

ROCKY MOUNTAIN PENSTEMON

Penstemon strictus Benth.

Plant Symbol = PEST2



Rocky Mountain Penstemon. Sally and Andy Wasowski, Ladybird Johnson Wildflower Center

Alternate Names

Common Alternate Names: Strict beardtongue, Toadflax beardtongue

Uses

Grazing/rangeland: Rocky Mountain penstemon is used by wildlife and is rated as fair forage for cattle and fair to good forage for sheep (Forest Service, 1937). It provides diversity in the plant communities where it is found.

Erosion control/reclamation: Penstemon species are used in seed mixes for erosion control and reclamation.

Pollinators: Rocky Mountain penstemon is used by bumblebees to gather nectar and is also visited by various other bees and wasps. Hummingbirds only visit Rocky Mountain penstemon occasionally (Castellanos et. al., 2003).

Ornamental: The beautiful flowers and evergreen basal leaves of Rocky Mountain penstemon make it attractive for ornamental and landscape planting (Smith, et. al., 2009). Rocky Mountain penstemon has been identified as a compatible and beneficial companion plant to grow along with several paintbrush (*Castilleja*) species for ornamental applications (Nelson, 2005). Paintbrush plants require a companion plant to serve as host for its semi-parasitic needs.

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: Rocky Mountain penstemon, a member of the Figwort family (Schrophulariaceae) is a semi-evergreen, native, perennial forb with fibrous roots and is 35-70 cm tall. Plants are mostly glabrous and the leaves are entire. Basal and lower leaves are 5-15 cm long, 5-16 mm wide, narrowly oblanceolate, rounded at the tip and tapering to the base. The upper leaves are 4-10 cm long, 2-7 mm wide, linear and often folded. The flower stalks have a whorl of 1 or 2 flowers (sometimes 4) at each node. The sepals are 3-5 mm long, glabrous and ovate or rounded to obtuse and are glabrous. The petals are 24-32 mm long and the flower tube is 6-10 mm long, deep blue in color with a whitish color at the opening and often with red-violet lines inside the throat and sparsely bearded to sometimes glabrous. The fruit is a capsule 8-13 mm long (Cronquist et. al., 1984).

Distribution: Rocky Mountain penstemon is native to the western United States from southern Wyoming south into northern New Mexico, and the eastern portions of Utah and Arizona. For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site.

Habitat: Rocky Mountain penstemon is found with sagebrush in pinyon-juniper woodland, oak scrub and in openings of ponderosa pine and spruce-aspen forests (Cronquist et. al., 1984).

Adaptation

Rocky Mountain penstemon is best adapted to well drained, rocky and sandy loam soils that are weakly acidic to alkaline and in areas with 15-20 inches annual precipitation (Monsen et. al., 2004) and 6,000-10,500 feet elevation (Cronquist et. al., 1984).

Establishment

Monsen et. al., (2004) state that the planting process for Rocky Mountain penstemon is similar to other penstemon species. The general recommendation is to plant seed in the fall from 1/8 to no more than ¼ inch depth into a firm, weed-free seedbed. Good seed to soil contact is important for germination and establishment. There are approximately 490,000 seeds per pound (USDA, NRCS, 2013). To achieve a target seeding rate of 30 seeds per square foot, 2.7 pounds PLS (Pure Live Seed) per acre should be planted to achieve a full stand. When used as a component of a seed mix adjust the seeding rate to the percent of mix desired. Rocky Mountain penstemon should be drilled with a seed diluent such as rice hulls because the seeds are small and may separate from other seeds in the mix.

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 the 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 broadleaf weeds when they are beginning to bloom will help reduce weed seed development in subsequent years.

Management

Rocky Mountain 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. With proper management, natural regeneration should maintain plants in the vegetative community.

Pests and Potential Problems

Information on pests and diseases of Rocky Mountain 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. Grasshoppers and other insects may also damage plants. Colorado State University Extension (2013) has identified a penstemon weevil (*Hesperobarus sp.* - precise species not yet confirmed) that has caused catastrophic damage to several species of penstemon (including Rocky Mountain penstemon) seed production fields in southwestern Colorado. Penstemon weevil damage is difficult to control because no control methods are available. Weevils damage the plant by feeding in the taproot.

Environmental Concerns

Rocky Mountain 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). Allen and Meyer (1990) found that 3-4 year old seed of 'Bandera' Rocky Mountain penstemon germinated to full viability without stratification and 1-2 year old seed responded favorably to stratification treatments, although the 1 year old seed failed to germinate to full viability even with an 8-week stratification. Lindgren and Schaaff (2004) indicated that 2-6 year old seed of Rocky Mountain penstemon does not need a stratification treatment to enhance emergence. Kitchen and Meyer (1991) determined that treatment of Rocky Mountain penstemon with GA₃ was not necessary but caution may be warranted for special treatment as more dormant seed lots are likely to exist. 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. Although Rocky Mountain penstemon was not included in this study, there were 5 of 8 penstemon species in the study that were significantly stimulated by smoke treatment.

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, pressed into the soil surface then stored under cool (36° F), dark conditions for 8-12 weeks. After the stratification period, bring plants into greenhouse conditions and allow plants to grow for 8-12 weeks before transplanting in the field. Rocky Mountain penstemon can be produced with fertilizer concentrations (up to 200 ppm N) and media pH ranges (5.5-7.2) similar to those used to produce other common greenhouse plants (Cardoso et. al., 2007). Propagation of new plants from division of older plants is also possible. Sprigs need some roots and a few leaves for best results. The basal portions of the stems also layer or root readily in moist soil (Smith, et. al., 2009).

Fields for seed production can be established from direct seeding or from transplanting greenhouse grown containerized stock. Direct seeding should occur in late fall to allow for natural stratification of the seed. Rocky Mountain penstemon should be seeded in 30-36 inch spaced rows at a rate of 0.9-1.0 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. Removal of the flowering stalk at harvest will ensure flowers the following year (Smith, et. al., 2009). Seed can be harvested by hand-stripping or with a 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.

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

'Bandera' Rocky Mountain penstemon was released by the Agricultural Experiment Stations at New Mexico State University and Colorado State University, New Mexico State Highway Department and USDA Natural Resources Conservation Service in 1973 (Smith, et. al., 2009).

Bandera was originally collected near Mountainair, Torrance County, New Mexico in the ponderosa pine zone at approximately 7,400 feet elevation and 16-18 inch annual precipitation and was tested at the Los Lunas, NM Plant Materials Center. It is best adapted to medium to sandy and rocky textured soils that are well-drained and elevation ranging from 6,000-10,000 feet with 15-20 inches annual precipitation. Its intended uses are for erosion control, diversity, and beautification. In gardens or landscape with cultivation it can be grown at lower elevations (Smith, et. al., 2009). Breeder and Foundation seed is maintained by the Upper Colorado Environmental Plant Center and Certified seed is commercially available.

Wildland collected Rocky Mountain penstemon seed can also be obtained through commercial vendors (Native Seed Network).

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