

## Notes on Common California Native Grasses from A to V

By David Amme

*Agrostis exarata* (Spikebent). Spikebent is the most common bunchgrass form of bentgrass found in moist meadows and wet areas throughout California and the west from sea level to alpine meadows. In the mountains of northern California, Oregon, and Washington, spikebent is found frequently as a pioneer groundcover after disturbance (timber harvest operations). Spikebent is a vigorous, short-lived bunchgrass, ideal for revegetation uses.

*Agrostis pallens* (Thingrass). Thingrass, originally called *A. diegoensis* has been recently lumped under the *A. pallens* name. Originally, *A. pallens* was called dundbent (Hitchcock and Chase) and is found in moist sand dunes along the coast from Washington to central California. Rarely are flowering panicles found on dunebent as the grass is found in moist swales associated with coastal freshwater springs and seeps. The lumping of *A. diegoensis* into *A. pallens* makes it difficult to reconcile the high elevation form (possibly the former *A. lepida*) with the lower elevation form commonly known as thingrass (aka *A. diegoensis*). The thingrass form is adapted to shady woodlands in the mountains and foothills and open, north facing meadows along the coast. This form has underground rhizomes forming a solid meadow stand. Thingrass has several forms from northern to southern California. In southern California thingrass grows as a tall pure stand meadow (20-30 inches high) on north slopes mixed with the southern coastal scrub. In the Bay Area and the coastal mountains of northern California, thingrass is found in similar settings (north slopes, shady stands, etc.) and forms a grassy meadow approximately 12-14 inches in height. *A. pallens/diegoensis* is also very similar to *A. hallii* (coastal California). There are many geographical and ecological varieties of thingrass, many of which have horticultural merit and would do well in a native meadow seeding mix.

*Aristida* sp (Three-awn.). Three-awn grass or poverty grass are annual and perennial medium-sized, warm-season bunchgrasses. Generally, these grasses grow on extremely dry sites in the central and southern foothills of the Sierra Nevada and into the mountains and deserts of southern California. In southern California and the desert regions, the perennial, purple three-awn (*A. purpurea*), and annual, six-weeks three-awn (*A. adscensionis*) are common. Hook three-awn (*A. ternipes* var. *hamulosa*) is found in the north-central and southern California valleys, plains, and dry hills. In the Sierran foothills and the northern portion of the Sacramento valley grows the annual oldfield or prairie three-awn (*A. oligantha*).

*Bromus carinatus* (California Brome). California brome is a large, leafy, short-lived bunchgrass with strong seedling vigor. It grows in woodland sites throughout California, which receive between 12 and 40 inches of rainfall per year. California brome is a very productive grass on fertile sites and provides good groundcover for wildlife and waterfowl. It is an excellent, general-purpose grass that is very competitive with herbaceous weeds. California brome is quite variable throughout its range and many previous described taxa in the same group have now been included under the general name, *carinatus* (*B. marginatus*, *B. breviaristatus*, *B. polyanthus*, *B. sitchensis*, *B. subvelutinus*, etc.). A vigorous, fast-growing annual form of *B. carinatus* selected by the Soil Conservation Service from San Bernardino County is sold under the name, Cucamonga. This has recently been identified as *B. arizonicus* based on its chromosome number. Mountain brome (originally identified as *B. marginatus*) sold

under the name Bromar, is longer-lived than typical California brome and is grown primarily for seeding mid-elevation mountains of the Northwest. Bromar is almost identical to Deborah Brome (described as a P.V.P. "native type" *B. carinatus*). Deborah Brome was selected from the Royal Botanical Garden in Kew, Great Britain and has been called a hybrid between *B. carinatus* and a yet unnamed brome in the *Bromus carinatus* "complex" from South America. In reality this grass is a weed in the Kew parking lot and is most likely was introduced from the Pacific Northwest.

