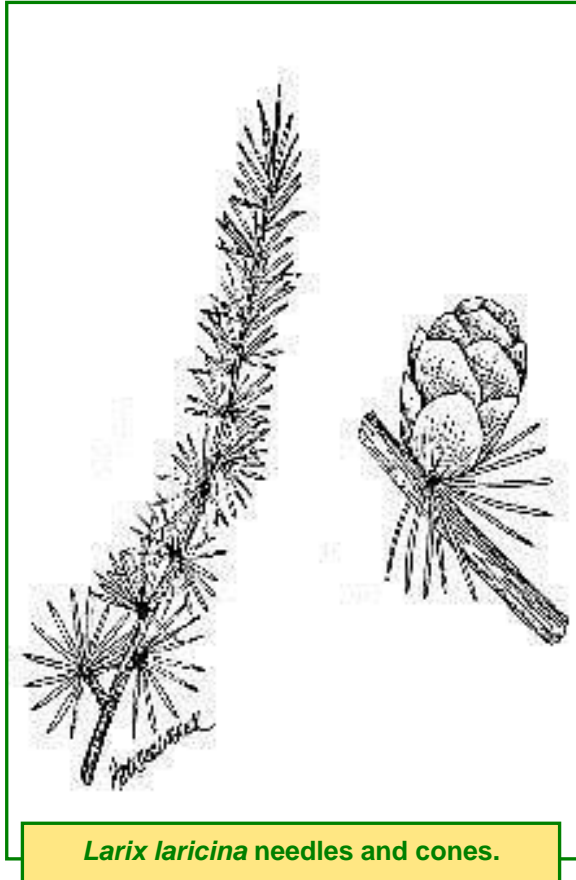


**Scientific Name:** *Larix laricina* (Du Roi) K. Koch

**Family:** *Pinaceae*

**Common Name:** tamarack, Alaskan larch, American larch, eastern larch, hackmatack



*Larix laricina* needles and cones.

### Plant Description

Deciduous monoecious tree, up to 20 m tall; straight trunk 10 to 25 cm diameter, thin, reddish brown bark with small, rough scales; leaves soft and needle-like in clusters of 12 to 20, 1 to 2.5 cm long, deciduous (turn yellow as fall in autumn) (Moss 1983). Plants live to 150 years (Government of the Northwest Territories n.d.).

**Fruit:** Brown seed cones (reddish when young, becoming brown when mature – Inkpen and Van Eyk n.d.) ovoid, 1 to 2.5 cm long, rounded scales (Moss 1983, Royer and Dickinson 2007). Two seeds produced per scale.

**Seed:** Light brown, winged on one side, 3 to 4 mm long and 2 to 3 mm wide.

### Habitat and Distribution

Common in muskeg, swamps, fens and other poorly drained sites (Inkpen and Van Eyk n.d., Johnson et al. 1995, Moss 1983) but grows best on drier, well drained sites; shade intolerant (USDA NRCS n.d.).

**Seral Stage:** Early.

**Soil:** Medium to coarse textured mineral soils with pH between 5.5 and 6.5 (Johnson et al. 1995, USDA NRCS n.d.).

Not tolerant of saline soils (USDA NRCS n.d.). Renault (2005) tested tolerance to two levels of NaCl and found that seedlings had moderate tolerance to salinity.

**Distribution:** Widespread in boreal regions (Johnson et al. 1995), found throughout Canada and north-eastern US (USDA NRCS n.d.).

Alaska, Yukon to central British Columbia east to Labrador, Newfoundland south to Great Lakes, New Jersey (Moss 1983).



Developing *Larix* cones

### Phenology

Blooms in mid spring (April to May), produces seed in the summer and it ripens and is dispersed in the fall (USDA NRCS n.d.).

Trees are approximately 5 to 20 years old before seed is produced (Tosh and Powell 1991). Female plants mature at 10 years and peak at 75 years (Government of the Northwest Territories n.d.).

Good cone crops are produced every 3 to 6 years (Government of the Northwest Territories n.d., Young and Young 1992).

### Pollination

Wind pollinated.

### Seed Dispersal

Wind (Royal Botanic Gardens Kew 2008).

### Genetics

$2n=24$  (Moss 1983).

### Symbiosis

Associated with ectomycorrhizal fungi particularly from genus *Fuscolentinus* and genus *Suilus* (Samson and Fortin 1988).

### Seed Processing

**Collection:** Cones can be picked from trees or from felled slash into sacks.

**Fruit Weight:** 55 kg of cones (35 L) produces approximately 1.7 kg of seed.

**Seed Weight:** 1.43 g/1,000 seeds (Young and Young 1992).

2 g/1,000 seeds (Royal Botanic Gardens Kew 2008).

**Harvest Dates:** Collect August 15 to September 15 (Formaniuk 2013).

Although seed dispersal can be delayed and occur throughout the winter it is recommended that cones should be harvested from trees as soon as they are ripe as early dispersal is common.

**Cleaning:** Air dry cones or kiln at 40°C until cones open; for recalcitrant cones soak in 40°C water, kiln dry for up to 8 hours (or until they open), tumble or

shake to release seeds and then dewing by rubbing or using a dewinger (Wood pers. comm.).

**Storage Behavior:** Orthodox (Royal Botanic Gardens Kew 2008).

**Storage:** Store dry at 1 to 3°C for short periods, longer storage should be at -18 to 20°C in airtight containers. Moisture content should be below 8% for storage (Palamarek pers. comm.).

Hermetic storage at 2 to 4°C with seed moisture content at 2% to 5% (Royal Botanic Gardens Kew 2008).

