

Report of a Working Group on Fibre crops (Flax and Hemp)

Second Meeting, 7-9 July 2010, Šumperk – Velké Losiny, Czech Republic
M. Pavelek and E. Lipman



European
Cooperative
Programme
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Genetic
Resources



ECP/GR

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Flower of flax variety 'Aurore'. Courtesy of © Z. Jankauskienė, Upytė Experimental Station of the Lithuanian Research Centre for Agriculture and Forest, Lithuania.

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Related presentations and papers can be downloaded from
http://www.ecpgr.cgiar.org/Workgroups/Flax_Hemp/Presentations_2010.htm

EXECUTIVE SUMMARY

Introduction

The Second Meeting of the Working Group on Fibre Crops (Flax and Hemp) of the European Cooperative Programme for Plant Genetic Resources (ECPGR) was held 7-9 July 2010 in Velké Losiny (Šumperk), Czech Republic.

The meeting was attended by six participants from ECPGR member countries, three observers and one representative from the ECPGR Secretariat (see Appendix III, p. 12).

Martin Pavelek, Chair of the Working Group (WG), opened the meeting and welcomed the participants to the Czech Republic. He was pleased to host the meeting and to be able to introduce the Group to the activities carried out by AGRITEC Research, Breeding and Services, Ltd., and to show the participants the flax and hemp field trials during the visit planned on the last day. He wished the Group a fruitful meeting.

The participants introduced themselves briefly. Only two members had also attended the previous meeting of the WG in Wageningen, The Netherlands, in 2006.

List of presentations and other contributions

(* = Corresponding papers and/or presentations by the participants and other WG members were uploaded after the meeting on the Web page of the WG on Fibre Crops and can be downloaded from http://www.ecpgr.cgiar.org/Workgroups/Flax_Hemp/Presentations_2010.htm)

Background information

General briefing on ECPGR *

Elinor Lipman, ECPGR Secretariat

Chair's report (activities of the WG since the first meeting)

Martin Pavelek, Chair of the WG

The Chair reported on the First Meeting of the Working Group (14-16 June 2006, Wageningen, The Netherlands) and on the Third Meeting of the Network Coordinating Group on Sugar, Starch and Fibre Crops (8-9 October 2009, Quedlinburg, Germany). The reports of these meetings are available online.¹

In his capacity as Database Manager of the International Flax Database (IFDB), the Chair also presented the progress made on the IFDB and its current status (see further, section on IFDB).

¹ Bas N, Pavelek M, Maggioni L, Lipman E. 2010. Report of a Working Group on Fibre Crops (Flax and Hemp). First Meeting, 14-16 June 2006, Wageningen, The Netherlands. Bioversity International, Rome, Italy. (http://www.ecpgr.cgiar.org/Workgroups/Flax_Hemp/Flax_Hemp.htm).

Frese L, Hoekstra R. [2010]. Report of a Network Coordinating Group on Sugar, Starch and Fibre Crops. Third Meeting, 8-9 October 2009, Quedlinburg, Germany. (http://www.ecpgr.cgiar.org/Networks/Indus_crops/indus_crops.htm).

Status of national flax and hemp collections

Czech Republic – Flax and hemp*

Martin Pavelek

Germany – Flax and hemp*

(Frank Höppner and Helmut Knüpfper; paper submitted before the meeting)

Latvia – Flax and hemp*

Dace Grauda

Portugal – Flax*

Maria da Graça Mendonça Pereira

Italy – Flax and hemp*

Gianpaolo Grassi

Russian Federation – Flax*

Nina Brutch

Turkey – Flax and hemp*

Abdullah Inal

Additional presentations on national activities

Flax descriptors for *Linum usitatissimum**

Janka Nôžková

Production of fibre hemp at CIN-Rovigo

Gianpaolo Grassi

Databases

International Flax Database (IFDB) – Current status and perspectives*

Martin Pavelek

International Hemp Database (IHDB) – Current status and perspectives

Gianpaolo Grassi

A European Genebank Integrated System (AEGIS) – General presentation (background, current status and perspectives)*

Elinor Lipman

Summary of discussions and recommendations

International Flax Database

The International Flax Database (IFDB) is managed by M. Pavelek, AGRITEC. As indicated in the IFDB status report, most of the workplan agreed upon at the first meeting in 2006² has been completed, but the IFDB faces several crucial problems that need to be solved urgently.

Structure of the IFDB

As agreed at the first meeting, the IFDB structure currently includes the 39 passport descriptors of the European Plant Genetic Resources Catalogue (or European Internet Search Catalogue, EURISCO) + 7 characterization descriptors (stem length, flower: corolla size, flower: shape, petal colour, anther colour, 1000-seed weight, seed colour).

