

## Proposal for the establishment of an ECP/GR Working Group on Fibre crops

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### Background

In the framework of the Industrial Crops and Potato Network of ECP/GR an *ad hoc* meeting on Flax Genetic Resources was organized from 7- 8 December 2001 in Prague, Czech Republic.

In 1999 and 2001, M. Pavelek (Czech Republic) submitted an EU project focusing on *Linum* genetic resources. The project included partners from several European countries. Since this project was not approved, the need for European co-operation remains. An opportunity to organise an *ad hoc* meeting was eventually found in the framework of the ECP/GR Industrial Crops and Potato Network and this meeting was thus organised.

### ECP/GR *ad hoc* meeting on Flax Genetic Resources in 2001 in Prague, Czech Republic.

Representatives of 9 countries participated in this meeting and discussed the present situation on the plant genetic resources of flax. An inventory was made of flax collection holdings in Europe (Appendix 1) and the size of the most important *Linum* collections (Appendix 2). It is estimated that over 25.000 accessions of *Linum* are maintained in Europe.

The meeting revealed that substantial collections of flax are kept in European genebanks but the access to these collections is presently not optimal. The meeting suggested the following activities:

1. Further development of the IFDB (International Flax Data Base)
2. Evaluation/characterization of the collections
3. To apply for the establishment of a working group in the framework of the Industrial Crops and Potato Network of ECP/GR

The meeting decided unanimously to apply by the ECP/GR steering committee for an official working group status. The major reasons for this application can be summarized as follows:

- There are several collections of *Linum* in Europe (see Appendixes 1 and 2).
- It is not exactly known how many holdings of *Linum* germplasm exist in Europe and how many accessions are maintained in these collections. Appendix 1 provides a list with the most important collections in Europe. It is estimated that more than 25.000 accessions are maintained in European collections.
- There is a need to rationalize the European fibre collections in order to safeguard the germplasm for the future. The working group will consider duplications between the different collections by means of determining the 'Most Original Sample' (MOS). This action should be followed by a further rationalization of the European fibre collections to assure easier conservation and management.
- The flax acreage in Europe has been reduced during the last 10 years and as result of a decreasing interest of breeders to develop new cultivars a loss of the available genetic resources of this crop may be faced. Action is required to avoid genetic erosion within collections.

The meeting of the curators was very useful to initiate European co-operation for the conservation of *Linum* genetic resources

### Present situation of the International Flax Data Base (IFDB)

The International Flax Data Base (IFDB) has been managed and coordinated by AGRITEC company since 1994 (PAVELEK, 1995, 1997, 1998). Until recently The IFDB has contained a limited number of accessions (1416), the majority of which were described with 22 passport descriptors and partly with 25 other descriptors covering morphological traits (14), biological traits (5) and yield characters (6) (Pavelek 1995, 1997). This initial group of accessions was subdivided in type of use as follows: 50,2 % fibre types, 33,7 % linseed, 10,6 % intermediate types and 5,5 others including wild species. The status of the samples (population type) was as follows:

<i>Status of sample</i>	<i>% in the IFDB</i>
Advanced cultivars	38.5
Genetic resources	27.0
Breeding material	20.3
Landraces, primitive and wild forms	14.2

After the ECP/GR ad hoc meeting on flax held in Prague in 2001, an additional number of accession data was delivered to the database manager, bringing the total number up to 6173 accessions. Contributing countries and their respective number of accessions are listed in Table 1. A first analysis of the database has shown that 2346 accessions are unique, 1910 are duplicates and 1917 are not identified.

**Table 1.** Current composition of the IFDB after inclusion of new accessions

Contributing country	Accessions included	
	Number	%
Bulgaria	10	0.1
Czech Republic	100	1.6
France	62	1.0
Germany	1858	30.1
Ireland	14	0.2
Latvia	15	0.2
The Netherlands	803	<u>13.0</u>
Poland	59	0.9
Portugal	87	1.4
Romania	547	<u>8.8</u>
Russia - Torzhok	725	<u>11.7</u>
Russia - VIR	1486	24.0
Ukraine	38	0.6
USA	369	5.9
<b>Total</b>	<b>6 173</b> <b>1416</b>	<b>100</b>

#### *Characterization and evaluation descriptors*

25 characterization and evaluation descriptors were used in the IFDB and published by Pavelek (1998)

In order to evaluate *Linum* genetic resources, a set of standard varieties relevant for evaluation of the respective traits has been developed. It includes both fibre and linseed varieties and the list is published by Pavelek (1998). There are 21 standard varieties recommended for the evaluation of fibre flax types and 22 for linseed.

