

How to Improve a Genebank Collection: 15 Years of Progress (2001-2016)



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Introduction

Progress in genebank management occurs over long periods of time. Though annual or 5-year reports may only show minimal progress, genebank managers should concentrate efforts on longer term results. At the Plant Genetic Resources Conservation Unit in Griffin, GA, a number of needed improvements in the collection were identified in 2001. No germination testing was being conducted, most accessions were stored at 4C, availability and distribution quality were inadequate, backups of accessions at a second location were not complete, and -18C seed storage facilities were limited. These improvements were tackled systematically and progress over the last 15 years is presented.

Personal Genebank Goals

1. Be a caretaker of the plant genetic resources collection at the Plant Genetic Resources Conservation Unit, Griffin, Georgia and leave the collection in better shape in 2016 than it was in 2001 when I arrived.
2. Retain as much as possible the original genetic makeup of all accessions in the collection by minimizing regenerations, maximizing seed longevity, and keeping accessions viable, safe, and available for distribution to users.

Genebank Priorities & Improvements

1. Germination testing

Why? If the seed are all dead, the accession is lost.

Germination testing increased from **0% in 2001** to **93% in 2016**.

2. Cold seed storage (-18C)

Why? Minimize expensive regenerations, retain recessive traits, prevent outcrossing or selection

Seed storage space at -18C was increased from 98.6 m² in 2001 to 176.2 m² in 2016, moveable storage shelves were installed in all cold rooms, and % of collection in -18C increased from **40% in 2001** to **86% in 2016**.

3. Availability

Why? Conduct regenerations & eliminate duplicates to improve accession availability for users.

Availability of accessions for users increased from **83% in 2001** to **90% in 2016**.

4. Continued acquisition

Why? Continue to acquire new plant genetic resources to maximize genetic variability available.

New acquisitions increased collection size from **81,660 in 2001** to **92,215 in 2016**.

5. Safety backup at second location

Why? Don't take chances. Backup all accessions at another location to prevent loss.

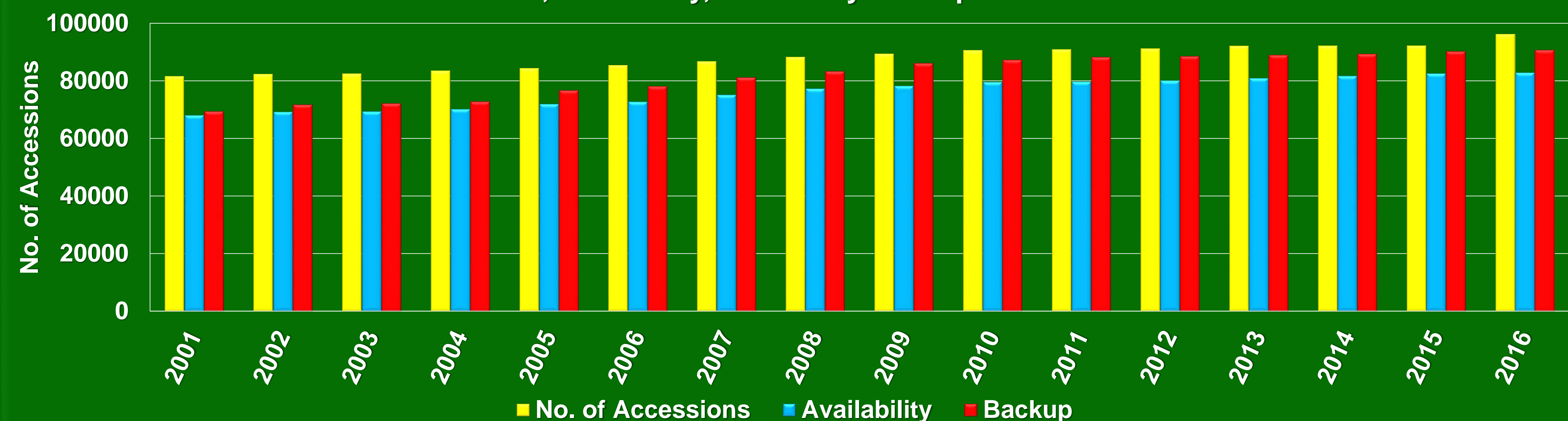
Backup of accessions at Ft. Collins increased from **85% in 2001** to **98% in 2016**. Additional backups at Svalbard Global Seed Vault increased to 14% in 2016.