Taxonomically the carinatus group of grasses (Section Ceratochloa) are difficult to distinguish. California brome grows from sea level to subalpine elevations. In California, *B. carinatus* exhibits different degrees of summer dormancy. A coastal form of California brome, *B. carinatus* var. *maritimus*, grows along the northern and central coast as far south as the Bay Area. This form is almost completely prostrate in the north near Fort Bragg and more pendulous along the coast north of Santa Cruz. A South American form of the *B. carinatus* group, known as *B. stamineus* (Chilean brome), is sold in the United States as Gala Brome. Unlike California brome, *B. stamineus* responds well to summer irrigation and is a strong forage producer, rivaling even Italian ryegrass in some climates. *B. stamineus* was originally introduced to the Bay Area at the grass garden at the U.C. Berkeley Oxford Tract in the early 1940's. It is now a naturalized ruderal grass in the Bay region and at one point was grown by U.C. Extensions in Davis with the cultivar name, Harlan Brome.

*Calamagrostis nutkaensis* (Sand Reedgrass or Alaskan Reedgrass). Sand reedgrass is a large densely tufted grass of California's north coastal plains and pine forests. It forms large pure stands or populations in the open grasslands along the coast often on north facing slopes and is a dominant grass in the Monterey pine and Bishop pine understory.

*Danthonia californica* (California Oatgrass). California oatgrass is a long-lived, medium-sized tufted bunchgrass. California oatgrass grows along California's north coastal prairie within the reach of the summer fog belt from Oregon south to the coastal plain near Cambria, San Luis Obispo County. Even though California oatgrass is a bunchgrass it can form dense turfs under moderate grazing by cattle. The coastal form of oatgrass grows the furthest inland in Solano County where it is found near the Jepson prairie south of Dixon. Oatgrass is found in the mid-elevation meadows and forests of the Sierra Nevada, extending south from the Shasta Trinity National Forest. The form of *Danthonia* with glabrous leaves (var. *californica*) is found mostly within its range in the northern part of the state. A form of *Danthonia* with conspicuously pilos foliage (var. *americana*) is also found within its range as well as in the high mountains of the Modoc Plateau (Warner Mountains) and the San Bernardino and Peninsular Ranges of southern California. This form is also native to Chile, South America. Both forms grow together (sympatricly) indicating that the species may be extremely plastic in its response to soil and climatic conditions. With three or four spikelets per flowering stem, California oatgrass does not produce large amounts of seed, however, each stem contains many seeds hidden beneath the leaf sheath above each node. The flowering stems are easily broken off and spread by livestock grazing and trampling. The seed exhibits both embryo dormancy and seedcoat dormancy defying efficient seed producing techniques, however, when the seed and straw is introduced to a site it can gradually becomes a dominant grass with proper grazing or mowing management. Part of the reason for this is that it is one of the only native bunchgrasses that has long-lived seed in the soil seed bank, often appearing spontaneously after cultivation or disturbance. California oatgrass stays green year-long and is an extremely palatable and nutritious grass adapted to grazing by cattle or elk. It is adapted to compaction and treading by animals and is often

found along trails and roadsides. Sheep grazing can quickly decimate a stand and are the prime reason (secondary to cultivation) this grass has been reduced in its cover and dominance in California. Interest in growing California oatgrass for seed was strong in the mid 1940's when U.C. extension researchers Merton Love and Burl Jones identified oatgrass as the most outstanding native forage grasses in the state. Sixty years later, seed growers are now actively working to produce seed of this splendid native perennial bunchgrass.

