

PLANT MATERIALS TECHNICAL NOTE

WESTERN YARROW *Achillea millefolium* var. *occidentalis*

A Native Forb for Conservation Use in Montana and Wyoming

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Western yarrow flowers

General Description

Western yarrow is a native, herbaceous perennial in the Aster Family. It is a very common wildflower that grows erect from creeping rootstocks, to a height mostly 10 to 36 inches tall. The leaves of western yarrow are lacy and fern-like in appearance. They are finely dissected into numerous, short and narrow divisions not over 0.04 inch wide--millefolium is derived from the Latin roots mill(i) meaning one thousand and foli(um) meaning a leaf. The basal foliage is up to 10 inches long, with leaves along the flowering stalk longest at the base and progressively shorter up the stem. The entire plant is densely covered in long, soft, woolly hairs. Western yarrow has a very distinctive aroma, similar to chamomile (*Anthemis*) or dog fennel (*Dysodiopsis*), and is especially noticeable, when crushed. The somewhat rounded terminal clusters of flower heads are normally white to pale pink in color and have an extended bloom period from May to September. The extremely small fruit is a whitish, flattened achene, with compressed margins that are grayish in color. There is considerable variation within native populations across the United States with up to seven varieties recognized by taxonomists.

Western yarrow should not be confused with the introduced, invasive species, common yarrow *Achillea millefolium*. It is difficult to morphologically distinguish between native and non-native yarrow. The primary difference may be in chromosome numbers where the natives are mostly tetraploid and non-natives are mostly hexaploid. Common yarrow has origins in Eurasia, the European continent, and the islands of Scandinavia. This introduced species is considerably

different from western yarrow in that it has a much taller stature, an aggressive weedy characteristic, and initiates a later sequence of flowering and seed ripening.

Adaptation or Range

Western yarrow is a very drought-tolerant, native species that is one of the most widely recognized and adaptable wildflowers in the western United States. The range of distribution includes many habitats across Manitoba to British Columbia, and south to Kansas, New Mexico, northern Mexico, and California. It prefers conditions in full sun along roadsides, hills, canyons, pastures, and disturbed areas. It is found scattered in sagebrush areas, open timber, and subalpine zones, and occurs at elevations ranging from 2,400 feet in Montana to 12,000 feet in Colorado. Western yarrow exhibits good survival in droughty conditions on gravelly loam and thin or sandy soils. This plant is a common component of such ecological sites as shallow, silty, shallow to gravel, and silty steep. Associated species include western wheatgrass *Pascopyrum smithii*, bluebunch wheatgrass *Pseudoroegneria spicata*, prairie Junegrass *Koeleria macrantha*, Sandberg bluegrass *Poa secunda*, common gaillardia *Gaillardia aristata*, big sagebrush *Artemisia tridentata*, and prairie coneflower *Ratibida columnifera*.

In Montana, western yarrow is found as a minor component on sites in Major Land Resource Areas (MLRAs) 32, 43A, 43B, 44, 46, 52, 53A, 54, 58A, and 60B. It is known to inhabit all of the 56 counties in Montana.

In Wyoming, western yarrow is found as a minor component on sites in MLRAs 32, 34A, 58B, 61, 67A. It is known to inhabit all of the 23 counties in Wyoming. Western yarrow was the best performing forb in a field planting near Pinedale, Wyoming.



Great Northern Germplasm western yarrow in a replicated plot near Pinedale, Wyoming

Conservation Uses

Western yarrow is commonly found as a minor component in many native plant communities and is considered as a non-dominant species. It is a forage source for bighorn sheep, pronghorn antelope, and deer. Mature and chick sage-grouse along with other upland birds rely heavily on the foliage of western yarrow as a food source. Domestic sheep and goats derive a fair amount of forage value from western yarrow, while cattle and horses mostly graze the flower head. It is an early successional species that readily establishes on disturbed sites. Western yarrow adds diversity in seed mixtures for rehabilitation of disturbed sites, such as rangeland, mine land, roadsides, park and restoration areas, prairie reconstruction projects, and farm bill program conservation plantings. It is used as an ornamental in low maintenance or naturalized landscapes.

Flowering occurs early to mid-season, attracting many different insects for pollinator habitat improvement plantings.



Wasp species foraging for pollen and nectar from a white western yarrow flower

Ease of Establishment

Western yarrow is moderately difficult to establish by direct seeding. Seedling vigor is good and stands are long-lived once established.

Planting Rates (all recommended amounts based on pure live seed PLS)

There are approximately 2,850,000 seeds per pound. As a guideline, at a seeding rate of 1 pound per acre, there are approximately 65 seeds per square foot. The full seeding rate, based on approximately 33 seeds per linear or square foot, is 0.5 PLS pounds per acre, but it would seldom be seeded in a pure stand. It is recommended in native seed mixtures at a rate of $\frac{1}{8}$ - to $\frac{1}{4}$ -pound PLS per acre. The broadcast seeding rate is double the recommended drilled rate. The critical area drill seeding rate is double the non-critical area drill rate, while the broadcast rate is quadruple the non-critical area drill rate. Wildland collected and field-produced seed is commercially available and cost is dependent on supply and demand.

