



*Opuntia* spp.



*Opuntia* spp. **Prickly Pear Cactus**

Two to three or more pads grow off the base pad at various angles. The pad's shape gives it another common name, Beaver Tail Cactus. It generally reaches no more than 12" tall, but the cluster can spread up to 3' wide. Showy 1 1/2-3 1/2" wide flowers bloom in shades of yellow, pink or red in June/July. White, needle-like, 1/4-4" long spines cover the pads. It can form a groundcover in the driest, harshest, most difficult sites. To propagate, remove a pad at the joint, allowing the wound to dry and callous for 2-3 weeks and then shallowly plant in soil. It will root wherever the pad is in contact with soil. It tolerates thin, highly alkaline soils and is native from the plains and foothills to lower mountains in the western states from British Columbia to TX and AZ.

**Notes on the following *Penstemon* species**

*Penstemon* is the largest genus of flowering plants endemic to North America, with approximately 270 species. Most penstemons prefer the drier regions of the west, and virtually all require good soil drainage and full sunlight for at least part of the day. Seldom browsed by livestock or wildlife, they attract a variety of pollinators such as bees, hummingbirds and moths. If the flower is long and narrow, it most likely attracts hummingbirds, whereas if wider towards the mouth, something larger than the hummingbird's beak, such as a bee or insect is the more likely candidate (Nold 1999). Most can be grown relatively easily from seed, but often require a prolonged cold moist environment to break dormancy (such as three months in the fridge in a moist media or seeded outside in the fall for natural stratification). Gravel mulch as opposed to bark will encourage self-seeding by holding moisture but preventing rot. Although they may self-seed under the right conditions, there should be no concern of them becoming weedy or invasive. Penstemons have largely been ignored by flower gardeners and commercial nurseries in the US until relatively recently. Commercial availability in local garden centers and catalogs is beginning to rise as admiration over their stunning flowers and low water needs grow. Being a large genus with numerous species, the avid wildflower enthusiast will find it handy to have a book

devoted to penstemons that will explain the terminology and specific flower structures necessary to identify them to species. Check the sources or recommended reading section at the end of the manual for recommendations.



*Penstemon angustifolius* **Pagoda Penstemon**

*Angustifolius* refers to the narrow leaves on this medium sized species that reaches approximately 1' tall x 1' wide. It can have one to many stems per plant. Blooming in summer, the flowers completely encircle the stem, and the colors come in various shades of blue to lavender, paler on the inside with nectar guides. There are four subspecies, one of which comes in pink (var. *dulcis* found in sand dunes of western Utah) (Nold 1999). Often growing in deep sand, it can grow extremely long roots to reach water. Its range spans the Great Plains from eastern MT and the Dakotas to CO east of the Rocky Mountains (Strickler 1997).



*Penstemon barbatus* **Scarlet Bugler**

This penstemon can be recognized by its long, linear leaves and distinctly bright red corolla with a strongly reflexed lower lip. Not a long-lived plant, it grows to 2-3' tall by 1-2' wide, but tends to topple if over watered. It flowers from June to September and is a parent to a number of hybrids. One of the most widely available species, it is native to southern UT, CO, to AZ, NM and west TX.



*Penstemon cyaneus* **Dark Blue Penstemon**

A dark blue to violet flower, paler on the inside, blooms from late May to early August. The strong, thick stems, woody at the base, grow 12-28" tall and spread to a similar width. The flowers are 1-1.5" long and 1/2" wide at the mouth. To differentiate it from *P. cyanthus*, a similar species, the anther should be twisted and S-shaped. Native to open plains and lower mountains of southern ID, southwest MT and northwest WY (Strickler 1997).



*Penstemon deustus* **Hot Rock Penstemon**

Growing 8-18" tall with a similar width, this *Penstemon* blooms from May to July with small, creamy white flowers. Plants tend to be short-lived under cultivation, but may self-seed under the right conditions, such as in a gravel mulch. The name *deustus* means scorched or burned up, and as the name implies, the species has a preference for exposed, rocky sites, particularly basalt scabland and other volcanic areas. Native east of the Cascades from central WA to southwest MT, northwest WY, northwest UT and southern CA.



