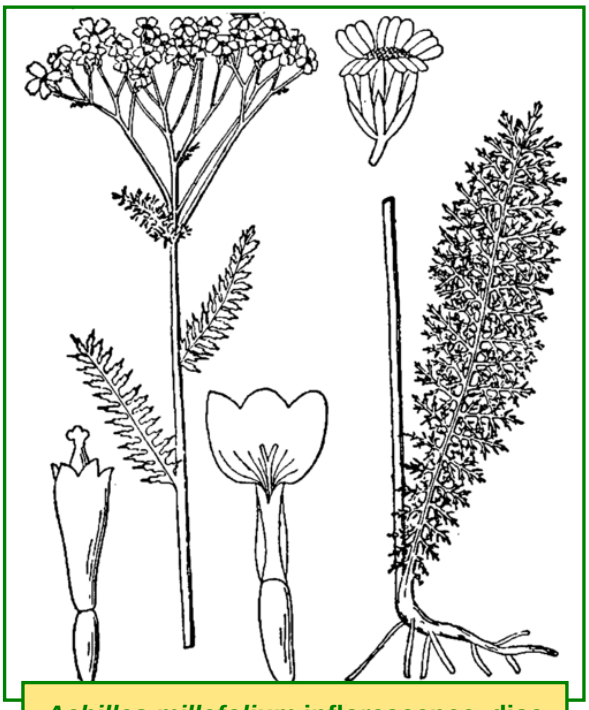
Scientific Name: *Achillea millefolium* L. **Family:** *Asteraceae*

Common Names: common yarrow



***Achillea millefolium* inflorescence, disc flower, ray flower, single head, basal leaf and rootstock**

Plant Description

Rhizomatous aromatic herb; stems are mostly 30 to 70 cm tall, sparsely to densely woolly-villose; leaves, alternate along the stem as well as in basal tuft, two or three times pinnately divided into many narrow segments, ultimate divisions sharply pointed; basal leaves are petioled, plume-like, 3 to 10 cm long; cauline leaves are shorter and sessile; flower heads borne in a dense cluster, round topped to flattish umbel formation; involucre 4 to 5 mm high; bracts pale or dark margined; white rays, approximately 5 per flower, 2 to 3 mm long surrounding 10 to 30 disc-flowers (Moss 1983).

Fruit/Seed: 2 mm long, grey, oblong, flattened, narrow winged margin, longitudinally striate (Currah et al. 1983).

Habitat and Distribution

Grasslands, mountain and boreal regions of Alberta. Found on prairies, in clearings, along roadsides and on disturbed sites, ubiquitous.
Seral Stage: Early pioneer species that persists throughout succession (Aleksoff 1999).
Soil: Medium textured soil with a pH of 6 to 8, low tolerance to salinity and moderate tolerance to drought (USDA NRCS n.d.).
Distribution: Throughout Alberta. Circumpolar: Alaska, Yukon to northern Hudson Bay, northern Quebec, Newfoundland, ubiquitous south (Moss 1983).

Phenology

Flowers from May until freeze-up, seeds generally ripen in late summer (Currah et al. 1983).

***Achillea millefolium* seed**

Pollination

Insect pollinated; self-incompatible (Pahl and Smreciu 1999, Plants for a Future n.d.).

Seed Dispersal
By wind (Aleksoff 1999).

Genetics
2n=18, 27, 36, 45, 54, 72 (Moss 1983).

Symbiosis
Yarrow forms mycorrhizal associations with vesicular-arbuscular fungi (Currah and Van Dyk 1985).

***Achillea millefolium* in bloom**

Seed Processing
Collection: Seeds can be hand-picked by snipping stems into bags or harvested with hand-held strippers (fine brush stripper with a vacuum attachment) if sufficient plant density occurs (Burton and Burton 2003).

Seed Weight: 0.16 g/1,000 seeds (Gerling et al. 1996).

0.12 g/1,000 seeds (Burton and Burton 2003).

Harvest Dates: August.

Cleaning: Air-dry seeds in paper or Tyvek bags at 15 to 25ºC. Crush material or remove large chaff and crush remaining material. Sieve to remove seeds from chaff using appropriate size screens (ASTM #12 or #14). Small chaff and dust can be removed by winnowing.

Storage Behavior: Orthodox; can be dried to lower moisture contents and stored at low temperatures (Royal Botanic Gardens Kew 2008).

Storage: Store cool and dry (Luna et al. 2008). International Plant Genetic Resources Institute (IPGRI) preferred storage conditions; low moisture content (3% to 7% fresh weight, depending on the species) and storing them, in hermetically-sealed containers, at low temperature, to 18ºC or cooler (Fassil and Engels 1997).

