

NEW MEXICO STATE UNIVERSITY
COLORADO STATE UNIVERSITY
UTAH STATE DIVISION OF WILDLIFE AND RESOURCES
AND
UNITED STATES DEPARTMENT OF AGRICULTURE
INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION
SOIL CONSERVATION SERVICE

recommend the naming and release of 'Cedar' Palmer penstemon for commercial production and marketing of seed.

INTRODUCTION

Scientific Name: Penstemon palmerii var. palmeri A. Gray

Common Name: Palmer penstemon

Varietal Name: 'Cedar'

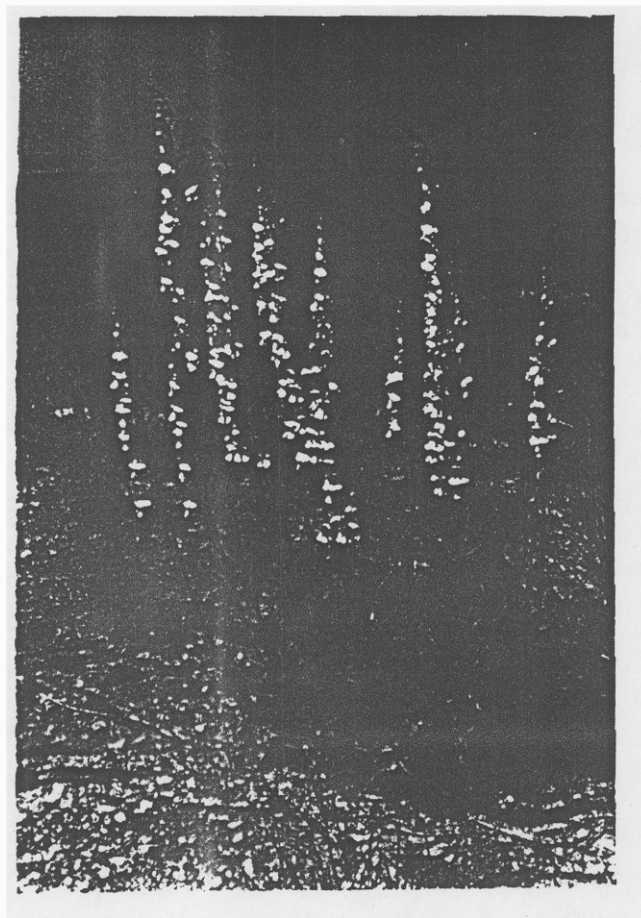


Fig. 1--'Cedar' Palmer penstemon
Three years old, 4-feet tall

Other Identification Used: U5, T3885, T30433

Origin: The original seed of 'Cedar' was collected from a native stand located approximately fifteen miles west of Cedar City, Utah. The initial collection was made in 1939 by A. Perry Plummer. The selection occurs throughout a mixed pinyon-juniper, big sagebrush community at an elevation of 5,800 feet which receives 9 to 12 inches of annual precipitation. Soil is described as Hiko Peak gravelly loam. This soil is deep, well drained, moderately to strongly alkaline and is strongly calcareous below a depth of approximately 16 inches (Wiarda 1984).

Description: 'Cedar' is an evergreen native perennial. Long (up to 4 feet), erect, flowering stalks arise from a thick crown (fig. 1). Large pink to lavender-pink blossoms with red-violet throats, occur along the stalks for several weeks in late spring and early summer (fig. 2). Flowers give off a very unique and pleasant fragrance that is not found in other penstemon species, which usually have little or no scent.



Fig. 2--Large pink flowers of 'Cedar' Palmer penstemon

An abundance of seed matures in mid-August after which the flowering stalks dry. A rosette of succulent evergreen, basal leaves, gray-green in color, are produced and are present year around (fig. 3). A thick fibrous tap root is produced.



Fig. 3--Evergreen basal leaves of 'Cedar' Palmer penstemon.

Method of Development: Seed was collected from the original site and entered into comparative studies at 20 locations in Utah, with up to 17 other accessions of Palmer penstemon (Davis 1984, Stevens 1984). 'Cedar' was adapted to more sites, established better, and was generally the most aggressive spreader and produced as much or more forage as the other accessions tested. Extensive test plantings have been extended to large tracts in conjunction with other herbaceous plants (Stevens 1984). 'Cedar' was originally elected as a winter and spring forage species for improvement of the pinyon juniper (fig. 4), big sagebrush, black sagebrush, mountain brush, and antelope bitterbrush communities.