*P. eatonii* (left), *P. palmeri* (right)



***Penstemon eatonii* Firecracker Penstemon**

A short, woody base produces flower stalks as much as 3' in length (15" wide) lined with bright red flowers that bloom in mid-spring to early summer. The long (1-1½") tubular flowers make superb hummingbird lures. Evergreen basal leaves are a deep shiny green. It is a good species for barren slopes or roadside revegetation projects and grows well from seed. It occurs naturally from southwest CO to NM and southern CA.



***Penstemon fruticosus* Shrubby Penstemon**

This short evergreen sub-shrub (18" tall x 2' wide) has blue or lavender to light purplish flowers and blooms from May to June. The large, showy flowers are produced on the tips of every branch. It is longer lived than other Penstemons and has three recognized varieties. It requires well-drained soils and occurs throughout the western states east of the Cascades.



***Penstemon palmeri* Palmer Penstemon**

This showy species is a medium to tall (2-4' x 2' wide) evergreen forb with large, pink, fragrant flowers attractive to bumblebees and hummingbirds. Flowers bloom in late spring and early summer, and the foliage is a blue green color. It is cold hardy and very drought tolerant. While it is short lived, it easily reseeds. Palmer penstemon requires well-drained soil, is a good species for barren slopes, and has been widely seeded on roadsides throughout the western states. Native to southern UT, southern NV, CA and northern AZ (photo on previous page).



***Penstemon pinifolius* Pine-Leaf Penstemon**

This low growing (6-18" by 12-24") evergreen forb has bright red flowers that attract hummingbirds. Adaptable to various soil types, Pine-Leaf Penstemon will flower all summer if irrigated weekly. It is cold hardy, drought tolerant and long-lived. Cultivars with yellow flowers are available as are cultivars with a short, compact growth form. This is an excellent plant for dryland gardens and the pine-like evergreen leaves are bright green even in the middle of winter. Plants can be pruned back in the late spring. Native to NM, southern AZ and northern Mexico.



*Penstemon pinifolius* close-up (left), en masse at 3+ yrs (right)



*Penstemon rydbergii*



***Penstemon rydbergii* Rydberg's Penstemon**

From May to July flowers bloom on this 8-28" tall plant. It has a similar width. The bluish-purple flowers are gradually inflated towards the mouth and two lipped where the color changes to a velvety white. The plant forms a large basal rosette while the stem leaves are few. Flowers are held horizontally in clusters around the stem, with equal distance between them. There are three recognized varieties. Often found in meadows to moist open slopes, from foothills to mid-elevations in the mountains. Rydberg's Penstemon ranges from central WA to southwest MT, south along the eastern Cascades and Sierras to UT and NM (Strickler 1997).





*Penstemon speciosus*



*Penstemon speciosus* **Showy Penstemon**

Showy Penstemon flowers from May to July. Its large, bright purple to violet flowers fade to a pale blue on the inside, where the lips roll or curl back distinctly. There are typically a few stems per clump, and the leaves are long and linear, the basal ones reaching 2-6". It can survive on less than 12" of precipitation per year, but good drainage is a must. Native to sagebrush steppe and ponderosa pine forests to sub-alpine regions from central and eastern WA to southwest ID, southwest OR, southern CA and northeastern UT (Strickler 1997).



*Penstemon strictus* **Rocky Mountain Penstemon**

Plants bloom in June and July and can be moderately long-lived in the garden (to 7 years). This blue to violet penstemon grows 1-3' tall and wide (it spreads via stolons to form clumps). It is a common ingredient of some wildflower mixtures. Its occurrence outside its native range, along highways and other seeded areas has condemned it as an "invasive plant" by some native plant enthusiasts. The cultivar "Bandera" is said to be more tolerant of heavy clay soils. Native to pinyon-juniper, scrub oak, ponderosa pine and aspen communities in south-central and south west WY, eastern UT, western CO, northeast AZ and northwest NM (Nold 1999).



