

***Calamagrostis canadensis* (Michx.) Beauv.**
bluejoint reedgrass

Family: Poaceae

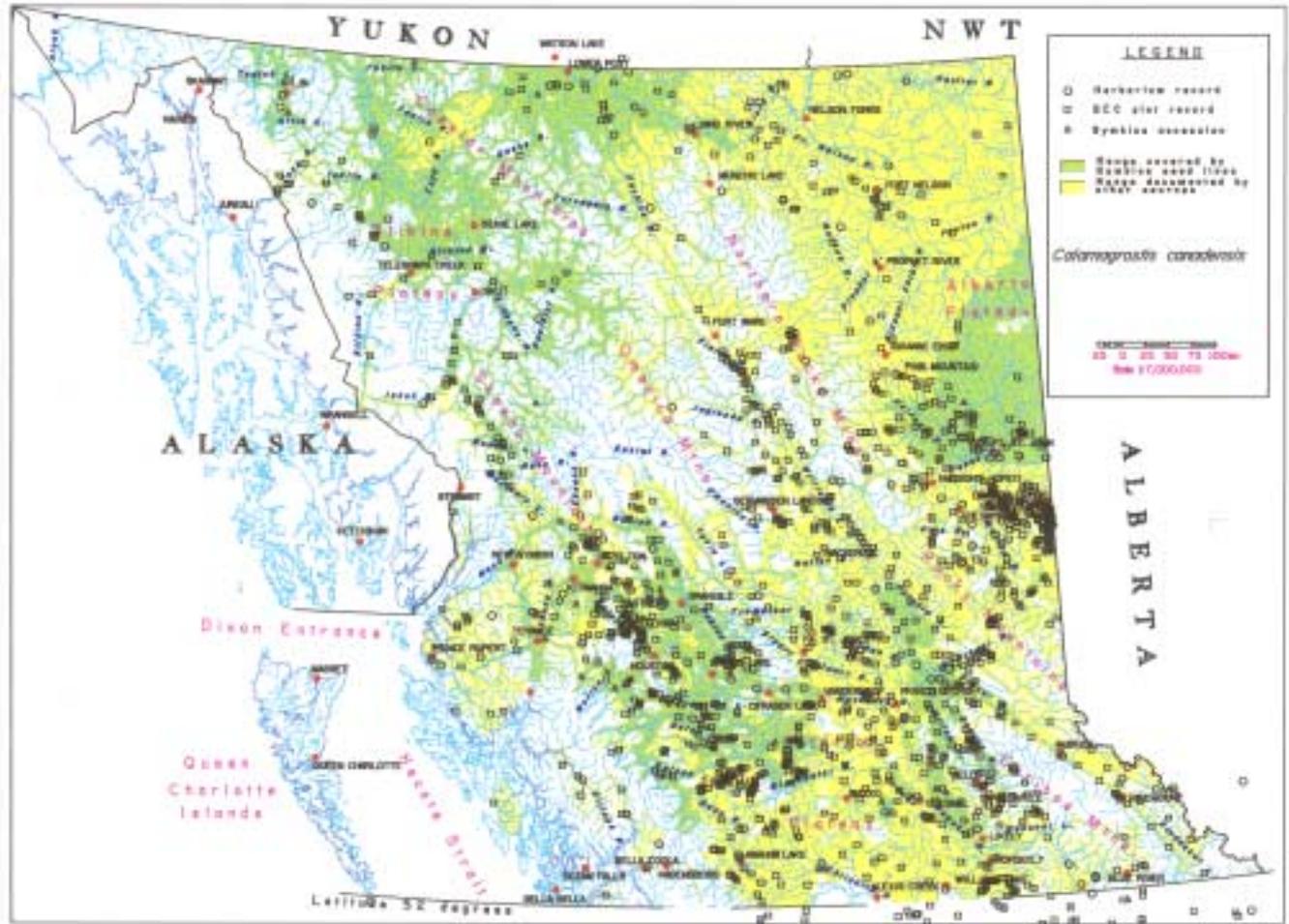


Figure 23. Documented range of *Calamagrostis canadensis* in northern British Columbia.



Figure 24. Growth habit of *Calamagrostis canadensis* in cultivation.

