

# Protocol Information

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## Plant Materials Program

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Family Scientific Name: **Fagaceae**

Family Common Name: **Beech**

Scientific Name: *Quercus muehlenbergii* Engelm.

Common Name: **chinkapin oak**

Species Code: **QUMU**

Ecotype: **Stones River source**

General Distribution: **Chinquapin oak is common throughout the eastern two-thirds of the continental United States with the exception of the New England states of New Hampshire, and Maine and the North Central states of North Dakota and South Dakota.**

Known Invasiveness: **None**

Propagation Goal: **Plants**

Propagation Method: **Seed**

Product Type: **Bareroot (field grown)**

Stock Type: **1-0**

Time To Grow: **2 Years**

Target Specifications: **A second spring seedling ranging in height from 8" to 16" with a 1/16" to 3/16" caliper stem and a compact, well developed tap root system.**

Propagule Collection: **Seeds are collected from established natural stands within the confines of Stones River National Battlefield in the fall immediately after the acorns have matured and begun to fall from the tree.**

Propagule Processing: **Chinquapin oak reproduces readily from seed. Seed has no physiological dormancy and should be sown immediately upon harvest for best results. Fall**

sown seed typically exhibits >90% germination, while seeds stored overwinter exhibit greatly reduced germination; typically <50%.

Pre-Planting Treatments: Seed may be floated in water to help determine viability. Seed that floats is normally poorly filled and has low or no viability. Floaters are discarded, while the seed that sinks is retained for planting.

Growing Area Preparation/

Annual Practices for Perennial Crops: **Best germination and growth of seedlings is in raised beds or sandy soil with adequate moisture. Prepare beds by deep rototilling or other tillage methods that achieve thorough loosening and mixing of soil. Seed are placed into 3/4" to 1" deep furrows scribed into the tilled soil. Furrows are spaced 2" apart and seed are placed 1" apart within furrows to optimize seedling development. Seed are covered with soil to a depth equal to 1 and 1/2 times the average diameter of the seed; usually 3/4" to 1" of soil. Beds should then be covered with a 2 - 3 inch thick layer of straw to insulate against frost heaving. When seedlings begin to emerge, one-half of the straw should be removed.**

Establishment Phase: **A radicle is produced in the fall soon after planting. Top growth is initiated the following spring.**

Length of Establishment Phase: **4-6 months which includes the overwintering period.**

Active Growth Phase: **Plants require little maintenance during active growth other than application of at least 1 inch of water per week during drought conditions and elimination of weed competition. Weeds must be removed during early growth phases to avoid uprooting the chinquapin oak seedlings.**

Length of Active Growth Phase: **6-8 months**

Hardening Phase: **Since the plants are grown outside, no additional hardening is required.**

Length of Hardening Phase: **None**

Harvesting, Storage and Shipping: **Seedlings are harvested in late winter while dormant. The best harvesting method employs a nursery bed lifter/shaker which undercuts the seedlings and gently loosens the soil around the roots. Bare root seedlings are then plucked from the loosened soil by hand. Refrigeration is employed to maintain seedling dormancy after harvest until shipping. Optimal temperatures for**

**maintenance of dormancy are 35-40 degrees Fahrenheit. Root desiccation during storage is prevented through packing in aged, moistened hardwood sawdust.**

**Length of Storage: 1-2 months**

**Outplanting performance on typical sites: Best survival and growth of chinquapin oak is achieved by planting while the plants are dormant between the date of the first frost in the fall and the date of the last frost in the spring. Plantings for wildlife habitat improvement or forest restoration should be established at a ten foot spacing between plants and rows. Plantings for seed orchards or wildlife habitat improvement where seed production is a primary goal should be established at a spacing of fifteen to twenty feet. Dipping bare root plants in root gel before planting to retain moisture around the roots may enhance survival and growth. Applying a slow release fertilizer at planting will also enhance survival and early growth.**

**References: Bonner, F.T. and R. P. Karrfalt, 2008. The Woody Plants Seed Manual. USDA Forest Service. Agriculture Handbook 727.**

**Dirr, Michael A.,1998. Manual of Woody Landscape Plants, 5th ed. Stipes Publishing, LLC. Champaign, IL.**

**USDA, NRCS. 2013. The PLANTS Database (<http://plants.usda.gov>, 30 August 2013). National Plant Data Team, Greensboro, NC 27401-4901 USA**

**Citation:**

Vandevender, John 2013. Propagation protocol for production of field-grown *Quercus muehlenbergii* Engelm. plants (1-0); USDA NRCS - Appalachian Plant Materials Center, Alderson, West Virginia. In: Native Plant Network. URL: <http://www.nativeplantnetwork.org> (accessed 13 September 2013). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.