*Penstemon venustus* **Lovely Penstemon**

The name "venustus" means "beautiful" or "graceful." This stunning 36" tall (with flower stalks) species has medium sized (1 1/2") flowers that range from lavender to purple and bloom from May to June. A key to identification is the spider web-like hair at the end of the filament, unique to this species. The flowers are on one side of the stem, and the leaves, which are lightly serrated, are on the stem only (no basal rosette). The native habitat includes open rock outcrops and gravelly slopes from valleys to the subalpine. Its natural range includes the Blue Mountains of southeast WA and northeast OR and adjacent west-central ID (Strickler 1997).



*Penstemon whippleanus* **Whipple's Penstemon**

This species grows 8-24" tall. It blooms in July and August. In the northern part of its range, it is most often found in a creamy white, almost green color; in other areas it may be blue purple to burgundy red. The flowers are unique in that the lower lip is much longer than the upper one. They bloom on one side of the stem (secund), densely crowded in clusters, with 2-7 clusters per stem. There may be only one to a few upright stems per plant. Native to rocky slopes and meadows into alpine regions of southwestern MT, southeastern ID, WY, AZ and UT (Strickler 1997).



*Petalostemon purpureum*



*Petalostemon purpureum* **Prairie Clover**

(*Dalea purpurea*)

Prairie clover grows 1-2.5' tall, blooming from late May through September. Several stems per plant produce clusters of pinkish purple flowers on elongated spikes. Used in revegetation projects and wildflower gardens for its long bloom season and ability to fix nitrogen. It can easily become overgrazed because it is highly palatable and nutritious to animals. The taproot can be made into a tea to reduce fever in measles patients (<http://plants.usda.gov/plants>). Native to prairies, along roadsides, and rocky or open woods from IN to Saskatchewan and MT, south to TN and AR.



### *Solidago* spp. **Goldenrod**

This large wildflower reaches 2-5' tall with a similar width, depending on the species. Yellow flowers cover the plant in late summer and early fall. Spreading by underground stems or rhizomes, it can be used as a small deciduous hedge. Prefers full sun and rich soil. *Solidus* is Latin for "to make whole" in reference to its numerous healing properties.

#### Notes on the following *Sphaeralcea* species

All *Sphaeralcea*, or globemallows, have minute hairs on the leaves that are stellate or star-shaped when viewed with a hand lens. These common plants are not deer resistant, and are difficult to find in areas grazed by livestock because of their palatability. Globemallow is very drought tolerant and readily grown from seed. With the clumps of silver green foliage and abundance of red orange flowers, they seem to rejoice in the heat of the summer, despite poor soil and low water. Within a few years, some species become a dense, multi-stemmed plant that benefits from a grow ring or stakes to keep upright. At a native plant garden in Boise, they are hand watered 4 times per month in the first year, and then only once per month in subsequent years. Over watering will kill them or encourage tall lanky plants that continually flop over. Cutting back after flowering keeps plants more compact and encourages continual blooming. At this time, there is limited commercial availability, usually via seed.



### *Sphaeralcea ambigua* **Desert Globemallow**

More drought tolerant than the other two species listed here and the earliest to bloom, Desert Globemallow typically grows 20-40" tall and wide with orange to brick red flowers in March through June. The gray green foliage typically has 3-5 lobes. Very easy to grow from seed. Native to AZ and NM.



*Sphaeralcea* spp.



### *Sphaeralcea grossulariifolia* **Gooseberry-leaf Globemallow**

A perennial forb with salmon colored flowers that bloom in the summer. Plants range in size from 12-24" tall and wide, depending on the presence of flower stalks. The generic name refers to the Greek word *sphaera*, or sphere, and *alcea* in reference to the round or globose fruits. In this species the leaves are divided nearly to the midvein. Native to ID, OR, NV and UT.



