

Balsamorhiza sagittata Arrow-leaf Balsamroot

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Photo: Drake Barton

Balsamorhiza sagittata (Arrow-leaf Balsamroot)

On July 7, 1806 on their return from the Pacific Ocean, Captain Lewis and his group of nine men followed the Nez Perce trail up the Blackfoot River to today's Alice Creek, east of Lincoln, Montana. The trail wound up the north side of the creek, and then switched back a couple of times. Along the trail Lewis collected arrow-leaf balsamroot, a large, showy wildflower, and several other plant species. Today the specimens collected by the explorers can be found in the Lewis & Clark Herbarium in Philadelphia. The specimen sheet contains several dried flowers and leaves and two labels written by the botanist Frederick Pursh who examined the botanical collections from the expedition. Arrow-leaf balsamroot was collected on two dates. The first collection, likely made by William Clark, was on April 14, 1806 along the Columbia River in present-day Washington. Pursh's label for these plants reads, "The stem is eaten by the natives, without any preparation. On the Columbia. April. 14th 1806." The second collection was made in Montana

near Lewis & Clark Pass, as noted above. Pursh's label for these fragments says, "Rocky mountains. Dry hills Jul. 7th 1806." The flowers collected in April are still in bloom, while the ones from the July date in Montana contain fully mature seeds. On April 14 Lewis and Clark were along what they called Canoe Creek, the present White Salmon River, a tributary of the Columbia River, in Washington state. Clark wrote in his journal on April 14, 1806, "after dinner we proceeded on our voyage. I walked on Shore with Shabono on the N. Side through a handsome bottom. met Several parties of women and boys in Serch of herbs & roots to Subsist on maney of them had parcels of the Stems of the Sun flower [arrow-leaf balsamroot]. I joined Capt. Lewis and the party at 6 miles, at which place the river washed the bottom of high Clifts on the N. side."

Arrow-leaf balsamroot (*Balsamorhiza sagittata*) is easily recognized by its large, showy, yellow flowers that often color dry hillsides a golden-yellow starting in early May. Considered a long-lived, cool season plant and member of the sunflower family

(Asteraceae), it grows in clumps to a height of two and a half feet. Its arrow-shaped leaves (hence the name) can be six inches wide and are covered with silvery-gray hairs, with stalks up to twelve inches long. The leaves arise from a branched, underground caudex, or persistent woody stem, to form dense rosettes. The bright yellow flowers are usually arranged singly on long stems and the stem leaves are mostly lanceolate in shape and alternate in position as they advance up the stem. The root is a taproot that may be as large as four inches in diameter and can be as much as eight feet deep. It is usual for lots of seed to be produced if the developing seedheads are not attacked by insects and are protected from grazing. The seeds are dispersed by animals and by wind, as are many members of the sunflower family, but apparently are not banked in the soil for any length of time. New plants are slow to mature and require three to four years or longer to flower on the best sites, and as many as eight years in areas of low precipitation.

In Montana, the plant occurs from the valleys and plains, to the foothills of the island mountain ranges in the central portion of the state, to the western foothills and mountains, as well as on open slopes and ridges, often in the company of sagebrush (*Artemisia* spp.) and ponderosa pine and is found in open, fairly dry locations such as southerly exposures, open ridges, and parks with well-drained, silty and loamy soils. Arrow-leaf balsamroot is found from as low as 1,000 feet in elevation in other states to as high as 9,000 feet. The Canadian provinces of Alberta and British Columbia support populations of arrow-leaf balsamroot and it is found from Washington to California and as far east as North and South Dakota and south to Arizona. It is strongly drought-resistant, has good winter-hardiness, tolerates semi-shade, and is tolerant of grazing and trampling.

Arrow-leaf balsamroot may be top-killed by fire, but its strong and persistent taproot allows it to regenerate from the caudex following most fires. Many of the habitats where the species occurs benefit from occasional fire and arrow-leaf balsamroot may also benefit and increase following moderate fire.

Native Americans relied on all parts of arrow-leaf balsamroot for food. Young leaves and shoots were peeled and eaten raw, boiled or steamed. The peeled roots have a bitter, strongly pine-scented sap. When cooked for several days (roasted or steamed) the root

became edible and was often ground into meal and mixed with grease and made into cakes, or mixed with powdered berries and eaten with a spoon. The small, sunflower-like seeds were dried or roasted and pounded. The plant was also used for medicinal purposes, with the leaves being used as a poultice for burns, the roots boiled and the solution applied as a salve for wounds, cuts and bruises, and a tea derived from the roots used as a treatment for tuberculosis and whooping cough. Today, it is added to muffins, breads and granola, and can also serve as an emergency survival food. Modern herbal practitioners may use the root as an immunostimulant or expectorant.

Many Montana wildlife species use arrow-leaf balsamroot for food. The flowers are especially sought after, but deer and elk also eat the leaves. Mule deer and bighorn sheep also use the plant as forage throughout the year. Balsamroot is most palatable in the spring and summer, but wildlife will graze it throughout the winter. Rocky Mountain mule deer utilize arrow-leaf balsamroot year-round and the plant is considered an important food in all seasons. Elk in the Rocky Mountain region use the plant as food in spring, summer and winter. Seeds of arrow-leaf balsamroot are consumed by small mammals such as Columbia ground squirrels, which also utilize the leaves. In a study of flammulated owl habitat in the Bitterroot Valley of Montana, owls were positively associated with dry-site indicator species such as arrow-leaf balsamroot. Domestic stock animals also use the plant for forage. Sheep utilize arrow-leaf balsamroot, especially in the spring. Extensive sheep grazing has been shown to decrease production of arrow-leaf balsamroot. Cattle and horses also eat the plant throughout the spring and early summer and are fond of the flowers.

Arrow-leaf balsamroot has been used in seed mixtures for restoration, recovery of disturbed sites, and improving forage production. It is best to sow seeds in the fall and allow them to follow a normal period of freezing and thawing to break down the germination inhibitors. The plant also has potential for restoration of oil shale, coal-mined lands, and can be used along roadsides to stabilize areas prone to erosion. Arrow-leaf balsamroot is an attractive plant and a great addition to a native garden or landscape site. Being drought tolerant, once established it needs little care. After flowering, the plant will dry up and go dormant until the following spring, so don't forget where you planted it!

Arrow-leaf balsamroot is beautiful and defines many Montana landscapes in the spring by producing gorgeous displays of yellow flowers. By appreciating not only the plant's beauty, but also its history and biology, our own appreciation of Montana's native flora and natural landscapes is increased.