However, it was noted that some members do not have this latest format; therefore the DB manager will have to re-send it to all members of the WG.

Regarding the inclusion of characterization and evaluation (C&E) data in the IFDB, M. Pavelek requested WG members to check their national databases for material that is already documented with data in agreement with the seven C&E descriptors listed above, select these records (i.e. records compliant with the above C&E structure) and send them to AGRITEC for inclusion in the IFDB.

Composition of the IFDB

The IFDB is now composed of several heterogeneous files which need to be standardized and merged:

- New data received since the first meeting: a total of 2903 records were provided by Hungary, Italy, Lithuania, Poland and Portugal following the agreed format. These records will become the base of the new IFDB.
- Previous IFDB data: the 7934 records will be revised and adjusted as much as possible to the most recent IFDB structure.

Scope of the IFDB

The IFDB is still far from containing all European data concerning approximately 27 000 accessions. Efforts should be made to obtain the missing data.

Online availability

The IFDB is not searchable online yet, only downloadable as an Excel table (<http://www.ecpgr.cgiar.org/databases/Crops/flax.htm>).

The current resources available at AGRITEC do not allow the IFDB manager to carry out the work required to put the DB online. The proposal submitted to the Steering Committee, requesting funds for this activity, was not accepted (Tenth Meeting of the SC, September 2006);³ therefore, another source of funding must be found.

EURISCO and the IFDB

Given the amount of work to be done on the IFDB and the fact that EURISCO is planning to include C&E data, the participants discussed the option of feeding EURISCO with the new data rather than continuing with two separate databases. However, since the contents of EURISCO did not appear to be fully reliable in some cases (e.g., verification of Russian data on 5282 accessions recorded in EURISCO), it was decided to pursue improvement of the IFDB.

² See Appendix I, p. 15 in Bas et al. 2010 (footnote 1)

³ Report available from http://www.ecpgr.cgiar.org/SteeringCommittee/SC10/SC10_report.pdf

Workplan

- M. Pavelek will send the most recent version of the IFDB data format to all members **by end 2010.**
- M. Pavelek will check the two current sets of data and merge them into one single Excel file **by end 2012.**
- M. Pavelek will put the DB online **by end 2013 if an appropriate source of funding is found.**
- M. Pavelek will integrate new data continuously as they are received.
- G. Pereira will complete the Portuguese data with the seven characterization descriptors agreed by the WG **by July 2011,** after completion of the next growth cycle.
- The Russian data currently integrated in EURISCO must be checked. The ECPGR Secretariat/EURISCO Coordinator will inform the Russian National Inventory Focal Point that the set of Russian data for *Linum* spp. needs to be checked and validated. At the same time, Nina Brutch is welcome to extract the relevant data from EURISCO and inform the National Inventory Focal Point of what needs to be changed.

International Hemp Database

G. Grassi reminded the Group that Andrea Carboni, former manager of the International Hemp Database (IHDB), had taken new responsibilities and was not working on hemp any more. The IHDB was therefore “frozen” but the issue was taken up again at the time of preparation of this meeting. G. Grassi, current representative of Italy in the WG, believed that the development of the database should continue and agreed to also take on the responsibility of Hemp Database Manager.

G. Grassi demonstrated the prototype database under development at CRA-CIN. The new database will follow the structure of the IFDB. The data already available will first be converted into the new format, with the support of Claudia Maestrini. The description of accessions needs to be completed but the recording of data for agreed descriptors is an issue, since it is forbidden by law in Italy to grow accessions with a THC value above 0.2%; the plants therefore have to be grown in a greenhouse. G. Grassi wished this issue to be discussed with other partners working on hemp in order to find a way of standardizing the procedures for observations and recording of data.

The hemp descriptors currently used at CRA-CIN are listed below.

| | | |
|----------------------|------------------------|------------------------|
| 1000-seed weight (g) | Sex | Fibre production (%) |
| Plant height (cm) | dioecious | THC content (%) |
| Stem colour | monoecious | CBD content (%) |
| green | gynoecious | CBD/THC ratio (number) |
| yellow | Flowering time (50% of | CBG content (%) |
| violet | flowers open) (week) | Other cannabinoids |
| Stem diameter (mm) | Growth cycle | absent |
| Leaflet (width) (mm) | very early | CBDV |
| | early | THCV |
| | intermediate | CBC |
| | late | other (specify) |
| | very late | |

It was noted that yield descriptors should be compared to one or more standard varieties, to be proposed.

Since few members of countries holding active hemp collections were present at the meeting, G. Grassi underlined the need to coordinate with other WG members to decide on the most urgent tasks.

The absence of representatives from France was mentioned several times during the meeting. It was agreed that the WG would benefit from the inputs of French partners.

