**Scientific Name:** *Cornus sericea* ssp. *sericea* L.  
**Family:** *Cornaceae*

**Common Names:** red-osier dogwood, dogwood, red willow

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**Plant Description**
Deciduous, perennial, upright shrub, 1 to 3 m high, with spreading rhizomes; lower branches often prostrate; deep-red (green-purple) pubescent twigs; oval to ovate-lanceolate leaves 2 to 6 cm long, glaucous beneath; flat-topped terminal clusters of many white flowers with 2 to 3 mm long petals (Moss 1983).

**Fruit:** White round drupe, succulent, 6 to 8 mm in diameter (Banerjee et al. 2001).

**Seed:** 3.5 to 5 mm oval stone, 1 to 2 embryos, grey to deep brown with pale striations, smooth.

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**Habitat and Distribution**
Common in moist woods, ponds, riverbanks, thickets, clearings and coulees throughout the Canadian prairies (Moss 1983). Also, found in river flood plains.

**Seral Stage:** Early to late seral species.

**Soil:** Found on well drained to poorly drained soils. Most successful on free draining soils with adequate moisture availability. Tolerant of a wide range of pH values (3.2 to 8.0), preference for nutrient rich sites (Smithberg 1974). In a greenhouse study, Mustard and Renault (2006) found that NaCl reduced shoot dry mass and height.

**Distribution:** Widespread across Alberta (boreal forest, aspen parkland and Rocky Mountains). Alaska, Yukon, western District of Mackenzie to James Bay, Newfoundland south to California, Arizona, New Mexico, Nebraska, Ohio, West Virginia, Pennsylvania (Moss 1983).

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**Phenology**
Flowers April to August (September). Fruit ripens from mid-July to mid-October in north-eastern Alberta. Fruit bearing at 3 to 4 years of age (Rook 2002).

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**Pollination**
Cross-pollinated by *Andrena*, *Apis* and *Bombus* spp. (Gunatilleke and Gunatilleke 1984), some beetles, flies and butterflies (Eyde 1988).

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**Seed Dispersal**
Used for food by white-tailed deer, mule deer, elk, mountain goats, cottontail rabbits, snowshoe hares, and numerous birds (Gucker 2012) and black bears and beavers (Smithberg 1974), all of which may disperse seed.
Genetics
2n=22 (Moss 1983).

Symbiosis
Endomycorrhizal inoculation with Glomus fasciculatum and Glomus macrocarpum during propagation significantly increases the growth of the plant during later stages of development (Verkade et al. 1988).

Seed Processing
Collection: Berries are easily shaken or picked from taller bushes or trees. Large clumps make collection particularly easy. Seeds should not be picked from isolated plants to avoid the risk of self-sterile seed or empty fruit collection (Young and Young 1992).
Seed Weight: 24.7 to 28.6 g/1,000 seeds (27.0 average).
Fruit/Seed Volume: 2,050 to 2,890 fruit/L (2,460 average), 2,460 seeds/L fruit.
Fruit/Seed Weight: 4,520 to 5,470 fruit/kg (4,900 average).
Average Seeds/Fruit: 1 seed/fruit (occasionally with 2 embryos).
Harvest Dates: Collect in late July to late August in north-eastern Alberta; September 1 to September 30 (Formaniuk 2013). Harvest as soon as fruits are ripe (snowy white to blue tinged) (Banerjee et al. 2001).
Cleaning: Mash fruit in a sieve (1.40 mm works well). A blender with taped blades may also be used to macerate the fruit. Suspend residue in water allowing seeds to settle. Decant water and chaff. Repeat suspension and decanting until only seeds remain. Allow seed to dry at room temperature.
Storage: Store dry in sealed containers at cool temperatures (3 to 5°C) (Roof 2008, Young and Young 1992).
Longevity: 4 to 8 years when stored in sealed glass containers at 1 to 3°C (Harrington et al. 1999, Smithberg 1974).

Propagation
Natural Regeneration: Both by seed and vegetative means (new shoots from roots and prostrate branches) (Gucker 2012). Will produce stolons in very moist soil. Reproduces from sprouts and root shoots (Hardy BBT 1989, Smithberg 1974).
Germination: 11% in 30 days from 1 or 2 year old seeds harvested in north-eastern Alberta.
Pre-treatment: McTavish and Shopik (1983) recommend 60 to 90 days cold stratification at 1°C. Needs 60 days cold stratification (Wood pers. comm.). Both Nichols (1934) and Young and Young (1992) recommend 2 to 3 months cold stratification at 3 to 5°C. Formaniuk (2013) recommends 120 days stratification.
Seeds may be stored at cold temperatures for a month and then stratified for a month using light dark cycles during incubation (Acharya et al. 1991). The short warm stratification period can be replaced with mechanical scarification or by bathing the seeds in sulphuric acid (Roof 2008).
Direct Seeding: Less than 1% emergence from seeds sown in north-eastern Alberta. Sowing intact fruit results in numerous robust seedlings (> 7% emergence for fall sown fruit). Fruit should be
Sown immediately after harvest. Sow seeds using drills and occasionally broadcast (Roof 2008). If using frozen stored berries, fall sowing resulted in slightly better emergence than spring sowing. Young seedlings are drought intolerant.

