

The National Plant Germplasm System: 2012 Status and Prospects

Peter Bretting

USDA/ARS Office of National Programs

The USDA/ARS National Plant Germplasm System (NPGS)

- One of the largest national genebank systems.
- More than 548,000 samples of more than 14,500 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.

FY 2012 and FY 2013 Budgets

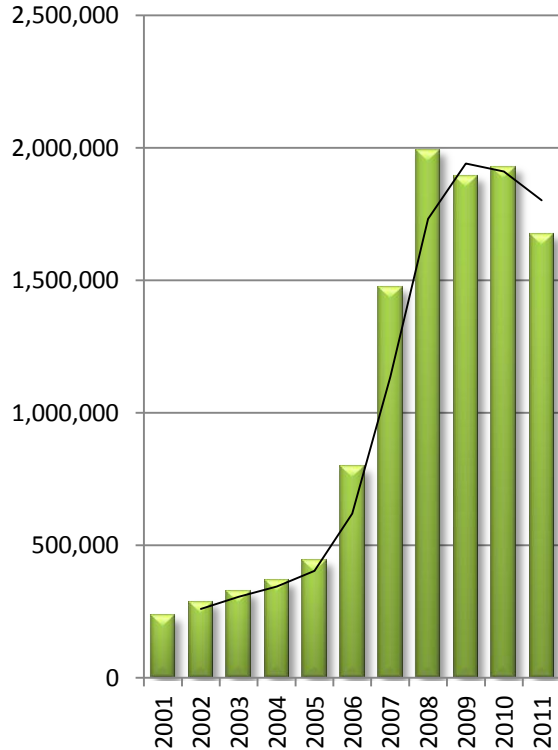
- **The President's FY 12 budget proposed a substantial increase (\$3.3 million) for the NPGS, but the Congress reduced the USDA/ARS's budget by about 3.5%.**
- **Nine locations and one program were closed, including the NPGS genebank at Palmer, AK. The closures cost ARS an additional ca. \$30 million for FY 12, which reduced budgets for travel and for specific cooperative agreements.**
- **The President's FY 13 budget proposed modest budget increases (\$581,000) for the NPGS. The Senate mark-up would increase the ARS FY13 budget very slightly (0.06%); the House Appropriations Committee mark-up would reduce ARS's budget by about 2%.**

USDA National Plant Germplasm System (NPGS)

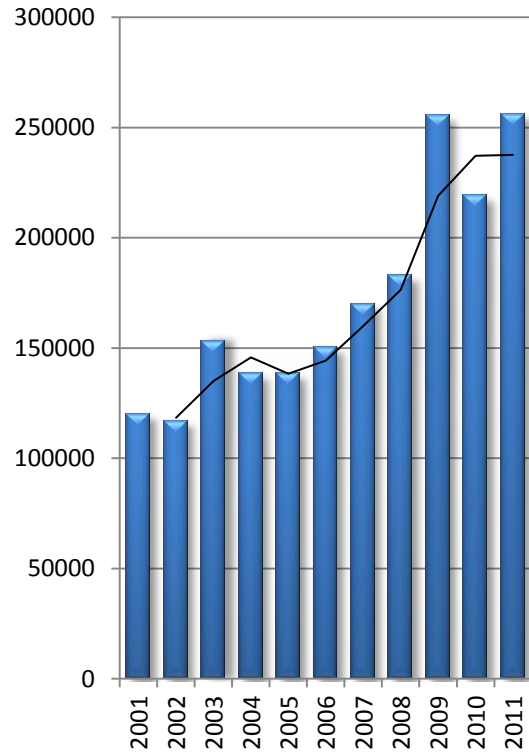


DEMAND FOR NPGS GERMLASM AND INFORMATION VS. NPGS BUDGET

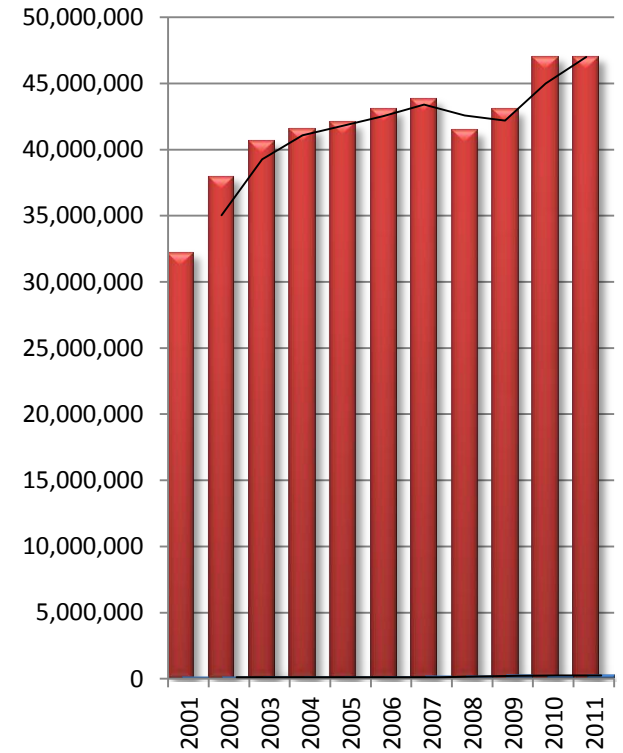
NPGS Web Page Access



Germplasm Distribution



NPGS Annual Budget



Retrospective review of USDA/ARS National Program 301: Plant Genetic Resources, Genomics, and Genetic Improvement

