

The NCRPIS - Providing Diverse Plant Genetic Resources for Worldwide Research and Development

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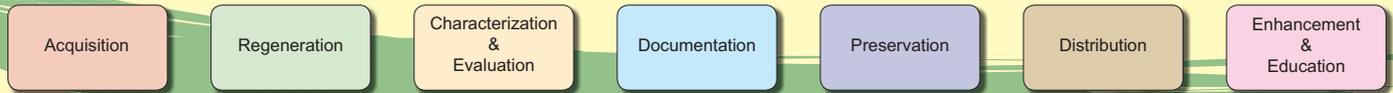
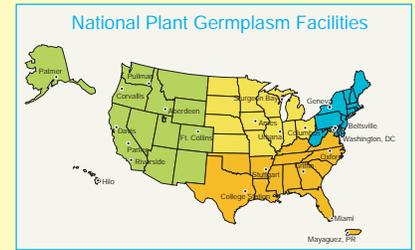
North Central Regional Plant Introduction Station

- An active plant genebank of the National Plant Germplasm System (NPGS)
- The NPGS is a network of federal and state institutions and research units coordinated by the USDA - Agricultural Research Service
- The NCRPIS was established as the first Plant Introduction Station in 1948 in Ames, Iowa in cooperation with Iowa State University
- Employs USDA-ARS and ISU staff, as well as part-time students

NCRPIS Mission

- Acquire and conserve genetically diverse crop germplasm and associated information
- Conduct research that supports germplasm conservation activities
- Encourage germplasm improvement in research and product development and education

Impact: Over the NCRPIS's 60-year history, curatorial and staff efforts have led to increased global use of plant genetic resources and associated data. Ready access to quality information enables researchers to better target their efforts and achieve their objectives. As a result, new and improved crops and new uses for crops have been developed that contribute to societal well-being.



Acquisition

- Accomplished through foreign and domestic explorations
- Exchanges with other germplasm collections, botanical gardens and collectors
- Germplasm developers (originators)
- Must comply with national and international laws



Preservation

- Original seed is stored at -18 °C
- Standard viability testing protocols are used for crops such as cucurbits, maize, and sunflower
- Many wild species do not have established germination protocols so research efforts are devoted to developing methods
- Seed is deposited at the National Center for Genetic Resources Preservation (NCGRP) in Ft. Collins, CO as a safety backup



Regeneration

- Requires control pollination techniques to preserve the materials' original genetic profile
- NCRPIS has one of the most extensive controlled pollination programs in the United States
- A variety of pollinating insects, including alfalfa leaf cutter bees, bumble bees, honey bees, Osmia or mason bees and flies, are used



Distribution

- Germplasm and information is freely available to researchers and educators worldwide
- Materials can be requested via the GRIN website, fax, phone, email, or postal mail
- In 2008, 24,726 items (seed packets and vegetative samples) were sent out to requestors
- 18,142 items to US requestors
- 6,584 items to foreign requestors



Characterization & Evaluation

- Field notes are taken for agronomic performance and aesthetic traits
- Biochemical and genetic analyses of highly heritable traits support quality assurance and assessments of genetic diversity
- Plants and seeds are tested using several methods to ensure they are free from diseases and insects prior to distribution
- All data are available to the public via the Germplasm Resources Information Network (GRIN) database



Enhancement & Education

- Genetic enhancement adapts exotic germplasm to grow in different environments
- High-value genes are incorporated into adapted varieties, improving agronomic performance
- NCRPIS staff members have:
 - adapted cuphea to the Midwestern climate
 - transferred fruit rot resistance to cucumbers
- The Germplasm Enhancement of Maize (GEM¹) project, part of NCRPIS, adapts exotic maize to increase genetic diversity of temperate U.S. maize



Documentation

- Identifying information (passport data) usually accompanies an accession and is entered into the GRIN database
- Digital images are captured to provide useful detail on plants and seed structures, and permanent information for reference use

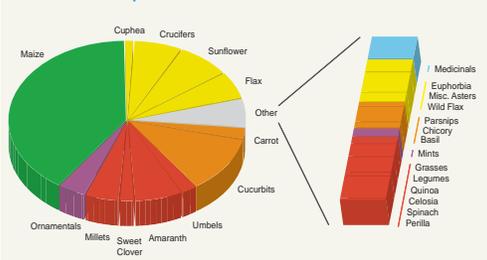


Germplasm Resources Information Network

- Information associated with NPGS collections available via the world wide web
- Maintained by the Database Management Unit in Beltsville, MD
- Website: www.ars-grin.gov/npgs
- A new version of GRIN is under development (GRIN-Global) to provide for genebank information management system and public user access
- GRIN-Global will be freely available for use by any genebank in the world



Crops Maintained at NCRPIS



NCRPIS Collections

- Contains over 1,400 plant species
- About 50,000 accessions (types) of:
 - crop cultivars
 - landraces
 - elite lines
 - populations
 - valuable wild and weedy crop relatives

Curators

 Mark Millard Maize	 Laura Marek Oilseeds	 Luping Qu Medicinals	 Kathy Reitsma Vegetables	 David Brenner Amaranth	 Mark Widrlechner Ornamentals
<ul style="list-style-type: none"> Maize Coix Teosinte 	<ul style="list-style-type: none"> Cuphea Crucifers Sunflowers Flax 	<ul style="list-style-type: none"> Actaea Hypericum Prunella Echinacea 	<ul style="list-style-type: none"> Carrots Cucurbits Chicory Basil 	<ul style="list-style-type: none"> Amaranth Millets Sweet Clover Umbels 	<ul style="list-style-type: none"> Ornamentals Woody Ornamentals Mints