*Deschampsia caespitosa* (Tufted Hairgrass). Tufted hairgrass is a large, densely-tufted, coarse bunchgrass. It grows in moist meadows of the higher mountains in California and along the coast as far south as Santa Barbara County. There are three distinct varieties in California. The mountain meadow form (*D. caespitosa* ssp. *caespitosa*) grows in high and mid elevation wet meadows, seeps and bogs as well as lower meadows in the North Coast Range often on meadows in the higher coastal terraces. This form has an airy, expanded panicle. The coastal form (*D. caespitosa* ssp. *holciformis*) grows primarily along the coastal terraces and marshes from northern California as far south as San Luis Obispo County. Its panicle is strongly compressed sometimes with one or two compressed lower branches. A third form not officially recognized in the Jepson Manual (*D. caespitosa* ssp. *beringensis*) is a dense giant form found in scattered locations in the lower valleys of the North Coast Range (e.g., Napa Valley) and along the coastal waterways (Russian River, Drakes Bay, and the Sacramento Delta). Tufted hairgrass requires a moist (mesic) location or extra irrigation to maintain a stand in the garden. The grasses need to be cut back at least once per year. Typically, tufted hairgrass does not respond well to close mowing and the bunches tend to break down.

*Deschampsia danthonioides* (Annual Hairgrass). Annual hairgrass is a native annual grass adapted to very wet meadows and vernal pools throughout California and the west from sea level to the highest peaks. In cultivation, the plant grows much more dense and larger than plants found in the wild. Annual hairgrass is an excellent grass for wet, poorly drained sites. Annual hairgrass commonly grows with native wild flowers and would make an excellent grass component in a wildflower mix.

*Deschampsia elongata* (Slender Hairgrass). Slender hairgrass is a small to medium sized tufted biennial grass adapted to shady areas in mixed conifer forests and areas associated with seeps and riparian habitat. It is often associated with disturbed ground and open clearings in forest and riparian communities. Slender hairgrass is an ideal pioneer grass for landslide areas, roadsides, and disturbed areas such as recent timber harvests and dirt road decommissioning.

*Distichlis spicata* (Saltgrass). Saltgrass is a low, strongly creeping, warm season perennial grass that often forms large, dense colonies in mesic, low-lying salty or alkali soils near the ocean, in interior alkaline flats, floodplains, and gullies, or on sandy hillsides and gullies. Saltgrass is a dioecious grass with male and female flowers. Collecting large quantities of seed in the wild is problematical. Several ecotypes are now being grown and evaluated for seed production. Transplanting rhizomes or sod has been and continues to be the primary method of establishment.

*Elymus californicus* (California Bottlebrush Grass). California bottlebrush grass has recently been moved into the wildrye group having been considered a distinctive taxon (*Hystrix californica*) for many years. California bottlebrush is a large grass that grows in shady forest settings and shaded banks near the north-central coast (Marin and Santa Cruz Counties). It is almost always associated with open moist Douglas Fir

forests. Bottlebrush has a distinctive, tall arching flowering culm with rigid spikelets perpendicular to the stem like a bottle brush.

*Elymus elymoides* & *E. multisetus* (Squirreltail). The squirreltail grasses, previously known as the taxa, *Sitanion*, are now lumped in the wildrye (*Elymus*) group. Both squirreltails freely hybridize with blue wildrye forming a large, vigorous sterile hybrid also known as *S. hanseni*. Both squirreltail species (squirreltail and big squirreltail) are short-lived, medium-sized, bunchgrasses with bristly spreading awns resembling a squirrel's tail. Squirreltail (*E. elymoides*) is widespread throughout California from dryer, lower elevation foothill ranges, in the desert and dryer mountain ranges, up to high subalpine elevations. Big squirreltail (*E. multisetus*) is more often found at lower elevation grasslands. Both species have strong seedling vigor and naturally invades disturbed habitat. In California *E. elymoides* is also quite variable. The Jepson manual lists four subspecies (spp. *brevifolius*, spp. *californicus*, spp. *elymoides*, and spp. *hordeoides*). It is often difficult to distinguish squirreltail (*E. elymoides*) from big squirreltail (*E. multisetus*). Big squirreltail is often not as big as the name would imply. Because of their fluffy seed heads, these species are difficult to harvest in reliable quantities from production fields and remain competitive with the wild collected material from the Great Basin and Intermountain region.

