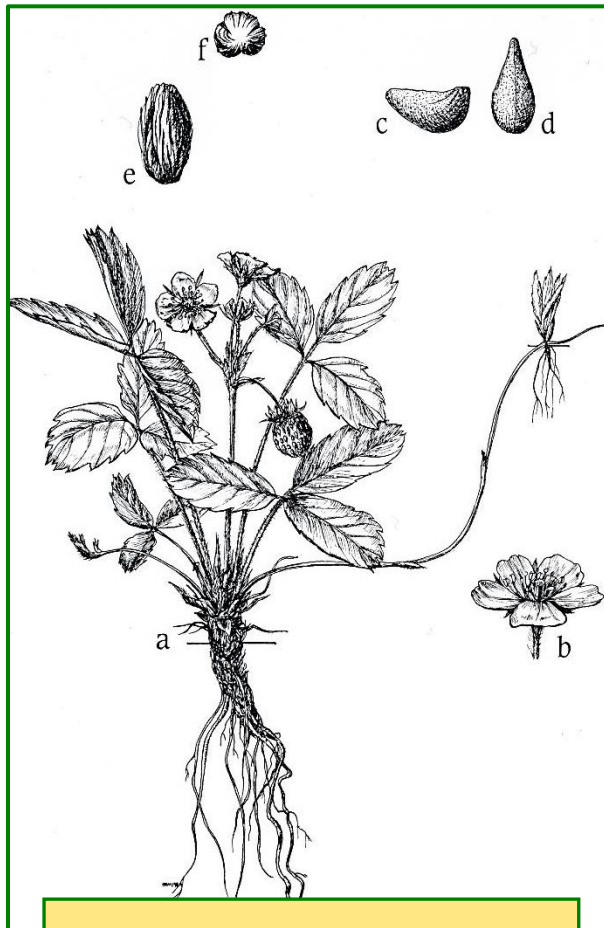


**Scientific Name:** *Fragaria virginiana* ssp. *glauca* (S.Wats) Staudt.  
**Family:** *Rosaceae*

**Common Names:** wild strawberry, Virginia strawberry



***Fragaria virginiana* line diagram**  
a. crown b. flower c & d seed  
e & f pollen

### Plant Description

Low growing perennial herb, stems up to 15 cm long from short, scaly rhizomes producing long slender stolons which root and form new plants; basal leaves, 2 to 7 cm long, long-petioled, trifoliate, coarsely toothed, terminal tooth usually shorter than the two adjacent lateral teeth, bluish green above and often rounded at the base; small white flowers, 2 to 15 in open clusters, five petals, 6 to 8 mm long (Moss 1983).

**Fruit:** Tiny achenes sunken in a fleshy red berry (Moss 1983).

**Seed:** Round, tear shaped, light brown, 1 mm long (Moss 1983).

### Habitat and Distribution

Common in depressional areas and moist coulees in prairie region, dry to moist open woods, meadows, clearings and often in disturbed areas.

**Seral Stage:** Early. Ubiquitous on recently disturbed sites.

**Soils:** Wet to mesic soil moisture (Gerling et al. 1996).

Prefers pH of 5.3 to 6.0 (Jett 2005).

**Distribution:** Widespread across Alberta. Alaska, Yukon, western District of Mackenzie to Hudson Bay, Newfoundland south to California, Colorado, Oklahoma, Tennessee, Georgia (Moss 1983).

### Phenology

Bud initiation takes place in autumn with declining photoperiods. Flower buds appear from mid April to late May. Flowers May to June. Stolon production occurs from early May to August (Jurik 1985). Fruit ripens by late June to July.



***Fragaria virginiana* flower.**



### Pollination

Wild strawberry is pollinated by a wide variety of small generalist bees (Apidae, Halicidae, Anthophoridae, Andrenidae and Megachilidae), several species of flies (Syrphidae, Bombyliidae, and Conopidae) and ants (Formicidae) (Ashman 2000).

