USDA-ARS
National Germplasm Resources Laboratory
Beltsville, Maryland
2020 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).

Quinn Sinnott retired in August 2019 after more than 30 years of service as the GRIN Database Administrator. Fortunately, we used a vacant position to hire a new IT Specialist, Benjamin Haag, who started in April 2019 and benefitted from overlapping with Quinn for about four months. Benjamin came to ARS from the IT group at the Kennedy Center for the Performing Arts in Washington, DC; he also has previous federal service with the National Institute of Standards and the Department of State/Peace Corps.

There are four positions currently vacant in NGRL, including a Botanist position in the PEO. We hope to fill most, if not all, of these positions in 2020 consistent with an increased emphasis by ARS on recruiting vacant positions.

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 2020. Proposals must be endorsed by the appropriate CGC or other crop experts.
- The deadline for submitting proposals for explorations or exchanges to be conducted in FY 2021 is July 24, 2020.
- All foreign explorations supported by PEO comply with the principles in the Convention on Biological Diversity covering 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 2019 NPGS Plant Explorations

Target crop/taxon	Country	Principal contacts
Wild apple	Vietnam	G. Volk, T. Chao, T. Hoai, N. Van Klein

Woody landscape plants	Georgia	T. Kurdadze, M. Khutsishvili
Wild potato	United States (AZ, CO, NM, UT)	J. Bamberg, C. Fernandez, A. del Rio, I. Bamberg, M. Martin
Cladrastis kentukea	United States (KY)	J. Campbell
Amelanchier spp.	United States (KY)	J. Campbell
Monarda brevis	United States (WV)	J. Carstens
Amaranthus spp.	United States (AZ, CA, NM, TX)	K. Waselkov
Parthenium argentatum	United States (TX)	C. Heinitz, H. Abdel-Haleem, G. Ponciano, P. Manning
Woody landscape plants	United States (NC, TN)	M. Lobdell, K. Shearer
Chenopodium spp.	United States (CA, CO, OR)	R. Jellen
Wild blueberry	United States (FL)	G. Nunez

Collaboration on Crop Wild Relatives in the U.S.:

In 2016, ARS and the U.S. Forest Service established an agreement to foster collaboration on conservation of crop wild relatives on U.S. National Forests. A pilot project is currently underway to evaluate the suitability of the Wild Chile Botanical Area in the Coronado National Forest, AZ as an *in situ* reserve for multiple species of crop wild relatives. The project is a collaborative effort of the US Forest Service, Borderlands Restoration Network, the University of Arizona, and ARS. In addition to wild chiles, wild relatives of cotton, beans, cassava, grapes, passion fruit, walnut, squash, sunflower and other crops occur in the Botanical Area.

GRIN Taxonomy for Plants:

- GRIN Taxonomy, available through GRIN-Global (https://npgsweb.ars-grin.gov/gringlobal/taxon/taxonomyquery.aspx), 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. 16,000 taxa. A broad range of economically important plants is supported by GRIN nomenclature, including food, spice, timber, fiber, drug, forage, soil-building or erosion-control, genetic resource, poisonous, weedy, and ornamental plants.
- GRIN Taxonomy includes scientific names for 27,533 genera (14,430 accepted) and 1,422 infra-genera (1,360 accepted) and 117,688 species or infra-species (66,030 accepted), with over 67,292 common names, geographical distributions for 28,902 taxa, 481,197 literature references, and 38,146 economic importance records. These numbers increase regularly.
- Since 2008, a project to provide thorough coverage of wild relatives of all major and minor crops in GRIN Taxonomy has been underway. We have completed our initial work on 241 major and minor crops from 120 genera, and an interface to query these data is available

(https://npgsweb.ars-grin.gov/gringlobal/taxon/taxonomysearchcwr.aspx). We invite feedback from NPGS curators and CGC members for those CWR classifications already developed. A new CWR page is being developed and should be released in 2020 to allow users to search for trait class and breeding type data contributed by the Global Crop Diversity Trust.

Facilitation of Germplasm Exchange:

The PEO helps 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 2019, 579 public orders containing a total of 44,786 samples of NPGS accessions were shipped from Beltsville to individuals in 69 countries around the world for research and education. In addition, PEO facilitated the agricultural inspection of arriving germplasm shipments containing accessions from numerous foreign countries for researchers and curators at NPGS sites.

Crop Germplasm Committees:

- The CGC section in GRIN (https://www.ars-grin.gov/CGC) was revised when the GRIN platform was migrated to the Microsoft Azure cloud in September 2019.
- A new coffee and cacao CGC has been created consistent with new funding allocated to ARS by Congress to establish collections for these crops.
- Please send updates to the individual crop committees of the CGC page on GRIN (https://www.ars-grin.gov/CGC) to Gary Kinard.
- Most committees continue to meet regularly and are active. Committees are particularly urged to update their Crop Vulnerability Statements and several CGCs recently completed new versions.
- A virtual meeting/web conference was held for CGC Chairs on March 25, 2019. Updates were provided from ARS and the NPGS including on international issues related to plant genetic resource exploration and exchange, GRIN-Global, and the activities of the CGCs.
- NGRL has a WebEx conferencing account that is available to the CGCs to host virtual meetings (teleconference and/or webinar).

Database Management Unit

GRIN and GRIN-Global:

- At the time of this report, the GRIN-Global plant database included the following:

  596,132 active accessions representing 13,481 species and 2,497 genera
  3,353,167 inventory records
  2,050,371 germination records
  8,414,832 characteristic/evaluation records
  469,116 digitized images

Many of these numbers increase almost daily.

- The entire GRIN platform (all databases and informational pages) were migrated from in-house servers to the Microsoft Azure cloud in September 2019. At that time, the GRIN home page (www.ars-grin.gov) was totally redesigned with new navigation for the ARS genetic resource collection informational pages, the Crop Germplasm Committee pages and the content for the National Genetic Resources Advisory Council.
- New email accounts were established for the NPGS internal email lists during the migration to the cloud. The older email addresses for curators, CCG Chairs, and PGOC members were disabled and can no longer be used. Information about this change was distributed in September 2019.
- We anticipate releasing a new version of the GRIN-Global (accession search, accession detail, germplasm requests, etc.) public website in spring 2020.
- Current information about the project, including user documentation and release notes from each version of the software, can be found on the project website at https://www.grin-global.org/.

Plant Disease Research Unit

The PDRU conducts research on pathogens that infect clonally propagated prohibited genus (i.e., quarantine) plant germplasm, including their etiology, detection, and elimination by therapeutic procedures. This project provides direct support to the APHIS Plant Germplasm Quarantine Program and helps facilitate the safe introduction, conservation, and international exchange of valuable plant germplasm. PDRU also collaborates on virus related problems with NPGS germplasm repositories, state departments of agriculture, and university scientists. Additional updates will be provided for those committees whose crops are within the scope this project's research.

Key NGRL Contacts

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