



United States Department of Agriculture

A Conservation Plant Released by the Natural Resources Conservation Service
Bridger Plant Materials Center, Bridger, Montana

Ekalaka Germplasm

Bur oak

Quercus macrocarpa Michx.

Ekalaka Germplasm is a selected class release of bur oak *Quercus macrocarpa* Michx. (accession number 9087732) chosen for superior seedling survival, rate of height growth, and vigor rating relative to the other seed sources tested. Although selected primarily for windbreak and shelterbelt applications in the northern Great Plains and valleys of the Intermountain West, it also has wildlife, riparian forest buffer, woody draw restoration, and naturalistic landscaping uses.

Ekalaka Germplasm was selected and released in 2009 by the USDA-Natural Resources Conservation Service, Plant Materials Center, Bridger, Montana, in cooperation with the Montana Agricultural Experiment Stations, and the Wyoming Agricultural Experiment Stations.

Description

Ekalaka Germplasm is a long-lived, native, deciduous tree with a medium to tall mature stature in Montana and Wyoming (up to 50 feet). It has strong branches, and is drought-tolerant and winter hardy, with few pest problems. It has the same general botanical (floral, foliage, fruit, and seed) and phenological attributes as the species and variety. It is assumed Ekalaka Germplasm traits are heritable and the appearance and performance of the progeny from this selection will be comparable to its parents. At 10 years-of-age, Ekalaka Germplasm averaged 11.3 inches of annual height growth under dryland conditions in a 10- to 11-inch annual precipitation zone in Bridger, Montana.

Source

Collection sites were primarily undisturbed native populations growing at the western edge of the native range for bur oak. Seed was collected from plants exhibiting superior phenotypic characteristics, such as single, straight stems with strong apical dominance, and well-formed crowns. Ekalaka Germplasm was selected from 370 plants representing 24 seed sources of bur oak from three states. The 67-tree seed orchard is located in Bridger, Montana and represents a bulk of nine seed sources from North Dakota (5), Montana (3), and South Dakota (1).

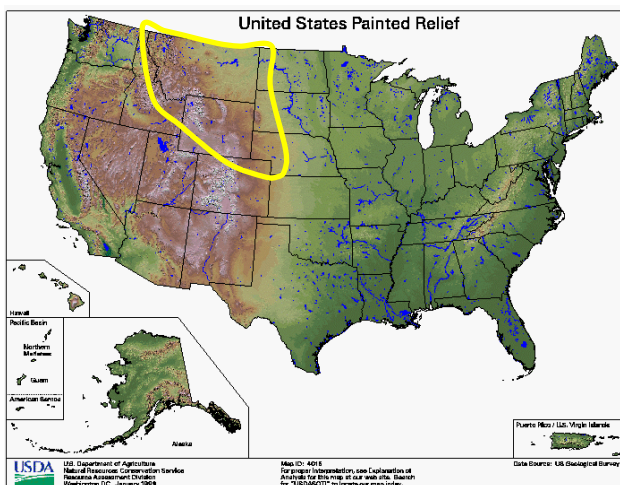
Conservation Uses

Ekalaka Germplasm was selected primarily as a medium-sized component in windbreak and shelterbelt systems for adapted locations in Montana and Wyoming. It is also useful in wildlife enhancement plantings, riparian forest buffers, woody draw

restoration projects, and low maintenance landscapes. This selection may be used to replace Russian olive in several designs, as well as provide a slower growing alternative for green ash should emerald ash borer limit green ash use in the future.

Approximate Area of Adaptation and Use

Bur oak grows well on a variety of sites including rocky hillsides, limestone soils, droughty soils, clayey sites, and other marginal locations -- given full sun conditions. Bur oak is intolerant of flooding and prolonged soil saturation. It has a large, native range extending from Nova Scotia, west to Manitoba, south through Kansas to Texas, east to Alabama, and northeast to Virginia and New England. In Montana, it is indigenous only in the extreme southeastern corner of the state in uncultivated, natural stands. Landscape specimens can be found in many Montana communities over much of the state. Since most of the seed sources comprising



this selection are found occurring naturally in the northern Great Plains, it is assumed this selection will perform well in most regions east of the Continental Divide at elevations below approximately 5,500 feet, given other favorable site and climatic conditions. It may also grow well in valley bottoms west of the Continental Divide given favorable conditions.

Establishment and Management for Conservation Plantings

Ekalaka Germplasm establishes best as container-grown plants, although seedling growth is slow for 2 to 3 years after planting. Both 1-0 and 2-0 stock is acceptable, the latter preferred. Asexual propagation is by grafting only. Best survival and establishment occurs when competing vegetation is adequately controlled prior to and after planting. Continuous rows of woven weed fabric, 6 feet in width, enhances survival, establishment, and early growth. Seedlings of Ekalaka Germplasm tolerate light shade, but prefer full sun, and the species is considered shade intolerant. It has an extensive taproot(s) with few lateral roots, and therefore transplants best before 8 years of age. Deer and rabbits highly prefer browsing bur oak foliage.

Ecological Considerations

Ekalaka Germplasm demonstrates growth, reproductive habits, and ecological niche functions comparable to the species. It does not spread aggressively in the western US by sexual means, and is not known to be invasive or weedy. It is a native species that reproduces only by seed under natural conditions.

Seed and Plant Production

Ekalaka Germplasm bur oak began acorn production at approximately 8 to 9 years of age under fallow, dryland conditions at Bridger, Montana, with substantial production at 10 years of age. Acorns ripen in 1 year and can fall as early as August or as late as October depending on the individual tree. Ekalaka Germplasm produces substantial quantities of seed most years. It may be necessary to monitor seed-bearing trees regularly in order to assure harvesting acorns before wildlife.

Ekalaka Germplasm is propagated from seeds without pretreatment. It averages 240 seeds per pound. Seedlings grow well in a peat-lite mix with modest fertility. Ideal planting depth ranges from 1/2 to 3/4 inches. Use 10-cubic-inch or larger containers for 1-0 stock and 40-cubic-inch containers when seedlings are held for two or more growing seasons. Tall, narrow pots that do not restrict normal taproot development are preferred. Bur oak can be field grown as bareroot stock; however, undercutting of taproots for root pruning or during lifting may restrict top growth for 2 to 5 years. Storage of seed is best in a cooler or refrigerator maintained at a high relative humidity and cool temperatures (33 to 37°F). Germination rates decline quickly after 2 years in storage. Bur oak does not propagate well by cuttings and must be grafted under controlled conditions to produce clonal material.

Availability

For Conservation use: Commercial seedlings are available from state and private conservation seedling nurseries.

For seed or plant increase: G1 (Foundation) seed of Ekalaka Germplasm for commercial seedling production is available by contacting the Foundation Seed Stocks Program, Plant Sciences and Plant Pathology Department, Montana State University, Bozeman, Montana 59717-3150 or Wyoming Seed Certification Service, Powell Research and Extension Center, University of Wyoming, P.O. Box 983, Powell, Wyoming 82435-9135.

For more information, contact:

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Citation

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For additional information about this and other plants, please contact your local USDA Service Center, NRCS field office, or Conservation District <<http://www.nrcs.usda.gov/>>, and visit the PLANTS Web site <<http://plants.usda.gov/>> or the Plant Materials Program Web site <<http://www.plantmaterials.nrcs.usda.gov/>>.

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