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(continued)**

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Background Information

Calamagrostis canadensis is a circumboreal species found north to Alaska, Yukon and the Northwest Territories, east to Newfoundland and south to Mexico and North Carolina, and is also found throughout Eurasia. Two varieties are recognized in B.C., though we do not distinguish them in this treatment: *C.c.* var. *canadensis* is common throughout British Columbia east of the Coast-Cascade Mountains, but is rare in coastal B.C.; *C.c.* var. *langsdorfii* is common in northern British Columbia east of the Coast-Cascade Mountains, but is less frequent southward (Douglas et al. 2001b). This species has been reported to be the most common and widespread *Calamagrostis* species in North America (*USFS 1937). Work in progress (R. Hebda pers. comm.) suggests that pollen of this species is often sterile, especially in populations found in wetlands, but viable seed is nevertheless produced apomictically.

Growth Form: Long-lived rhizomatous tufted coarse grass; leaves lax, collars hairless, auricles lacking, ligules 3-8 mm long; nodding flowering head 10–25 cm long often turning purplish; mature plant size is 60–120 cm tall. In Alaska, it may reach heights of up to 200 cm (Hardy 1989, MacKinnon et al. 1992).

Site Preferences: Moist to wet bogs, meadows and open forests at low to high elevations (Douglas et al. 1994). In B.C. it is reported to be extremely winter hardy, tolerant of flooding and saturated soils, tolerant of drought, shade-tolerant to shade intolerant, abundant in pioneer and young seral stages, especially if mineral soil has been exposed (Beaudry et al. 1999). It is found on poor to very rich sub-mesic to sub hydric sites in the SBSx or SBSd subzones, medium to very rich hygric and subhydric sites in the SBSw or SBSv subzones, and mesic to subhydric very poor to very rich sites in the SBSm subzones; sub-hygric to hydric poor to very rich sites in the BWBSx or BWBSd subzones, submesic to subhydric poor to very rich sites in the BWBSm subzones and submesic to hygric poor to rich sites in the BWBSw or BWBSv subzones; on mesic to hygric medium to very rich sites in the ESSFx or ESSFd subzones, submesic to subhydric poor to very rich sites in the ESSFm subzones and subhygric to subhydric medium to very rich sites in the ESSFmk; on subhygric to subhydric poor to very rich sites in the SBPSx or SBPSd subzones, submesic to subhydric poor to very rich sites in the SBPSmc and subhygric to subhydric poor to very rich sites in the SBPSmk (Banner et al. 1993, Beaudry et al. 1999).

Seed Information

Seed Size: Length: 2.97 mm (2.50 - 3.64 mm)
Width : 3.34 mm with callus hair (2.04 - 5.01 mm)
without callus hair 0.51 mm

Seed per gram: 15,312 (range: 9,115 – 24,370)

Volume to Weight Conversion: 28.2 g/L at 34.0% purity

Germination Capacity: At 30°/20° C untreated: 42.5%
At 25°/15° C untreated: 17.6 (6 - 40%)
stratified: 2.0% (0.3 - 4%)

Germination Speed: To first germination: 15.4 days
To 50% potential: 22.0 days



Figure 25. Seeds of *Calamagrostis canadensis*. Rule divisions are 1.0 mm.

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(Seed Information, continued)

Seed Longevity: Conn and Farris (1995) and Hardy BBT (1989) report that *Calamagrostis canadensis* seed can remain viable in the soil for up to seven years. Germination capacity of seed tested by Symbios Research in the year it was harvested has been low, however Link (1993) reports germination >84% in seed stored for at least two years after collection and storage. Though germination levels were not quantified, we have very successfully germinated seed 4 to 6 years old.

Considerations for Growing

Techniques for Seed Production

Seed treatment: Untreated seeds germinate best in warmer soils. We did not find stratification beneficial, though Young and Young (1986) report that cool moist stratification may increase germination.

Soil considerations: Soil should be planted in the spring and should be moist to saturated at the time of planting, but with no standing water (Link 1993). When growing in the wild, this species is frequently found growing in peaty soils (Tesky 1992).

Stand establishment: Site should be free of all weeds. Broadleaf weeds can be controlled with the use of a selective broadleaf herbicide without damage to the grass seedlings. Young and Young (1986) report that fertilization may improve seedling emergence and establishment. Link (1993) reports that *Calamagrostis canadensis* establishes best by rhizome. MacDonald and Lieffers (1991) and *Powelson and Lieffers (1991) state that this species produces an extensive network of rhizomes during a single growing season.