### Seed Dispersal

*Fragaria sp.* are likely spread by birds and mammals (Munger 2006).



*Fragaria virginiana* berry.

### Genetics

2n=56 (Moss 1983).

### Symbiosis

Is host of the root endophytic fungus *Phialocephala fortinii* (Addy et al. 2000).

### Seed Processing

**Collection:** Primarily by hand. Carry berries in plastic buckets.

**Seed Weight:** 0.3717 g/1,000 seeds.

**Fruit/Seed Volume:** 2,368 fruit/L (70,400 seeds/L fruit).

**Fruit/Seed Weight:** 3,939 fruit/kg (118,000 seed/kg).

**Average Seeds/fruit:** 32 seeds/fruit.

**Harvest Dates:** Late July.

**Cleaning:** Place pulpy fruit in water (use about 3:1 water with fruit) and place in a blender on low speed until fruit are fully macerated. Pour through sieve(s) to remove chaff smaller than seeds. Re-suspend residue in water and mix. Allow seeds to settle and decant water with floating and suspended larger chaff. Repeat re-suspension step until seeds are clean. Sieve and place seeds on paper toweling or cloths to dry. Dry at room temperature or up to 25°C over a moving air stream.

**Storage Behaviour:** Orthodox, seeds may be dried to 3% to 7% relative humidity and stored frozen (Royal Botanic Gardens Kew 2008).

**Storage:** 75% viability following drying to moisture content's in equilibrium with 15% relative humidity and freezing for 107 days at -20°C (Royal Botanic Gardens Kew 2008).

**Longevity:** When stored in sealed containers the seeds can remain viable for up to 20 years (Rose et al. 1998).

### Propagation

**Natural Regeneration:** Spreads by short rhizomes (Anderson and Roderick 2006). Reproduces primarily by stolons and at a lesser extent by seeds (Gerling et al. 1996).

**Germination:** Greater than 70% germination after 30 days, with fresh and one year old seeds from northeastern Alberta.

75% to 95% germination was achieved at varying temperatures on a 1% agar media (Royal Botanic Gardens Kew 2008).

**Pre-treatment:** None required, germinate readily. Rose et al. (1998) recommend 2 to 3 months cold stratification with exposure to light.

**Direct Seeding:** Up to 5% emergence of seedlings after two growing seasons (Smreciu et al. 2006).



**Vegetative Propagation:** In the fall, plant runners or plantlets in pots in a sheltered place with constant moisture; in late winter or early spring, plant seedlings outdoors in full sun, in a light loose soil, 25 cm apart (Anderson and Roderick 2006). Wild strawberry grown from root cuttings in styroblock containers had a 60% to 80% survival rate and was spreading the first growing season in the landfill revegetation study carried out by Smreciu and Barron (1997).

Cut newly rooted runners with at least two nodes from the parent plant and treat basal end with a mild strength rooting hormone and plant in perlite: vermiculite (1:1) medium and place on a mist bench at 20°C (Rose et al. 1998).

### Aboriginal/Food Uses

**Food:** Wild strawberry is a very important fruit. They can be eaten fresh or preserved, can be frozen, dried or made into jams and jellies (Duke 1992, Marles et al. 2000). They contain more vitamin C than an equal weight of oranges (Kindscher 1987).

**Medicinal:** The whole plant, the leaves, or roots were boiled and used as a decoction to treat heart conditions. The roots, leaves, and runners were boiled and the decoction was drunk to treat diarrhoea and dysentery. Strawberry leaf tea, using completely dried

leaves, was used as a wash to treat sores, eczema and other skin problems (Duke 1992, Gray 2011, Marles et al. 2000).

### Wildlife/Forage Usage

**Wildlife:** Poor forage value. Used to some extent by elk and deer (Tannas 1997). The fruit and leaves are eaten by small mammals and birds (Anderson and Roderick 2006).

