Know Your Natives

A Pictorial Guide To California Native Grasses

Yolo County Resource Conservation District
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INTRODUCTION

Why it was written:
Interest in native plants has increased dramatically in recent years. Recognized as integral and critical ecosystem components, they contribute to structure, function, biodiversity, and habitat values.

Natives are used in restoration and revegetation projects, integrated into farmland habitats, and used to out-compete undesirable plants in weed management projects. Even landscaping projects around homes and businesses are incorporating natives.

In the midst of this increased interest and use, there are relatively few people who are able to accurately identify native plants, especially perennial grasses, or to distinguish them from non-native perennials or annuals, which are often weeds.

This publication, Know Your Natives, is intended to fill a need for quality, pictorial examples of the various growth stages of commonly planted and commonly seen native grasses. Each grass presented here is used in the settings mentioned above and their seed is commercially available. Each is also commonly found in wildlands in California, such as the Coastal or Sierra foothills. There are innumerable other species that you might see, but those presented in this publication represent some of the most common types and will give the observer a growing sense of the characteristics to look for in trying to determine if a particular grass is a native perennial or not. This publication is intended to provide increased understanding and ideas on their use, adding to the extent and quality of the native landscape.

Who it is for:
This guide is especially written for the private landowner, farmers and ranchers in particular. It also should be a valuable tool for owners of small parcels, those who wish to integrate native species into their home landscape, or those who want a better understanding of the plants they might see when on local outings or hikes.

How it is organized:
This introduction is followed by photos and specific information on each grass. Typically, the photos will include the seedling, mature plant, seed head, and mature, cleaned seed. Some species may show more information than others, according to how well they are understood. Showing cleaned, as opposed to freshly collected seed, indicates the focus on species with commercially available seed for planting. The seeds pictured may or may not look like seed collected directly from the plant, depending on whether or not any flower parts have been removed in the cleaning process. Studying the seed head photographs will help determine those similarities or differences.

Side-by-side comparisons of plant species can be of great value in learning relative differences in characteristics such as size, color, and growth habit. To that end, fold-out comparative photo pages are included of seedlings, seed heads and seed. One fold-out shows eleven key species planted side-by-side in a plug tray,
providing the opportunity to compare these species’ growth and characteristics when planted on the same date and grown under the same conditions.

The backs of the fold-out comparison sheets will contain a glossary, plant part identification diagrams, seed mix and seeding rate sample calculations, sources for purchasing seed, information on the Yolo County Resource Conservation District, and references used in the writing of this guide.

**Missing information:**

If there are blank spots after headings for a species, such as “Former names” or “Spikelets,” this indicates that information on that aspect of the species may not be currently available.

Specific recommendations on seeding rates were intentionally left out. A listing of specific pounds per acre seeding rates for each type could end up being inappropriate for a given site, depending on the species used, site conditions, soil type, rainfall, prior vegetation, or fertility. Per-acre seeding rates for the species in this publication can range from 5 to 10 lbs. if planted in a mix, and 10 to 30 lbs. if planted alone. A more useful figure, which typically applies to cleaned seed, is the “number of live seeds per pound.” Methods for calculating seeding rates using this figure are provided at the end of the manual.

Finally, it is the District’s intention, when future grant opportunities become available, that additional grasses, native forbs, and other native plants will be added to the manual.

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All photography is by David Rosen/Wildside Photography & Public Relations, with the exception of Festuca rubra “Molate,” mature plant and seed head, photos courtesy of Scott Stewart. Photos may not be copied or reproduced in any way without expressed permission from the photographer.
Bentgrass: *Agrostis exarata*

Mature plant

Seed heads

Seedling

Seeds

Detailed information about this species is on the other side.

Yolo County Resource Conservation District
(530) 661-1688
Common name: Bentgrass, Spike bentgrass, Spike redtop

Latin name: *Agrostis exarata* Trin.

Former/other name(s): *Agrostis exarata* var. *monolepis*

Season of growth: Cool

Reproduction/spread: Seed

Elevation range: 0 - 2,000 m (0 - 6,562 ft.)

Mature plant height: 8 - 100 cm (3 - 40 inches)

Flower characteristics: The panicle is variable but is nearly always dense and narrow. It varies in length, with uneven spaces between the branches.

  - **Type:** panicle-like
  - **Spikelets:** present; one floret
  - **Awns:** up to 3.5 mm, straight or bent

Seed: The seed matures from late spring to summer, with a 4 - 6 week collection window. There are between 3,189,000 and 6,130,000 seeds/lb. and if planted at a rate of 1 lb./acre there will about 107 seeds/ft².

General description: This is a common perennial, and sometimes annual, grass whose form is variable, ranging from slender plants with narrow blades and few-flowered panicles to very robust plants a meter or more tall with dense panicles as much as 30 cm long. A mature plant will form a tuft ranging from about 0.25 - 0.5 meter (10 - 20 inches) across. The flat leaf blades are from 2 - 10 mm (.08 - .4 inch) wide.

Habitat: This grass lives primarily at low to medium altitudes in a variety of habitats and plant associations. It is found naturally in moist, open areas, such as near streams and meadows in mountainous regions, and along the north coast. Although it is common in moist areas, it will tolerate some dry conditions and may also be found on serpentine soils.

Field use notes: Bentgrass will establish well on disturbed soils, and will re-seed well, but as other plants become established it will decrease in abundance. Wild populations can be highly variable in size and robustness, but more uniformity can be expected from plants grown from commercially produced seed. It typically grows in full sun, but will also grow well in broken sunlight. This is an excellent plant to use for grassed waterways. It establishes rapidly, maturing in one season if started in the fall.

This is a valuable forage grass. The entire plant is used by grazing animals in the mountains during the summer. It has good mowing tolerance and will also take some seasonal flooding. Fire can kill the tops, but it may increase in abundance after a burn. It was used by Native Americans for food.
Dune bentgrass: *Agrostis pallens*

Mature plant

Seed heads

Seeds (cm)

Seedling

Detailed information about this species is on the other side.
Common name: Dune bentgrass, Thin grass, San Diego bentgrass

Latin name: *Agrostis pallens* Trin.

Former/other name(s): *Agrostis lepida, Agrostis diegoensis*

Season of growth: Warm

Reproduction/spread: Seed and rhizomes.

Elevation range: 200 to 3,500 m (650-11,500 ft.)

Mature plant height: 10-70 cm (4-28 in.)

Flower characteristics: Contracted to somewhat open panicle 5-20 cm (2-8 in.) long; narrow, tapering at both ends, primary branches generally ascending; flowers June through August
   - **Type:** Panicle – spike-like
   - **Spikelets:** Glumes 2.5-3 mm (0.1 in.) long; lemma 1.5-2.5 mm (0.06-0.1 in.); palea obsolete; callus hairs minute.
   - **Awns:** Awn less than 0.5 mm (0.02 in.), straight.

Seed: Seed matures in late spring to summer; approximately 4,200,000 seeds/lb.

General description: Dune bentgrass is a medium sized perennial with coarse-textured leaves and erect culms. Leaf blades are flat or sometimes inward-rolling and 1-4 mm (0.04-0.2 in.) wide. Creeping rhizomes may be up to 10 cm (4 in.) long.

Habitat: Dune bentgrass is common and is found on dunes, in open meadows, chaparral, woodland, forest, and sub-alpine habitats from Washington to central California, throughout the California and Great Basin Floristic Provinces to British Columbia and Montana. It tolerates dry to moist and sandy to rocky soils, and is sometimes found on rhyolite tuff.

Field use notes: This is an important forage plant, either in cultivation or in mountain meadows of the Western States. It is good as a low water-use lawn substitute, is soft to walk on and reseeds readily. It makes a good groundcover or permanent cover crop in California and the Pacific Northwest. In horticultural settings it needs good drainage and part shade. It is fire resistant.
Three-awn: *Aristida ternipes var. gentilis*

Mature plant

Seed head

Seeds (with awns)

Seeds (de-awned)

Seedling

Detailed information about this species is on the other side.
Common name: Three-awn, Spreading three-awn

Latin name: *Aristida ternipes* CAV. var. *gentilis* (Henrard) Allred

Former/other name(s): *Aristida hamulosa*, *A. ternipes* v. *hamulosa*

Season of growth: Warm season

Reproduction/spread: Seed

Elevation range: 100 - 1,350 m (328 - 4,429 ft.)

