesulfonate
EU	European Union
EURISCO	European Internet Search Catalogue
FAO	Food and Agriculture Organization of the United Nations, Rome, Italy
INRA	Institut National de la Recherche Agronomique (National Institute for Agronomic Research), France
IPK	Leibniz Institut für Pflanzengenetik und Kulturpflanzenforschung (Leibniz Institute of Plant Genetics and Crop Plant Research), Germany
JIC	John Innes Centre, Norwich, UK
MAA	Most Appropriate Accession ( <i>for AEGIS</i> )
MoU	Memorandum of Understanding
NCG	Network Coordinating Group
NordGen	Nordic Genetic Resources Centre, Alnarp, Sweden
PGR	Plant genetic resources
SC	Steering Committee
USDA	United States Department of Agriculture
VIR	N.I. Vavilov Institute of Plant Industry, St. Petersburg, Russian Federation
WG	Working Group

## Appendix III. Agenda

### Fifth meeting of the ECPGR Working Group on Grain Legumes 7-8 May 2013, Novi Sad, Serbia

#### Monday, 6 May

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Arrival of participants in Novi Sad

#### Tuesday, 7 May

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Venue: Hotel Park

##### 08:30-09:00 Introduction

- Opening and welcome address (*M. Ambrose*)
- Aims of the meeting
- Brief self-introduction of the participants
- Approval of the agenda

##### 09:00-10:00 ECPGR and the Working Group on Grain Legumes

- ECPGR towards Phase IX (*L. Maggioni*)
- The Chair's report (*M. Ambrose*)

Discussion

10:00-10:30 Coffee break

##### 10:30-11:00 AEGIS

*Update on the current status of the project; purpose, scope and mission as well as the instruments being developed for implementation. Current status of member countries and associate membership (L. Maggioni)*

##### 11:00-12:30 AEGIS Quality System (AQUAS)

*The AQUAS system is considered one of the cornerstones of AEGIS and will consist of four complementary components, i.e. a) operational framework; b) technical elements; c) capacity building, and d) oversight mechanism.*

- Brief overview of AQUAS (<http://aegis.cgiar.org/aquas.html>) (*L. Maggioni*)
- Overview of the draft FAO Genebank Standards followed by discussion with respect to our Working Group to capture comment and concerns in order to agree on the WG's specific Quality System elements (presented by *S. Krativalieva*).  
FAO Genebank Standards available at  
<http://www.fao.org/docrep/meeting/027/mf804e.pdf>

12:30-14:00 Lunch

##### 14:00-15:30 Central Crop Databases progress reviews

*Reports from the Central Crop Database Managers of progress made for each grain legume crop in terms of their current status, accessibility, and having special regard for the AEGIS project requirements (Chaired by G. Duc)*

- *Lens* (introduced by *E. Karagül* on behalf of *L. Aykas Gul*)
- *Lupinus* (introduced by *W. Świącicki*)
- *Phaseolus* (introduced by *W. Kainz*)
- *Pisum* (introduced by *M. Ambrose*)

15:30-16:00 Coffee break

**16:00-17:30 Central Crop Databases progress review (continued)**

- *Vicia faba* (introduced by G. Duc)
- *Lathyrus* (introduced by G. Duc on behalf of D. Combes)
- *Cicer*
- *Glycine*
- *Arachis*

19:30 Social dinner

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**Wednesday, 8 May**

Venue: Hotel Park

**08:30-10:00 National collections**

*Each representative is welcome to briefly present relevant changes, since the 2007 meeting, of the status of their national collection. Contributions from corresponding members are also welcome and should be sent to the ECPGR Coordinator, to be uploaded on the Web. Please note that country reports will not be included in the final report.*

10:00-10:30 Coffee break

**10:30-11:00 In situ and on-farm conservation**

*Please contact M. Ambrose or the ECPGR Coordinator if you wish to make a presentation in this session.*

11:00-11:15

**Inter-regional cooperation**

Global Crop Diversity Trust: Expert Group meetings on Crop Wild Relatives of grain legume crops and the Trust's continuing online survey (*Update by M. Ambrose*)

**11:15-11:30**

**Joint projects**

*Discussion on the possible basis for new collaboration and joint projects: which traits to characterize in order to promote potential environmental and ecological services offered by legumes in agrosystems? (Discussion led by G. Duc)*

**11:30-12:30**

**Grain Legume European Central Crop Databases (CCDBs) and AEGIS**

*An extended session will be a focused discussion across the different grain legume species involving the CCDB managers on planning activities and actions required to move towards implementation of AEGIS. The emphasis will be to seek a generic approach wherever possible and highlight species specific matters where they are critical (Discussion led by M. Ambrose)*

12:30-14:00

Lunch

**14:00-15:00**

**Grain Legume European Central Crop Databases and AEGIS (continued)**

**15:00-15:30**

**Updating of Workplan**

Discussion, recommendations and action points

15:30-16:00

Coffee break



**16:00-16:30**      **Election of Chair and Vice-Chair**  
**Any other business**

**16:30**            **Close of formal meeting**

**17:30**            **Restricted meeting requiring only the NCG to help finalize the report**

## Appendix IV. List of participants

### Fifth meeting of the ECPGR Working Group on Grain Legumes 7-8 May 2013, Novi Sad, Serbia

*N.B. Contact details of participants updated at the time of publication. The composition of the Working Group is subject to changes. The full list, constantly updated, is available from the Grain Legumes WG's Web page ([http://www.ecpgr.cgiar.org/networks/oil\\_and\\_protein\\_crops/grain\\_legumes.html](http://www.ecpgr.cgiar.org/networks/oil_and_protein_crops/grain_legumes.html))*

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