Row spacing: Unknown; suggest 75-120 cm under dryland conditions, 30-90 cm under irrigation.

Seeding density: Unknown at present; suggest 60-100 PLS per linear metre (Smith and Smith 2000).

Seeding depth: 0.6-1.2 cm.

Stand maintenance: Regularly cultivate rows and spot spray with herbicide to keep plot weed free; annual fertilization with low N formulations will extend the life of the plot, although it may not be necessary with this species since stands in the wild are reported to persist for long periods, possibly as long as 100 years under suitable site conditions (Hardy 1989).

Harvesting and Seed Processing:

Since this species exists in nearly pure stands on poorly drained clearcut sites, the opportunity exists to harvest seed in the wild.

Dates of selective harvesting in the Bulkley Valley of northwestern B.C. range from September 10th to October 17th. Ringius and Sims (1997) report that seed set occurs from mid-August to late September. This species holds on to its seed well.

Hand clipping: Harvest manually with a hand sickle or clippers when most seeds are ripe in late August (Pahl and Smreciu 1999), followed by drying in the sun or indoors in a warm dry area.

Vacuum: It is unknown at present if seed can be harvested directly from the stalk with a vacuum. If necessary, use a vacuum immediately after manual or mechanical harvesting to glean seed that scatters. Plastic placed between the rows will assist this type of salvage harvesting.

Seed stripper: Harvest with a seed stripper (using a soft-threaded harvesting head) when most seeds seem ripe; freshly harvested seed should then be dried or cured further.

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(Harvesting and Seed Processing, continued)

For both hand clipping and mechanical harvesting, plastic between rows is recommended so any scattered seeds can be salvaged by sweeping or vacuuming.

Combine/thresher settings: 1548 rpm with 5 mm gap.

Seed cleaning: Rotary flail works well if seed is harvested with long stalks. Clean further using a fanning mill: prescreen, 4 x 19 mm slot; top, 4.98 mm round; bottom blank; use hand to rub the seed through the screens as the seed balls together.

Storage requirements: Link (1993) reports that this species can survive dry storage at room temperature, but seeds stored for long periods survive best under cool, dry conditions (0.6–7.2° C).

Considerations for Use in Revegetation

- Due to its aggressive rhizomatous nature, this species provides good erosion control and is considered particularly important on higher gradient streams where there is seasonal flooding (Hardy 1989, *Boggs et al. 1990).
- *C. canadensis* is found growing naturally on coal mine spoils in Alberta (Strong et al. 1978).
- This species has also been noted to invade oil spill sites in the Northwest Territories and is reported to recover rapidly after spills (Hardy 1989).
- In Alberta, *Calamagrostis canadensis* is reported to grow on fine to coarse textured wet to mesic soils, and to be tolerant of extremely acidic soils, flood, drought and saline conditions (Hardy 1989, Gerling et al. 1996). *Calamagrostis canadensis* is reported by Douglas et al. (1994) and Gerling et al. (1996) to have fair to moderate forage value for cattle. Others report that it provides a large amount of forage for many big game species and livestock (*USFS 1937, *Herzman et al. 1959, Hardy 1989).
- Hogg and Lieffers (1991) report that this species is an important forage for livestock in Alaska and an important component in the diet of bison herds in the Slave River lowland in the Northwest Territories; however, it can be sensitive to overgrazing (Hardy 1989).
- The low germination rates of filled seeds suggests a dormancy mechanism, but its widespread success suggests long-term viability in the seedbank (Lieffers et al. 1993).
- *Calamagrostis canadensis* seedlings do well in sheltered sites on moist mineral soil or decomposed organic soil (Lieffers et al. 1993).
- Developing seedlings of this species do not tolerate drought well but are drought tolerant once established (Mueller-Dombois and Sims 1966, Lieffers et al. 1993).
- The root system of this species tolerates low soil temperatures, so it is suitable for revegetation of cold sites (Hardy 1989).
- Some strains of *Calamagrostis canadensis* are susceptible to "white top" (Hardy 1989).
- *Calamagrostis canadensis* tends to be a silviculturally competitive species in much of northeastern B.C. and northern Alberta and on moist disturbed sites (Haeussler et al. 1990, Hogg and Lieffers 1991).
- Stands of this species can produce thick litter, which covers the soil surface causing decreased soil temperature (Hogg and Lieffers 1991).

* *fide* Tesky 1992.