*Elymus glaucus* (Blue Wildrye). Blue wildrye is a large, short-lived bunchgrass with strong seedling vigor. Generally, blue wildrye is an upright, tall grass that inhabits woodland areas of the foothills and high mountains, however, there are more compact, leafy varieties adapted to sunny grassland habitats. Blue wildrye grows where annual rainfall ranges between 10 and 40 inches and is generally more drought tolerant than common meadow barley and California brome. Blue wildrye is an excellent grass for reseeding burned and disturbed areas in the oak woodland and forested habitats. There are several varieties of blue wildrye presently available adapted to different elevations and regions in California. The closely related Pacific ryegrass (*E. virescens*) is now considered a subspecies of *E. glaucus*. *E. virescens* is commonly found along the immediate coastal bluffs of northern California often sympatrically with blue forms of *E. glaucus* with no apparent hybridization. Pacific ryegrass is very distinct from blue wildrye as the florets have no or very short awns, the plants are deep green and the culms grow close to the ground. Pacific ryegrass is also found higher in elevation on open serpentine soils and in damp forests.

*Elymus trachycaulus* (Slender Wheatgrass). Slender wheatgrass is a common native bunchgrass in the higher elevational areas of the intermountain west. Slender wheatgrass is very similar to blue wildrye in form and stature. There are three primary forms or ecotypes in California. The mountain form of slender wheatgrass is rather sparse, usually with only two or three flowering culms. This form readily hybridizes with *E. elymoides* and *Hordeum brachyantherum* and is difficult to grow in cultivation. A variety (var. *majus*) native to California's central valley region in Yolo County west of Davis. This form is much more robust and faster growing than typical western American plant material on the market. It is longer-lived than typical blue wildrye and requires more moisture to persist. Variety *majus* has very strong seedling vigor and is a good weed competitor. A third form is found along the north and central coastal valleys of California. It is associated with serpentine soils as well as mesic (moist), deep clay soils. This form has a small awn, slender leaves and is a prolific seeder with many flowering culms.

*Festuca californica* (California Fescue). This is a robust bunchgrass that grows on mesic hillsides associated with brushlands and deciduous oak forests. Deep green to

steel blue ecotypes are found throughout its range. California fescue is an excellent grass for shady or filtered light settings. It grows in the North and Central Coast Ranges south to Santa Barbara County and found occasionally in the Sierra Nevada.

*Festuca idahoensis* (Idaho Fescue). Idaho fescue is a medium-sized, long-lived, densely tufted bunchgrass. It has a fine leaf with blue and green forms. There are two basic forms of Idaho fescue in California. The Great Basin form (*F. idahoensis* var. *idahoensis*) is found east of the Marble Mountains and Sierra crest as far south as the Lake Tahoe region. The second form is referred to as the western form (*F. idahoensis* var. *roemer*). This form is native to western Washington, Oregon and the northern and central California. In California it extends down the coastal and inland hills and mountains of the North Coast Range as far south as Monterey County adapted to both serpentine and sedimentary soils. It is also found in the Sierra Nevada west of the crest in Lassen, Plumas, and northern Tahoe National Forests. Unlike the Great Basin form, the Roemer variety has less summer dormancy and grows throughout the winter at lower elevations. Idaho fescue is similar in habit and form to the introduced hard fescues and sheep fescues (*F. trachyphylla*, *F. ovina*), however, most Idaho fescue ecotypes exhibit summer dormancy but are active during the winter while the hard fescues will stay green in the summer as long as there is adequate moisture.

*Festuca occidentalis* (Western Fescue). Western fescue is a medium-sized, short-lived tufted bunchgrass adapted to shady environments usually associated with Douglas Fir in California's mid-elevation mixed conifer forests. Western fescue is difficult to grow in sunny cultivated stands despite many attempts by growers both in California and Oregon.