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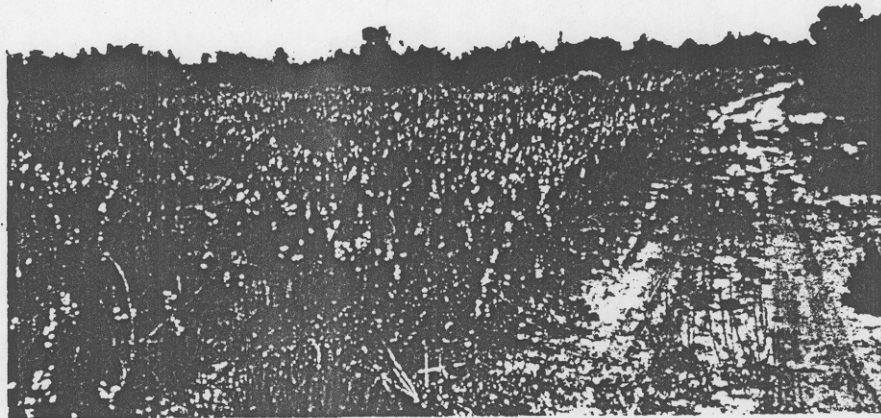


Fig. 4--Cleared Utah juniper-pinyon pine site in southeastern Utah.

'Cedar' Palmer penstemon spread over the entire area from 2 five-foot long rows. Stand has maintained itself by extensive reproduction for 22 years.

Original plantings were established in Utah but subsequently extended to sites in Idaho (Monsen 1984), Montana (Monsen 1984), Wyoming (Monsen 1984), Nevada (Everett 1984), Colorado (Stranathan 1984), New Mexico (Oaks 1984), Arizona (Oaks 1984), and Oregon (Monsen 1984). 'Cedar' has also been evaluated for revegetation of mine of mine spoils and disturbed areas (fig. 5) within the Intermountain Region (Monsen 1984, Everett 1984, Stevens 1984).

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Fig. 5--'Cedar' Palmer penstemon established and reproducing on a road fill in southeastern Idaho

Uses: 'Cedar' has been selected for its ability to establish, persist, and provide forage diversity when seeded in mixtures on winter, spring, fall, and summer game and livestock ranges. It produces a considerable amount of succulent foliage during the spring and summer (fig. 1) growing periods. A large percent of the basal leaves remain green during the summer and winter months (fig. 3); consequently, allowing foraging animals to graze the plants during critical periods. The plant provides high quality forage during the winter. Small birds big game and livestock selectively use 'Cedar'. It provides good ground cover for erosion control and stabilization of disturbed sites and burns (fig. 4, 5, 6). 'Cedar' is also useful for horticultural and landscape plantings because of the abundant flowers, pleasing aroma, and persistent foliage.

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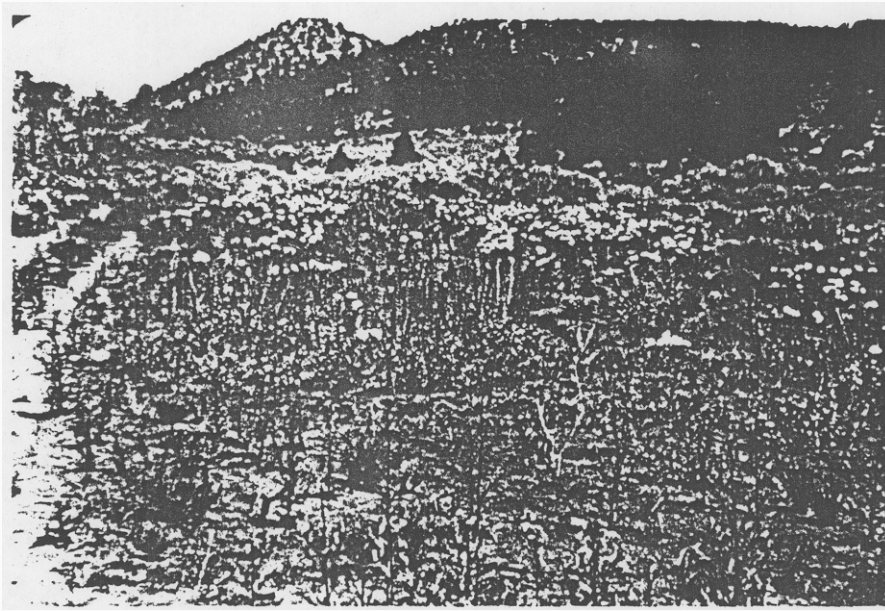


Fig. 6--'Cedar' Palmer penstemon invading singleleaf pinyon pine-basin big sagebrush burn in southwestern Utah.

