

Capturing the Diversity of Apple Genetic Resources

The NPGS apple collection includes more than 1350 *Malus x domestica* cultivars. In addition, there are more than 4000 samples representing wild progenitors of domesticated apples. Cultivars are maintained as field in Geneva, NY and wild species are maintained both as seed and trees.

Does the NPGS collection adequately represent the genetic diversity of *Malus*?

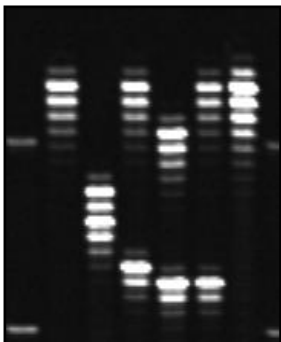
In addition to genetic diversity, assessments of the apple collection include:

- Species differentiation and identification
- Identification of primary crop wild relatives
- Genetic diversity of wild populations
- Geospatial analyses to predict adaptive variation
- ‘Duplicates’ within the collection
- Core collection identification and coverage
- Comparisons with other apple collections
- Domestication of apples
- Cryopreservation of cultivars
- Longevity of cryopreserved materials

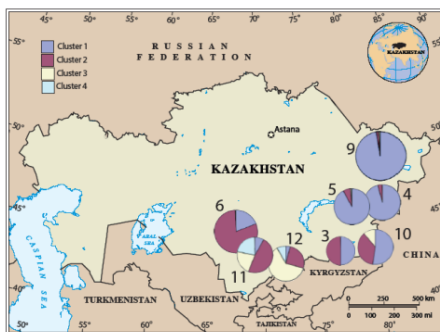


Diversity of apple genetic resources in the NPGS (left); Wild apple collection expedition in Kazakhstan (upper right), apple trees in the PGRU (lower right).

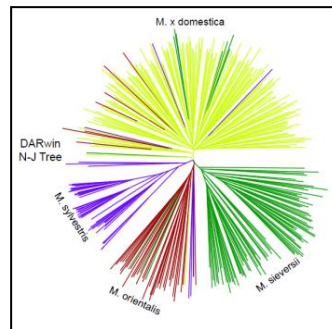
Improved characterization of the NPGS apple collection will increase its value and use, since customers will receive well-documented materials. Using cryopreservation technologies, it is also secure from environmental and biological threats.



Microsatellites measure diversity



Partitioning of *Malus sieversii* diversity in Kazakhstan



Differentiation of *Malus x domestica* (cultivated apple) and progenitor species



Recovery after cryopreservation