International Barley Core Collection Status Report

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Introduction

A workshop on the International Barley Core Collection (BCC) and a business meeting of the International BCC Coordinating Committee were held in conjunction with the 9th International Barley Genetics Symposium in Brno, Czech Republic on 20 and 21 June 2004, respectively. This report summarises the main points from both meetings. Details on the history, aims, principles and the network of cooperating institutions of the BCC is presented separately in a chapter of the book "Diversity in Barley (*Hordeum vulgare*)".

After 15 years since the start all subsets of the BCC are developed or nearly so. The few still remaining issues, for example, the legal status of the Ethiopian subset will be accomplished before long. The whole core consists now of ca. 1,600 accessions, and it is so far, mainly used for research and screening purposes. Since the core is now almost fully operational the committee has decided to terminate itself – thus "Mission is completed". For the full operational phase there is no need for the continuous work of a committee, but of a coordinator. It was decided that for a first period of four years, until the next IBGS, Dr. Helmut Knuepffer at IPK, Gatersleben, Germany, will take the coordinating role for the Barley Core Collection.

Definition and objectives

The BCC is a selected and limited set of accessions. It optimally represents the genetic diversity of cultivated barley and the wild species of *Hordeum*, covering the three genepools. The core should include as much as possible of its genetic diversity.

The BCC is being developed in order to (1) increase the knowledge about the barley genepool; (2) increase the efficiency of evaluation and thus of utilisation of existing collections; (3) provide a manageable and representative, highly diverse selection of the available barley germplasm for use in research and plant breeding; (4) provide adequate standards, e.g., for studies of genetic diversity in barley.

Whenever a diverse set of barley accessions is needed for an investigation, the BCC or a subset of it can be used. Consequently, large numbers of diverse results of characterisation, evaluation and other research will be accumulated for a relatively small number of accessions. The BCC does not replace existing collections and does not make them superfluous. It is a key for better utilisation of the existing collections.

BCC structure

The barley genepool is hierarchically structured and can be described by a dendrogram, each branch of which will be represented in the BCC by one or several accessions. The diversity of the barley genepool will be represented as completely as possible. The total number of BCC accessions should not exceed 2,000.

The genepool was initially divided into five main categories, namely, (1) cultivars (500 accessions), (2) landraces (800 accessions), (3) *Hordeum vulgare* ssp. *spontaneum* (150-200 accessions), (4) other *Hordeum* wild species (60-100 accessions, ca. two per species), and (5) "genetic stocks" and reference material (max. 200 accessions). The further subdivision of the cultivated barleys and ssp. *spontaneum* follows ecogeographical criteria, whereas the wild species of *Hordeum* are divided according to taxonomic and ecogeographical criteria.

BCC coordination
Designated coordinators for subsets of the BCC, leading scientists in their field, selected candidate accessions from the world barley holdings, in cooperation with other experts for the particular region or taxonomic group.

The BCC network and coordination presently consists of the following institutions and persons: Chairman: Roland von Bothmer, secretary: Kazuhiro Sato (designated in 2002, formerly Theo van Hintum), documentation: Helmut Knüpffer, methodology: Theo van Hintum

Central & West Asia, North Africa: 285 accessions available from ICARDA, Aleppo, Syria, coordinator: Jan Valkoun

East Asia: 380 accessions available from RIB Okayama, Japan, coordinator: Kazuhiro Sato

Europe: 298 accessions available from IPK Gatersleben, Germany, coordinator: Andreas Graner

Americas: 152 accessions available from USDA, Aberdeen, USA, coordinator: Harold Bockelman

Ethiopia & Eritrea: 105 accessions at the final selection was on the way by Mekelle University, Tigray, Ethiopia/Institute of Biodiversity Conservation and Research, Agricultural University of Norway (temporary coordinator: Asmund Björnstad). The legal status of this subset has to be solved.

Oceania: 11 accessuibs available from Tamworth – Australian barleys only AWCC, Tamworth, Australia, coordinator: Michael Mackay

H. vulgare ssp. *spontaneum*: 70+144 two sets of accessions (at the final multiplication)– original material and a newly selected set of populations, coordinator: Jan Valkoun. The final subset of ssp. *spontaneum* has to be selected.

Other wild *Hordeum* species: 48 accessions, coordinator Roland von Bothmer, available from the Nordic Genebank (NGB)

Genetic stocks & reference material: ca.200 accessions are currently under final multiplication, coordinator: Udda Lundqvist, Svalöf Weibull AB, Svalöv, Sweden and Jerry Franckowiak, North Dakota State Univ., Fargo, USA

BCC distribution, Material Transfer Agreement
BCC accessions should be distributed only to researchers who present a clear statement on the purpose of research or evaluation. A Material Transfer Agreement (MTA) is under development for the BCC. The question of MTAs needs to be handled very carefully. It was suggested that a standardised MTA, agreed among the BCC centres, be used for all requests of BCC accessions. The MTA should contain the project title and keywords, as well as a section where the user signs a commitment of feedback of data (or at least the MTA should contain the statement that data feedback is expected). It still needs time to receive whole set of collection with the completed MTA. For receiving each subset, contact each coordinator its availability.