Mature plant height: 25 - 80 cm (10 - 32 inches)

Flower characteristics: Feathery, loose, drooping panicle, somewhat open. Flowers June through July.
- **Type:** Panicle
- **Spikelets:** One-flowered
- **Awns:** Long, 3-part, sometimes spreading widely, center one a little longer than the two outer ones.

Seed: Seed matures mid to late summer, with a 3 - 7 week collection window.

General description: Three-awn is a perennial with a cespitose, or cushion-like, growth form that is loose and airy. The leaf blades are usually slender and rolled. It is a warm season grass that begins green-up in spring and remains green well into summer in spite of growing on dry sites.

Habitat: This grass is found in full sun on dry hills, slopes and valley grasslands throughout the Central Valley, in coastal sage scrub particularly in southern California, in many of the transverse mountain ranges and in the Mojave Desert.

Field use notes: Three-awn does not have high forage quality, but may be important where other forage is lacking. It is extremely valuable and a consistent performer on poor soils or parent soils. It has good tolerance to mowing and to fire. It was used by Native Americans for food.
California brome: *Bromus carinatus*

Mature plant

Seed heads

Seedling

Seeds

Detailed information about this species is on the other side.
**Common name:** California brome

**Latin name:** *Bromus carinatus* Hook. & Arn.

**Former/other name(s):** *Bromus maritimus* (Piper), Hitchc.

**Season of growth:** Cool. Summer-active only above 5,000 ft.

**Reproduction/spread:** Primarily by seed, with strong seedling vigor.

**Elevation range:** 0 - 3,500 m (0 - 11,483 ft.)

**Mature plant height:** 45 - 150 cm (18 - 59 inches)

**Flower characteristics:** Open, spreading, drooping flower heads between 15 and 30 cm (6 - 12 inches), flowering from April to August.
- **Type:** Panicle
- **Spikelets:** 2 - 3 (sometimes up to 5) cm (up to 2 inches) long, strongly flattened
- **Awns:** Straight, 7 - 15 mm (.28 - .59 inches)

**Seed:** Seed matures from spring to summer, with a 2 - 6 week collection window. Seeds are highly variable, measuring from 6 and 10 mm, with between 78,000 - 100,000 seeds/lb. If planted at a rate of 1 lb/acre, there would be approximately 2 seeds/ft². It has good seedling vigor and is easy to establish.

**General description:** This is a large, leafy biennial or short-lived perennial bunchgrass with cespitose, or cushion-like, form usually getting between 46 and 90 cm (18 and 36 inches) tall and 30 cm (1 ft.) wide with drooping leaves. Leaves are between 12 and 25 mm (.5 and 1 inch) wide and can be smooth or hairy.

**Habitat:** California brome is native to dry, open areas in a variety of habitats, especially canyons, hillsides, meadows and disturbed areas, up to 3,200 m (10,500 ft) throughout California, however, it is most commonly found in woodlands in the low to middle elevations of the foothills. It will tolerate partial shade, openings, and full sun and grows best in moderately dry to moderately moist soils. It can sometimes be locally abundant. Needs between 46 - 102 cm (12 and 40 inches) of rain per year, but is surprisingly drought resistant.

**Field use notes:** This grass establishes rapidly and competes well with weeds. Because of its rapid growth, it is good for erosion control, but if seeded too densely with slower growing native species it can hamper their establishment. It is very productive on fertile ground but is thinner elsewhere. It is useful in range, pasture and agricultural situations; the young growth is nutritious and readily grazed, but becomes fibrous when mature. If it is overgrazed it will decline in vigor and decrease in cover. It responds well to early spring and late summer mowing, so may be good as a cover crop where this mowing regime fits. Stand densities sometimes decline over time. The tops are killed by fire, but it re-sprouts from surviving root crowns the next growing season. It provides cover for wildlife and waterfowl and was used by Native Americans for food.
Barbar sedge: *Carex barbarae*

Mature plant

Seed heads

Leaf/stem detail

Seeds (cm)

Seedling

Detailed information about this species is on the other side.

Yolo County Resource Conservation District
(530) 661-1688
Common name: Barbar sedge, Santa Barbara sedge, Basket sedge

Latin name: Carex barbarae Dewey

Former/other name(s):

Season of growth: Late cool through warm.

Reproduction/spread: Seed and rhizomes.

Elevation range: 0-900 m (2,900 ft.)

Mature plant height: 30-100 cm (12-39 in.)

Flower characteristics: Separate, dark brown male and female spikelets are borne on culms that are usually longer than the leaves.

Type: Lateral spikelets

Spikelets: 1 or 2 linear, male spikelets 2.5-8 cm (1-3 in.) long and 5-8 mm (0.2-0.3 in.) wide; 2-5 female spikelets, the upper spikelet usually separate, often having both male and female flowers, linear to oblong; 50-200 bracts per spikelet.

Awns: Pistillate flower bract is awned

Seed: Dark brown, 1.7-2 mm (0.07-0.08 in.) long and 1.2-1.7 mm (0.05-0.07 in.) wide; wall thick, tough; beak less than 0.5 mm (less than 0.02 in.), tip is notched in front; approximately 342,600 seeds/lb.

General description: Barbar sedge is a cespitose, grass-like plant with very long, coarse-textured leaves, long, stout rhizomes, and upright culms that are usually longer than the leaves. The leaf blade is 3.5-9 mm (0.14-0.35 in.) wide, strongly channeled along its length, with the lower part shredding to a network or fringe of veins. The front of the sheath is typically purple.

Habitat: This sedge is commonly found from foothill slopes, valley flats, and coastal prairies to mixed evergreen and yellow pine forests that are seasonally wet, from sea level to 900 m (3000 ft.) in the Klamath Ranges, the North Coast Range, foothills of the Cascade Range and Sierra Nevada, the great Central Valley, the south Coast, and southern Oregon.

Field use notes: Barbar sedge is a very robust, strongly rhizomatous plant that is an important soil stabilizer. It is particularly useful along both natural and constructed waterways and is an important riparian understory plant, competing with all but the most aggressive weeds. In natural settings, seeds tend to germinate in the warm season and on or near the soil surface, but it is typically sold by nurseries as plugs (plants in 1 in. x 1 in. x 3 in. cells in trays) for transplanting rather than as seed. It is fire tolerant, fairly drought tolerant, and very flood tolerant. It provides nesting and brood habitat for waterfowl and cover for other wildlife. It is a very important traditional basket fiber plant for Native Americans. In horticultural settings Barbar sedge requires some summer watering.
Nebraska sedge: *Carex nebrascensis*

Mature plant

Seed heads/flowers

Seed head/flower detail

Seeds (cm)

Seedling

Detailed information about this species is on the other side.

Yolo County Resource Conservation District
(530) 661-1688
Common name: Nebraska sedge  
Latin name: *Carex nebrascensis* Dewey

Former/other name(s): *Carex jacintoensis*

Season of growth: Warm. Summer into late fall.

Reproduction/spread: Seed and rhizomes.  
Elevation range: To 2,500 m (8,200 ft.)

Mature plant height: 25-110 cm (10-43 in.)

Flower characteristics: 5-8 spikes per flower stalk, lowest one usually separated from the others; inflorescence sessile, 5.5-16.5 cm (2-6 in.) long; separate male and female flowers on the same stalk, usually 1-2 male spikes above the 2-5 female spikes; flowers May to July or August.

Type: Unisexual or androgynous spikes.

Spikelets: Upper 1-3 spikelets staminate; lower spikelets pistillate; or occasionally androgynous, with upper 1-3 spikelets pistillate with staminate portion at the tip; several staminate flowers per spike; 30-150 pistillate flowers per spike; scales brownish to purplish-black with white midrib.

Awns: Midrib of the flower sometimes extends beyond the scale forming an awn.

Seed: Nutlet two-sided, lentil-shaped, 1.5-2.2 mm (0.06-0.1 in.) long, 1.2 mm (0.05 in.) wide; leathery capsules (perigynia) surrounding seed is veined, thick-walled, and often red-dotted; seeds mature August to October; approximately 2.7 million perigynia/kg - not necessarily equivalent to seed, which may or may not form or remain within capsule; enhance germination by separating seed from perigynia and chilling wet seed 30 days at just above freezing.

