



**USDA Peanut Germplasm Collection at the UGA Griffin Campus Genebank**

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# Terminology



**Genebank/Seed bank:**  
A repository of living plant materials to preserve the genetic diversity



**Germplasm:**  
Living tissue from which new plants can be grown



**Genetic/Germplasm Resources:**  
Genetic material of actual or potential value



**Genetic Diversity:**  
Variation within a species. Genetic diversity helps species to adapt to changing environments

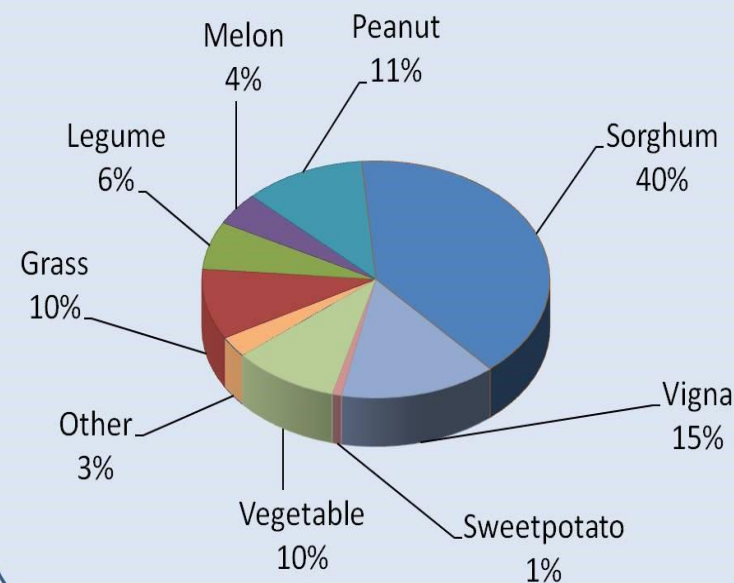


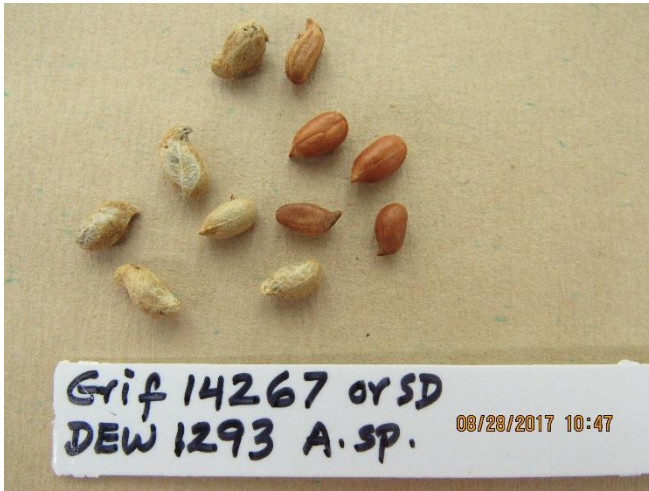
# Plant Genetic Resources Conservation Unit (PGRCU) USDA-ARS, Griffin, Georgia



- PGRCU was established on November 1, 1949, as a cooperative effort between the USDA-ARS and the Southern State Agricultural Experiment Stations (S-009 Multistate Project).
- The PGRCU is a unit of the National Plant Germplasm System (NPGS), to preserve **plant genetic resources of regional importance** for current and future researchers, educators, and commercial producers.
- PGRCU crops collections comprise of about 17% of the NPGS collection.
- PGRCU has 104,831 accessions of 1596 crop species and 269 genera with 84.2% available for distribution.
- Seeds are stored at 4C for short term and at -18C for long term storage, respectively. They are also backed up in Fort Collins, CO, at the National Laboratory for Genetic Resources Preservation (NLGRP).

Composition of PGRCU Collection





## Peanut Germplasm Collection Status in the Genebank - 2022

- Cultivated peanut:
  - Total 9210
  - Available for research 8504
- Wild species:
  - Total 536
  - Available for research 440

# Peanut Genetic Diversity

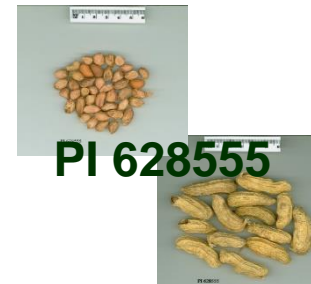
- Genetic diversity is essential for crop improvement.
- Peanut genetic diversity for pod and seed traits offers opportunities for improving their size, shape, flavor, seed oil content and quality, nutritional quality, especially seed protein content and other biological compounds including antioxidants for a healthy diet and a happy world.
- Additionally, the germplasm collection provides sources of high yield, disease resistances, drought tolerance and early maturity to improve peanut.



PI 664990



PI 672865



PI 628555



PI 153342



Grif 13795



PI 200431



Grif 12608



PI 476025



Grif 12545



PI 648259



PI 668524



PI 162659



PI 161307

# Peanut Seed Increase Plots in Byron, GA

- Annually, about 600 Peanut accessions are planted for seed increase to replenish fresh seeds into the genebank
- Some with low seed quantity are grown in the greenhouses for seed increase for field planting the following year
- Wild species are grown in the greenhouses for seed replenishment





# Tomato Spotted Wilt Virus

- When TSWV began infecting peanut crop in 1987, UF and UGA peanut breeders identified TSWV resistance in the Griffin genebank peanut collection.
- One accession, PI 203396, collected from a market in Porto Alegre, Brazil in 1952 was resistant to the virus.
- Georgia Green was released in 1995 with PI 203396 in its pedigree conferring TSWV resistance. Economic Benefit: \$200 million annually.

# Emerging Pathogens

## Peanut Smut in Argentina

Soilborne fungus, *Thecaphora frezzii*



- First reported in Argentina in 1995.
- Spread to all production areas by 2012.
- Yield reductions as high as 51% reported.
- Proactive measures to identify sources of resistance were initiated so that our growers and the industry wouldn't be threatened, should this disease ever reach the U.S.
- The USDA-ARS in partnership with peanut industry and partners in Argentina evaluated the peanut mini core accessions, promising breeding lines and cultivars from the U. S. for a total of **208 entries from 33 countries.**
- Materials were evaluated in replicated field plots in 2017, 2018 and 2019 in Argentina.
  - **25 potential sources of peanut smut resistance were identified**
    - **8 entries had 0% disease over a 3-year testing**
    - **8 entries had 0% disease over a 2-year testing and**
    - **Additional ones between 5 and 10% disease**
- Crosses were made, populations developed, and genomic tools are being developed for field testing and selection of best materials for cultivar development.

## **Summary**

**National Peanut germplasm collection with its genetic diversity is extremely important for continued development of cultivars for sustained peanut production.**

**The collection is utilized by peanut breeders and other researchers to identify novel sources of desirable traits to develop new cultivars.**

**We safeguard the national peanut germplasm collection in the Griffin genebank as our legacy to future generations.**

**Thank you!**

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