

## CUTLEAF BALSAMROOT

*Balsamorhiza macrophylla* Nutt.

Plant Symbol = BAMA4

Contributed by: USDA NRCS Idaho Plant Materials Center



Cutleaf balsamroot. Photo by Tris Hoffman, USDA Forest Service.

### Alternate Names

Cleft-leaf balsamroot, large-leaved balsamroot.

### Uses

Livestock and big game utilize cutleaf balsamroot. It is moderately palatable to grazing animals during the spring and early summer but has low protein content (Walter, 2007). Leaves are grazed lightly and flowers are often eaten. Horses are especially fond of the flowers (Plants of Utah, Online). The plant becomes dry and worthless as forage by midsummer (Forest Service, 1937; Herman, 1966). It attracts large numbers of native pollinators. It may have some value for restoration but is not a dominant or major species in its area of adaptation.

### Status

Please consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status (e.g., threatened or endangered species, state noxious status, and wetland indicator values).

### Ethnobotany

The Cheyenne tribe boiled the roots, stems and leaves and drank the decoction for stomach pains and headaches. They also steamed the plant and inhaled the vapors for the same conditions. Ripe seeds were pounded into flour and the fleshy roots were often eaten raw or boiled (Plants of Utah, Online).

### Description

*General:* Sunflower Family (Asteraceae). Cutleaf balsamroot is a native perennial forb with a large taproot from which several branches arise underground. The leaves are large, 3-6 dm (12-24 in) long, pinnate-shaped with broad, generally entire or coarsely few-toothed segments mostly 5-12 cm (1.97-4.72 in) long. The stems are lax, 3-10 dm (12-39 in) tall and leafless or often with a pair of much reduced, coarsely toothed or few-pinnate leaves toward the base with sparse, but long pubescence. The yellow colored flower heads are large and resemble those of a sunflower with long, leafy bracts that may surpass the disk. The ray flowers are 3-6 cm (1.18-2.36 in) long and the disk flowers are about 11 mm (0.43 in) long. The fruit is a lance-shaped achene, 1 cm (0.39 in) long. The achenes are lance-shaped and about 1 cm (0.39 in) long (Montana Field Guide, Online; Cronquist et al., 1994). The plant has a slight, unpleasant medical odor resembling turpentine (Plants of Utah, Online). Chromosome number is  $2n = 100 \pm 2$  and is highly polyploid. It evidently arose from hybridization between *Balsamorhiza sagittata* and *B. hispidula*. Cutleaf balsamroot has the multi-branched caudices of *B. sagittata* and the leaf dissection of *B. hispidula* (Flora of North America, Online).

*Distribution:* Cutleaf balsamroot is found in Idaho, Montana, Utah and Wyoming. For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site.

*Habitat:* Cutleaf balsamroot is a minor component of plant communities found in the Rocky Mountain subalpine and upper montane grasslands and on montane sagebrush steppe (Montana Field guide, Online).

### **Adaptation**

Cutleaf balsamroot is most abundant on well-drained soils ranging from clay to gravely in texture (Plants of Utah, Online). It is found from 4,500 to 7,000 feet (1372-2133 m) elevation in areas receiving 14-40 inches (355-1,016 mm) of annual precipitation. It has minimal tolerance to drought and flooded conditions (Walter, 2007). Cutleaf balsamroot is adapted to soil pH ranges from 6.3 to 8.6; has low salinity tolerance and intermediate shade tolerance (PLANTS Database).

### **Establishment**

There is no published information on the establishment of cutleaf balsamroot. Monsen et al., (2004) infer that establishment, production, and management of cutleaf balsamroot are similar to arrowleaf balsamroot (*Balsamorhiza sagittata*). They further state that neither cutleaf or arrowleaf balsamroot should be seeded in place of each other but site differences for the two species are not easy to differentiate.