General description: Nebraska sedge is a perennial grass-like plant with long, scaly rhizomes that are brown to straw-colored. The overall form is generally tufted but it can form dense stands originating from the rhizomes. Eight-15 leaves originate from each culm, mostly on the lower one-third. They are 10-40 cm (4-16 in.) long, 3-12 mm (0.1-0.5 in.) wide and flat or channeled near the base. The blades are thick and generally covered with a bluish waxy film. The culms are triangular, stout, erect, and up to 1 m (3.3 ft.) tall. Dry leaves of the previous year typically remain and form a thick mat surrounding the plant.

Habitat: Nebraska sedge is found in wet meadows, swamps, streams, marshes, and edges of lakes or ponds throughout California and the western United States; it is found specifically in the Klamath Range, High Cascade Range, high Sierra Nevada, the Great Central Valley, Western Transverse Ranges, and San Jacinto Mountains.

Field use notes: Nebraska sedge is good for soil stabilization and for restoring degraded areas. It is typically sold as plugs (plants in 1 in. x 1 in. x 3 in. cells in trays). It can handle standing water for long periods of time, as long as there are periods of drying, and tolerates alkaline conditions very well. It has fair to good forage value for cattle and wildlife, poor to fair for sheep and will tolerate grazing disturbance. It is valuable for late-season forage and makes good hay. It provides cover for nesting waterfowl and seeds for small mammals and birds. In horticultural settings, the roots should be kept moist. Native Americans ate the raw stem bases as a famine food.
Slender sedge: *Carex praegracilis*

Mature plant

Seed heads

Seeds (cm)

Seedling

Detailed information about this species is on the other side.

Yolo County Resource Conservation District

(530) 661-1688
**Common name:** Slender sedge, Blackcreeper sedge, Clustered field sedge, Field clustered sedge, Silver sedge

**Latin name:** *Carex praegracilis* W. Boott

**Former/other name(s):** *Carex douglasii* var. *brunnea*, *Carex usta*

**Season of growth:** Warm

**Reproduction/spread:** Seed and rhizomes.

**Elevation range:** 0-2,700 m (8,800 ft.)

**Mature plant height:** Culms 20-75 cm (7.8-30 in.)

**Flower characteristics:** Inflorescence generally dense; flowers closely aggregated to form an elongated oblong head 1-5 cm (0.4-2 in.) long and 6-10 mm (0.2-0.4 in.) wide, lower spikelets sometime separate; unisexual, separate male and female flowers on a plant, or sometimes dioecious; flowers May through August.

- **Type:** Spikes
  - **Spikelets:** 5-15, female scales dull and dark brown at maturity, nerveless underneath, finely nerved on the upper side, tapering into a beak.
  - **Awns:** Pistillate flowers minutely pointed to awned.

**Seed:** Nutlet, 1.2-1.9 mm (0.05-0.07 in.), 1.1-1.4 mm (0.04-0.06 in.) wide; flower scales surrounding the seed generally point upward, widest above base, tapered above; dark brown, generally dull, several veins on back, none on front, beaked, white tip; approximately 455,000 seeds/lb.

**General description:** Slender sedge is a perennial grass-like plant whose culms and leaves grow in scattered tufts, and arise from blackish long-creeping rootstocks 2-5 mm (0.08-0.2 in.) thick. The culms are smooth, sharply triangular and 20-75 mm (0.8-3 in.) tall. They may be stiffly erect or laxly spreading. Leaf blades are 1.5-3 mm (0.06-0.1 in.) wide, flat or with fine grooves;

**Habitat:** Slender sedge is a variable and very widely distributed species found in open, moist or wet, often alkaline places, but not confined to alkaline sites. It is found in plains and lowlands along coastal strand to moderate elevations in the mountains, trans-montane desert oases and volcanic plateaus from the Yukon and British Columbia, south to California and Mexico and east to Manitoba, Iowa, and Kansas.

**Field use notes:** This sedge is useful in a variety of habitats, including sun, broken sun and shade, in flood plains, meadows and uplands. It is good for soil stabilization and for restoring degraded areas. It is tolerant of fire, long periods of standing water, and extended dry periods and may go dormant in the winter, depending on conditions. Seeds tend to germinate in the warm season. It is a suitable substitute for lawns and handles mowing well. Nurseries typically sell it as plugs (plants in 1 in. x 1 in. x 3 in. cells in trays). It provides cover for nesting waterfowl and other wildlife. Native Americans may have used the stems for food in times of famine.
Foothill sedge: *Carex tumulicola*

Mature plant

Seed heads

Seeds (cm)

Seedling

Detailed information about this species is on the other side.
**Common name:** Foothill sedge

**Latin name:** Carex tumulicola Mack

**Former/other name(s):**

**Season of growth:** Late winter to early spring.

**Reproduction/spread:** Seed and rhizomes.

**Elevation range:** 0-1,200 m (3,900 ft.)

**Mature plant height:** 20-80 cm (8-32 in.)

**Flower characteristics:** Inflorescence open, often flexible, 2-5 cm (0.8-2 in.), 6-8 mm (2.4-3.1 in.) wide; lowest spikelet bract bristle-like, red, white-margined, and awned.

- **Type:** Spike
- **Spikelets:** Spikelets without stalks, male flowers at the tip, female flowers below; generally less than 1.5 cm (0.6 in.), several times longer than wide.
- **Awns:**

**Seed:** Fruit 2-sided, more than 3 per spikelet, 1.8-2.3 mm (0.07-0.09 in.), 1.3-2 mm (0.08 in.) wide; structures surrounding the seed 3.5-5 mm (0.1-0.2 in.), 1.5-2 mm (0.06-0.08 in.) wide, beaked, light green to brown, several veins on back but none on front.

**General description:** Foothill sedge is a medium sized grass-like plant that spreads mainly by short rhizomes. Leaves and culms grow directly from the rhizomes. The leaf blades are 1-2.5 mm (0.04-0.1 in.) wide; flat, or sometimes folded along the middle.

**Habitat:** Foothill sedge is found in meadows, grassy slopes and open woodlands on the north coast of California, the northern Coast Range, Sierra Nevada, the Central Coast, the San Francisco Bay area and the Channel Islands to northwestern Washington from sea level to 4,000 ft. It is not generally a wetland plant; it prefers some moisture but can tolerate periods of dryness.

**Field use notes:** Foothill sedge is excellent for use on poor soils and for site stabilization and wildlife cover. It also makes an attractive groundcover. It is very drought tolerant.

**Important note:** Carex divulsa, “Berkeley sedge,” has been broadly confused with C. tumulicola. C. divulsa is non-native and has the potential to be invasive. It should not be used in restoration plantings. Check with your plant or seed provider to be sure of the correct species.
California oatgrass: *Danthonia californica*

Detailed information about this species is on the other side.
**Common name:** California oatgrass

**Latin name:** *Danthonia californica* Bol.

**Former/other name(s):**

**Season of growth:** Cool

**Reproduction/spread:** Seed

**Elevation range:** 0-600 m (2,000 ft.)

**Mature plant height:** Culms 30-100 cm (12-40 in.)

**Flower characteristics:** Inflorescence 2-6 cm (0.8-2.4 in.); all California species produce fertile 1-2 flowered spikelets within the basal sheath. The culms break away from the clump easily. Panicles are reduced to a few large, spreading spikelets, mostly longer than 1 cm (0.4 in.); flowers May to July.

- **Type:** Panicle
- **Spikelets:** 2-5 spikelets of 5-10 florets; spreading or bending in many directions. 1-2 cm (0.8 in.) long; glumes 15-20 mm (0.6-0.8 in.) long. Lemmas, excluding awns, 8-10 mm (0.3-0.4 in.) long.
- **Awns:** 4-12 mm (0.2-0.5 in.), usually on either side of the notched lemma; a flat, loosely-twisted awn arises from the back of the lemma below the notch and is bent once above the twisted portion.

**Seed:** Approximately 95,000 seeds/lb.

**General description:** California oatgrass is a densely tufted perennial grass. The sparse culms are erect to widely-spreading; sheaths and blades are ordinarily hairless with the exception of tufts of long hairs on either side of the collar; leaf blades are 10-20 cm (4-8 in.) long, often flat and smooth.