### *Sphaeralcea munroana* **Orange Globemallow**

This 12-24" tall and wide forb with apricot-pink to reddish-orange flowers blooms in the summer. This species has leaves divided or lobed less than halfway to the midvein and is more common at lower elevations than *S. grossulariifolia*. In great contrast to the other two listed here, it does well in clay. It is very drought tolerant and grows readily from seed. Native to ID, NV, UT and CO.



*Stanleya pinnata*



### *Stanleya pinnata* **Prince's Plume**

Tall in stature, this showy species reaches 3-4' by 18", with spikes of lacy yellow flowers (lacey look from the stamens which extend well beyond the petals) from mid-spring to mid-summer. Numerous stalks branch near the base where the leaves are deeply dissected. Towards the apex, the leaves are more narrow lanceolate to elliptic. As is typical with many Brassicaceae species, the seedpods are long (up to 3") and very narrow. In its natural habitat it is indicative of selenium in the soil. *Stanleya* refers to Lord Edward Stanley (1755-1851) of the Linnaean and Zoological societies in London. Widespread from plains to lower mountains in southeast OR to southern CA, east to the Dakotas, KS and TX.



### *Yucca glauca* Narrowleaf Yucca

Narrowleaf Yucca leaves are long, narrow, and strap-like with spiny tips. The plant grows 2-3' tall and wide, bunched at the base, and then spreads outwards, appearing like a V in profile. Creamy white, pendulous, bell-shaped flowers bloom in July, rising on spikes 3-6' tall. It prefers coarse, well-drained soil, and does well on slopes, surviving harsh, exposed sites with poor soil (the roots can be up to 20' long). The fruit is large and



*Yucca glauca*

fleshy, the seed glossy and 1/2" across. Yucca requires a specific insect, the yucca moth, for pollination. The roots and leaves can be used to make soap, the flower stalk eaten like asparagus, and the leaves woven into baskets. Native to deserts and sandy slopes in the southwestern US, north into MT and N. Dakota, east to IA, and southwest to TX and NM.

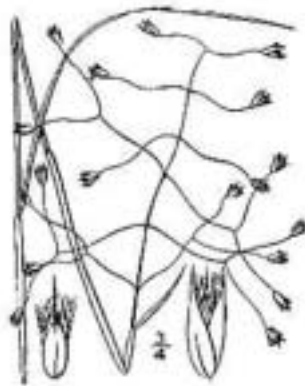


# Grasses



## Notes on warm season vs. cool season grasses

Grasses are categorized as warm vs. cool season based on their season of greatest growth. Cool season grasses actively grow in the spring and fall, becoming dormant during the hottest months of summer. Warm season grasses are at their peak during summer, and break winter dormancy later than cool season grasses.



*Achnatherum hymenoides*



## *Achnatherum hymenoides* Indian Ricegrass

(*Oryzopsis hymenoides*)

This warm season, short-lived perennial bunchgrass grows 12-16". It forms a beautiful airy inflorescence when it goes to seed (the small kernel-like seeds are purportedly edible). Besides its ornamental value, this is a great grass for sandy sites. It does not tolerate shade. Cultivars are being developed that retain the seed in the inflorescence, which facilitates collecting. Seeds must be planted 2-3" deep. Native to grasslands, desert plains and foothills, often rocky or sandy soil, ranging from east of the Cascades, British Columbia to southern CA and northeast Mexico, east to the Dakotas and TX.



*Andropogon scoparium* (left), *Bouteloua gracilis* (right)



## *Andropogon scoparium* Little Bluestem

(*Schizachyrium scoparium*)

This blue green, warm season, tall tufted grass grows approximately 12-36" tall by 18" wide and needs well-drained soil. The decorative seed head forms in summer and matures to a rich, red brown color in the fall. The fall color lasts throughout the winter. It can grow as a bunchgrass in drier areas, or as a ground cover in moister spots. Being non-invasive it will not crowd out surrounding grasses or wildflowers. In restoration projects, it can be used for roadside revegetation projects. While not native to Idaho, it grows well with occasional summer watering. Native habitats are foothills, tall grass prairies, and plains ranging from the east side of the Rocky Mountains to the Great Plains.