Workplan

- G. Grassi will contact all WG members working on hemp to define a common strategy to (1) identify ways to improve hemp production and breeding, and (2) obtain data to complete the new Hemp Database. G. Grassi will circulate a questionnaire to identify the problems specific to each country and will share the results with all WG members **by end 2010**.
- G. Grassi will coordinate with the ECPGR Secretariat for updating of the Hemp DB homepage as necessary.
- G. Grassi will contact French partners to try to involve them in the WG's activities.⁴

A European Genebank Integrated System

Based on the suggestions made by the ECPGR Secretariat, the implementation of "A European Genebank Integrated System" (AEGIS) by the WG on Fibre Crops was discussed. This being the first exposure of the WG to AEGIS, no formal workplan was drawn but the following recommendations and decisions were agreed upon:

- Participants felt that more time was needed to fully absorb the information on AEGIS and that the involvement of all members of the WG was necessary in order to implement the process. It was therefore recommended that **all members familiarize themselves with the available documentation** (<http://www.aegis.cgiar.org/>).
- The participants agreed to suggest **Most Appropriate Accessions** (MAAs) to the European collection. However, since the information on hemp is very scarce, **the WG will concentrate first on flax**.
- All WG members need to be involved in the various steps of the AEGIS process; no formal decision could therefore be made at this meeting. The discussions will continue after the meeting on issues such as:
 - The formal **procedure for selecting the MAAs** needs to be defined. This issue will be followed up by the Chair in consultation with all WG members and the AEGIS Coordinator (Jan Engels).
 - Similarly, the development of a "**List of selection criteria for flax accessions**" will be followed up after the meeting. This exercise can be supported by the activities/results of other WGs that have advanced further in the process.

During the discussions, various aspects of the practical implementation of AEGIS were questioned, such as:

- Value of the European Collection (EC): since the accessions selected for the European Collection will be available freely, some of the most valuable accessions (e.g., higher

⁴ First contact was taken in September 2010 with Olivier Beherec, from the French Fédération Nationale des Producteurs de Chanvre (FNPC). The French delegate to the WG has not been identified yet.

yielding) may not be selected since they could potentially be a source of income. This entails the risk of ending up with an EC that contains only the less valuable accessions, while the best ones would be available only from the private sector and on payment.

- Cost issue: the participants cautioned that the selection process of the MAAs will be time-consuming and involve costs that cannot be supported by the institutes. There should be a financial contribution from ECPGR/AEGIS. It was reiterated that participation is based on the principle of “input in kind” for the benefit of all.
- It was also noted that WG members have limited power and their decisions have to be confirmed by higher management levels. This issue might be critical in particular for countries that have not yet signed the MoU for AEGIS.

Closing session

Election of Chair and Vice-Chair

Martin Pavelek was unanimously reconfirmed in his responsibility of Chair of the Fibre Crops Working Group. He thanked the members and suggested that the new Vice-Chair should be a hemp specialist to ensure a balance between the two crops. He proposed the name of Gianpaolo Grassi. The proposal was approved by the participants and accepted with thanks by G. Grassi, who added that although he was a new member, he would strive to contribute effectively to the WG’s work.

The venue of the next meeting was discussed. The WG members agreed that France would be an appropriate place for the meeting, but this would be possible only if the issue of the membership of France in ECPGR is settled. Other options proposed were Latvia, Poland and Portugal. The Chair will contact the WG members in due time to discuss the organization of the meeting.

Thanks were extended to the local organizers, including colleagues from AGRITEC who provided technical support and participated in the meeting.

Field visit

On Friday 9 July, the participants visited AGRITEC’s flax and hemp field trials and the company’s headquarters, where they were received by the Director, Miroslav Hochman. In the afternoon, the Group visited the water dam Dlouhé Stráně.

APPENDICES

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Appendix I. Acronyms and abbreviations

| | |
|---------|--|
| AARI | Aegean Agricultural Research Institute, Izmir, Turkey |
| AEGIS | A European Genebank Integrated System |
| C&E | Characterization and evaluation |
| CBC | Cannabichromene |
| CBD | Cannabidiol |
| CBDV | Cannabidivarin |
| CBG | Cannabigerol |
| CRA | Consiglio per la Ricerca e la Sperimentazione in Agricoltura, Italy |
| CRA-CIN | Consiglio per la Ricerca e la Sperimentazione in Agricoltura - Centro di Ricerca per le Colture Industriali, Rovigo, Italy |
| ECPGR | European Cooperative Programme for Plant Genetic Resources |
| EURISCO | European Internet Search Catalogue |
| IBCB | Institute of Biodiversity Conservation and Biosafety, Slovak Agricultural University, Nitra, Slovakia |
| IFDB | International Flax Database |
| IHDB | International Hemp Database |
| INIA | Instituto Nacional de Investigação Agrária, Portugal |
| MAA | Most Appropriate Accession |
| MoU | Memorandum of Understanding |
| THC | Tetrahydrocannabinol |
| THCV | Tetrahydrocannabivarin |
| VIR | N.I. Vavilov Research Institute, St. Petersburg, Russian Federation |

