USDA-ARS National Germplasm Resources Laboratory
Beltsville, Maryland
2015 Report to PGOC, RTACs and CGCs

The National Germplasm Resources Laboratory (NGRL) supports the acquisition, introduction, documentation, evaluation, and distribution of germplasm by the National Plant Germplasm System (NPGS) and other components of the U.S. National Genetic Resources Program (NGRP). The Laboratory is comprised of the Plant Exchange Office (PEO), the Database Management Unit (DBMU), and the Plant Disease Research Unit (PDRU).

Plant Exchange Office

Plant Exploration and Exchange Program

- The PEO supports the collection of germplasm for the NPGS through the management of a Plant Exploration and Exchange Program. Guidelines for developing plant exploration and exchange proposals will be distributed to CGC chairs in February 2015. Proposals must be endorsed by the appropriate CGC or other crop experts.
- Ned Garvey retired June 30, 2014. Recruitment for his replacement is pending. The position is being revised to provide additional expertise to support GRIN-Taxonomy.
- The deadline for submitting proposals for explorations or exchanges to be conducted in FY 2016 is July 24, 2015.
- All foreign explorations supported by PEO comply with the Convention on Biological Diversity on access and benefit sharing related to genetic resources. Prior informed consent to collect genetic resources is obtained from the host country before the exploration. The PEO is involved in most requests to foreign governments for permission to collect, and negotiates the terms of agreements when necessary.

FY 2014 NPGS Plant Explorations

Target Crop	**Country**	**Principal Contacts**
Camelina and other crops	Armenia	G. Fayvush, A. Lexanyan, H. Hovhannesyan
Wild lettuce	Azerbaijan	A. Asgarov, N. Quliyev, M. Eldarov
Walnut and grape	Georgia	M. Aradhya, D. Kluepfel, D. Maghardze, Z. Bobokashvili
Kentucky coffeetree	United States (IN, IL))	J. Carstens, A. Schmitz
Chenopodium spp.	United States (UT, WY, AZ, NM, CO, NE, MN)	R. Jellen, P. Maughan
Ash	United States (ND)	J. Zeleznik
Ash	United States (AL, AR, MI)	J. Carstens, M. Scanlon

Wild potato	United States (AZ)	J. Bamberg, C. Fernandez, A. del Rio
Wild squash	United States (FL)	H.R. Kates
Spiraea alba and *Diervilla lonicera*	United States (IA)	J. Carstens, A. Schmitz, E. Malin
Betula nigra	United States (IA)	J. Carstens

Complementary Conservation of Crop Wild Relatives (CWR) in the United States

- A framework for collaboration between ARS and the US Forest Service (USFS) on the *in situ* and *ex situ* conservation of native CWR occurring on National Forest System lands has been published: http://www.fs.fed.us/wildflowers/ethnobotany/documents/cwr/FrameworkNativeCropWildRelativesOct2014.pdf

Conservation of cranberry genetic resources in the U.S.

- As a pilot project under the USFS-ARS framework, the Plant Exchange Office is collaborating with the USFS botanists on the conservation of the genetic resources of wild cranberry (*Vaccinium macrocarpon* and *V. oxycoccos*) on U.S. National Forests. Representative populations across the species' native ranges are being evaluated using standard protocols developed by the ARS and USFS to collect leaf tissue for DNA analysis, collect fruit and seed (when present), and prepare herbarium vouchers.
- Seed from all populations is sent to the ARS National Clonal Germplasm Repository in Corvallis, OR. Leaf tissue from all populations is sent to the ARS Cranberry Genetics and Genomics Laboratory in Madison, WI, for molecular analysis of inherent genetic variability. Herbarium vouchers are sent to the U.S. National Arboretum in D.C.
- The goal is to identify wild cranberry populations on National Forests that are the highest priority for designation as *In Situ* Genetic Resource Reserves (IGRRs). Long-term management plans will be implemented by the USFS to monitor, manage, and safeguard the security of the populations. Germplasm will be conserved and distributed by the NPGS. The evaluation will be extended to populations on land under ownership of other public or private entities in the future.

