

PALMER'S PENSTEMON

Penstemon palmeri A. Gray
Plant Symbol = PEPA8

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National Plant Data Center



Palmer's penstemon. John Hixson, Ladybird Johnson Wildflower Center.

Alternate Names

Common Alternate Names: Palmer's beardtongue, scented beardtongue, balloon flower

Scientific Alternate Names: *Penstemon palmeri* var. *palmeri*, *Penstemon palmeri* var. *macranthus*, *Penstemon palmeri* var. *eglandulosus*

Uses

Grazing/rangeland/wildlife: Palmer's penstemon produces succulent foliage during the spring and summer and is selectively used by small birds, big game and livestock. It also provides high quality forage during the winter (Stevens and Monsen, 1988).

Erosion control/reclamation: Palmer's penstemon provides good ground cover for controlling erosion and stabilizing disturbed and burned sites (Stevens and Monsen, 1988; Ogle, et. al., 2012). It has also been used for revegetation of mines and mine spoils.

Pollinators: Flowers of Palmer's penstemon attract bumblebees (*Bombus* sp.), carpenter bees (*Xylocopa* sp.) and digger bees (Anthophorini tribe) (Wilson, et. al., 2003).

Ornamental: Palmer's penstemon produces persistent foliage and abundant, aromatic flowers that are pleasing in ornamental settings.

Ethnobotany

The Kayenta Navajo prepared a poultice of the plant to apply to snakebite sores (Native American Ethnobotany Database).

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).

Description

General: Figwort Family (Scrophulariaceae). Palmer's penstemon is a short-lived (4-5 years), evergreen, native, perennial herb to slightly woody subshrub 50-140 cm tall with a thick crown and fibrous taproot that can reach to 1m deep. The plant is glabrous and glaucous with fleshy leaves. The leaves are opposite, dentate, 6-10 cm long and 1.5-3 cm wide with the upper ones smaller and sometimes triangular. Palmer's penstemon has long flowering stalks that are up to 140 cm tall. Flower clusters are 2-4 flowered and the flowers range from white to lavender pink color with prominent red-violet colored guidelines on the lower lip and inside the strongly inflated throat. Flowers of Palmer's penstemon give off a pleasant fragrance which is unique among penstemon species. The fruit is a many-seeded capsule. Cronquist, et. al. (1984) recognizes three botanical varieties and provides a key to distinguish them based on floral and leaf characteristics as well as geographic distribution.

Distribution: Palmer's penstemon is found in the western United States from Wyoming south to New Mexico and westward to California. For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site.

Habitat: Palmer's penstemon is found in blackbrush, sagebrush, Joshua tree, pinyon-juniper and ponderosa pine communities where subsurface moisture is available for most of the growing season and elevation ranges from 2,600-8,200 feet above sea level (Cronquist et. al., 1984).

Adaptation

Palmer's penstemon is best adapted to well-drained, slightly acidic to slightly alkaline, coarse textured soils in areas receiving 10-16 inches annual precipitation and has excellent cold and drought tolerance (Ogle, et. al., 2012). Once established it can persist on sites receiving as little as 8 inches of annual precipitation (Stevens and Monsen, 1988). It has intermediate tolerance to salinity especially during periods of cool temperatures and lower light intensities (Zollinger, et. al., 2007). Palmer's penstemon is usually found in open areas but will tolerate semi-shaded conditions. It is not tolerant of fire, but is somewhat fire resistant due to leaves staying green with relatively high moisture content during wildfire season.

Establishment

Meyer and Kitchen (1992) observed cyclic seed dormancy in Palmer's penstemon. Chilling causes the seed population to diverge into spring-germinable and spring dormant fractions allowing the seed bank to persist from year to year. The general recommendation is to plant seed in the fall from 1/8 to no more than 1/4 inch depth into a firm, weed-free seedbed. Good seed to soil contact is important for germination and establishment. The full seeding rate is 2 pounds Pure Live Seed (PLS) per acre (Ogle, et. al., 2012) and there are approximately 586,000 - 600,000 seeds per pound (Stevens and Monsen, 1988; USDA PLANTS database). When used as a component of a seed mix, adjust the seeding rate to the percent of mix desired. Stevens and Monsen (1988) recommend drilling Palmer's penstemon through a legume box on a drill or with a seed diluent such as rice hulls because the seeds are small and may separate from other seeds in a mix. Vigorous seedlings appear in the spring, compete well, and usually are not eliminated by competition from other species (Monsen, et. al., 2004).

Mulching, irrigation and weed control benefit stand establishment. Some seed may not germinate until the second growing season. Plants begin growth early in the spring and flower blossoms appear in late spring and early summer. Flowering should not be expected until the second growing season.