6. Distribution

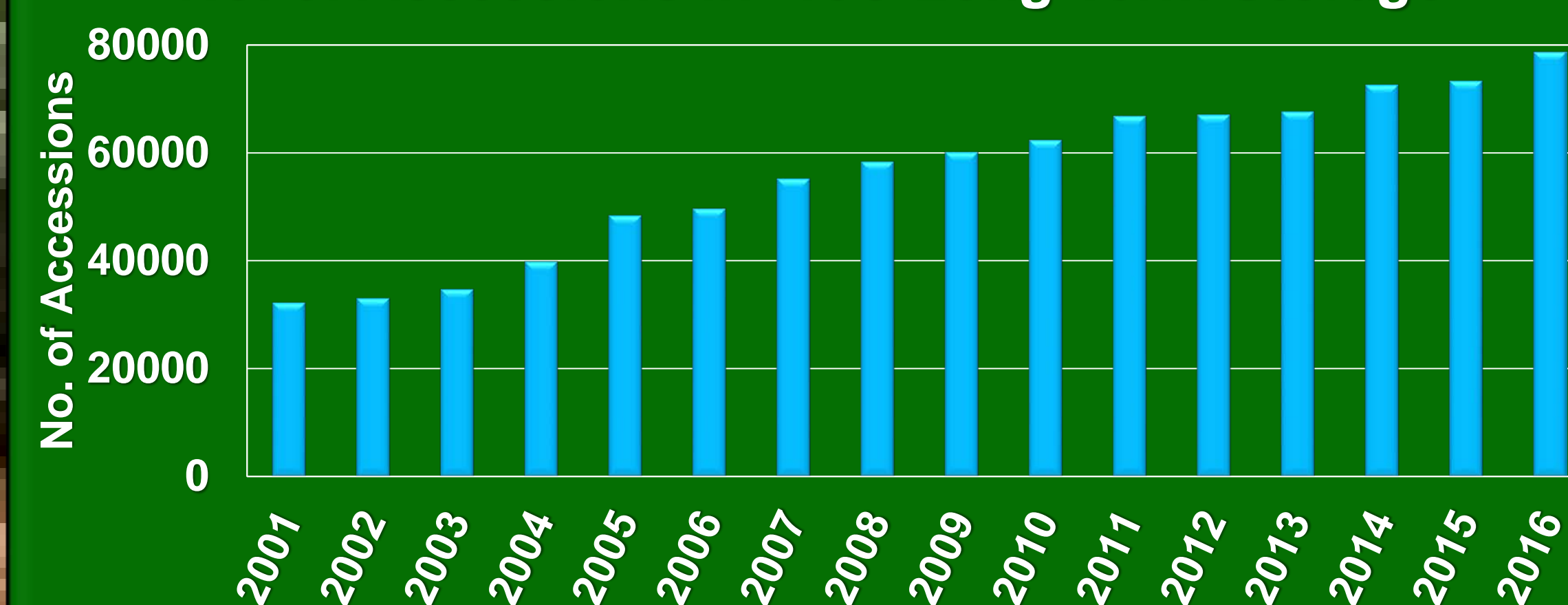
Why? An active genebank distributes to users. Otherwise it is simply a storage vault.

Distributions to users increased from **16,917 in 2001** to **35,376 in 2015**. Provide excellent customer service ("Give 'em the pickle!").

Collection Size, Availability, and Safety Backup at Second Location



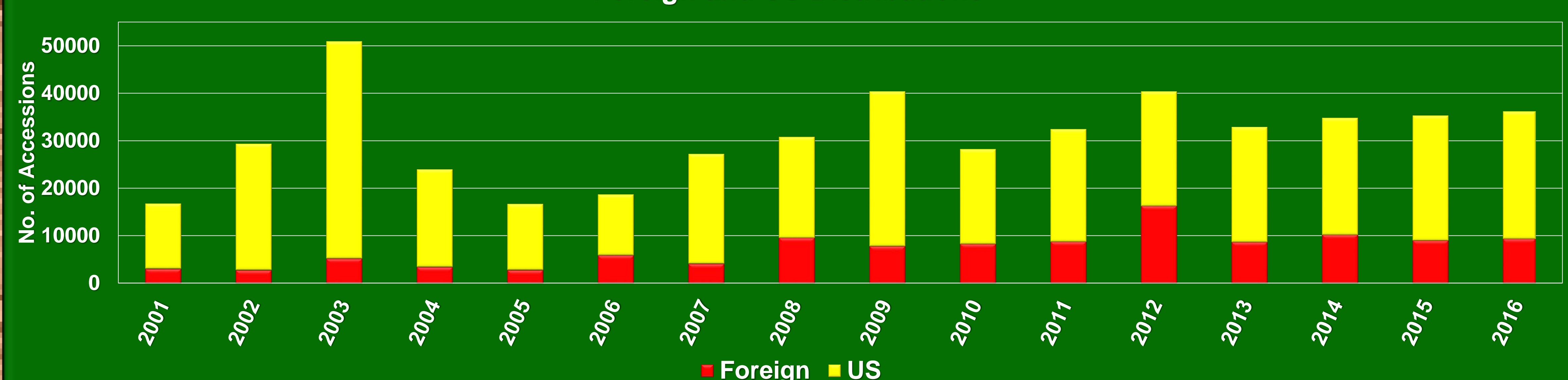
No. of Accessions in -18C Long Term Storage



% Collection Tested for Viability



Foreign and US Distributions



Conclusion

Improving a genebank requires long-term vision and dedicated personnel (below) providing excellent customer service to users of plant genetic resources. Day-to-day and year-to-year changes are minor. But minor changes in a positive direction will lead to major improvements over time. Genebank managers and personnel must continue to focus on long-term improvements to conserve useful plant genetic resources for future researchers and educators.

Current Personnel