Longevity: Can survive at least 5 years under cool dry conditions (Burton and Burton 2003). Oldest collection is 15 years old with viability of 98% at IPGRI preferred storage conditions (Royal Botanic Gardens Kew 2008).

Propagation
Natural Regeneration: Naturally regenerates from seeds and by extensive rhizome system (Gerling et al. 1996).

Germination: 1 to 3 months to germinate (Plants for a Future n.d.).

Pre-treatment: Cold stratification may be required for certain seed lots. Although some seed lots require no stratification, dormant lots can be stratified or given alternating moistening and drying at 22 to 29°C (Pahl and Smreciu 1999).

Seeds get 90% to 100% germination; 14 days to germinate at 22°C (Luna et al. 2008).

Direct Seeding: 60 to 90 cm row spacing. Sow in spring or autumn. Surface seeding (Pahl and Smreciu 1999).
Planting Density: 1,900 to 7,700 plants/ha (USDA NRCS n.d.).
Seed Rate: 375 seeds/m^2 (Pahl and Smreciu 1999).
Vegetative Propagation: Rhizome cuttings may be taken in spring or fall, and mature plants can be divided (Currah et al. 1983).
Micro-propagation: Tissue culture is possible (Turker et. al. 2009).

Aboriginal/Food Uses

Food: Can be eaten raw or cooked, they have a slight bitter flavour. The leaves are best when they are young (Plants for a Future n.d.). If eaten in large quantities it is possible to experience sedative and/or diuretic effects; can be harmful if consumed over long periods of time (Plants for a Future n.d.).
Medicinal: Yarrow's diaphoretic (increases sweating) properties make it one of the best herbal teas to fight fever (Gray 2011).
Flower heads can be chewed and applied to treat a number of skin afflictions, such as burns, bee stings, or sores; also it could be placed in the nostril to stop nosebleeds. Flower decoctions can be ingested to treat menstrual cramps, labour pains and haemorrhaging, coughs or liver ailments as well as sinus and chest congestion. Sometimes a reduced concoction might be used to treat the skin as well. It may be added to other herbs as a painkiller. Smoke of burning yarrow may also be used for pain relief and fumigation of areas occupied by the ill and infectious. The root may be used in a decoction to treat fever, teething sickness and toothaches. The alkaloids identified, although relative amounts vary widely throughout the species, have been shown to have weak fever reducing and blood pressure alleviating effects (Gray 2011, Marles et al. 2000).
Other: Leaves and flower heads are both made into essential oils and used for aromatherapy (Gray 2011). Also used in combination with other leaves to bait traps for lynx (Marles et al. 2000). Used to coat sled dog feet to heal wounds, to lubricate pads to keep snow from building up, and to stop licking (Gray 2011).

Wildlife/Forage Usage

Wildlife: Several authors suggest yarrow is browsed by deer and goats (Plants for a Future n.d., Tannas 2004).
Livestock: Poor forage value due to low palatability (Tannas 2004).
Grazing Response: An increaser. *Achillea* is an indicator of overgrazing, very resistant to trampling and a common component in altered rangeland (Tannas 2004).

Single inflorescence of *A. millefolium.*

Reclamation Potential

In a review of Syncrude and Suncor plot data, Geographic Dynamics Corp. (2006) found that *A. millefolium* invaded plots and showed significant increase in prevalence at around 15 to 20 years and continued to increase over the subsequent time periods.
An early seral species with rhizomatous habit, *Achillea millefolium* could spread through an open area relatively quickly, providing groundcover. It is not generally persistent, and as a native species, most other natives are already adapted to sharing their environment with yarrow (Pahl and Smreciu 1999, Tannas 2004).

Commercial Resources

Availability: Seeds and plants are commercially available in Alberta (ANPC 2007). It is recommended that seed be collected locally for use in reclamation.

Cultivars: There are many including: 'Fireland', 'Terracotta', 'Summer Pastels', 'Salmon Beauty', 'Royal Tapestry', 'Red Velvet', 'Red Beauty', 'Peggy Sue', 'Paprika', 'Little Susie', 'Lavender Beauty', 'Laura', 'Hoffnung', 'Heidi', 'Apple Blossom', 'Colorado', 'Cassis', 'Cerise Queen' (Perennials.com n.d.). However, cultivars are not suitable for use in reclamation.

Uses: Often used as an ornamental in dried arrangements or horticultural in gardens (Perennials.com n.d.). Can be used as a hops substitute in beer, essential oils made from the flowers are used in soft drink flavoring and a tea can be made from its flowers and leaves (Plants for a Future n.d.). Yarrow is used in Europe in phytotherapy products as well as an anti-inflammatory both internally (stomach tonic) and externally (skin rashes and sores) (Marles et al. 2000). The antimicrobial nature of yarrow is also recognized and attributed to monoterpenes and polyacetylenes (Marles et al. 2000).