The ECP/GR ad hoc meeting on flax in Prague (2001) decided to initially prioritise the compilation of 6 characterization descriptors.

#### *Request for an ECP/GR Working Group on Fibre crops (flax and hemp)*

At the last meeting of the Industrial Crops and Potato Network Coordinating Group, held in Bologna, Italy on 22 October 2002, it was considered important to broaden activities devoted to under-utilised crops, such as flax and hemp, for which breeding activities are reducing in Europe, leading to the risk of loss of genetic resources. At the same time these crops are considered important for the future of European agriculture, considering their increasing importance for industry (fibres for cars, textile, pharmaceuticals, etc.) and their beneficial impact in rotation systems and diversification of agriculture.

There is an increasing interest in the cultivation of fibre hemp in Europe. The area under cultivation in Eastern Europe is rather stable, but in West Europe there is a clear tendency to increase the acreage of hemp cultivation for fibre production (e.g. production of green fibres for cars and composite fibres for the building industry). It is estimated that approximately 25.000 ha. Fibre hemp is cultivated West Europe. In general the hemp collections in Europe are small (25 to 400 accessions). It is estimated that 2000 to 3000 accessions are maintained in 15 to 20 European collections.

It was recommended to request the Steering Committee to establish a Working Group on fibre crops (flax and hemp), with the objective to facilitate the implementation of the workplan proposed by the ad hoc group on flax and to help the development of a European Central Database for Hemp.

#### Workplan on flax

##### 31 March 2003

Partners to submit the first passport data of individual European National gene banks to the IFDB – of their own origin especially

##### 1 April 2003 – 31 December 2006

Inclusion of all available passport data of individual European National gene banks and other collections in the IFDB, in order to include as much as possible accessions of the European flax genepool in this data base. Start defining the MOS of the fibre collection in order to come to a system of sharing responsibilities.

##### 31 January – 31 December 2004

Starting with the incorporation of characterization and evaluation data in the data base, initially the selected six priority morphological characters

##### 31 January 2004 – 31 December 2008 ?

Completing the characterization and evaluation part, including all accessions of individual European National gene banks and other collection holders. Defining the system of sharing responsibilities in fibre crops.

#### **Workplan on hemp**

Establishment of a European Hemp database at Istituto Sperimentale per le Colture Industriali, Bologna, Italy

Identification of hemp focal persons in relevant European countries

Collecting of European hemp passport data, possibly through EURISCO

Definition of priority characterization data for inclusion in the database

Analysis of data with the objective to obtain a cleare picture of the status of hemp diversity conservation in Europe

#### **Planned meetings of the ECP/GR Working Group on fibre crops**

##### October or November 2004 – CGN, Wageningen, the Netherlands?

- discussion on the progress of the inclusion of passport data in the IFDB
- discussion on the inclusion of the characterization and evaluation data in the IFDB, considering further morphological, biological and yielding characters
- agree to a workplan for the period 2004 to 2006

##### October or November 2006 – venue to be specified

- final discussion on the progress of the inclusion of passport data in the IFDB – the inclusion of passport data in the IFDB should be finalashed at the end of 2006
- further discussions on inclusion of characterization and evaluation data in the IFDB, – further characterization and evaluation characters should be chosen and the selectedinformation should be filled in the IFDB
- agree to a workplan for the period after 2006