*Festuca rubra* (Red Fescue). Red fescue is a medium sized, loosely tufted, fine-leaved grass that spreads with underground rhizomes. Red fescue is native to California despite the many forms of red fescue that have been introduced to California as a turf seed. Red fescue is native along the coast as far south as Big Sur and is found in fertile valleys and moist meadows in the coastal mountain ranges and the higher mountains of the state. Pure colonies of low blue and green forms of red fescue inhabit the north coast terraces of Mendocino and Sonoma County giving rise to several unique cultivars (Patrick's Point, Jug Handle, Point Arena) propagated by cuttings. A hardy blue form from Point Richmond's Potrero Hills, called Molate Fescue, is a very attractive ornamental grass that is aesthetically pleasing whether mown or not. Its fine foliage and spreading character make it ideally suited to natural landscapes and low-maintenance buffer areas. Molate fescue can handle more heat and summer drought than the typical introduced turf varieties of red fescue, and is the most winter active red fescue available in the world. Molate fescue takes on a more intense waxy blue color as a response to drought and thrives with little summer irrigation. Generally red fescue does not thrive in the full sun and intense heat of the Central Valley but will do well with partial shade and some summer irrigation. However, the Molate Fescue form is proving itself in the Central Valley with irrigation.

*Hierochloë occidentalis* [California Sweetgrass]. California sweetgrass is a leafy bunchgrass found in the shade of the coastal redwood and coniferous forests of central and northern California. It is found as far south as the Big Sur coast commonly found in the shade of redwoods and tanbark oak stands. The dry leaves of sweetgrass has a fragrance of vanilla. The plants grow in forest duff and loose soils and are tolerant to dry conditions. It is distinguished by its delicate white flowers and deep green wide leaves.

*Hordeum brachyantherum* (Meadow Barley). Meadow barley is a medium sized, short-lived bunchgrass adapted to moist soils and wet meadows from sea level to over 10,000 ft. elevation. It has good seedling vigor and grows quickly, yet allows other slower growing native grasses to establish if not planted too densely. On dryer sites it will persist for a few years but eventually yields to the longer lived native bunch grasses. There are many ecotypes of this grass in California. Typically, it is an upright tufted grass with flowering culms reaching to 18-20 inches in height. As it climbs into higher elevations it matures later in the season. A subspecies of meadow barley (*Hordeum brachyantherum* ssp. *californicum*) is adapted to drier conditions. This form is a longer-lived bunchgrass with finer, narrower leaves and is associated with the much more drought-tolerant bunchgrasses such as squirreltail (*Elymus multisetus*), and purple needlegrass (*Nassella pulchra*). Ecotypes of subspecies *californica* currently available are from Hastings Reservation in Carmel Valley and the Jepson Prairie in Solano County. Along the wind-swept central and northern California sea bluffs is a variety of meadow barley that grows prostrate with the flowering culms flat on the ground. A fine leaf form of meadow barley has recently been collected from the sandy soils of the Point Reyes back dunes.

*Koeleria macrantha* (Junegrass). Junegrass is a long-lived, perennial bunchgrass that spreads with short underground rhizomes and has an erect ornamental flowering panicle. During pollination in May the dense panicle spreads open and as the seed heads mature in June the panicle closes up. In late June when most of the native grasses and annual grasses have dropped their seeds and fallen apart the junegrass panicle continues to stay whole, a trait that gives the grass its name. Junegrass is a circumpolar species that is native throughout North America and is a common cool-season grass in the mid-grass prairie. Junegrass is associated with woodland glades, grassland prairies, and rocky outcrops from the sea level to the highest mountains. Junegrass is not an abundant grass in California though there are records that it was once more abundant as late as the turn of the century. In California junegrass exhibits some late summer dormancy but will remain green with supplemental irrigation.

*Leymus cinereus* (Great Basin Wildrye). Great Basin wildrye is found throughout the mountains and valleys east of the High Sierra from eastern Siskiyou County to the Desert Mountains. It is associated primarily with streamsides, canyons, and mesic areas in Great Basin sagebrush shrublands. It is known to hybridize with creeping wildrye in its range and merges with giant wildrye (*L. condensatus*) in the Tehachapi/Transverse Mountain region near Teton Pass where valley oak, piñon pine and Joshua tree come together.