## *Bouteloua gracilis* Blue Grama

Growing only 4-12" tall and wide, this mat-forming, warm season grass can be naturalized to form a fairly dense, grass-like meadow with minimal irrigation once established. For a low water alternative to a thirsty lawn, high success rates have been reported by seeding a mixture of Blue Grama with Buffalo Grass (*Buchloe dactyloides*). It can be mown to a height of 4-6" to encourage sod formation. Requires full sun and well-drained soil. It is a major range grass for animals of the prairies and Great Plains, often associated with buffalograss, wheatgrass and needlegrasses.



*Buchloe dactyloides* **Buffalograss**

This warm season grass has 10-18” long blue-gray to green blades. The actual height is only 3-5” as the blades do not stand erect, but bend and lean over at the nodes. It spreads by vegetative stolons to form a mat 2’ wide, which turns reddish in the fall. As discussed above, it can be used in combination with Blue Grama as an alternative to the thirsty Kentucky Blue Grass for low maintenance and low traffic areas. The plant is dioecious, (male or staminate plant is separate from female or pistillate plant). If unmowed, the male plants have spikes on one side that rise above the leaves, while the female plants have small bundles in the leaf axis, and a blade that is curly and lightly hairy on both sides. It makes a soft, dense lawn if used alone. The widespread roots are often 3-4 feet deep, needing only 12” of rain/year once established (or 1/2” every 2 weeks to stay green during summer), and less than 1/3 of the fertilizer of a typical lawn. It can be mowed once a month May through September. It tolerates compacted soil, and prefers clay or clay loam to sand. While it will stay green during the summer given its minimal water requirements, it will begin to turn tan at the first frost, not greening up until warm weather the following spring. Use treated seed in early spring or after the first frost in fall at 2-3 lb per 1,000 square feet, or sow plugs 1’ apart. Consult a specialist regarding appropriate soil preparation and seeding methods for the best results. Native to the central Great Plains regions of short grass prairies, it provides cover and a food source for small rodents, birds and grazing animals.



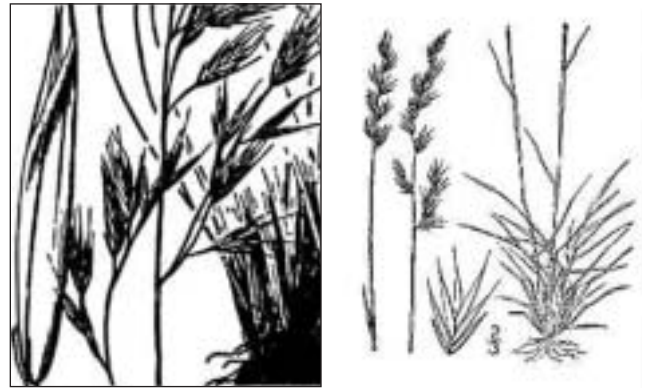
*Buchloe dactyloides* (left), *Elymus elymoides* (right)



*Elymus elymoides* **Bottlebrush Squirreltail**

(*Sitanion hystrix*)

This cool season grass grows 13-24” tall. It develops a unique tufted seed head in mid-spring with awns forming a distinct right angle to the stem, much like a bottlebrush. It is a short-lived, early successional species that grows well after wildfires and other disturbances. It can act as a nurse plant on harsh sites barren of most other vegetation. Native to dry hills, plains, open woods from British Columbia south and east to MS, TX, CA, and Mexico. In the often harsh climates of NV it can survive at elevations ranging from 2,000-11,000’ with only 7-20” of rain per year.