Photo Credits

Photo 1: Hurst, S. USDA-NRCS PLANTS Database. Public Domain.

Photo 2: Salguero, A. Wikimedia commons 2005.

Photo 3: SriMesh. Wikimedia commons 2008.

Line Diagram: Britton, N.L. and A. Brown Illustrated flora of the northern states and Canada. Public Domain.

References

ANPC (Alberta Native Plant Council), 2010. Native Plant Source List. http://www.anpc.ab.ca/assets/ANPC_2010_Native_Plant_Source_List.pdf [Last accessed October 10, 2013].

Aleksoff, K.C., 1999. *Achillea millefolium*. IN: Fischer, W.C. (compiler). The fire effects information system. United States Department of Agriculture, Forest Service, Intermountain Research Station, Intermountain Fire Sciences Laboratory, Missoula, Montana. http://www.fs.fed.us/database/feis/plants/forb/achmil/introductory.html [Last accessed October 8, 2013].

Burton, C.M. and P.J. Burton, 2003. A manual for growing and using seed from herbaceous plants native to the northern interior of British Columbia. Symbios Research & Restoration, Smithers, British Columbia. 168 pp.

Currah, R., A. Smreciu and M. Van Dyk, 1983. Prairie Wildflowers. An illustrated manual of species suitable for cultivation and grassland restoration. The Friends of the Devonian Botanic Garden, University of Alberta, Edmonton, Alberta. 300 pp.

Currah, R. and M. Van Dyk, 1985. A survey of some perennial vascular plant species native to Alberta for occurance of mycorrhizal fungi. Canadian Field-Naturalist 100: 330-342.

Fassil, H. and J. Engels, 1997. Seed conservation research: IPGRI's strategies and activities. BGC News 2(9). http://www.bgci.org/worldwide/article/349/ [Last accessed October 10, 2013].

Geographic Dynamics Corp., 2006. Investigation of natural ingress of species into reclaimed areas: A data review. Cumulative Environmental Management Association, Fort McMurray, Alberta. CEMA Contract Number 2005-0008 RWG. 12 pp. plus appendices.

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. Yarrow *Achillea millefolium*. IN: The Boreal Herbal: Wild Food and Medicine Plants of the North. Aroma Borealis Press, Whitehorse, Yukon. pp. 178-183.

Luna, T., J. Evans and D. Wick, 2008. Propagation protocol for production of container *Achillea millefolium* L. (Nutt.) Piper plants (172 ml conetainers); USDI NPS - Glacier National Park, West Glacier, Montana. IN: Native Plant Network, University of Idaho, College of Natural Resources, Forest Research Nursery, Moscow, Idaho. http://www.nativeplantnetwork.org/Network/ViewProtocols.aspx?ProtocolID=11 [Last accessed December 5, 2013].

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. *A. millefolium* L. Common yarrow. IN: 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. pp. 526-527.

Pahl, M. and A. Smreciu, 1999. Growing native plants of western Canada: common grasses and wildflowers. Alberta Agriculture, Food and Rural Development and Alberta Research Council. 118 pp.

Perennials.com, n.d. *Achillea millefolium*. http://www.perennials.com/results.html?findplant=Achillea+millefolium&searchbutton.x=0&searchbutton.y=0 [Last accessed November 2 2012].

Plants for a Future, n.d. *Achillea millefolium* L. IN: Plants For A Future, Dawlish, Devon, UK. http://www.pfaf.org/user/Plant.aspx?LatinName=Achillea+millefolium [Last accessed October 10, 2013].

Royal Botanic Gardens Kew, 2008. *Achillea millefolium* L. IN: Seed Information Database. http://data.kew.org/sid/SidServlet?ID=658&Num=6pg [Last accessed October 7, 2013].

Tannas, K., 2004. Common plants of the western rangelands. Volume 3: Forbs. Olds College, Olds, Alberta and Alberta Agriculture, Food and Rural Development, Edmonton, Alberta. 505 pp.

Turker, A.U., B. Yucesan and E. Gurel, 2009. In vitro regeneration of *Achillea millefolium* L from shoot-tips and root segments of seedlings. Journal of Plant Biochemistry & Biotechnology 18(1): 65-69.

USDA NRCS, n.d. *Achillea millefolium* L. common yarrow. IN: The PLANTS Database. National Plant Data Center, Baton Rouge, Louisiana. http://plants.usda.gov/core/profile?symbol=ACMI2 [Last accessed October 8, 2013].