Scientific Name: *Alnus viridis* ssp. *crispa* (Ait.) Turrill

Family: *Betulaceae*

Common Names: green alder, sitka alder, mountain alder, wavy-leaf alder, slide alder

Plant Description

Monoecious shrub, 1 to 3 m tall; fuzzy branches with pale lenticels, sticky when young; alternate leaves are irregularly toothed, ovoid, leathery, 2 to 8 cm long; inflorescence in catkins, male pendulous (5 to 8 cm), female woody and erect (1 to 1.5 cm) (Royer and Dickson 2007).

Fruit: Short-stalked seed cones, 1 to 2 cm long (Royer and Dickson 2007).

Seed: Samaras, smooth to rough texture, 3 mm x 1.5 mm (2 to 3 mm with wings), flat, oblong, light brown with papery translucent wings.

Habitat and Distribution

Habitat: Sand hills, open forests and edges of wetlands and streams. Semi-shade tolerant, but cannot grow with a dense overstory (Hardy BBT 1989, Matthews 1992).

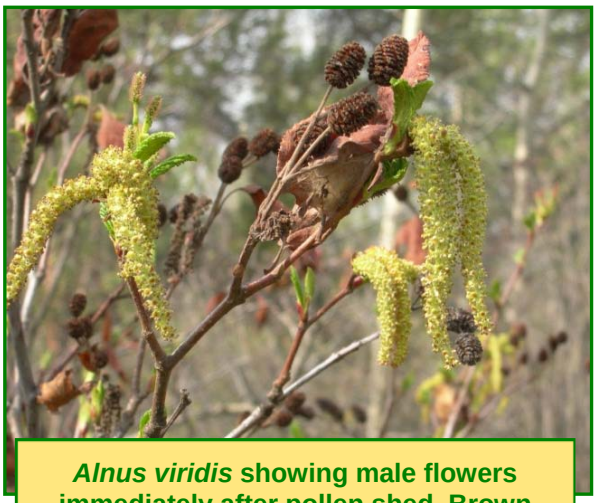
Seral Stage: Pioneer species, invading terraces above floodplains. Responds well to fire and resulting bare mineral soils (Hardy BBT 1989).

Soils: Coarse textures ranging from sandy to gravely/rocky; morainal deposits (Hardy BBT 1989).

Distribution: Boreal forest, aspen parkland, and Rocky Mountains foothills in Alberta. Alaska, Yukon, District of Mackenzie, Hudson Bay, Newfoundland south to northern California, Idaho, Montana, central Saskatchewan, Minnesota, Great Lakes; North Carolina (Moss 1983).

Phenology

Female plants mature in 5 to 10 years (Government of the Northwest Territories n.d.). Female catkins open at the same time as leaves in spring. Flowers in May and June, fruit matures in July, seeds ripen from late August to November. Abundant seed crops every four years (Government of the Northwest Territories n.d.).



***Alnus viridis* showing male flowers immediately after pollen shed. Brown cones are those that shed seeds last year and young female cones can be seen just opening.**

Pollination

Wind pollinated (Rook 2002).

Seed Dispersal

Wind dispersal (Rook 2002).

Genetics

2n=28 (Moss 1983).

Symbiosis

Green alder is ectomycorrhizal (Hagerman and Durall 2004). Inoculation of *Frankia* is rarely necessary as most soils contain abundant populations (Hendrickson et al. 1993). A single fungus is not associated with *Alnus*, but a seral succession of

mycorrhizal species follows both plant succession as well as aging of the dominant plants of a community (Sampo et al. 1997).

Seedling of *Alnus viridis* grown from directly sown seeds.