**Habitat:** California oatgrass is found in moist places, open sites, meadows, and forests in northwestern California, the Cascade Range, the Sierra Nevada, central western California, the San Bernardino mountains, southern peninsular ranges, and Modoc Plateau. Arid soils do not support this grass at all; consequently it is generally absent from the drier hills of the inner Coast Range and Sierra Nevada foothills. It can also be found in western Canada, throughout the western United States, and in South America.

**Field use notes:** California oatgrass prefers moist soils or at least soils with adequate subsurface moisture. It is a slow germinator (6-8 weeks) but then has moderate vigor and growth. It is fire-resistant, and moderately drought-tolerant. It is a nutritious grass and provides valuable livestock forage, though it may not be abundant. Grazing animals seek out the individual plants and consistently overgraze them, sometimes causing rapid depletion of good stands. The low stature and moisture tolerance of this grass make it a candidate for use in a native lawn. With frequent mowing it can form an almost turflike cover that is tolerant of foot traffic.
Tufted hairgrass: *Deschampsia cespitosa*

Mature plant

Seed head

Seeds

Seedling

Seeds of *Deschampsia elongata*

Detailed information about this species is on the other side.
Common name: Tufted hairgrass, Fairy wand grass, Pacific hairgrass

Latin name: Deschampsia cespitosa (L.) P. Beauv.

Former/other name(s): Deschampsia caespitosa caespitosa

Season of growth: Cool

Reproduction/spread: Seed, or by division

Elevation range: 0 - 3,900 m (0 - 12,795 ft.)

Mature plant height: Height: 20 - 100 cm (8 - 39 inches)

Flower characteristics: Produces a profusion of purplish, feathery, upright, spreading flowers in late May (July – September at higher elevations).
  Type: Open, nodding panicle, 10 - 25 cm (4 - 10 inches) long
  Spikelets: 4 - 5 mm (.2 inch) long, pale or purple-tinged
  Awns: Straight or nearly straight, hair-like, 2 - 4 mm (.1 inch)

Seed: Seeds mature late spring to mid summer and are very tiny. There are approximately 1,273,000 – 1,690,000 seeds/lb. There is a 2 - 6 week collection window. If planted at a rate of 1 lb./acre, there are approximately 34 seeds/ft².

General description: Tufted hairgrass is a very attractive, long-lived perennial that forms large, dense tufts about 30 cm (1 ft.) wide. Its leaves are dark green and vary from fine to moderately course 1.5 - 4 mm (.01 - .12 inch) wide. D. elongata (seed only, pictured on reverse) is similar, but smaller (10 - 70 cm), having a narrower elevation range (up to 3,100 m), a more upright, greenish-tan seedhead, and smaller seed.

Habitat: This grass prefers moister soils and grows in shaded openings to full sun. It is often the dominant grass in mountain meadows and stream banks, but is also found at lower elevations and along the central coast in wet areas. It is native to the mountains throughout the West, including the Sierra Nevada to slightly over 12,000 ft., and between 6,800 and 8,500 ft. in the San Bernardino Mountains. It is also found in northwestern California, the Cascade Range, and the White and Inyo Mountains.

Field use notes: This is a widely distributed grass that is frequently found in dense stands and in combination with sedges and rushes. It is valuable grass for controlling soil erosion, especially along streambanks and canals. Its use as an ornamental plant is increasing. It will not tolerate hot, dry situations and in fact needs moisture. Light shade can be helpful. This is a good plant for native pasture in wet or irrigated sites due to high productivity and its palatability for all classes of livestock. It can provide dense nesting cover and a long green period. Withstands rather close grazing, and likewise mowing, and recovers well. It is tolerant of short duration flooding and some ecotypes are salt tolerant. Severe fires may kill the tops, but generally the crown survives low intensity fires, resulting in a return to pre-fire populations within just a few years. Residual seed is stored in the soil and can be a source of regeneration.
Saltgrass: *Distichlis spicata*

Mature plant

Seed heads

Leaf/stem detail

Seeds (cm)

Seedling

Detailed information about this species is on the other side.

Yolo County Resource Conservation District
(530) 661-1688
Common name: Saltgrass, Seashore saltgrass, Inland saltgrass

Latin name: Distichlis spicata (L.) Greene

Former/other name(s):

Season of growth: Warm. Summer through fall.

Reproduction/spread: Primarily rhizomes, rarely seed.

Elevation range: 0-1,000 m (3,300 ft.)

Mature plant height: Culms 10-40 cm (4-16 in.) tall, or more.

Flower characteristics: Plants dioecious – male and female flowers on separate plants; flowers look generally similar except female inflorescences usually fatter than the male; spikelets several to many-flowered; pistillate spikelets break off above glumes and between florets; glumes 3- to 7-nerved, lateral nerves sometimes faint; flowers April to July.

Type: Panicle, or raceme-like, 1-7 cm (0.4-2.8 in.) long; somewhat dense, contracted, narrow, and more or less cylindrical in outline; straw-colored to purplish.

Spikelets: Unisexual, stalked, compressed, 3-20 florets per spikelet; 0.6-1.7 cm (0.02 in.) long; staminate spikelets straw-colored to purplish, pistillate spikelets green; margins yellow and coarse, more leathery and closely overlapping than the staminate flower.

Awns: None

Seed: Approximately 672,500 seeds/lb.

General description: Saltgrass is a low perennial with extensively creeping scaly rhizomes, and sometimes stolons, that form dense mats. It has erect, rather rigid culms with short internodes, bearing numerous leaves in two ranks resulting in a very recognizable two-row leaf pattern similar to Bermuda grass. It is unusual among the grasses in having the male and female flowers on separate plants and is often found in large colonies of either male or female plants produced vegetatively, with no opportunity for seed production. Where both male and female plants are present, seed is produced. Leaves are sharp-pointed, usually less than 10 cm (4 in.) long and 1-3.5 mm (0.1 in.) wide, and typically bluish-green.

Habitat: Saltgrass is a very common member of flood plains, salt marshes and seasonal or permanent alkaline wetlands. Saltgrass can occur bordering well-drained habitats and is also very tolerant of prolonged arid conditions. It is found on seashores from British Columbia to California, Mexico, Cuba, both Catalina and Santa Cruz Islands, and along the Pacific slope of South America.

Field use notes: Saltgrass is a winter-dormant, very low-growing perennial grass that is excellent for anchoring soils and providing surface protection from erosion and trampling. It tolerates saline and alkaline conditions as well as fluctuating water tables. It may spread aggressively when competition is reduced. It has some forage value, particularly when other vegetation is scarce, and recovers well from close grazing and trampling by animals. Livestock digestive problems may develop if they are allowed to only graze dried Saltgrass in fall or winter. In horticultural settings it is a good groundcover. Seed availability may be limited because the plant is dioecious. It is typically propagated through cuttings. Because it is a warm-season grower, transplants need water during the establishment phase.
Great Basin wildrye: *Elymus cinereus*

Mature plant

Seed heads

Seeds (cm)

Seedling

Detailed information about this species is on the other side.
Common name: Great Basin wildrye, Basin wildrye, Ashy wildrye, Giant wildrye, Great Basin lyme grass

Latin name: *Elymus cinereus* Scribn. & Merr.

Former/other name(s): *Leymus cinereus*

Season of growth: Warm

Reproduction/spread: Seed, tillers, and short rhizomes.

Elevation range: To 3,000 m (9,800 ft.)

Mature plant height: 70-210 cm (28-83 in.)

Flower characteristics:
- **Type:** Spike
- **Spikelets:** 2-17 per node, 3-6 flowered, 9-20 mm (0.4-0.8 in.) long.
- **Awns:** Lemma awned, 1-5 mm (0.2 in.) long or awnless; glumes awn-pointed.

Seed: Approximately 130,000 seeds/lb and 3 seeds/ft² if planted at 1 lb/acre; seed matures by August.

General description: Great Basin wildrye is a very large, cespitose perennial bunchgrass with upright culms 1-3 m (3.3-10 ft.) tall. It may occasionally develop short branches with up to 6 nodes; 10-25 cm (4-10 in.) long.
- Leaf blades are flat or sometimes rolled inward and are 20-60 cm (8-24 in.) long and 5-15 mm (0.2-0.6 in.) wide, narrowing to a pointed tip.
- Leaf sheaths are rounded and also range from smooth to coarsely fine-haired. There may be 1-2 mm finger-like, membranous structures at the node.

