Cryopreservation of Vegetative Dormant Winter Buds
Apple and Sour Cherry

Preservation of woody fruit crop germplasm is traditionally done in field collections. Due to high costs associated with maintaining field collections, an accession is often represented only by one or two individual trees or shrubs. As a consequence, the risk of permanent loss of germplasm, due to diseases, insects or adverse environmental conditions, is very high.

Cryopreservation of vegetative winter buds is an alternative method to preserving plant species in the field. In this method, nodal sections of scionwood are stored in liquid nitrogen vapor. Cryopreservation of the vegetative dormant winter buds involves low maintenance costs and virtually eliminates the risk of germplasm loss. At the NCGRP, this method is routinely used to preserve *Malus* sp. (apple) and *Prunus cerasus* (sour cherry) germplasm.

The dormant buds cryopreserved at the NCGRP, were obtained through collaboration with the Plant Genetic Resource Unit, Geneva, NY.

Steps in Cryopreservation of Vegetative Winter Buds

1. Dormant scions containing last season's growth are shipped overnight to the NCGRP for processing. Scions should be harvested at their peak dormancy.

Image 1. Bundles of scions with dormant buds.
Photo by NCGRP

2. Scions, cut into 35 mm single bud sections, are desiccated (at -5^{o}C) to 25-30% moisture content.

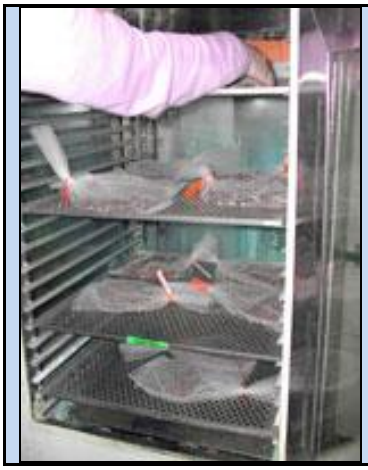

Image 2. Bud sections placed in mesh bags during desiccation.
Photo by NCGRP

3. The desiccated one-bud sections are sealed in polyolefin tubes, slow cooled (1°C/hour) to -30°C, held at that temperature for 24 h and are immediately placed into the vapor phase of liquid nitrogen for long-term storage.

Image 3. Desiccated single bud segments in polyolefin tubes. *Photo by NCGRP.*

4. Before viability testing (by grafting), dormant buds are rehydrated for 12 days, at 2^{o}C and dark conditions, in moist, sterile peat moss.

5. Viability is tested by grafting.

Image 4. Grafting of preserved buds. *Photo credit:* www.ars.usda.gov/is/graphics/photos/nov03/k10813-1.jpg

III. References

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