**Livestock:** Poor forage value, low palatability (Gerling et al. 1996, Hale et al. 2005). Used to a small extent by sheep (Tannas 1997).

**Grazing Response:** Increaser, very resistant to heavy grazing and trampling (Tannas 1997), often covering the ground where grazing pressure has removed more favourable species (Hale et al. 2005).

### Reclamation Potential

*F. virginiana* is a pioneer plant on disturbed lands. The abundant production and rapid spread of its runners makes it an important plant for soil stabilization while climax species establish. It has great potential for increased ground cover with its long stolons, trailing stems, or root sprouts. Wild strawberries can be transplanted in early spring (Kindscher 1987).

*Fragaria* is highly susceptible to damage caused by sodium and sulfate enriched consolidated tailings water (Renault et al. 1998).

### Commercial Resources

**Availability:** Available commercially at various sources in Alberta (ANPC 2010).

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

**Uses:** Aromatherapy (essential oil) (Marles et al. 2000).

### Notes

*Fragaria virginiana* is listed as 92% intact (less occurrences than expected) in the Alberta oil sands region (Alberta Biodiversity Monitoring Institute 2014).



Exhibits aggressive growth (Gerling et al. 1996). In their study, Holler and Abrahamson (1977) suggest that wild strawberries under high population density conditions (increased competition) will exhibit a decrease in vegetative reproduction and an increase in seed production. This encourages dispersal to new and possibly more favourable sites. In low population density conditions, the vegetative reproduction of wild strawberries will increase to ensure local spread.

### Photo Credits

**Photo 1:** Glen Lee, Regina, Saskatchewan.

**Photo 2:** Wild Rose Consulting, Inc.

**Photo 3:** Shannon Hammonds, Kamloops, British Columbia.

**Line diagram:** John Maywood, used by permission of Bruce Peel Special Collections, University of Alberta.

### References

Addy, H.D., S. Hambleton and R.S. Currah, 2000. Distribution and molecular characterization of the root endophyte *Phialocephala fofinii* along an environmental gradient in the boreal forest of Alberta. *Mycological Research* 104(10): 1213-1221.

Alberta Biodiversity Monitoring Institute, 2014. The status of biodiversity in the oil sands region of Alberta. Alberta Biodiversity Monitoring Institute, Edmonton, Alberta. 47 pp.

[http://www.abmi.ca/FileDownloadServlet?filename=The%20Status%20of%20Biodiversity%20in%20the%20Oil%20Sands%20Region%20of%20Alberta\\_2014\\_Supplemental%20Report.docx&dir=REPORTS\\_UPLOAD](http://www.abmi.ca/FileDownloadServlet?filename=The%20Status%20of%20Biodiversity%20in%20the%20Oil%20Sands%20Region%20of%20Alberta_2014_Supplemental%20Report.docx&dir=REPORTS_UPLOAD) [Last accessed June 16, 2014].

Anderson, M.K. and W. Roderick, 2006. USDA NRCS plant guide for mountain strawberry *Fragaria virginiana* Duchesne.

[http://www.plants.usda.gov/plantguide/pdf/cs\\_frvi.pdf](http://www.plants.usda.gov/plantguide/pdf/cs_frvi.pdf) [Last accessed June 10, 2013].

ANPC (Alberta Native Plant Council), 2010. Native Plant Source List.

[http://www.anpc.ab.ca/assets/ANPC\\_2010\\_Native\\_Plant\\_Source\\_List.pdf](http://www.anpc.ab.ca/assets/ANPC_2010_Native_Plant_Source_List.pdf) [Last accessed June 14, 2013].

Ashman, T., 2000. Pollinator selectivity and its implications for the evolution of Dioecy and Sexual dimorphism. *Ecology* 81(9): 2577-2591.

