

VIABILITY METHOD—DORMANT BUDS
NLGRP CLONAL DB MALUS DORMANT BUD GRAFTING 1
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Introduction

Malus dormant budwood is shipped from PGRU in Geneva, NY to NLGRP in Fort Collins, CO to be cryopreserved. Standard recovery of this material involves rewarming at NLGRP, followed by rehydration and grafting at PGRU. Grafting is a practical application to quickly produce a mature plant from the cryopreserved tissue.

Source of Plant Material

Budwood is collected at peak dormancy from PGRU in Geneva, NY. Material is sent to NLGRP and briefly stored at -5 °C in sealed plastic bags. Budwood is processed, desiccated to ~25% to 30% moisture content (FWB), packaged, slow cooled, and then transferred to liquid nitrogen vapor (LNV).

Plant Material Description

Budwood is cut into 3.5 cm segments with at least one healthy dormant bud in the center. Ten segments are packed into each polyolefin tube for storage.

Warming

Quickly transfer tubes from LNV to refrigeration conditions (-5 °C). Keep tubes refrigerated for about 24 hours prior to shipment to the grafting facility.

Regrowth/Viability Conditions

Prior to receiving dormant buds, PGRU staff prepare rootstocks by pruning and potting the bare-root apple seedlings in cone-tainers and growing in a greenhouse.

Dormant bud segments (10-20 per accession) arrive at PGRU where they are tightly packed in moist peat moss for rehydration. These are stored for 14 to 21 days at 2 to 4 °C.

After rehydration, a skilled grafter will patch/chip-bud the cryopreserved dormant buds onto actively-growing, healthy rootstock (grown in the greenhouse for 3-4 weeks prior to grafting). Two buds are grafted onto each rootstock alternately, a few inches above the soil line. Grow these in the greenhouse for 3 weeks before removing budding bands and top the trees just above the upper graft.

Regrowth/Viability Assessment

Viability is reported for each graft after 8 to 10 weeks. Buds are considered viable if they are showing shoot formation and growth. Viability data are recorded and reported in the GRIN-Global database. Accessions are considered successfully cryopreserved when viability

tests show an average shoot formation of 40% or more and the estimated number of viable buds in storage is 60 or more.

Comments

N/A

References

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Appendices

N/A