Seed Processing

Collection: Female catkins are easily stripped or snipped from low branches, or by bending branches to bring catkins within reach.
Seed Weight: 0.135 to 0.222 g/1,000 seeds (0.2 average).
Harvest Dates: Late August (WRC pers. comm.). Collect September 15 to October 15 (Formaniuk 2013).
Cleaning: Air-dry fruits in paper at 15 to 25°C. Crush material or remove large chaff and crush remaining material. Sieve to remove seeds from woody catkins using appropriate size screens. Small chaff and dust can be removed by winnowing.
Storage Behaviour: No literature found.
Storage: Store in sealed containers at cool temperatures (2 to 5°C) (Young and Young 1992).
Longevity: Seeds are viable for at least 2 years when stored dry at room temperature. 0% to 34% viability lost after 4 years hermetic storage at 2 to 4°C with 5.7% to 7.2% moisture content (Royal Botanic Gardens Kew 2008).

Propagation

Natural Regeneration: Sprouts from root crown *in situ* (Rook 2002.
Germination: 10% to 20% germination in the first month with seeds from northeastern Alberta. Seed germinated after approximately 12 days, 28% of the seed germinated in temperatures of 30/20°C, low quality of seed is due to the possibility that the light weight of the seeds makes it more difficult to remove empty seed (Bonner and Karrfalt 2008). Fresh seed was found to exhibit some dormancy but no dormancy was found after 1 year in the soil (Bonner and Karrfalt 2008).
Pre-treatment: Cold stratification of 30 days. Wood (pers. comm.) suggests 21 day cold stratification before seeding; Formaniuk (2013) suggests 60 days stratification; Nichols (1934) suggests 60 to 90 days cold stratification.
Vegetative Propagation: Propagates by layering (Rook 2002). It also sprouts from the root crown if damaged or cut (Matthews 1992). They cannot be grown from cuttings (USDA NRCS n.d.).
Greenhouse Timeline: 20 weeks in the greenhouse before the seed can be out-planted. Plants can be over wintered for a spring or fall plant (Wood pers. comm.). Plant for 100 days before harvest (Formaniuk 2013).

Aboriginal/Food Uses

Food: Dry alder wood is burned to smoke salmon (Marles et al. 2000).
Medicinal: Stems can be boiled to treat upset stomachs. Roots can be used in a decoction to treat menstrual cramps. Inner bark decoction can be used as a wash for sore eyes and bark can be taken as a laxative (Marles et al. 2000).
Other: Bark and stem pieces, once chopped and boiled, make a red to brown dye for hides. Carved

tools and implements can be made out of alder wood. Peat moss burned with rotten alder wood can be used to smoke hides during tanning. Also, rotten wood can be burned to repel mosquitoes (Marles et al. 2000). Wood was burned as heat source where other fuels where scarce (Matthews 1992).

Wildlife/Forage Usage

Wildlife: Heavily browsed by moose and caribou in some areas; consumed in small quantities by deer; muskrat, beaver and cottontail. Snowshoe hares feed on twigs and foliage; birds feed on catkins, seeds, and buds; winter forage for white tailed ptarmigan (Matthews 1992).
Livestock: May be important as secondary forage for cattle (Matthews 1992).
Grazing Response: Resistant to grazing, regenerates from rhizomes and seed (Hardy BBT 1989).

Reclamation Potential

Increases soil organic matter through nitrogen fixation. Early serial species that invades disturbed site. Provides protection from wind and sun to young spruce trees (Hardy BBT 1989).
Alnus viridis also increases above ground biomass accumulation in *Pinus banksiana* stands (Vogel and Gower 1998).

Commercial Resources

Availability: Several Alberta nurseries carry propagules.
Seeds have been collected by the Oil Sands Vegetation Cooperative for use in the Athabasca Oil Sands Region.
Cultivars: None are known.
Uses: The treetops are used for interior decorating (the trunks and branches are used to produce natural to looking, semi to artificial trees with silk leaves), and the branches are used for baskets, wreaths, birdcages and decorative furniture (Marles et al. 2000).

Notes

Alnus viridis is listed as 97% intact (less occurrences than expected) in the Alberta oil sands region (Alberta Biodiversity Monitoring Institute 2014). Can be a major competitor for conifer seedlings (Matthews 1992).

Photo Credits

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