

NPGS Curator Workshop Executive Summary

This Executive Summary presents an abstract of each session; captures recommendations and follow up items brought up in discussions, and concludes with a list of outcomes.

The workshop was held Dec. 5,6 in Chicago, Illinois with the goal of bringing together NPGS curators, site managers and staff to share information on a broad range of topics identified as high priority in a pre-workshop survey. The scope of the workshop included clonal and seed crop concerns. Forty eight people attended the workshop, representing 19 NPGS Sites. The following 7 topics were covered:

- GRIN Issues
- Germplasm Acquisition
- Taxonomy
- NPGS Inactivation Guidelines
- Relations between NCGRP and Active Sites
- Technology Show and Tell
- Regeneration Issues

Workshop Website:

<http://www.ars-grin.gov/ars/PacWest/Pullman/Curators/workshop2005.htm>

(View and download individual presentations, supplemental documents and listen to specific discussions).

I. GRIN Issues

A. Overview from the DBMU Unit (Quinn Sinnott)

The presentation started with a report on the GRIN feed back received from the NP-301 Stakeholders Meeting (November 2005): “ARS efforts to document and characterize genetic resources are viewed as having low impact. Efforts are needed to improve interoperability with other databases and better meet user needs”. Speaker pointed out that GRIN does deliver passport and evaluation/observation data on NPGS accessions. The question is how does it need to be improved? Current DBMU resources have been focused on developing GRIN for the Animal, Insect/Invertebrate, and Microbial Genetic Resource Programs; exporting GRIN for use in Canada and Latin America; and upgrading hardware and software. The Unit has also been investigating interoperability with germplasm collections (GBIF) and genomic databases (GDPC).

B. Morphological Evaluation Data in GRIN (Clare Coyne, Melanie Harrison-Dunn)

1. Numerous items were discussed during this session. Outcomes of the discussions were as follows:
 - a. Multiple years of observational data should be displayed on GRIN with as much detail provided as possible in regard to location, environment, etc. No clear decision was made about GRIN format.

- b. A standard color chart such as the RHS or Munsell color chart should be used for color descriptors. Each curator should decide which chart is most appropriate.
- c. The use of 0-9 scales would be improved if discrete categories were defined for each value on the scale. Images illustrating each category would be useful. No clear decision was made about GRIN format.
- d. It was generally agreed that all descriptors, historical and current, be displayed on GRIN. Several formats were discussed that would indicate whether a descriptor was old, archived or current, but no decision was made as to which format would be the best.

C. Molecular Marker Evaluation Data in GRIN (Laura Marek, Chuck Simon)

The purpose of the Molecular Session was to:

- a. Present an overview of the current organization of molecular descriptors and information in GRIN, to decide if the schema is adequate to handle forthcoming molecular data,
- b. Discuss what specific information should be included with molecular descriptors.

A wide range of information content exists for currently (December 2005) defined molecular descriptors; however, only ten crops have defined molecular descriptors making this an opportune time for us to review GRIN schema. What do users want to see and how should it be presented? Descriptor examples were selected from isozyme data because it is the only molecular descriptor category for which there are data from multiple crops and data for the same isozyme from multiple crops. Descriptor names vary widely as do definition and evaluation/environment field content. *Vaccinium* has the most detailed and largest number of molecular descriptors (SSR category) and was used to provide an in depth look at how molecular data are presented on public GRIN.

Suggestions include:

- a. Change the structure of GRIN to better handle molecular data. “Existing GRIN schema may not be set up efficiently for molecular marker (MM) data. MM datasets are too large. Not efficient to treat each marker as an individual descriptor. Better to organize MM datasets into tables” [Ed Buckler]
- b. Consider standardization in descriptor naming, information content and organization to facilitate across crop searching and analyses [Laura Marek].

D. GDPD Model and GRIN (Ed Buckler)

E. GRIN report from Corvallis workshop (Joseph Postman)

F. GRIN Panel Discussion (Morning speakers formed panel)

1. Appear to be two separate GRIN issues:
 - a. GRIN Database Structure (adequate for molecular data?)
 - b. GRIN User interface (needs to be easier to use)

2. DBMU could use a GRIN advisory committee represented by its' diverse users (plant breeders, NPGS curators/staff, taxonomists, genomics, casual public users) to address both issues.
3. Overall coordination is needed to orchestrate the improvement of GRIN, perhaps an outside IT specialist that can work with DBMU and diverse user community
4. General comments:
 - a. Need better user documentation for GRIN, (i.e. online tutorial)
 - b. Test GRIN interface with real live users (users with no prior knowledge of GRIN)
 - c. Develop "use cases"- what do people want GRIN to be? Important to identify all users (internal and external users)
 - d. NPGS sites continue to differ in their use of GRIN. Some sites use GRIN minimally, due to lack of personnel or development of "workaround" applications that are used instead of GRIN; other sites use GRIN to support all germplasm activities.
 - e. Public GRIN (public web access) needs to be made more user friendly
 - f. GRIN used by NPGS needs to be more user friendly
 - g. Need a more efficient way to get feedback from users to DBMU (can we construct GRIN with extensions that encourage users to provide feedback; can curators facilitate GRIN feedback form CGC's?)