Areas of Adaptation: Cedar originated on gravelly loam soil but has proven well adapted to heavy, fine sandy loam (fig. 4), and rocky soils (fig. 5), ranging from slightly acid to strongly alkaline. It is well adapted to infertile, disturbed soils. 'Cedar' is best adapted to areas receiving 10 to 16 inches annual precipitation, but once established, will persist on sites receiving as low as 8 inches of annual precipitation (Stevens 1984, Monsen 1984). Seedlings and mature plants of 'Cedar' have excellent winter hardiness and drought tolerance. Seedlings are well adapted to mixed plantings and compete successfully with most herbaceous species.



Mature plants are long-lived for penstemons, living 5 to 7 years. Extensive regeneration can occur by natural seeding (fig. 4). An abundance of seed is normally produced even during adverse years. Seeds are small, yet may persist in the soil for a number of years allowing for natural spread and stand maintenance. 'Cedar' does best in open stands but will grow in association with grasses, low shrubs, and intermediate shrubs like big sagebrush and antelope bitterbrush. Complete range of adaptation has yet to be determined, but 'Cedar' should do well in Utah, Arizona, New Mexico, Colorado, Idaho, Montana, Wyoming, Nevada, and Oregon.

Disease or Insect Problems: 'Cedar' is subjective to diseases associated with some cultivated crops, alfalfa and potatoes. When grown on cultivated fields, infestation may occur particularly on heavy, poorly drained soils (Nelson 1984). Flowers are insect-pollinated (fig. 2) and a reduction in seed yields may occur if insect populations are reduced.

Seed Harvesting, Handling, and Planting: Seed may be harvested by hand stripping or combine. Seed normally ripens from mid-July to mid-August. Seeds are mature when seed capsules are dry and seed is hard and dark in color. Seeds will shatter once capsules have opened. Seeds can be separated from the capsule by use of a hammermill or barley debarber followed by fan cleaning. Cleaned seed should be allowed to dry and then stored in a cool, dry area. An after-ripening period is needed of two to three months before germinating is determined (Jorgensen 1984).

There are approximately 600,000 seeds per pound (Jorgensen 1984). Seed germination averages about 80 percent, yet a variation of 15 to 20 percent has been recorded among different years of production (Jorgensen 1984). Seeds retain viability when stored for up to seven years (Stevens and others 1981). Seeds can be easily cleaned to a purity of 95 percent. Seeding rates should be based on pure live seed (PLS). Fall rangeland seeding is highly recommended, yet stands, especially under irrigation, can be achieved by spring planting if seeds are stratified under cool moist conditions. For best results, it is recommended that 'Cedar' is seeded through the legume box or with a seed diluent such as rice hulls when planted with a regular grass or grain drill. Seeds are small and may separate from other seeds during planting. Seed may be broadcast planted (ground rig or aerially), and covered. Seed should not be covered more than 1/4 inch deep. Recommended seeding rate in a mixture for range and disturbed sites is 1/2 to 1 pound per acre PLS.

For seed increase fields, rows should be spaced at 30-42 inch distances. Seeding rate should be about 1-2 pounds per acre PLS (Jorgensen 1984, Oaks 1984). Seed yields have averaged about 100 pounds per acre on non-irrigated sites (Jorgensen 1984).

Increase and Distribution: Breeder, foundation, registered and certified seed classes are recommended. Breeder plants will be maintained at the Los Lunas Plant Materials Center (PMC), Los Lunas, New Mexico. Foundation seed will be produced by the Los Lunas PMC. Breeder or foundation seed may be obtained from Crop Improvement Associations, Agricultural Experiment Stations, and Soil Conservation Districts beginning in Fall 1984. For two years, seed harvested by the Forest Service Intermountain Forest and Range Experiment Station from I-80 near Mountain Home, Idaho, will be considered breeder seed class producing registered or certified seed. Thereafter, foundation seed will be produced at the Los Lunas PMC.

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CITATIONS

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- Monsen, S. B.; Botanist. USDA Forest Service Intermountain Foret and Range Experiment Station. Shrub Sciences Laboratory, Provo, Utah. 1984.
- Nelson, D. L; Plant Pathologist, USDA Forest Service Intermountain Forest and Range Experiment Station. Shrub Sciences Laboratory, Provo, Utah. 1984.
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- Wiarda, C; Soil Scientist, USDA Soil Conservation Service, Cedar City, Utah. 1984.

Supporting data have been presented to the Varietal Release Committees in New Mexico, Idaho and Colorado; and 'Cedar' penstemon has been accepted for release to commercial growers and users.

Approval signatures:

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