

RIVER ALDER

Alnus serrulata (Ait.) Willd.

Plant Symbol = ALSE2

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Alternate Names

hazel alder, smooth alder, brookside alder, common alder

Uses

River alder is used predominantly for streambank stabilization and wetland restoration. It is also a critical cover component of woodcock habitat.

Status

Please consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status (e.g. threatened or endangered species, state noxious status, and wetland indicator values).

Description

River alder is a nitrogen-fixing, thicket-forming shrub or small tree with dark, green foliage. It is native to the United States. It is suitable for streambank stabilization because of its flexible stems and fibrous root system. River alder reaches mature height of 8-12 feet in 10 years. Seed is produced in small cones and pollen is contributed by birch-like

catkins which bloom in mid-to late March.

Compared to other alder species, river alder is more densely branched and produces more seed. Alders produce nitrogen for themselves by the activity of nitrogen-fixing bacteria located in root nodules^{1,2,3,4}. For this reason, it is not recommended for planting in areas where additional nitrogen might add to water quality problems. River alder has about 400,000 seeds per pound¹.

Adaptation and Distribution

River alder is native to the eastern United States in USDA plant hardiness zones 5 through 8 where the precipitation exceeds 32 inches. It occurs from southern Maine to northern Florida, west to southeastern Oklahoma, Missouri, and Illinois. It grows best in wet bottomlands and stream margins; however it will also grow in moist, well-drained upland areas. River alder is adapted to a pH of 5.0 to 7.0. It is moderately shade tolerant, but is weak-wooded and susceptible to wind and ice damage. It is not adapted to alkaline, saline, droughty, or extremely acid soils.

Although river alder is naturally widely distributed throughout the eastern United States, use of 'Panbowl' is recommended only in USDA Major Land Resource Areas (MLRA's) where it was tested. Those MLRA's are: 99, 111, 114, 121, 124, 126, 127, 139, 147, and 148.

Field Establishment

For streambank stabilization, river alder is best established as a bare-root or containerized seedling planted two feet apart within rows with rows two feet apart. A minimum of three rows should be planted for an effective erosion control planting; river alder will not be effective for erosion control on droughty or well-drained sites that are not moist year-round. It may be incorporated into a soil bioengineering system by planting at the toe of the bank just above any toe stabilization measures such as rip-rap, coir (coconut) logs, or fascines. If this alder is planted for wildlife habitat improvement or wetland mitigation, planting should be done at a 5-10 foot spacing to allow for crown development and to optimize seed production. In seed orchards, plants should be spaced at least ten feet apart to allow for crown development and to optimize seed production. Seed orchards should be fenced to prevent deer browse and predation from beavers.

Seed Harvesting and Nursery Establishment

River alder produces a crop every year and produces a good seed crop every four years. Seed of river alder matures in the late fall (October and November). Cones with the mature seed should be harvested promptly and placed in paper bags. Seed will be released as the cones dry. Bags may be shaken to extract the seed. Seed may be separated from the cones with combinations of #14, 9, 6 and 1/18 screens by hand or a seed cleaning machine.

Smooth alder seed does not maintain its germination in storage. Seed should be sown in nursery beds within a month of the date it matures. Best germination and growth and easiest digging of bare-root seedlings is in raised beds or sandy soil with adequate moisture. Nursery beds must be inoculated with soil from an alder stand to provide the nitrogen fixing-bacteria necessary for adequate growth. Seed can be broadcast over the bed and covered with sand or sown in rows a quarter inch deep. Recommended seeding rates are 50 grams of seed broadcast per 100 square feet of bed or 15 grams of seed per 10 linear feet of row.

Beds should be covered with straw to insulate them against frost heaving. When the seedlings begin to emerge, half of the straw should be removed. Seedlings should be of adequate size to transplant the second spring after the seed was sown. A typical second spring seedling will range in height from 6" to 12" and have a 1/16" to 1/8" caliper stem and a compact, well developed root system.

Pests

River alder is resistant to most insect and disease pests. It is browsed by deer and domestic livestock and is very palatable to beaver. Seed orchards should be fenced to prevent browsing and beaver predation.

Management

Very little maintenance of field plantings is needed except for the replacement of dead plants and removing debris from the plants so it does not inhibit growth.

Cultivars, Improved, and Selected Materials (and area of origin)

The cultivar 'Panbowl' was released by the Appalachian Plant Materials Center in 2007. 'Panbowl' was collected on Panbowl Lake in Jackson, Breathitt County, Kentucky in USDA plant hardiness zone 6b and MLRA 125 Foundation plants are available to commercial and government nurseries from the Appalachian Plant Materials

Center in Alderson, West Virginia to establish seed orchards.

Common genetic material of river alder is available from commercial and state nurseries.

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References

1. van Dersal, William R. 1938. Native Woody Plants of the United States: Their Erosion Control and Wildlife Values. US Government Printing Office, Washington, DC
2. Thunhorst, Gwendolyn A. 1993. Wetland Planting Guide for the Northeastern US. Environmental Concern, St. Michaels, MD
3. Mylona, Panagiota; Pawloski, Katharina and Bisseling, Tom. 1995. Symbiotic Nitrogen Fixation. The Plant Cell, Vol.7, pp.869-885.
4. Harrington, Constance A., Brodie, Leslie Chandler, DeBell, Dean S., and Schopmeyer, C. S. 1979. *Alnus P.* Mill. published in Symbiotic Nitrogen Fixation in the Management of Temperate Forests. Gordon, JC, Wheeler, CT and Perry, DA, eds.
5. Strausbaugh, P. D. and Core, E. L. 1977. Flora of West Virginia, 2nd Edition.
6. USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>) National Plant Data Center, Baton Rouge, LA 70874-4490
7. Glennon, Robert. 2007. personal communication

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

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