Weed control will be required during establishment. Because penstemon is a broadleaf plant, the use of broadleaf type herbicides is not recommended. Mowing

weeds when they are beginning to bloom will help reduce weed seed development.

Management

Palmer's penstemon 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 after seeding to allow for full stand establishment. Although Palmer's penstemon is short-lived, once established, it is self-perpetuating because of its abundant seed production and seed dormancy which allows it to establish readily when conditions are favorable for germination and survival (Monsen et. al., 2004).

Pests and Potential Problems

Information on pests and diseases of Palmer's penstemon is not well known. In general, penstemon is susceptible to soil-borne fusarium and rhizoctonia root rot which can be severe in poorly drained loam and clay textured soils. Stevens and Monsen (1988) mention that Palmer's penstemon irrigated seed production fields are subject to diseases associated with alfalfa and potatoes but do not specify those diseases. Colorado State University Extension (2013) has identified a penstemon weevil (*Hesperobarus ovulum*, precise species not yet identified) that has caused catastrophic damage to several species of penstemon (including Palmer's) seed production fields in southwestern Colorado. Penstemon weevil damage is difficult to control because even once damage is observed, no control methods are available. Weevils damage the plant by feeding in the taproot.

Environmental Concerns

Palmer's penstemon is a native plant species found in western North America and has no known negative impacts on wild or domestic animals. It is not considered a weedy or invasive species but can spread to adjoining vegetative communities under ideal conditions. It co-exists with other native species and adds biodiversity to plant communities.

Seed and Plant Production

There can be considerable variability in seed dormancy among collections of the same species of penstemon. A few methods can be used to overcome dormancy including the use of aged seed where after-ripening causes seed to lose dormancy, moist pre-chilling (stratification), and the use of plant hormones referred to as gibberellins (GAs). Kitchen and Meyer (1991) found one collection of Palmer's penstemon out of 3 collections tested that did not show dormancy. There were also significant differences in germination between different lengths of stratification periods. Treatment of Palmer's penstemon seed with GA₃ at a minimum concentration of 50 ppm resulted in complete germination. Abella (2009) evaluated emergence of 61 plant species where seed was subjected to liquid smoke treatments and found significant difference between non-treated seed and seed

exposed to a 10 % (vol/vol) aqueous smoke. Non-treated seed of Palmer's penstemon had 41% emergence vs. treated seed which had 81% emergence.

A standard method for propagating penstemon for transplants is to stratify the seed for 8-12 weeks in cold and moist conditions. Seed should be surface sown into plant containers and pressed into the soil surface and then containers stored under cool (36° F), dark conditions for 8-12 weeks. After stratification period, bring plants into greenhouse conditions and allow plants to grow for 8-12 weeks before transplanting in the field. Propagation of new plants from dividing older plants is also possible.

Fields for seed production can be established from direct seeding or from transplanting greenhouse grown containerized stock. Direct seeding should take place in late fall to allow for natural stratification of the seed. Palmer's penstemon should be seeded in 30-36 inch rows at a rate of 1.2 pounds PLS/ac (target 30 pure live seeds per linear foot of drill row) to allow for mechanical weed control (Cornforth, et. al., 2001). The use of weed barrier fabric is an alternative to allow closer spacing, reduce weeds and conserve soil moisture. Plant spacing of 18 inches provides for maximum growth and seed yield when using weed barrier fabric.

Seed normally ripens from mid-August to mid-September and is mature when seed capsules dry and become hard and dark in color. Seed will shatter once capsules have opened. Seed can be harvested by hand-stripping or with combine. Seed is separated from the capsule with use of a hammermill or barley debearder followed by fan cleaning. Seed yields average 100 pounds per acre (Stevens and Monsen, 1988). Storage of seed of up to 5 years has resulted in no significant loss in germination (Stevens and Jorgensen, 1994).

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

'Cedar' Palmer's penstemon was released by Utah Division of Wildlife Resources and the Intermountain Research Station, Forest Service, and Soil Conservation Service, Department of Agriculture in 1985. The Agriculture Experiment Station of New Mexico State University, Colorado State University, University of Idaho, and Utah State University also participated in the release (Stevens and Monsen, 1988).

Cedar was originally collected in 1939 from a native stand near Cedar City, Utah in a mixed pinyon-juniper, big sagebrush plant community. Seed from the original site was compared with 17 other accessions at 20 locations in Utah and also in range plantings in Idaho, Montana, Wyoming, Nevada, Colorado, New Mexico, Arizona, and Oregon. Cedar was adapted to more sites, established better, was generally the most aggressive spreader, and produced as much or more forage than the

other accessions tested. Certified seed is available and the Forest Service maintains Breeder seed.

Wildland collected Palmer's penstemon seed can also be obtained through commercial vendors (Native Seed Network).

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