Habitat: Great Basin wildrye can be found on moist to dry soils, along streamsides, canyons, roadsides, in sagebrush shrubland, plains, and open woodlands. It is adapted to a broad range of soil types, including moderately saline soils, and is found in the Cascade Range, the Sierra Nevada, the Tehachapi Mountain area, the Sacramento Valley, the Transverse Ranges, and in the eastern desert mountains (Kingston Mountains) from Colorado to Canada.

Field use notes: Great Basin wildrye has a wide habitat range. It is best adapted to fine-textured soils in valley bottoms, along roadsides, streams and in gullies, but will grow on many soil types. It is moderately tolerant of alkaline and saline soils and is tolerant to short-duration flooding. It has an extensive fibrous root system, penetrating from 100-200 cm (40-80 in.) which makes it a good soil stabilizer. This grass has good forage value for cattle and fair value for sheep and wildlife, but is not tolerant of heavy grazing because of the relatively high position (10-15 cm, 4-15 in.) of the growing points. It furnishes important winter feed for most classes of livestock, and excellent, abundant early spring forage, but is relatively unpalatable in the summer. It is somewhat fire tolerant. It has poor germination and seedling vigor and so may be difficult to establish, but is valuable once-established, and long-lived. It may hybridize with *Leymus triticoides*.

Yolo County Resource Conservation District
(530) 661-1688
Blue wildrye: *Elymus glaucus*

Mature plant

Seed heads

Seedling

Seeds

Detailed information about this species is on the other side.

Yolo County Resource Conservation District

(530) 661-1688
**Common name:** Blue wildrye

**Latin name:** Elymus glaucus Buckley

**Former/other name(s):**

**Season of growth:** Cool, at low altitudes, dormant in the summer. Begins growth before rains start.

**Reproduction/spread:** Seed. Re-seeds itself well.

**Elevation range:** 0 - 2,500 m (0 - 8,202 ft.)

**Mature plant height:** 60 - 140 cm (24 - 55 inches)

**Flower characteristics:** Produces a stiff, upright spike that flowers from May to August.

- **Type:** Spike, 6 - 16 cm (2.4 - 6.3 inches) long, internodes 4 - 8 mm (.16 - .3 inch)
- **Spikelets:** Generally 2 per node, 8 - 16 mm (.3 - .6)
- **Awns:** 10 - 30 mm (.4 - 1.2 inch)

**Seed:** Seeds mature in late spring to summer; can be collected for 2 - 7 weeks depending on ecotype and growing conditions. Seed is up to 6 mm long (1/4 in.), germinates easily, and has good seedling vigor. There are approximately 109,000 - 121,000 seeds/lb., and if planted at a rate of 1 lb./acre, there would be approximately 2.6 seeds/ft².

**General description:** Blue wildrye is a large perennial bunchgrass. It is very tall, with an upright growth habit and just a few stems per plant. It is similar in stature and growth habit to Slender wheatgrass. The leaf blades are thin and flat, ranging from 4 - 12 mm (.2 - .5 inch) wide. Leaf color ranges from green to blue green, with a white waxy coating. If it is given water it will stay green all year. Frosts induce dormancy.

**Habitat:** Blue wildrye is a highly variable species. It is found throughout California in the foothills and lower mountain slopes, where it is associated with chaparral, as well as open stands of oaks and conifers. At lower elevations, it grows in valley grasslands, open areas, alluvial channel banks, and swales. It is often found with other native perennial grasses. It’s adapted to 25 - 100 cm (10 - 40 inches) annual rainfall.

**Field use notes:** Blue wildrye grows well in both disturbed and undisturbed areas and is a good competitor. It tolerates wide variations in soil and weather conditions, though grows best in good soils. It prefers moisture but tolerates drought and is usually more drought-tolerant than Meadow barley and California brome. Some ecotypes are tolerant of short duration flooding. Some shade may be good in interior areas, though some ecotypes are adapted to sunny grassland habitats. This grass is good for streambank restoration, meadow and swale seeding. It is also excellent for reseeding burned or disturbed areas in oak woodland or forest. It is very tolerant of fire, burning quickly with little downward transfer of heat. After fires it will resprout from basal buds and is a strong post-fire seeder. Burning may reduce weed competition and create good seedbeds for seed germination. Seeds may also survive moderate intensity fires. Blue wildrye can provide excellent wildlife habitat for mammals, birds and waterfowl. It provides good forage early in the season, but later, may be too coarse and stemmy. Forage quality can be excellent when cut before dormancy. It will not survive if grazed too heavily. Likewise, it is generally tolerant of mowing if not cut too short.
Big squirreltail: *Elymus multisetus*

Mature plant

Seedling

Seed heads

Seeds

Detailed information about this species is on the other side.
**Common name:** Big squirreltail

**Latin name:** *Elymus multisetus* (J. G. Sm.) Burtt Davy

**Former/other name(s):** *Sitanion jubatum*

**Season of growth:** Cool

**Reproduction/spread:** Seed. May flower twice in a year if sufficient moisture.

**Elevation range:** 0 - 3,200 m (0 - 10,500 ft)

**Mature plant height:** 10 - 65 cm (4 - 26 inches)

**Flower characteristics:** The culm and bristly spikes are erect, spreading and somewhat stiff. The flower breaks apart at maturity. Flowering occurs in May.

- **Type:** Spike. Upright, 3 - 17 cm (1.2 - 6.7 inches), partially enclosed in a sheath
- **Spikelets:** 2 per node, 2 - 6 flowered, smooth to slightly hairy, glumes divided near base into 3 - 5 awns.
- **Awns:** On glumes and lemma. Rough to the touch, 2.5 - 10 cm (1 - 4 inches), stiff and spreading widely; farthest half curving outward with age.

**Seed:** The low-dormancy seed matures from late spring to early summer, with a collection window varying from 2 - 4 weeks. There are between 51,240 and 64,500 seeds/lb. and if planted at a rate of 1 lb./acre, there would be 1.3 seeds/ft².

**General description:** This is a medium sized, densely tufted perennial bunchgrass that starts growth in early spring and partially lodges after flowering. The leaf sheaths is smooth. Leaf blades may be flat or have the edges rolled upward, or may be upright to spreading 5 - 20 cm (2 - 8 inches) long. The leaves taper to a fine point, have a prominent vein, and are sometimes stiff. Nearly mature plants will have a bronze cast to the seed heads. It can hybridize with other Elymus species. *E. multisetus* is similar to *E. elymoides* (Squirreltail). They differ primarily in overall plant size and seed head size, *E. multisetus* having the more robust inflorescence, *E. elymoides* not typically having the additional glume-associated awns.

**Habitat:** Big squirreltail is found, and grows best on, open, sandy, gravelly or rocky soils of hillsides, plains, open woods, and rocky slopes under 3,200 m. It does best in full or nearly full sun. It is sometimes found on alkaline or saline flats and on serpentine soils. It readily pioneers disturbed soils. It is usually seen as scattered plants, but is rarely abundant in specific locations. It is found in the Klamath, Cascade, and Sierra Nevada ranges, as well as in the desert and throughout low elevation valleys and foothills. It prefers full sun, but will grow in broken sun.

**Field use notes:** This grass has fair forage value for sheep and cattle when it is young, but at maturity, and as the spike breaks down, it can penetrate the mouth, nose and ears of stock and cause injury. It may also be grazed after the seed heads are gone. This bunchgrass is highly fire tolerant. There is limited heat transfer below ground, allowing growing points to survive and re-sprout. It may, in fact, become more dense after a fire. It re-seeds readily.
Bluebunch wheatgrass: *Elymus spicatus*

Mature plant

Seed heads

Seed head detail

Seeds (cm)

Seedling

Detailed information about this species is on the other side.
**Common name:** Bluebunch wheatgrass, Big bunchgrass  
**Latin name:** *Elymus spicatus* (Pursh) Gould

**Former/other name(s):** *Pseudoroegnaria spicata*, *Agropyron spicatum*, *Elytrigia spicata*

**Season of growth:** Cool  
**Reproduction/spread:** Seed, tillers, rarely rhizomes.

**Elevation range:** 800-1,650 m (2,600-5,400 ft.)  
**Mature plant height:** 20-100 cm (8-40 in.)

**Flower characteristics:** Slender inflorescence 8-16 cm (3-6 in.) long, internodes 1-2 cm (0.8 in.) long; axis may break between florets.  
- **Type:** Spike  
- **Spikelets:** Usually 5-14, one per node; spikelets 4- to 8-flowered, 1-2.5 cm (0.4-1 in.) long; lemmas about 1 cm long.  
- **Awns:** Lemmas may/not be awned; if awns, bend strongly out at maturity, 1-2 cm (0.8 in.) long.