*Leymus condensatus* (Giant Wildrye). Giant wildrye is a robust (4-10 feet) perennial that forms large clumps with short rhizomes. It grows primarily south of the Bay Area along the coastal bluffs, hills, and terraces. Inland, it is often found in the scrub and woodland plant communities of the coast range, San Jacinto, and San Bernardino Mountains. Variable hybrid forms of giant wildrye and creeping wildrye are found in the Bay Area and in the San Joaquin Valley (*L. xmultiflorus*).

*Leymus mollis* (American Dunegrass). American dunegrass is a tall, stout glaucous-blue grass with long rhizomes. It is well adapted to coastal foredunes of California from the central coast north to Oregon and Washington State. It is always found closer to the high tide area between the beach and the stabilized dunes covered with the introduced European beachgrass (*Ammophila arenaria*). In the southern part of its range American dunegrass is found irregularly as far south as Point Conception. A

unique look-alike *Leymus* is found on San Miguel Island's windward sand dunes resembling a possible hybrid with *L. condensatus*. This variety is now a horticultural selection sold from cuttings as Canyon Prince. In California, American dunegrass rarely forms abundant seed as this out-crossing species' isolated clones and populations are separated by long distances. In the northern part of its range American dunegrass commonly hybridizes with creeping wildrye forming a distinct looking species currently recognized as a hybrid, *L. xancouverensis*. American dunegrass is closely related to if not identical to the more compact circumpolar European dunegrass or lymegrass (*L. arenarius*).

*Leymus pacificus* (Pacific dunegrass). Pacific dunegrass is unique to California growing as far north as the sand dunes of the mouth of the Gualala River, south, sporadically to the Channel Islands. It is a low, 6 to 10 inch, dark green creeper and is often found in back dune swales and on sandy soils on coastal bluffs (e.g., Point Reyes, Bodega Head). The flowering culm is distinct in that it has only three to four fat single brome-like spikelets per node. It flowers frequently on the more sterile dune sites and rarely on the more developed soils. Pacific dunegrass often forms pure meadow-like stands in the back dune areas and swales.

*Leymus triticoides* (Creeping Wildrye). Creeping wildrye is a tall, strongly rhizomatous perennial grass that grows on clay soils and bottomlands from the coastal marshes to high Sierra valleys. Creeping wildrye is adapted to alkaline soils and is tolerant to high summer temperatures. It stays green longer into the summer dry season than any other cool-season perennial grass and spreads vigorously with underground rhizomes. With proper management creeping wildrye will form large colonies and patches. Despite the fact that seedling vigor is weak, and the seed has delayed germination, creeping wildrye is competitive enough with weeds and annual grasses that it will begin to dominate a seeded site the second year. Most wild stands of creeping wildrye do not make viable seed, usually representing a large long-lived clone. There are two ecotypes currently available that do make seed. One is named Rio, and was developed by the Soil Conservation Service from material collected in the central San Joaquin Valley near Fresno. Another vigorous form named Yolo is from the grasslands of the Northern Yolo Bypass in Yolo County.

*Melica californica* (California Melic). California melic is a medium-sized, loosely tufted perennial that spreads from short rhizome-like culms with a swollen base. California melic is native to the grasslands and oak woodlands of the northern and central coast range and the foothills of the Sierra Nevada. California melic is most often associated with purple needlegrass (*N. pulchra*) and one sided bluegrass (*P. secunda*). California melic exhibits strong summer dormancy. It has an ornamental flowering culm that lasts beyond the time when the plant has gone dormant.

*M. imperfecta* (Foothill Melic). Foothill melic is a medium-sized, loosely caespitose perennial bunchgrass with a branched, often reflexed panicle, especially in the lower portion of the panicle. It is associated with coastal sage, soft chaparral, and steep rocky soils of the central and south coast range from the San Francisco Bay Area south to San Diego County as well as the foothills of the Sierra Nevada. It is found primarily in shady woodland sites, riparian areas, and on north and eastern exposures. In the Bay Area it comes close to overlapping with the range of *Melica torreyana* but is found on dryer sites associated with sandy, well drained soils and chaparral.