Appendix II. Agenda

Second meeting of the ECPGR Working Group on Fibre Crops (Flax and Hemp) 7-9 July 2010, Šumperk – Velké Losiny, Czech Republic

Tuesday, 6 July 2010

Arrival of participants

Wednesday, 7 July 2010

Venue: Hotel Diana, Velké Losiny near Šumperk

- 9:00 – 10:30 **Introduction**
- Opening of the meeting and welcome address (*M. Pavelek*)
 - Brief self-introduction by the participants
 - Approval of the agenda
 - General briefing on ECPGR (*E. Lipman*)
- 10:30 – 11:00 *Coffee break*
- 11:00 – 12:30 • Chair's report (activities of the WG since the first meeting) (*M. Pavelek*)
- Flax national collections** - status reports from countries that were not present at the first meeting (June 2006, Wageningen) and news for the period 2006-2010
- Czech Republic, Italy, Latvia, Portugal, Russian Federation, Turkey*
- 12:30 – 13:30 *Lunch*
- 13:30 – 14:00 **Flax national collections** (continued)
- Russian Federation, Czech Republic*
- A European Genebank Integrated System (AEGIS)**
- General presentation (background, current status and perspectives) (*E. Lipman*)
- 14:00 – 15:00 **AEGIS** (continued)
- Discussion on the implementation of AEGIS by the WG on Fibre Crops
- 15:00 – 15:30 *Coffee break*
- 15:30 – 16:00 **International Flax Data Base (IFDB)**
- Overview of current status (*M. Pavelek*)
- 16:00 – 18:00 **International Flax Data Base (IFDB)** (continued)
- Discussions on:
- Further development (inclusion of additional passport data according to the EURISCO descriptors)
 - Characterization and evaluation (C&E) data
 - Standardization of evaluation methods
 - Use of standard varieties
 - Unification of the two descriptor systems: the ESCORENA characterization and evaluation descriptors and ECPGR Flax and Hemp WG descriptors
- 18:00 *Dinner*

Thursday, 8 July 2010

Venue: Hotel Diana, Velké Losiny near Šumperk

- 9:00 – 10:00 **Hemp national collections** – status reports
Czech Republic, Italy, Latvia, Turkey
- 10:00 – 10:30 *Coffee break*
- 10:30 – 11:00 **International Hemp Database (IHDB)** – Current status and perspectives
(G. Grassi)
- 11:00 – 12:00 **Scientific presentation – Production of fibre hemp at CIN-Rovigo**
(G. Grassi)
- 12:00 – 12:30 **Continuation of discussions if necessary /**
- 12:30 – 13:30 *Lunch in hotel*
- 13:30 – 14:30 **Continuation of discussions if necessary / Summary of decisions and recommendations**
- 14:30 – 15:30 **Drafting of the summary report of the meeting** *(M. Pavelek and E. Lipman)*
Free time for interactions *(all other members)*
- 15:30 – 16:00 *Coffee break*
- 16:00 – 17:00 **Approval of Workplan and recommendations**
- 17:00 – 18:00 **Conclusion**
- Election of the Chair / Vice-Chair
 - Closing remarks
- 18:00 *Dinner together with some staff of AGRITEC Ltd., tasting of Czech wines*

Friday, 9 July 2010

Field trip to AGRITEC Ltd., flax and hemp field trials; visit to water dam Dlouhé Stráně or hand paper factory Velké Losiny

- 8:00 – 9:00 Transport to AGRITEC Ltd., Šumperk
- 9:00 – 10:00 Tour of AGRITEC Ltd., welcome by Miroslav Hochman, Director
- 10:00 – 12:00 Visit of flax and hemp field trials, guided by the respective research workers
- 12:00 – 14:00 *Lunch at AGRITEC*
- 14:00 – 15:00 Transport to Kouty nad Desnou
- 15:00 – 17:00 Visit of Dlouhé Stráně water dam
- 17:00 – 18:00 Transport to the hotel
- 18:00 *Dinner and end of meeting*

Saturday, 10 July 2010

Departure of participants

Appendix III. List of participants

Second meeting of the ECPGR Working Group on Fibre Crops (Flax and Hemp) 7-9 July 2010, Šumperk – Velké Losiny, Czech Republic

N.B. Contact details of participants updated at time of publication. However, the composition of the Working Group is subject to changes. The full list, constantly updated, is available from the Working Group's Web page (http://www.ecpgr.cgiar.org/Workgroups/Flax_Hemp/Flax_Hemp.htm).

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