- This second five-year retrospective review covered overall NP 301 accomplishments from 2006-2011. The NPGS is part of this National Program. Accomplishment Report is at <http://www.ars.usda.gov/SP2UserFiles/Program/301/NP301%20Accomplishment%20Report%20Appendices%202006-2011.pdf>
- Because of budgetary constraints, the review occurred “on-line,” with “virtual” meetings of the review panel in October 2011.
- An “in-person” customer-stakeholder workshop was held in November 2011, at the GWCC in Beltsville.

Major observations from 2011 NP 301 External Retrospective Review

- **Impact of NPGS genetic diversity analyses could be improved with greater utilization of new tools and information. NPGS has the potential to be a world leader in this area and should be.**
- **Need more quantitative data regarding success of serving clientele—“customer surveys?”**
- **CGCs and PGOC are important for maintaining NPGS excellence.**

Major observations from 2011 NP 301 External Retrospective Review

- Remarkably high germplasm distribution rate—why?
- How are genetic diversity assessments and data applied to curatorial decision-making and managerial operations?
- Need to apply novel approaches for “gap analyses”

New National Program 301 Action Plan

- **Describes the overall research goals, needs, anticipated products, and potential benefits generated by this, ARS' largest National Research Program.**
- **Provides overall guidance and direction for the individual Research Projects that are aligned with and contribute to NP 301 goals.**
- **Its Anticipated Products serve as benchmarks for subsequent retrospective assessments of programmatic achievements.**

New National Program 301 Action Plan

Component 2: Crop Genetic and Genomic Resources and Information Management: Problem Statement 2b: Plant and microbial genetic resource and information management. (essentially the NPGS)

- **Co-authors Clare Coyne, Pete Cyr, Brian Irish, Gary Pederson, Gayle Volk, Karen Williams**

Anticipated Products from Problem Statement 2B

- **Priority genetic resources and associated knowledge safeguarded in state-of-the art genebanks and databases.**
- **Genetic gaps in collections identified and priority genetic resources acquired.**
- **Genetic resources characterized systematically.**
- **Genetic resources evaluated for priority agricultural traits.**
- **More efficient and effective genetic resource management methods developed.**
- **High quality genetic resources and associated information delivered to requestors.**
- **International partnerships for genetic resources research and exchange expanded.**
- **Genetic resource management plans and Crop Germplasm Committees strengthened.**

Costs for phytosanitary certificates

- **Required by some nations for importing germplasm of some crops. To date, the NPGS has paid APHIS directly for issuing such certificates.**
- **APHIS has increased the price of issuing certificates substantially from \$23 three years ago to \$61 now.**
- **NPGS is discussing whether to request international recipients to voluntarily reimburse APHIS (via an on-line site) directly. Ultimately, this might become mandatory, with waivers from the NPGS for requests from the poorest nations.**

Potential international trends for charging for plant germplasm?

- **The Dutch national genebank requested input from other European genebanks regarding charging requestors a €50 “handling fee” per accession (packet). Such a fee would be one means to deal with budgetary shortfalls.**
- **No charge to “NGOs” or those who regenerate samples for the genebank. Volume discounts?**
- **Apparently, Japan’s national genebank and the Asian Vegetable Research and Development Center already levy handling fees.**

International Treaties

- **On 30 November 2010, during its last Business Meeting of the 111th Congress, the Senate Foreign Relations Committee (SFRC) voted the FAO International Treaty out of committee for consideration by the full Senate. The full Senate adjourned without voting on it, so now the 112th Congress must consider it.**
- **On 29 October 2010, the Convention on Biological Diversity (CBD) adopted the Nagoya Protocol on Access and Benefit-Sharing of Genetic Resources. It is uncertain how this new protocol will affect ABS for plant genetic resources.**

Likely Trends for Crop Germplasm and its Management

- **Budgets will likely not increase**
- **Increasing costs for managing germplasm**
- **Larger germplasm collections**
- **Increasing demand for germplasm**

Some (but not all!) Key Challenges for the NPGS

- **Managing and expanding NPGS operational capacity and infrastructure**
- **Fulfilling the demand for additional germplasm characterizations/evaluations**
- **Acquiring and conserving germplasm of wild crop relatives**
- **Managing genetic/genomic seed stocks**
- **Conserving germplasm of crop-associated microbes**

Genetic Resource Management Priorities

- **Acquisition**
- **Maintenance**
- **Regeneration**
- **Documentation and Data Management**
- **Distribution**
- **Characterization**
- **Evaluation**
- **Enhancement**