Stand Establishment

For best results, seed should be planted into a firm, weed-free seedbed as early in the spring as possible. To ensure uniform seed placement, drill-seed western yarrow to a depth of $\frac{1}{4}$ - to $\frac{1}{2}$ -inch at 12-inch row spacing. Seeding a forb component in alternate rows, or cross-planting, with the grass component may ensure better forb establishment. As shown in the photos below, establishment success may be higher when yarrow seed is mixed at the time of planting with a small amount of carrier such as chick starter, or a barley nurse crop (planting rate less than 6 seeds per square foot). Because of its small seed size, broadcast seeding is preferred if seed-to-soil contact is provided; however in dryland situations, adequate precipitation at the time of germination is critical for survival. Periodic mowing during the establishment year is one option for weed suppression.

Western yarrow may increase in heavily grazed rangeland but tends to decrease when grazing pressure is eliminated. Late spring burning and intense wildfire will negatively impact growth of western yarrow.



Seven weeks after seeding yarrow with chick starter (left) and barley nurse crop (right)

Seed production fields should be established in rows of 25 PLS per linear foot. Between-row spacing is dependent on the type of planting and cultivation equipment used, and ranges from 22 to 36 inches. Allow adequate between-row space for mechanical weed control. At 24-inch row spacing, the recommended seeding rate is 0.2 pounds PLS per acre and at 30- and 36-inch row spacing, the seeding rate is 0.15 and 0.13 pounds PLS per acre, respectively. There are presently no herbicides specifically labeled for controlling weeds in seed production fields of western yarrow.



Great Northern Germplasm western yarrow seed production field at the Bridger Plant Materials Center

Seed harvest can be accomplished by swathing and combining from cured windrows, or direct combining. Swath to a stubble height of approximately 6 to 8 inches so the cutter bar of the combine can get under the windrow as the pickup reel feeds the harvested material onto the conveyor. If done in this manner, there is less seed lost to shatter, and there is no need to use a pickup attachment which tends to collect dirt and debris with the seed crop.

The wind setting of the combine should be set very low, or if necessary, detach the belt to minimize seed loss. Direct combining should take place when the inflorescence is brown in color and seeds readily shatter off the seedhead. The harvesting or combining process is slow because there is a high volume of material and the seed stalks remain relatively green. Seed production of 100 to 167

pound PLS per acre can be attained under irrigated conditions. Seed viability is high and longevity can be expected for at least 5 years when stored at cool temperatures and low humidity.



Combining swathed windrow of Great Northern Germplasm western yarrow without a pickup attachment

Limitations

Root rot (*Sclerotinia sclerotiorum*) may occur in poorly-drained soils and powdery mildew (*Erysiphe*, *Microsphaera*, *Phyllactinia*, *Podospaera*, *Sphaerotheca*, or *Uncinula*) may develop at times of elevated humidity. Western yarrow is not a problem weed but may spread from rhizomes and re-seed itself under favorable conditions.

Releases

Great Northern Germplasm western yarrow was released in 2004 as a Selected Class pre-varietal germplasm from the USDA-NRCS Bridger Plant Materials Center in cooperation with the Agricultural Experiment Stations in Montana and Wyoming. It originates from a source in northwestern Montana. Great Northern Germplasm is recommended to add species diversity in native seed mixes in conservation practices such as range and critical area plantings, conservation cover, and early successional, wildlife, and pollinator habitats.

Eagle Germplasm western yarrow was released in 2011 as a Selected Class pre-varietal germplasm from the USDA Forest Service, Rocky Mountain Research Station; the United States Department of the Interior Bureau of Land Management, Boise, Idaho; and the Agricultural Experiment Stations in Idaho and Utah. Eagle Germplasm is recommended for use in native seedings following wildfires and on other disturbed sites to re-establish diverse native communities, provide site stabilization, and to improve wildlife habitat. It is a quickly establishing species for use in conservation and low-maintenance landscape plantings.

Yakima Germplasm western yarrow was released in 2004 as a Source-Identified class pre-varietal germplasm from the USDA Agricultural Research Service and the Utah Agricultural Experiment Station in cooperation with the United States Army-Engineer Research and Develop Center. Yakima Germplasm is a composite of seed collected from 27 locations representing 7 ecological sites at the U.S. Army Yakima Training Center in Washington. It is intended for use in rehabilitation and restoration of western rangelands with special emphasis on re-vegetating severely disturbed military training lands and after wildfires.

Additional Information

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Winslow, S.R., M.E. Majerus, and L.K. Holzworth. 2005. USDA-NRCS Bridger Plant Materials Center Release Brochure: Great Northern Germplasm Selected Class Western Yarrow, available at http://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/mtpmcrb6027.pdf