The USDA/ARS National Plant Germplasm System

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What is germplasm?

• Living plant reproductive and propagating material, e.g., seeds, tubers, cuttings.

• Germplasm (genetic resources) requires conservation in original habitats or in genebanks.
The USDA/ARS National Plant Germplasm System (NPGS)

- One of the largest national genebank systems.
- More than 576,000 samples of more than 15,000 plant species.
- Large collections of the major staple crops important to U. S. and world agriculture.
- Large holdings of crops without major collections at international agricultural research centers, e.g., cotton, soybean, various horticultural and “specialty” crops.
- Germplasm Resources Information Network (GRIN): an international standard.
Example of an NPGS genebank: U. S. Potato Collection, Sturgeon Bay, WI
How do genebanks conserve genetic resources?

- Acquisition
- Maintenance
- Regeneration
- Documentation and Data Management
- Distribution

- Characterization
- Evaluation
- Enhancement
- Research in support of the preceding priorities
- To sum: keep them safe, encourage their use.
Availability of seeds, tubers, etc.

- Seeds, tubers, etc. are available from the USDA/NPGS free-of-charge and restriction for educational and research purposes.
- Order online at [http://www.ars-grin.gov/npgs/orders.html](http://www.ars-grin.gov/npgs/orders.html)
Native American Traditional Crops

- Traditional crops and a wide variety of useful “wild” plants embody Native American cultures and knowledge systems.
- Native Americans in the U. S. have cultivated a rich diversity of traditional crops, within a similarly diverse set of agricultural systems.
Native American Traditional Crops

- Some New World indigenous crops:
  - Beans (Phaseolus)
  - Pumpkins, squash, gourds (Cucurbita, Lagenaria)
  - Maize (Zea mays)
  - Chiles (Capsicum)
  - Cotton (Gossypium)
  - Tobacco (Nicotiana)
  - Sunflower (Helianthus)
  - Amaranthus and Chenopodium

- Some early Old World crop introductions:
  - Wheat (Triticum)
  - Barley (Hordeum)
  - Melon (Cucumis, Citrullus)
  - Cowpeas (Vigna)
  - Peaches, apricots (Prunus)
Recent USDA/NPGS collaborations with Native American Tribal Nations to conserve genetic resources

- Conservation and ash tree seed storage for Bad River Band of Chippewa (WI); Stockbridge-Munsee Mohican Community (WI); Grand Portage and Fond du Lac Tribes (MN), and Leech Lake band of Ojibwe (MN).
- Training for ash tree seed collection and preservation for the St. Regis Mohawk Tribe (NY).
Recent USDA/NPGS collaborations with Native American Tribal Nations to conserve genetic resources

- Joint USDA/ARS potato research with the Makah, Yakama, and Haida tribes of the Pacific Northwest.
- Joint Crop Wild Relatives Workshop with Keweenaw Bay Native American Community (Michigan) USDA/ARS, USDA/Forest Service, Chicago Botanical Garden.
- Plant Genome Outreach project supported by USDA/ARS, National Science Foundation, and Iowa State University trained Navajo students.