Protocol Information

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Family Scientific Name: **Betulaceae**
Family Common Name: **Birch**
Scientific Name: ***Alnus serrulata* (Aiton) Willd. 'Panbowl'**
Common Name: **hazel alder, smooth alder, brookside alder, common alder**
Species Code: **ALSE2**
General Distribution: **Smooth alder is native to the eastern United States in USDA plant hardiness zones 5 through 8 where the precipitation exceeds 32 inches annually. It occurs from southern Maine to northern Florida and 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 Aeas (MLRA's) where it was tested. Those MLRA's are: 99, 111, 114, 121, 124, 126, 127, 139, 147, and 148.**
Known Invasiveness: **None**
Propagation Goal: **Plants**
Propagation Method: **Seed**
Product Type: **Bareroot (field grown)**
Stock Type: **Bareroot**
Time To Grow: **1 Years**
Target Specifications: **A second spring seedling ranging in height from 6" to 12" with a 1/16" to 1/8" caliper stem and a compact, well developed root system.**
Propagule Collection: **Smooth alder is a monoecious plant. Flowering occurs in the spring before leaf emergence. Seed is produced in pistillate ovoid strobiles or conelets (cones). Pollen is contributed from staminate catkins**

	which are formed the preceding autumn and occur in small clusters. The catkins are naked and erect during the winter and become much elongated and pendulous at maturity. Pistillate aments are also erect and naked during the winter and occur in short racemes or elongated panicles. Aments enlarge slightly at flowering and develop into ovate strobiles or conelets upon pollination. Smooth alder fruit (seed) is a small, compressed, slightly winged nutlet borne in pairs at the base of each cone scale. Fruit matures in autumn. Ripe cones are thick, somewhat woody and dark brown in color. Compared to other alder species, smooth alder is more densely branched and produces more fruit. Smooth alder produces fruit (seed) every year and a good seed crop every four years. Seed typically matures in late autumn (October and November). Cones with mature seed should be harvested promptly and stored in paper bags at room temperature only until the cones dry.
Propagule Processing:	**Seeds are released as the cones dry. Cones may be shaken and/or crushed by hand or mechanically to extract the seed. Seed may be separated from the crushed cones by hand or a mechanical seed cleaner using combinations of #14, 9, 6, and 1/18 screens.**
Pre-Planting Treatments:	**Smooth alder seed does not maintain its germination in storage. Seed should be sown in nursery beds within one month of harvest.**
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. 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 lightly covered with sand or soil or sown in 1/4 inch deep rows and covered lightly. 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 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:	**Germination occurs in the spring after an overwinter period of cool, moist natural stratification.**
Length of Establishment Phase:	**4-6 months, including natural stratification period**
Active Growth Phase:	**Plants require little maintenance during active growth other than application of at least 1 inch of water per week during drouth conditions and elimination of weed competition. Weeds must be removed during early growth phases to avoid uprooting the alder seedlings.**
Length of Active Growth Phase:	**6-8 months**
Hardening Phase:	**Since the plants are grown outside, no additional hardening is required.**
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 dessication during storage is prevented through packing in aged, moistened hardwood sawdust.

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

Outplanting performance on typical sites: **For streambank stabilization, bare root smooth alder seedlings are planted two feet apart within rows with rows spaced two feet apart. A minimum of three rows should be planted for an effective erosion control planting. Smooth alder 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. When this alder is planted for wildlife habitat improvement, wetland mitigation or seed orchards, planting should be done at a 10 foot spacing to allow for crown development and optimal seed production.**

Other Comments: **River alder is resistant to most disease and insect pests. It is browsed by deer and domestic livestock and is very palatable to beaver. Seed orchards should be protected by fencing to prevent damage from deer and beaver.**

'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.

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Citation:

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