**Seed:** No specific information about the seeds of this species was available.

**General description:** Bluebunch wheatgrass is a grayish-blue, cespitose perennial bunchgrass that may have short rhizomes. The culms are erect, 20-100 cm (8-40 in.) tall and slender. The leaf blades are flat to slightly curved inward, 5-25 cm (2-10 in.) long, 1-5 mm (0.2 in.) wide, and covered with fine, short hairs. Leaf margins are white and weakly barbed; leaf sheaths are rounded, mostly smooth and prominently veined with overlapping margins. Old leaf sheaths remain on the plant. There are well-developed membranous structures at the nodes, 0.5-1 mm (0.04 in.) long, clasping and reddish in color. Ligules are irregularly notched and membranous to hairy, 0.5-2 mm (0.02-0.08 in.) long. The plant begins growth in April and may stay green through summer. Re-growth starts after fall rains.

**Habitat:** Bluebunch wheatgrass can be found on heavy to medium or coarse textured soils over 10 inches deep, including fairly sandy sites, on rocky sites and on very steep slopes. It is found on plains, mountain slopes, in canyons, in open woods, and along stream banks in the north Coast Range, Cascade Range, the northern and central Sierra Nevada, and the Modoc Plateau to southern Canada and Colorado. It is common in the northern Great Plains and the Intermountain regions of the western United States. It will tolerate moist soils but is most abundant in dry soils.

**Field use notes:** Bluebunch wheatgrass is a widely adapted, long-lived, drought tolerant native bunchgrass. It has an extensive root system with strong tillers and is good for stabilization of ditch-banks, roadsides and disturbed sites. It has low to good seedling vigor and is not highly competitive with aggressive, introduced grasses but is very compatible in mixes with slower developing native species. It does best on medium to coarse textured soil. It makes nutritious feed, and can be used for native hay production, but is best suited to pasture and rangeland use. It is a preferred feed for sheep, elk, deer, and antelope in spring and fall to winter. It cures well and makes good standing winter feed. The growing point is fairly high so established stands cannot withstand continuous grazing. It tolerates weakly saline conditions but can’t grow on acidic sties. It is cold tolerant, moderately shade tolerant, and very fire tolerant. It is intolerant of high water tables, poor drainage and extended inundation. It can be used in urban areas where irrigation water is limited.
Slender wheatgrass: *Elymus trachycaulus* subsp. *trachycaulus*
**Common name:** Slender wheatgrass  

**Latin name:** *Elymus trachycaulus* (Link) Shinners subsp. *trachycaulus*  

**Former/other name(s):** *Agropyron trachycaulum, A. pauciflorum*  

**Season of growth:** Cool  

**Reproduction/spread:** Seed. Abundant, with strong seedling vigor.  

**Elevation range:** 0 - 3,400 m (0 - 11,155 ft.)  

**Mature plant height:** 30 - 150 cm (12 - 59 inches)  

**Flower characteristics:** Produces a stiff, upright spike that flowers from June through September  
- **Type:** Spike. Slender, 10 - 30 cm (4 - 12 inches)  
- **Spikelets:** Somewhat farther apart in the lower part of the spike, 3 - 7 flowered, sometimes up to 20 mm (.8 inch) long  
- **Awns:** Very short  

**Seed:** The seeds mature in late spring to early summer, with a 2 - 6 week collection window. They are vigorous sprouters. There are between 72,000 and 90,000 seeds/lb. and if planted at a rate of 1 lb./acre, there will be approximately 1.8 seeds/ft².  

**General description:** Slender wheatgrass is a medium-lived perennial bunchgrass that is tall and upright. The leaf blades are green and flat to slightly rolled. It is similar in stature and growth habit to Blue wildrye. Various related species are common in higher elevations of California. There are two forms that are adapted to lower elevations. The first, known in the trade as variety “majus,” is found in the lower Sacramento Valley. It is a large, robust, plant that is a vigorous grower and has a bluish cast. The second is a slightly smaller plant but an equally fast grower, with thinner and slightly greener leaves.  

**Habitat:** This grass is found on dry to somewhat moist soils at medium to high elevations throughout California. It may grow on neutral, alkaline or serpentine soils. It prefers open, sunny areas, forest, and woodland, but will also tolerate some shade. The Sacramento Valley form is primarily a riparian and wetland associated grass. It grows very well on dark, hydric soils of the valley. The second is a more coastal form and is found primarily on open grasslands. It is adapted to clay soils and serpentine and prefers the coastal climatic influence.  

**Field use notes:** This grass tends to form dense tufts. It is quick to establish, fast growing and easy to grow. It can be short-lived, but plants have been documented to be in excess of 10 years old. It is excellent for use in riparian areas and will tolerate short periods of flooding (“majus”). It competes well with annual grasses and other weeds. This is one of the few native perennial bunchgrasses that were cultivated for cattle forage for many decades. The seed is very nutritious. Young growth, stems, and seed heads are all consumed. The strong roots resist pulling up when grazed and help prevent soil erosion, especially on disturbed sites. Overgrazing can seriously deplete it. Likewise, mowing it too short will seriously weaken it. It provides excellent habitat for nesting birds and other wildlife. Its dense root system allows it to survive most fires and it will re-sprout either from tillers or buried seed. It was used by Native Americans for food.
Creeping wildrye: *Elymus triticoides*

Mature plant

Seed heads

Seedling

Seeds

Detailed information about this species is on the other side.
Common name: Creeping wildrye, Beardless wildrye

Latin name: Elymus triticoides Buckley

Former/other name(s): Leymus triticoides

Season of growth: Cool, warm

Reproduction/spread: Primarily by extensive, creeping rhizomes

Elevation range: 0 - 2,300 m (0 - 7,546 ft.)

Mature plant height: 45 - 130 cm (18 - 51 inches)

Flower characteristics:
- Narrow, upright seed head flowers from May to July
- Type: Spike, 5 - 20 cm (2 - 8 inches), becoming curved after maturity
- Spikelets: 12 - 20 mm (.5 - .8 inches), somewhat deciduous, 1 - 3/node
- Awns: tiny, approximately 3 mm (.1 inch)

Seed: Seed matures in late spring to early summer. Most wild ecotypes flower but do not produce seed. Ecotypes “Rio” and “Yolo” produce good quantities of viable seed. If viable seed is present, it can be collected for 4 - 20 weeks. The seed does not shatter as easily as many other species. There are between 110,000 and 130,000 seeds/lb., and if planted at a rate of 1 lb./acre there would be approximately 2.8 seeds/ft².

General description: Creeping wildrye is a long-lived perennial grass that is typically tall and strongly rhizomatous. It stays green longer into the summer than other cool-season grasses. The stems are often smooth, but can be hairy. Leaf blades are green to blue-green and 2.5 - 4 mm wide with a slightly rough upper surface. It is very alkaline and salt tolerant. Seedling vigor is initially weak and there is delayed germination.

Habitat: This grass grows on mostly heavy soils in riparian areas, bottomlands, valleys, foothill, mountain flats, and meadows from coastal marshes to the high Sierra. It is found throughout California, except in the desert and prefers full sun over partial shade. It was probably the most common and widespread native grass on the Sacramento Valley floor. It is currently one of our more common riparian understory grasses.