Duke, J.A., 1992. *Fragaria virginiana* Duchesne (Rosaceae) wild strawberry. IN: Handbook of Edible Weeds. CRC Press, Boca Raton, Florida. pp. 98-99.

Gerling, H.S., M.G. Willoughby, A. Schoepf, K.E. Tannas and C.A Tannas, 1996. A Guide to Using Native Plants on Disturbed Lands. Alberta Agriculture, Food and Rural Development and Alberta Environmental Protection, Edmonton, Alberta. 247 pp.

Gray, B., 2011. Strawberry *Fragaria virginiana*. IN: The Boreal Herbal: Wild Food and Medicine Plants of the North. Aroma Borealis Press, Whitehorse, Yukon. pp. 229-231.

Hale, G., N. Ambrose, A. Bogen, K. Spicer-Rowe, M. Uchikura and E. Saunders, 2005. Wild Strawberry *Fragaria Virginia*. IN: A Field Guide to Common Riparian Plants of Alberta. Cows and Fish Program, Lethbridge, Alberta. p. 45.

Holler, L.C. and W.G. Abrahamson, 1977. Seed and vegetative reproduction in relation to density in *Fragaria virginiana* (Rosaceae). *American Journal of Botany* 64(8): 1003-1007.

Jett, J.W., 2005. Horticulture: Plant pH preferences. West Virginia University, Extensions Service. <http://www.wvu.edu/~agexten/hortcult/homegard/pHpref.pdf> [Last accessed June 10, 2013].

Jurik, T.W., 1985. Differential costs of sexual and vegetative reproduction in wild strawberry populations. *Oecologia* (Berlin) 66: 394-403.



Kindscher, K., 1987. *Fragaria virginiana* Wild Strawberry. IN: Edible Wild Plants of the Prairie. An Ethnobotanical Guide. University Press of Kansas, Lawrence, Kansas. pp. 115-118.

Marles, R.J., C. Clavelle, L. Monteleone, N. Tays and D. Burns, 2000. Aboriginal Plant Use in Canada's northwest Boreal Forest. Natural Resources Canada and Canadian Forest Service. UBC Press, Vancouver, British Columbia. 368 pp.

Moss, E.H., 1983. Flora of Alberta. A manual of flowering plants, conifers, ferns, and fern allies found growing without cultivation in the province of Alberta, Canada. 2nd edition. University of Toronto Press, Toronto Ontario. p. 351.

Munger, G.T., 2006. *Fragaria vesca*. IN: Fire Effects Information System. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. <http://www.fs.fed.us/database/feis/plants/forb/fraves/introductory.html> [Last accessed June 10, 2013].

Renault, S., C. Lait, J. Zwaizek and M. MacKinnon. 1998. Effect of high salinity tailings waters produced from gypsum treatment of oil sands tailings on plants of the boreal forest. Environmental Pollution 102: 177-184.

Rose, R., C.E.C. Chachulski and D.L. Haase, 1998. Propagation of Pacific Northwest native plants. Oregon State University Press, Corvallis, Oregon. 248 pp.

Royal Botanic Gardens Kew, 2008. *Fragaria virginiana* Mill. Seed Information Database. <http://data.kew.org/sid/SidServlet?Clade=&Order=&Family=&APG=off&Genus=Fragaria&Species=virginiana&StorBehav=0> [Last accessed June 14, 2013].

Smreciu, A. and D. Barron, 1997. Clover Bar Landfill site revegetation and naturalization. Phases 1,2 and 3a (1994-1997). Prepared for the City of Edmonton, Asset Management and Public Works Department, Waste Management Branch. 118 pp. + appendices.

Smreciu, A., M. Pahl, K. Gould and M. Fung, 2006. Native plants for revegetation: propagation and establishment of plants significant to local aboriginal communities. 39 pp.

Tannas, K., 1997. Common plants of the western rangelands. Volume 2 – Forbs. Lethbridge Community College. Lethbridge, Alberta. 310 pp.