#### **References**

- Maggioni, L., M. Pavelek, L.J.M. van Soest and E. Lipman, compilers. 2002. Flax Genetic Resources in Europe. *Ad hoc* meeting, 7-8 December 2001, Prague, Czech Republic. International Plant Genetic Resources Institute, Rome, Italy (In press).
- Pavelek, M., 1995. Further development of International Flax Data Base and special descriptors for more detailed evaluation of agronomic and processing characters. In: Proceedings of the Third meeting of the International Flax Breeding Research Group / Breeding for fibre and oil quality in flax. St. Valery en Caux, France, November 7-8, p. 1-13.
- Pavelek, M., 1997. Discussion for IFDB standard varieties. Euroflax Newsletter 1 (7), p 17-20, Information Bulletin of the FAO European Co-operative Research Network on Flax and Other Bast Plants, Institute of Natural Fibres - Co-ordination Centre of the FAO Network on Flax and Other Bast Plants, Poznan, Poland.
- Pavelek, M., 1998. Analysis of current state of International Flax Data Base. Proceedings of the Bast Fibrous Plants Today and Tomorrow, Breeding, Molecular Biology and Biotechnology Beyond 21<sup>st</sup> Century, St. Petersburg, Russia, 28 to 30 September 1998, p. 36 – 44.

#### **Appendix 1**

##### **1a. Institutions participating in the ECP/GR *ad hoc* meeting on Flax Genetic Resources, 7-8 December 2001.**

Bulgaria	AgroBioInstitute Centre of Excellence in Plant Biotechnology, Sofia Institute of Plant Genetic Resources "K. Malkov" (IPGR), Sadovo.
Czech Republic	AGRITEC Research, Breeding and Services, Ltd., Šumperk.
Germany	Institut für Pflanzenbiologie und Kulturpflanzenforschung (IPK) – Genbank, Gatersleben.
Hungary	Institute for Agrobotany, Tápiószele.
The Netherlands	Centre for Genetic Resources, the Netherlands (CGN), Wageningen.
Poland	Institute of Natural Fibres (INF) Ul. Wojska Polskiego.
Romania	Agricultural Research Station, Livada.
Russian Federation	N.I. Vavilov Research Institute of Plant Industry, St. Petersburg.
Ukraine	Institute of Bast Crops of the Ukrainian Academy of Agrarian Sciences, Glukhiv.

**1b. Institutions not participating in the meeting but known to maintain *Linum* collections**

France	IINRA, Centre Versailles-Grignon Unité de génétique et amélioration des plantes, Versailles *
Italy	Research Institute of Industrial Crops (ISCI), Bologna
Lithuania	Lithuanian Institute of Agriculture, Upyte*
Nordic Countries	Nordic Gene Bank, Alnarp, Sweden*
Portugal	Estação Nacional de Melhoramento de Plantas (ENMP), Elvas

**1c. Countries probably holding *Linum* collections**

In addition, there are most likely (small) *Linum* collections in Croatia, Latvia, Spain, Turkey, United Kingdom and Serbia and Montenegro.

**Appendix 2. List of flax holdings in Europe**

Country/Collection holder	Number of accessions	Remarks and specifications on collections
Bulgaria IPGR Genebank, Sadovo AgroBioInstitute, Kostinbrod	945 263	World-wide, over 15 countries Partly duplicates of IPGR
Czech Republic	2017	Especially from Europe, but also the rest of the world
France INRA, Versailles & Estrees-M GEVES, La Miniére	1696 ?	Two collections, world-wide, 42 countries European cultivars, not public
Germany IPK Genbank, Gatersleben BAZ Genbank, Braunschweig	1683 621	World-wide (>70 countries) + wild species World-wide, many cultivars
Hungary	409	Especially cultivars from Europe
Latvia	261	Mainly landraces and cultivars E. Europe
Lithuania	1060	Including 600 flax mutants
The Netherlands	974	World-wide, over 42 countries
Nordic counties NGB, Alnarp, Sweden	359	Cultivars, mainly from Nordic countries
Poland	864	World-wide, nearly 70 % cultivars
Romania	3845	World-wide, collections held at three different institutes
Russian Federation	5521	World-wide collection, including wild species, landraces, breeding lines and cultivars
Total of most important holdings in Europe	20. 518	World-wide collection, including wild species, landraces, breeding lines and cultivars