*M. torreyana* (Torrey's Melic). Torrey's melic is very similar in habit to foothill melic. It grows in shady woodlands and clearings from the Bay Area north to Oregon and in the foothills of the central Sierra Nevada. Torrey's melic has a thin narrow panicle and is generally smaller than foothill melic, however on sunny serpentine soils and outcrops *M. torreyana* grows as a much larger bunchgrass. On non-serpentine soils it grows in filtered shade associated with live oaks and bay primarily in the North Coast Range. In the Sierran foothills, *M. torreyana* is found exclusively on serpentine soils growing in sunny chaparral and Digger Pine woodland.

*Muhlenbergia microsperma* (Littleseed Muhly). Littleseed muhly is a common densely-tufted, warm season annual inhabiting open dry ground of southern California's desert mountain regions.

*Muhlenbergia rigens* (Deergrass). Deergrass is a coarse and robust, warm-season bunchgrass. It grows along streams, in seeps, ditches, and in wet meadows from southern California's mountains north to Monterey County along the coast and in the Sierra Nevada foothills to Shasta County. The biggest stands of deergrass are found in meadows of San Diego County from the coast to the back country mesa country and the Cleveland National Forest and Cuyamaca Mountains.

*Nessella cernua* (Nodding Needlegrass). Nodding needlegrass, formerly *Stipa cernua*, is similar to purple needlegrass in longevity and drought tolerance. Nodding needlegrass grows primarily in the central coast and inner coast ranges from Tehama County, south to Baja California. It is difficult to distinguish from purple needlegrass by the untrained eye and for many years both purple needlegrass and nodding needlegrass were considered the same species. The seed is narrower than purple needlegrass, the awn is generally longer and thinner with a slight curl near the end, and the glume color is closer to pink than purple. Nodding needlegrass has a finer leaf, is especially adapted to sandy, well-drained, loamy soils. Nodding needlegrass is a prolific seed producer and has strong seedling vigor. It is adapted to many harsh growing conditions including the sub soils of road cuts and mining sites.

*Nessella lepida* (Foothill Needlegrass). Foothill needlegrass, formerly *Stipa lepida*, is a medium-sized dense bunchgrass with fine leaves. It is common in and along the margins of soft and hard chaparral brushlands in the Coast Range the length of California's coastal ranges and in the central and northern Sierra Nevada foothills. Some ecotypes are adapted to serpentine soils. It establishes quickly on disturbed sites and is not as long-lived as purple needlegrass and nodding needlegrass.

*Nassella pulchra* (Purple Needlegrass). Purple needlegrass, formerly *Stipa pulchra*, is a medium-large, long-lived bunchgrass well adapted to clay soils. Purple needlegrass is the most wide spread native bunchgrass in the lower elevational grasslands of California. It grows from the coastal prairie and inland grasslands of northern California, throughout the valleys of the coast ranges to the coastal and mesa grasslands of San Diego County and Baja California. Purple needlegrass has earned the unofficial title of the State grass of California. Purple needlegrass is tolerant to summer drought and heat. It will establish on disturbed cut slopes and in thin soils and is adapted to serpentine soils. As with many of the long-lived bunchgrasses, purple needlegrass grows slowly as a seedling and is susceptible to competition from weeds and fast growing annual grasses. When seeded, it generally takes two years to become a viable established plant.

*Phalaris californica* (California Canarygrass). California canarygrass is an uncommon native bunchgrass adapted to moist swales, meadows, shaded woodlands, and brushy areas of the coastal mountain ranges of California. In the San Francisco Bay Area it is found in pure stands in swales on Angle Island and San Bruno Mountain. It has good seedling vigor and produces good quantities of both seed and forage.