GRIN Taxonomy for Plants

- GRIN Taxonomy provides online current and accurate scientific names and other taxonomic data for the NPGS and other worldwide users. This standard set of plant names is essential for effective management of ARS plant germplasm collections, which now represent ca. 14,895 taxa. A broad range of economically important plants are supported by GRIN nomenclature, including food or spice, timber, fiber, drug, forage, soil-building or erosion-control, genetic resource, poisonous, weedy, and ornamental plants.
- GRIN Taxonomy includes scientific names for 26,979 genera (14,282 accepted) and 1,375 infra-genera and 104,076 species or infra-species (61,330 accepted) with over

64,000 common names, geographical distributions for 53,909 taxa, 447,298 literature references, and 30,892 economic impacts.

- GRIN Taxonomy includes federal and state regulated noxious weeds and federally and internationally listed threatened and endangered plants, with links to information on noxious weed and conservation regulations to ensure unimpeded interstate and international exchange of plant genetic resources.
- Since 2008 a project to provide thorough coverage in GRIN-Taxonomy of wild relatives of all major and minor crops has been underway. We have completed our initial work on 135 major and minor crops, and an interface to query these data in various ways has been developed (www.ars-grin.gov/~sbmljw/cgi-bin/taxcwr.pl) and is now placed on the GRIN Taxonomy public site. We invite feedback from NPGS curators and CGC members for those CWR classifications already developed.

Facilitation of Germplasm Exchange

- PEO assists NPGS personnel and other scientists with acquiring germplasm from scientists, foreign national and international genebanks, domestic and foreign explorations, and special projects and agreements. The PEO also helps to expedite the distribution of germplasm from the NPGS to foreign scientists and other international genebanks through a long standing collaboration with USDA-APHIS at Building 580, BARC-East.
- In 2014, germplasm for 798 public orders containing a total of 44,707 samples of NPGS accessions were shipped from Beltsville to individuals in 65 countries throughout the world for research and education. In addition, PEO facilitated the agricultural inspection of 21 arriving germplasm shipments containing accessions from 13 different foreign countries to researchers and curators at several NPGS sites in the U.S.

Crop Germplasm Committees

- The position that was occupied by the late Mark Bohning, which helps coordinate CGC activities, is still awaiting recruitment.
- Most committees continue to meet regularly and are active. Committees are urged to update their Crop Vulnerability Statements.
- A virtual meeting/web conference was held for CGC Chairs on November 20, 2014 with about 30 committees represented. Updates were provided on the activities of ARS and the NPGS, international issues related to plant genetic resource exploration and exchange, GRIN-Global, and the activities of the CGCs.
- NGRL also has a conferencing account that is available to the CGCs to host virtual meetings.

Database Management Unit

GRIN and GRIN-Global

- The DBMU develops and maintains information systems for the National Genetics Resources Program comprised of plants, animals, microbes, and invertebrates. The primary emphasis is on the plant GRIN and GRIN-Global that supports the NPGS.

- At the beginning of 2015, the plant database included:
  568,900 accessions representing 14,895 species and 2,383 genera
  2,011,410 inventory records
  1,848,225 germination records
  8,882,171 characteristic/evaluation records
  325,134 images
  1,672,037 distinct visits to the NPGS pages of GRIN in 2014, a 7% decline from 2013
- We are awaiting a security review of the version 1.9.3. GRIN-Global source code before converting from GRIN to GRIN-Global. We hope this will be completed early in 2015.
- A fully functional test version of the GRIN-Global public website can be found at: http://www.ars-grin.gov/npgs/gringlobal/webpages/publicwebsite.html. **However, germplasm requests are not being filled through this test public website until we make the conversion.**
- Comments, ideas and suggestions on GRIN-Global can be sent to the entire development team at feedback@ars-grin.gov.

Plant Disease Research Unit

- The PDRU conducts research to understand the biology of pathogens that infect economically important prohibited genera plant germplasm, including their etiology, detection, and elimination by therapeutic procedures. This project provides support to the APHIS quarantine programs and help facilitate the safe introduction, conservation, and international exchange of valuable plant germplasm.
- Two new visiting scientists have recently joined the pathology project: Dr.Mengji Cao (a recent post-doc at the University of California-Riverside) and Dr. Nouman Tahir (a recent PhD from Quaid-i-Azam University in Pakistan).

Key NGRL Contacts

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