Seeds sown in a nursery should be at a soil depth of 0.6 to 1.25 cm (0.25 to 0.5 in) (Roof 2008). Beds sown in the fall should be mulched during the winter (Roof 2008).

**Seeding Rate:** 100 seeds/m² and 50 fruits/m² to obtain 1 to 4 plants/m².

**Vegetative Propagation:** Hardwood pole cuttings placed directly are often successful (Smreciu and Barron 1997). Can establish from softwood stem and root cuttings in high moisture conditions (Hartmann et al. 1990, Tannas 1997). 80% rooting using hardwood cutting with seradix #2 treatment in a mixture of 1:1:1 peat/sand/reground styrofoam chips with 16 °C bench heat (McTavish and Shopik 1983). Meilleur et al. (1997) report larger crown diameters 3 years after layering.

Root cuttings from early August were found to be 100% rooted within 5 weeks, while those cut mid-April were 90% rooted within 8 weeks (Gucker 2012).

French layering and/or division are also effective (Roof 2008).

Can be grown as a bare-root, containerized, or balled and burlapped plant (Pijut 2004).

**Greenhouse Timeline:** 12 weeks in greenhouse before out planting. Dormant seedlings can be stored frozen overwinter for spring or early fall planting (Wood pers. comm.). Grow for 90 days before harvest (Formaniuk 2013).

**Aboriginal/Food Uses**

**Food:** Some tribes mix the berries with other sweeter berries (Turner 1997).

**Medicinal:** Tea made from roots is used to treat dizziness; tea from stems is used to relieve chest trouble, as an emetic, or for coughs and fevers. A decoction made from the bark is used as a laxative. Peeled bark mixed with other plants and boiled can treat sore eyes. A wash, made of fruit or stem pith, is used to treat snow blindness or cataracts. A decoction made from ripe fruit can treat tuberculosis. A decoction made of roots mixed with other herbs is used to treat diarrhoea in children (Marles et al. 2000).

**Other:** Thicker stems can be used to make ribs for spruce bark canoes (Marles et al. 2000). Has been used by the First Nations people to make dream catchers, dye, baskets, tanning hides as well as arrows and other tools. They also used *C. sericea* as a toothbrush because the twigs can whiten teeth. Various native cultures have used the inner bark of *C. sericea* in the tobacco mixture for smoking the sacred pipe (Turner 1997, USDA NRCS n.d.).

**Wildlife/Forage Uses**

**Wildlife:** One of the most valuable browse species in Alberta (Tannas 1997) especially for moose. Used for food and cover by white-tailed deer, mule deer (heavy summer use) elk, mountain goats, cottontail rabbits, snowshoe hares, and numerous birds (Gucker 2012) including ruffed grouse (Hardy BBT 1989). Berries are also eaten by black bears and beavers (Smithberg 1974).

**Livestock:** Mature leaves are relatively unpalatable to livestock however, the young sprouts are palatable. It is not a preferred species for livestock browse (Gucker 2012).
Grazing Response: Resistant to heavy browsing (Tannas 1997). Extensive deer browsing increases branching and fruit/seed production on reclaimed sites (Smreciu and Barron 1997).

Reclamation Potential
High tolerance for oil and high salinity oil sands tailings water (Hardy BBT 1989, Renault et al. 1999). Grows successfully (from container seedlings) on various reclamation sites (Fedkenheuer et al. 1980, Fung 1984, Smreciu and Barron 1997). Dogwood has a high tolerance to sodium and sulphate enriched consolidated tailings water (Renault et al. 1998).

*C. sericea* is a prolific seed producer (Smreciu and Barron 1997). Useful in stabilization of eroding stream banks. Rooting from cuttings may accelerate this stabilization. Rapid growth and easy establishment of seedlings and transplants make it an ideal reclamation species.

Commercial Resources
Availability: Produced commercially by several Alberta and Saskatchewan nurseries. Seeds have been collected by the Oil Sands Vegetation Cooperative for use in the Athabasca oil sands region.

Cultivars: Numerous horticultural cultivars are available but these are not suitable for reclamation.

Uses: As an ornamental shrub, and dried or preserved floral product (Marles et al. 2000). Common for windbreaks and border plantings (Smithberg 1974).

Notes
*C. sericea* is listed as 89% intact (less occurrences than expected) in the Alberta oil sands region (Alberta Biodiversity Monitoring Institute 2014). Red-osier dogwood is able to tolerate extremely cold temperatures, and flooding. It is a semi fire-tolerant, seed banking species that generally increases in abundance following a fire (Gucker 2012).


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References