**Longevity:** Up to 10+ years at -18 to 20°C in airtight containers (Palamarek pers. comm.).

Still has 50% germination after 15 years of hermetic storage (Royal Botanic Gardens Kew 2008).



*Larix laricina* forest.

### Propagation

**Natural Regeneration:** From seed and predominately layering in northern climates (Rook 2002).



Germination in nature is often very low due high seed predation by small mammals (USDA NRCS n.d.).

**Germination:** Seeds exhibit physiological dormancy. Germination is greater in light than dark (Baskin and Baskin 2002).

**Pre-treatment:** 21 days stratification (Formaniuk 2013).

Generally seedlings emerge in approximately two weeks after seeds have been cold stratified for three weeks (Wood pers. comm.). 30 to 60 days cold stratification (Baskin and Baskin 2002). Germination increased when seed was cold stratified and left to germinate at low temperatures (Baskin and Baskin 2002).

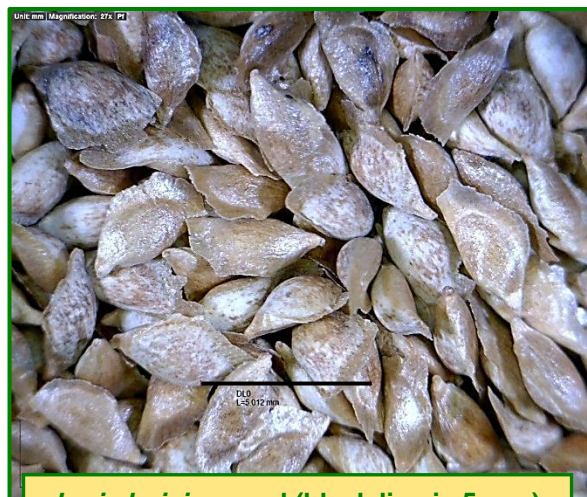
**Direct Seeding:** No literature found.

**Planting Density:** 1,000 to 3,000 plants /ha (USDA NRCS n.d.).

**Vegetative Propagation:** From cuttings (USDA NRCS n.d.).

**Micro-propagation:** Micro-propagation of 30 year old specimens of *L. laricina* by Bonga and Pond (1991) was unsuccessful as no adventitious buds grew.

**Greenhouse Timeline:** Grow for 170 days before harvest (Formaniuk 2013).



**Larix laricina seed (black line is 5 mm)**

### Aboriginal/Food Uses

**Food:** Young buds are sweet, raw or cooked (Gray 2011) although not commonly used for food (Johnson

et al. 1995) except in times of emergency (Wilkinson 1990). Sap has been used as a natural sweetener and the inner bark can be ground into a powder and used as flour (Gray 2011).

**Medicinal:** A poultice made from boiled inner bark and wood can be used to relieve frostbite, deep cuts and burns, and the sap can be chewed to treat indigestion (CYSIP: Botany n.d., Johnson et al. 1995, Royer and Dickinson 1996, 2007).

The needles are high in vitamin C, and tea made from the needles can prevent scurvy and treat sore muscles, arthritis and diabetes (CYSIP: Botany n.d., Johnson et al. 1995).

The gum (resin) of larch species can be chewed to relieve indigestion (Wilkinson 1990) or treat infected gums (Gray 2011) or applied as a wash or poultice on wounds (Gray 2011).

**Other:** Wood used to make snowshoes, toboggans and canoes and roots split to make rope and nets for fishing (CYSIP: Botany n.d., Gray 2011). Rotten wood used for tanning to give hides a yellow colour (Royer and Dickinson 1996).

### Wildlife/Forage Uses

Moose and white-tailed deer generally avoid eating tamarack; however it provides valuable cover (Uchytel 1991).

Red squirrels, pine siskin, crossbills, mice, voles, and shrews eat tamarack seeds (Uchytel 1991).

Sharptail grouse eat the buds (Hardy BBT 1989).

Snowshoe hares feed on twigs and bark, and porcupines feed on the inner bark (Government of the Northwest Territories n.d., Uchytel 1991).

### Reclamation Potential

In field trials at Syncrude *Larix* seedlings planted into 100 cm of stockpiled peat over CT had significantly greater survival than seedlings in 15 cm cover (50 cm cover produced intermediate results); watering plots with oil sands process-affected water resulted in no survival (Wytrykush et al. 2012).

A pioneer species in moist habitat and can tolerate acidic and low nutrient soils, therefore potentially useful for reclamation in specific areas.





Is shade intolerant and not highly competitive (USDA NRCS n.d.).

### Commercial Resources

**Harvest Methods:** Generally cones are gathered from felled slash, but can be picked from trees or obtained from squirrel caches (Wood pers. comm.).

**Availability:** Grown in Alberta nurseries.

**Uses:** This strong wood can be used for fence posts, railway ties and boat building (Hardy BBT Limited 1989) as well as for fuel and pulpwood products (USDA NRCS n.d.). Bark is a source of tannin for tanning leather (Wilkinson 1990).

### Notes

Synonyms include *Larix alaskensis*, *Larix laricina* var. *alaskensis* and *Pinus laricina*, none of which are valid (ITIS n.d.).

Tamarack is listed as 95% intact (less occurrences than expected) in the Alberta oil sands region (Alberta Biodiversity Monitoring Institute 2014).

### Photo Credits

**Photo 1:** USDA-NRCS PLANTS Database / USDA NRCS. Wetland flora: Field office illustrated guide to plant species. USDA Natural Resources Conservation Service.

**Photo 2:** Wikimedia Commons. Steven Katovich, USDA Forest Service 2009.

**Photo 3:** Wild Rose Consulting, Inc. 2000.

**Photo 4:** Lindsay Robb @ Alberta Tree Improvement and Seed Centre 2013.

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