Cutleaf balsamroot should be drill-seeded into a weed-free seedbed in late fall. Seeding depth should be 0.25-0.50 inches (0.6-1.3 cm). Broadcast seeding can be successful if seed can be covered by dragging or harrowing. There are 33,000 - 55,000 seeds per pound (Monsen et al, 2004; PLANTS Database). The calculated seeding rate based on 25 pure live seeds (PLS) per square foot at 12 inch row spacing is 19.8 pounds PLS/ac with a seed count of 55,000 seeds per pound. When planted in a mixture, the seeding rate should be adjusted according to the proportion of cutleaf balsamroot in the mix. Young seedlings develop slowly and are not competitive against more vigorous species. Alternate row seeding is recommended for arrowleaf balsamroot to help reduce interspecies competition and dense stands may take 10 years or more to develop (Monsen et al., 2004). This is likely to be similar for cutleaf balsamroot.

### **Management**

Cutleaf balsamroot should be used as a minor component of seed mixtures. Management strategies should be based on the key species in the established plant community. Grazing should be deferred on seeded lands for at least two growing seasons to allow for full stand establishment (Ogle et al., 2008). Cutleaf balsamroot is likely to be tolerant of fire due to its deep taproot. Plants are long lived with a life expectancy of approximately 14 years (Treshow and Harper, 1974).

### **Pests and Potential Problems**

The gall-forming nematode, *Anguillulina balsamophila* has been observed on cutleaf balsamroot (Goodey, 1948). Since cutleaf balsamroot is similar to arrowleaf balsamroot, the following information on pests and potential problems is from Tilley et al., (2012). Rodents and birds feed on the seed. Insect damage to seed can be significant and stored seed may require pesticide

treatment and cold storage. Mold has been observed on seedlings in greenhouse and growth chamber production.

### **Environmental Concerns**

Cutleaf balsamroot is native to western North America. It can spread under favorable conditions but does not pose any environmental concern to native plant communities.

### **Seed and Plant Production**

There is no published information regarding seed and plant production of cutleaf balsamroot. Since it is similar to arrowleaf balsamroot, the following information on seed and plant production is from Tilley et al., (2012). Seed requires stratification for germination and for container plant production, seed should be planted into containers to a depth of 0.25-0.5 inches, lightly covered with pea gravel and then placed outdoors in late fall or early winter for natural stratification. Transplanting is difficult and plants should be handled carefully to prevent damage to the root system. Plants develop slowly and take 3 or more years after establishment to produce flowers.

Seed production fields are typically planted at 36-42 inch row spacing to facilitate between-row cultivation. Seed should be planted at a depth of 0.25-0.5 inches in the fall to allow for natural stratification. Germination is erratic with new plants appearing for 2- 3 years after planting. Once established, cutleaf balsamroot is probably very competitive with weeds which may be controlled by hand, between-row cultivation and herbicides.

Fertilizer is not generally recommended and irrigation is limited to 15-20 inches (381-508 mm) per year including natural precipitation. Overhead irrigation should be avoided during pollination. It is very likely that cutleaf balsamroot requires insect visitation for pollination. Plants are slow to develop and may take 3-5 years to reach full production. Peak yields of arrowleaf balsamroot of 75 to 125 pounds per acre have been reported.

As with arrowleaf balsamroot, seed crops of cutleaf balsamroot may often be damaged by frost during flowering. Harvest can be done by hand, with a vacuum-type harvester, or by direct combining. Timing of harvest is critical. Mature, viable seed readily shatters. Seed cleaning is easy with the seed falling readily from the flower heads. Seed should be stored at cool temperatures ranging from 33-40°F (1-4°C). Seed is susceptible to insect damage and can be treated with pesticide prior to storage.

### **Cultivars, Improved, and Selected Materials (and area of origin)**

There are no cultivars, improved, or selected materials of cutleaf balsamroot. Common wildland collected seed is

available from commercial sources (Native Seed Network).

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## Citation

St. John, L. and D. Tilley. 2012. Plant Guide for cutleaf balsamroot (*Balsamorhiza macrophylla*). USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center. Aberdeen, Idaho 83210.

Published June, 2012

Edited: 15June2012ls; 15June2012djt; 15June2012jab

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