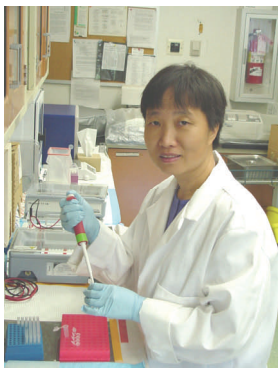


Plant Disease Research Unit (PDRU)

The PDRU conducts research on pathogens of prohibited genera plant material that must enter the U.S. through quarantine programs. Importation of valuable plant germplasm carries with it the concurrent risk of introducing diseases and pathogens that could harm U.S. agriculture. Such prohibited material must enter the country through federally operated or approved programs that conduct diagnostic tests for pathogens and diseases of quarantine significance. Most prohibited genera plant germplasm is propagated vegetatively and thus, the crops emphasized in PDRU include clonal pome, stone and cane fruits, sugarcane, grasses, and sweet potatoes.



PDRU research has three objectives:

- Characterize poorly described pathogens and diseases of quarantine significance
- Develop rapid, sensitive and reliable methods for detecting viral and sub-viral pathogens of quarantine significance
- Develop protocols to eliminate viral and sub-viral agents from infected clonal germplasm maintained in quarantine

The research emphasis is on viruses and viroids, the predominant pathogens of quarantine significance, which are especially difficult to detect and eliminate. The results and products of this research are shared with colleagues in USDA-APHIS who are responsible for regulatory issues associated with germplasm quarantine and also conduct the testing of imported plant germplasm.

PDRU research has the potential to accelerate the international exchange of important plant germplasm and promote science-based regulatory decisions. The exclusion and elimination of invasive pathogens infecting economically important plant germplasm minimizes the potential for agricultural losses. An effective quarantine program encourages compliance with federal regulations regarding importation of germplasm and reduces the temptation to smuggle prohibited plant material into the country. This research benefits the U.S. quarantine system, certification programs, plant breeders, and germplasm curators who need to exclude quarantine pathogens.

ARS Mission

The Agricultural Research Service conducts research to develop and transfer solutions to agricultural problems of high national priority and provides information access and dissemination to:

- Ensure high-quality, safe food and other agricultural products,
- Assess the nutritional needs of Americans,
- Sustain a competitive agricultural economy,
- Enhance the natural resource base and the environment, and provide economic opportunities for rural citizens, communities, and society as a whole.

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United States Department of Agriculture

Agricultural Research Service

National Germplasm Resources Laboratory

The Henry A. Wallace

Beltsville Agricultural Research Center (BARC)



National Germplasm Resources Laboratory

A broad range of genetic diversity is vital to world food security. Well-documented plant genetic diversity in germplasm collections provides plant breeders and other scientists with the raw materials necessary for crop improvement and other research efforts. These resources are necessary to adapt present crops and develop new crops to meet the needs of U.S. and world agriculture.

The primary mission of the National Germplasm Resources Laboratory (NGRL) is to support the ARS-managed U.S. National Plant Germplasm System (NPGS) efforts to acquire, document, conserve, evaluate, enhance and distribute plant genetic resources. In addition, the NGRL provides database support for the animal, microbial and invertebrate genetic resources programs of the U.S. National Genetic Resources Program (NGRP).

The NGRL conducts service and research programs to manage electronic data for the National Genetic Resources Program; facilitate the exchange, collection, and preservation of plant genetic resources; and improve the quarantine process for plant germplasm entering the U.S.

What is germplasm?

Germplasm is living tissue from which new organisms can be grown. Plant germplasm is normally in the form of seeds or plants, but can also be part of a plant (leaf, stem, pollen, or embryo) that can be cultured into a whole plant. All germplasm contains genes and other materials that control inheritance.

Lab Composition

The NGRL is part of the Plant Sciences Institute at the USDA-ARS Henry A. Wallace

Beltsville Agricultural Research Center. The NGRL is comprised of three units: the Database Management Unit (DBMU), the Plant Exchange Office (PEO), and the Plant Disease Research Unit (PDRU).

Database Management Unit (DBMU)

The DBMU develops and maintains centralized databases, collectively known as the Germplasm Resources Information Network (GRIN), to document and manage the collections of the U.S. National Genetic Resources Program. These databases:



- Are available to scientists through the web at: <http://www.ars-grin.gov>
- Provide a flexible way to store and retrieve data on plant, animal, microbial and beneficial insect accessions, thereby facilitating management and operation of these genetic resources collections
- Enable easy communication between scientists and curators
- Reduce duplication of data
- Maintain as much of the following information as is known on each of the accessions: taxonomy (nomenclature); origin, including collectors, location, and habitat; donors; developers; pedigree; vouchers and images; disease resistances and tolerances; morphology and molecular marker data

GRIN Germplasm Resources Information Network



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Plant Exchange Office (PEO)



The PEO facilitates international and domestic acquisition of plant germplasm for the NPGS and the international distribution of NPGS germplasm, according to national and international regulations. In addition, PEO supports the plant taxonomic nomenclature for the GRIN database.

The PEO manages the Plant Exploration Program to collect germplasm of traditional varieties of crops and wild plants closely related to crops from around the world that are necessary for crop improvement and other research. Foreign explorations follow a Code of Conduct on ethical and conservation issues. The PEO's approach to sharing the benefits of germplasm acquisition and utilization is beneficial to both host countries and the U.S. Germplasm acquired is deposited in the NPGS, where it is made available for use by scientists worldwide.

The activities of the PEO include:

- Identifying gaps in the NPGS collections
- Procuring plant germplasm through international and domestic exchanges
- Arranging for and participating in international and domestic plant explorations
- Working with Animal and Plant Health Inspection Service (APHIS) officials on import and export of germplasm and meeting quarantine requirements
- Developing *in situ* conservation programs for crop plants and their wild relatives
- Responding to foreign requests for plant germplasm
- Enhancing and maintaining the information on plants in the online GRIN database that includes validated scientific names, taxonomic classifications, common names, distributions, and associated data (such as economic uses)