*Pleuropogon* sp. (Semaphore Grass). *Pleuropogon* is a loosely bunched wetland grass native mostly to California. The annual *P. californica* is one of the most commonly found native grasses in wet grassland swales and vernal pools that flood during the spring in north central California. *P. hooverianus* is a rare perennial semaphore grass found in shady redwood forest wet areas in Marin and Mendocino Counties.

*Poa douglasii* and *P. macrantha* (Sand-dune Bluegrass). Sand-dune bluegrass (*P. douglasii*) and large-flowered sand-dune bluegrass (*P. macrantha*) are dioecious bluegrasses that grow in shifting sand dunes of the California coast. The grasses form dense tufts, rhizomes and very long stolons. *P. douglasii* grows as far south as the Channel Islands and north to the Sonoma and the southern Mendocino coast. *P. macrantha* grows from the Mendocino coast to Oregon, Washington, and British Columbia.

*Poa napensis* (Napa Bluegrass). Napa bluegrass is extremely limited in distribution, found near the Myrtle Dale Hot Springs and one other local hot spring swale in the town of Calistoga in the upper Napa Valley. Napa bluegrass is a very dense productive bunchgrass and does not exhibit the extreme summer dormancy that is the characteristic of the *P. secunda* spp. *secunda*.

*Poa secunda* ssp. *juncifolia* (Alkali Bluegrass). This taxon has recently been combined into the *P. secunda* group which also includes two other ecotypes: *P. ampla* (big bluegrass aka Sherman big bluegrass) and *P. nevadensis* (Nevada bluegrass). Alkali bluegrass is a very dense bunchgrass that does not exhibit strong summer dormancy and is very different in appearance to typical one sided bluegrass. It is found in alkaline depressions, low meadows and wet places mostly on the east side of the Sierra Nevada associated with sagebrush shrubland and montane forest.

*Poa secunda* ssp. *secunda* (One Sided Bluegrass, Pine Bluegrass, Malpais Bluegrass). One sided bluegrass (formerly *P. scabrella*) is the most widespread bluegrass in California, ranging in the lower to mid elevational mountains throughout the state. It is a medium-sized, tufted bunchgrass with soft basal foliage. This grass is extremely variable and has many ecological forms. *Poa secunda* exhibits strong late spring and early summer dormancy. The base of the plant can be completely dry and dormant while the flowering stems are green and still developing. It is a very shallow rooted species capable of growing on rock outcrops and shallow hardpan soils. *P. secunda* is found through the intermountain west and the mountains of Chile, South America.

*Poa unilateralis* (Ocean-bluff Bluegrass). Ocean-bluff bluegrass is a small caespitose bluegrass common with a small densely compact head. It grows along the immediate coastal bluffs from Monterey County north to Oregon and Washington State. It is tolerant to saline soils and salt spray and can be found on sandbars in the smaller creeks and esteros along the coast.

*Sporobolus airoides* (Alkali Sacaton). Alkali sacaton is a medium-size bunchgrass that grows in valley swales and alkaline soils. It was once more common in the San Joaquin Valley grasslands. A few remnant stands still exist on undisturbed lands.

Alkali sacaton is found in the desert regions of southern California and throughout the southwest.

*Vulpia microstachys* (Nuttall's Fescue). Nuttall's fescue is also known as six-weeks fescue by many authors. It is the most common native annual grass of California and frequently occupies the spaces in between perennial bunch grasses. It is adapted to dry hillsides, open woodlands, and coarse sandy and crumbling serpentine soils. There are four recognized varieties usually differentiated by the size of the panicle and hairy or glabrous glumes and lemmas. A key trade mark of Nuttall's fescue is the often reflexed lower branches of the panicle and stiff florets. Generally, the plants are 8 to 16 inches in height.

*Vulpia octoflora* (Six-weeks Fescue). Six-weeks fescue, also known as slender fescue is a small native annual fescue confined to sandy to rocky soils in chaparral and desert scrub in California and the west. It is known to germinate, mature, and produce seed in a very short period of time (six weeks). The plants have a narrow panicle, from 6 to 8 inches in height, and form dense stands following fires and disturbance.