*Festuca idahoensis* (left), *Festuca ovina* (right)



*Festuca idahoensis* **Idaho Fescue**

Growing 18” tall by 15” wide, this short, tufted bunchgrass with gray-blue blades blooms in early summer. As a cool season grass, it’s greatest growth occurs in March and April. It matures in late summer and can have moderate regrowth when provided moisture in the fall. It makes a nice ground cover and weed suppressor and will self-seed easily if the flowering stalks are not mowed or cut back. It is also a terrific specimen plant to use in garden beds. It prefers medium to moderately fine, deep fertile soils and prefers 14” of precipitation per year, but can survive on 11”. In the Intermountain Region it is a significant understory plant in sagebrush and bluebunch wheatgrass zones. Native to grasslands and semi-desert sagebrush communities in the foothills and mountains of the western US.



*Festuca ovina* **Sheep Fescue**

A cool season, relatively small but long-lived perennial bunchgrass, the flowering stalk grows 18” tall. It is more drought tolerant than *F. idahoensis* and less palatable to livestock and wild game. It is shade and cold tolerant, but does not do well on sites that are continually wet. Use it as a groundcover, in the interspaces of a plant community, for erosion control, and to compete with weeds such as cheatgrass. Widely available in several cultivars including “Covar,” which tends to form more seed heads and is a particularly aggressive and drought tolerant selection (Ogle 1997).



*Leymus cinereus* in June (left), same plant in late winter (right)



**WI 3**

### *Leymus cinereus* Great Basin Wildrye

Great Basin Wild Rye is a cool season, long-lived species that can develop taproots up to 14' deep. Upright bunches reach 4-6' tall and 3' in diameter, and take 2-3 years to become established. The blades are bluish tan with wheat-like seed heads in the summer and fall. Decorative as well as hardy, it is able to withstand fire, drought and flooding. "Magnar" is a bluish green cultivar that demonstrates good seedling vigor, seed production and salt tolerance. Overgrazing during the periods of regrowth in the spring and fall can easily damage Wildrye (Ogle 1997). Common along drainage basins and rocky slopes with a minimum of 10" precipitation in the Intermountain Regions of the western US at elevations up to 8,000 feet.

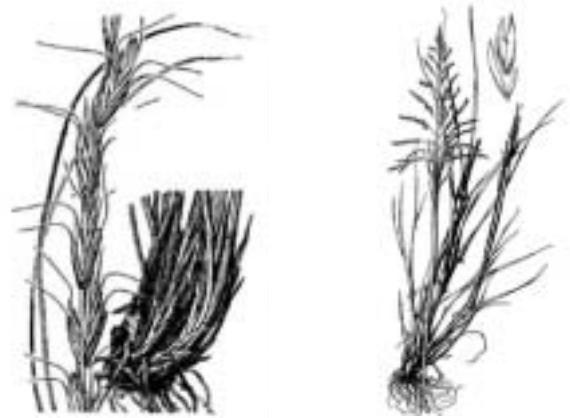


**WI 4**

### *Pseudoroegneria spicata* Bluebunch Wheatgrass

(*Agropyron spicatum*)

This is a long-lived, cool season bunchgrass that grows 13-24" tall. It is a common, widespread species in most of western North America. As the name implies, the grass has a bluish cast (or blue-green with more water) with a decorative inflorescence. Unfortunately, Bluebunch Wheatgrass has been overgrazed in many areas. It can deter the spread of fire when growing on sites without dense, dried annual grass (unless it is windy or the fire is moving uphill).



*Pseudoroegneria spicata* (left), *Sporobolus cryptandrus* (right)



**WI 4**

### *Sporobolus cryptandrus* Sand Dropseed

Sand Dropseed is a warm season, short-lived perennial that grows 8-16" tall. It forms an open, diffuse inflorescence and has a hairy ligule (collar around the top of the grass sheath which surrounds the blade). Sand Dropseed stays green in the heat of the summer and forms a fire resistant area if mowed annually. It has a very small seed and can be aerially seeded on steep slopes. It is common in well drained, sandy to gravelly soils, establishes easily, is drought tolerant and able to withstand moderate grazing. It is an early successional species and does well in disturbed areas. Native to the western states, but not the desert southwest.