G. Georeferencing: Getting latitude and longitude from historic data (Rebecca Rowe)

This presentation outlined the methodology that has been developed and published by Dr. John Wieczorek and colleagues, to georeference locality descriptions. The method has been widely adopted by institutes around the world that house biological collections, and is considered a standard.

II. Germplasm Acquisition (Karen Williams)

Several topics related to acquisition of germplasm through both exploration and exchanges were covered. The history and current status of the NPGS Plant Exploration/Exchange Program was presented. Resources for preparing exploration/exchange proposals, considerations for conducting explorations, regulations governing importing germplasm into the US, and the use of Geographical Information Systems for guiding plant explorations were described. Issues of international access to germplasm and the approach of the NPGS to addressing the challenges were discussed. An overview of permit regulations for collecting germplasm in the United States was also given. Topics that relate to germplasm exchange including the review of Material Transfer Agreements received from foreign donors and the implications of the International Treaty on Plant Genetic Resources for Food and Agriculture for the NPGS, were discussed.

III. Taxonomy: What's a Curator to Do?

A. “*Notes on taxonomic issues for Curators: a very basic introduction*” was prepared by Allan Whittemore, and presented by Kevin Conrad, both located at the National Arboretum. The presentation identified common problems where Curators may require taxonomic information, and reviewed resources available to resolve issues.

B. The second presentation, prepared and presented by John Wiersma, of the ARS, Systematic Mycology and Botany Lab. was entitled “*GRIN taxonomy – what curators need to know*” and covered the following topics:

1. Content of GRIN taxonomy
2. Demonstration of public web interface
3. Adding new accessions to GRIN
4. Resolving missing taxonomy or other taxonomic issues
5. Changing identities of accessions

IV. NPGS Inactivation Guidelines (Mark P. Widrlechner)

This presentation was designed to give NPGS curators and support staff an understanding of the need for sites to develop uniform guidelines for the inactivation of germplasm accessions, and information about specific procedures to process and document inactivation events. It was given as a PowerPoint presentation (available on the website) with ample time for discussion. The session was divided into five components:

- A. An overview of the NPGS inactivation guidelines**
- B. Current inactivation procedures used by the Ames site,**
- C. Methods to record inactivation events in the GRIN database,**
- D. Ideas on how the inactivation process might be automated (mostly for situations where a large number of similar accessions are being handled simultaneously), and**
- E. General discussion to share information on how various NPGS sites are inactivating accessions and related topics.**

V. Germplasm Storage at NCGRP (Dave Ellis, David Brenner, Phil Forsline)

A questionnaire was developed and sent to NPGS active sites, asking them to describe storage procedures for both seed and clonal crops. The session began by summarizing the results of the questionnaire received from 23 NPGS sites. A discussion then followed, covering topics such as communication between NCGRP and NPGS Active Sites, and NCGRP policy on distributing germplasm; including accessions located at Active sites, and accessions designated as restricted. A second presentation reviewed cryopreservation research on the apple collection.

VI. Technology Show and Tell (Gwen Pentecost, Mark Millard, Pete Cyr)

This session demonstrated several different data collection systems which have been developed for germplasm collecting trips and germplasm maintenance and evaluation tasks. It was followed by a presentation on the system developed at Ames, Iowa, for acquiring descriptor images through scanning or digital photography and their custom Photoshop application used to automate uploading of images into GRIN.

VII. Regeneration Issues (Susan Steive, Vicki Bradly and Maria Jenderak)

Nine presentations were given, in the format of 10 minute presentation, followed by 10 minute discussion. Topics covered a broad range, and Workshop participants were invited to share specific procedures and methodology used in individual collections. Topics included the distribution of healthy propagules, the regeneration needs of clonal material, harvesting strategies to minimize genetic change, the unique issues of insect-pollinated, self-pollinated and wind-pollinated crops, and handling dormant seeds. See Proceedings for list of speakers and to access contributions from speakers and work shop participants.

VIII. Outcomes

- A. There was unanimous support that the meeting had been successful and that we should meet again. Once a year was quickly decided as too often; every other year decided upon. Suggestion was made that we alternate with PGOC. Concern was expressed that we stay independent of PGOC. Suggestion made that we meet with the GRIN meeting which also meets every other year, although that would make for a long meeting. It was suggested that winter is best time for curators and technical staff to have a meeting. Combining the meeting with GRIN was well supported, and would provide for a good venue to have a biannual GRIN training session. The final suggestion was that we should strive to meet every other year in the winter and explore the possibility of combining with the biannual GRIN meeting.
- B. Develop an Executive Summary and Proceedings of the NPGS Curator Workshop and post on the web.
- C. Develop a Curator Resource Center web site which would contain Proceedings of this meeting, a directory of expertise, a curator directory (name and crops curated), a posting site for NPGS related publications (i.e. individual site operation manuals, acquisition and distribution policies), and listing of upcoming meetings and recent publications. Stephanie Greene, Susan Steive, and Clare Coyne volunteered to head up efforts to develop web site.
- D. Present a summary report to the PGOC in June 2006. Does a Curator Committee need to be formally organized to address and implement curator-level policy and procedures that could strengthen the NPGS by the adoption of system-wide standards?