Field use notes: Creeping wildrye, especially of the ecotype “Rio” or “Yolo,” is very popular for streambank erosion control because of its rhizomatous growth habit. In good soils, roots may go down 10 ft. It also lays flat during high water flow periods, thus allowing full water flow while still protecting the streambank. It prefers good soils but is adapted to alkaline soils and is tolerant of high summer temperatures. If managed properly, it will develop into large patches or colonies, but cultivation restricts it. It can be valuable forage in certain areas, especially meadows that become dry, where it is grazed through most of the summer. It resists trampling, and recovers well from grazing. At lower elevations it is coarser for grazing than annuals. It will also tolerate mowing well, especially if mowed late in the growing season and if not mowed too short. It is also fire tolerant. After mowing or burning it begins green-up in late summer if deep soil moisture is adequate. In spite of delayed germination of up to one month and poor seedling vigor, it can compete sufficiently with weeds and annual grasses to dominate a site in the second year. It provides high quality waterfowl and upland game nesting habitat. This species’ flood tolerance is excellent. It is found in flood plains that receive prolonged inundation. The seed was used by Native Americans for food.
California fescue: *Festuca californica*

Detailed information about this species is on the other side.
**Common name:** California fescue

**Latin name:** *Festuca californica* Vasey

**Former/other name(s):**

**Season of growth:** Primarily cool season, depending on altitude

**Reproduction/spread:** Best by division, but also from seed with some effort

**Elevation range:** 0 - 1,800 m (0 - 5,906 ft.)

**Mature plant height:** 45 - 120 cm (18 - 48 inches)

**Flower characteristics:** Flower stalks are airy and bloom from April through June. Seed heads turn golden when mature, then lodge.

- **Type:** Panicle, 10 - 30 cm (4 - 12 inches), pair of branches at each node, long and drooping
- **Spikelets:** At end of branches from panicle, 4 - 5 flowered
- **Awns:** Sometimes short ones

**Seed:** Seed matures from late spring to mid summer, but generally has a low germination rate; many are sterile. The collection window lasts 4 - 6 weeks long. There are approximately 175,000 seeds/lb. If planted at a rate of 1 lb/acre, there would be approximately 4 seeds/ft².

**General description:** California fescue is a strong, robust, long-lived perennial bunchgrass with a cespitose, or cushion-like, growth form. It may appear to be green or blue-gray in color. The leaf blades are flat, with the edges rolled in. It will stay green year-round if given some water.

**Habitat:** This grass likes north facing slopes with part shade to full sun. It prefers fertile soils, but will grow on poorer soils, including serpentine. It is found under deciduous oaks on north faces and in mixed evergreen and Yellow Pine forests of the Coast Range and occasionally in the Sierra Nevada. It is also found in Northwestern California, the Cascade Range, Central Western California, and the San Bernardino Mountains. It is commonly associated with brushlands or heavily wooded areas. It can sometimes be the dominant grass on a given site, being so dense as to almost form a carpet in the intervals between the shrubs.

**Field use notes:** This grass is drought tolerant in coastal areas. It does well if cut back. A mass planting on a slope gives the impression of falling water. It does not re-seed easily and does not tolerate fire as well as some other bunchgrasses. Although the culms and leaves may be killed by fire, it may re-sprout from the basal buds. It provides fair to good forage, depending on the stage of growth. The new growth is palatable but becomes less so as the stems elongate and the panicle emerges.
Idaho fescue: *Festuca idahoensis*

Mature plant

Seed heads

Seedling

Seeds

Detailed information about this species is on the other side.

Yolo County Resource Conservation District
(530) 661-1688
**Common name:** Idaho fescue, Blue bunchgrass

**Latin name:** *Festuca idahoensis* Elmer

**Former/other name(s):**

**Season of growth:** Cool. Usually dormant from late summer to winter

**Reproduction/spread:** Seed. Starts growth in early spring

**Elevation range:** 0 - 1,800 m (0 - 5,906 ft.)

**Mature plant height:** 30 - 100 cm (12 - 39 inches)

**Flower characteristics:** Flowering occurs in May. Flower heads are narrow and open.

- **Type:** Panicle, loosely contracted and narrow (10 - 20 mm, .4 - .8 inch), the branches are held close to the main axis of the flower head until flowering, when the panicle spreads open.
- **Spikelets:** 8 - 10 mm (.3 - .4 inch) long with 5 - 7 flowers
- **Awns:** 2 - 4 mm (.08 - .16 inch)

**Seed:** Seed matures from late spring to mid-summer, and may be collected for 2 - 6 weeks. There are approximately 336,000 seeds/lb. and if planted at a rate of 1 lb./acre there would be approximately 7 - 8 seeds/ft².

**General description:** Idaho fescue is a densely tufted, fine-leaved, long-lived perennial with a cespitose, or cushion-like, growth form. It usually has a blue-green appearance, but some individuals are a truer green. It has a distinctive thatch. The leaf blades are long, rough, stiff, and numerous.

**Habitat:** This grass can be found in open woods or rocky slopes in many plant communities of the coast ranges, the northern Sierra foothills and northern mountains below 8,000 ft. It is commonly found in the Modoc Plateau. It grows on all exposures and on many soil types, including hillsides, ridges, meadows, woodlands, and open ponderosa pine and lodgepole stands. It is found most commonly on dry, well-drained, moderately deep, sandy or gravelly loams and in partial shade or openings.

**Field use notes:** This grass is common in the mountains, where it is important as a range grass because of its abundance and utilization by livestock. It is excellent for both livestock and wildlife, especially late in the season. Overgrazing will deplete plant populations and contribute to decline, so proper management is necessary to maintain good stands. It is tolerant of mowing, but intolerant of fire. It may survive low to moderate intensity fires if the basal buds are not damaged. Pre-fire grazing reduces fire mortality by reducing litter buildup around tufts. This is a very attractive grass, frequently used for landscaping.

It does not compete well in mixes that include *Nassella pulchra* and *Elymus glaucus* in good soils.
Three-weeks fescue: *Festuca microstachys*

Mature plant

Seed heads

Seeds (cm)

Seedling

Detailed information about this species is on the other side.
Common name: Three-weeks fescue, Small fescue

Latin name: *Festuca microstachys* Nutt.

Former/other name(s): *Vulpia microstachys*

Season of growth: Cool.

Reproduction/spread: Seed

Elevation range: 0-1,500 m (5,000 ft.)

Mature plant height: 15-75 cm (6-30 in.)

Flower characteristics: Panicle-like with 2 or more lower branches, the upper portion unbranched with several sessile spikelets, 2-24 cm (0.8-10 in.); more or less open, at least lower branches spreading or turned backward; 1 branch per node.

- **Type:** Panicle-like
- **Spikelets:** spikelet 5.5-10 mm (0.2-0.4 in.), 2-4 florets each that may not open; axis breaks between florets; pubescent, with long, well developed hairs.
- **Awns:** 3.5-12 mm (0.1-0.5 in.)

Seed: Fruit 3-6.5 mm (0.1-0.3 in.), more or less linear, often sticking to the uppermost flower bract; approximately 248,980 seeds/lb; seed matures in early summer.

General description: Three-weeks fescue is a low-growing annual native grass that is only loosely clumped and has mostly upright stems that may be either smooth or hairy. The ligule is membranous and may have a tiny fringe. The leaf blade is less than 15 cm (6 in.), 0.5-2.5 mm (0.1 in.) wide, and either flat or rolled when dry.

Habitat: Three-weeks fescue is found occupying thin, sandy or sterile soils where competition is minimal, as well as oak woodlands and grasslands from Washington to California to Baja California and eastward to Idaho.

Field use notes: Three weeks fescue is one of the few annual native grasses that is commercially available. It germinates rapidly, re-seeds well, and is good for erosion control and stabilization, especially on sparse, dry soils, though it is not limited to these. It is often found in between other native grasses that are perennial and is good for filling in the spaces between those bunches. Both the plants and the seeds provide good wildlife forage.
“Molate” red fescue: *Festuca rubra*, “Molate”

Mature plant

Seed heads

Seedling

Seeds

Detailed information about this species is on the other side.
**Common name:** “Molate” red fescue

**Latin name:** *Festuca rubra* L, “Molate”

**Former/other name(s):** “Molate” blue fescue

**Season of growth:** Cool or warm, depending on altitude, water availability, and site characteristics.

**Reproduction/spread:** Seed. Somewhat rhizomatous, spreading by rhizomes over time.

**Elevation range:** 0 - 2,500 m (0 - 8,202 ft.)

**Mature plant height:** 30 - 80 cm (12 - 31 inches)

**Flower characteristics:**
- **Type:** Panicle, 5 - 18 cm (2 - 7 inches) long, commonly loosely contracted
- **Spikelets:** 5 - 10 mm long, purplish to green or glaucus
- **Awns:** None

**Seed:** Seeds mature in July and August. They are small (2 mm) and wrapped in a bract that is essentially awnless, but sometimes comes to a sharp point. There are between 365,000 and 403,000 seeds/lb., and if planted at a rate of 1b./acre there would be 8 - 9 seeds/ft². There must be a large population to produce seed.

**General description:** “Molate” fescue is a specific ecotype of California red fescue. It is a long-lived perennial, that is loosely tufted and rhizomatous. The base of the stem has a reddish color and a papery cover, sometimes with short rhizomes. Most of the leaves are folded and the plant appears fine-leaved. Some forms actually are fine-leaved. With water, it may stay green all year, but it is quite drought tolerant. The leaf blade is smooth or nearly smooth. Several ecotypes of California red fescue are available.

**Habitat:** This grass is best adapted to the North and Central coastal region where summers are cool and there is adequate moisture during the growing season. It usually grows in regions receiving more than 55 cm (18 inches) of rain per year. It does well in full sun but will tolerate heavy shade.

**Field use notes:** This is a very attractive grass. Its fine foliage and spreading character make it an ideal component for natural landscapes and low maintenance buffer areas. It is increasingly used in restoration and revegetation areas, as well as in vineyards and golf courses. When used for landscaping in the drier valleys and foothills, it requires shade and supplemental watering. It is readily grazed by livestock, though it seldom occurs in dense stands. Its tolerance to flooding is probably poor.
Big galleta: *Hilaria rigida*

Mature plant

Seed heads

Seeds (cm)

Seedling

Detailed information about this species is on the other side.
Common name: Big galleta

Latin name: *Hilaria rigida* (Thurb.) Scribn.

Former/other name(s): *Pleuraphis rigida*

Season of growth: Cool

Reproduction/spread: Primarily rhizomes. Also seed and tillers.

Elevation range: Up to 1,600 m (5,200 ft.)

Mature plant height: 50-100 cm (20-40 in.)

Flower characteristics: Inflorescence 4-10 cm (1.6-4 in.) long; flowers February through June.

- **Type:** Spike-like, generally cylindric
- **Spikelets:** Wedge-shaped groups of about 3 spikelets per node, 7-11 mm (0.3-0.4 in.) long, densely hairy at the base; outer flower parts usually have 1-3 nerves tapering into slender awns (variable in a single spike); fertile spikelet about equal in size to the lateral ones; groups of spikelets fall as a unit, leaving a zig-zag shaped stalk.
- **Awns:** Short, 0-3 mm.

Seed: Approximately 110,000 seeds/lb.

General description: Big galleta is a rather robust, cespitose perennial bunchgrass with woody rhizomes. It branches at the base, the branches grow mostly upright, the base is rather woody, and appears bush-like. Portions of the stem may lie on the ground. It produces numerous, rigid culms with a felty surface; leaves may be either felty or smooth, but are usually so at the top of the sheath; blades 2-6 cm (0.8-2.4 in.) long or longer, 2-4 mm (0.1 in.) wide, somewhat curved inward, tapering to a point. Its root system tends to be shallow and extends radially from the base of the plant, reaching typical depths of 8-10 cm (3-4 in.).

Habitat: Big galleta is commonly found in dry, open, sandy to rocky slopes, flats, and washes, sand dunes, scrub, and woodland such as Creosote Bush scrub and Joshua Tree woodland in the eastern and southern Mojave Desert and the Sonoran Desert, to Utah and northern Mexico.

Field use notes: Big galleta is considered a valuable forage plant for cattle and domestic sheep in the Mohave Desert. Deer may also utilize it. Protein content during the growing season may range from 57-86%. Its coarse, rigid culms make it relatively resistant to heavy grazing and trampling. It provides fair cover for small mammals and non-game birds. The clumped growth form of the grass stabilizes blowing sand and is a good dune stabilizer. Seed production is generally very poor and seedling establishment appears to be rare. It typically goes through two major growth periods, coinciding with the typical rainfall patterns in its range, and can also complete its life cycle rapidly in response to periodic rains. Tolerance to fire depends on the season of the burn. When plants are green, damage tends to be minimal and the plant recovers quickly.
Meadow barley: *Hordeum brachyantherum* subsp. *brachyantherum*

Mature plant

Seed heads

Seedling

Seeds

Detailed information about this species is on the other side.
Common name: Meadow barley

Latin name: *Hordeum brachyantherum* subsp. *brachyantherum*

Former/other name(s): 

Season of growth: Cool

Reproduction/spread: Seed. Strong seedling vigor

Elevation range: 0 - 3,400 m (0 - 11,155 ft.)

Mature plant height: Approximately 90 cm (35 inches)

Flower characteristics: Blooms May through August and may have a purplish cast. Seeds mature at the top of the spike first and drop off as they mature.

- **Type:** Spike, 8 - 10 cm (3 - 4 inches)
- **Spikelets:** 5 - 10 mm (.2 - .4 inches)
- **Awns:** 5 - 10 mm (.2 - .4 inches)

Seed: This grass produces lots of seed if given sufficient water. There is good seedling vigor. Seed matures mid-spring to early summer depending on the elevation, with a collection window of from 2 - 4 weeks. It shatters quickly in dry heat. There are between 66,000 and 109,000 seeds/lb. and if planted at a rate of 1 lb./acre, there would be approximately 2 seeds/ft².

General description: Meadow barley is a medium sized, tufted, fast-growing, short-lived perennial bunchgrass. Its leaf sheath is glabrous to sparsely hairy. The leaves are usually smooth to hairy and about 3 - 8 mm wide (1/4 inch)

Habitat: This grass prefers spring moist soils, meadows, pastures, flood plains, bottomlands, streambanks and grassy slopes below 3,400 m where annual rainfall is between 25 and 90 cm (10 and 36 inches). It is found throughout California, except in the desert. Some ecotypes will tolerate alkaline soils in drier locations. It grows best in full sun to partial shade. In flood plains, it is frequently found with sedges and rushes.

Field use notes: Meadow barley is useful in reclamation and erosion control situations especially when long-term vegetation stability is a prime concern. It develops deep roots to utilize moisture at deeper levels. It is used as a nurse crop for Nassella species and other long-lived grasses. It prefers moist conditions, and where sufficient water is provided, it will become the dominant grass. It is tolerant of alkaline or compacted soils. If conditions are droughty it will decrease in vigor and disappear. Although it may form pure stands on moist sites, it generally will not persist on dry sites. Seedlings can tolerate freezing temperatures; low temperatures will often turn the older leaves reddish. It provides excellent livestock forage in pastures and edible seed for nesting waterfowl.

It will tolerate mowing and its tolerance to flooding is good to excellent. Some local types can tolerate long periods of flooding, although it does not like summer inundation. It is tolerant to fire and can also be resistant to fire early in the dormant phase. It may, however, need to be mowed to carry a fire in mid-summer.
California barley: *Hordeum brachyantherum* subsp. *californicum*
Common name: California barley

Latin name: *Hordeum brachyantherum* subsp. *californicum* (Covas & Stebbins) Bothmer et al.

Former/other name(s):

Season of growth: Cool. Day-length obligate (late-spring dormant)

Reproduction/spread: Seed

Elevation range: 0 - 500 m (0 - 1,640 ft.)

Mature plant height: 70 - 80 cm (27 - 31 inches)

Flower characteristics: flowers in early May
- **Type:** Spike. 2.3 - 6 cm (.9 - 2.4 inches), mostly purplish, spikelets separate readily when mature and drop off
- **Spikelets:** 6 - 7 mm (.24 - .28 inches), in 3’s
- **Awns:** 7.5 mm (.3 inch)

Seed: Seeds mature in late spring to early summer and can be collected for 2 - 4 weeks. There are between 100,000 and 158,000 seeds/lb. If planted at a rate of 1 lb./acre, there would be approximately 3 seed/ft².

General description: California barley is a densely tufted, short-lived, fast growing, perennial, preferring spring moist soil areas like Meadow barley (*H. brachyantherum*), but is somewhat more tolerant of dry conditions. The base of the leaf blade is usually hairy, and about 2 - 3 mm (.1 inch) wide. The foliage appears soft and light green to glaucus. A “prostrate” selection grows low to the ground.

Habitat: This grass is found in meadows, pastures, streambanks, grassy slopes and dried creek beds throughout California. It does best on moist to dry soils and will tolerate alkaline conditions and clay. It typically prefers sun, but will take partial shade.

Field use notes: California barley is adapted to drier conditions than Meadow barley (*H. brachyantherum*). It is fairly tolerant to flooding if it is short in duration. It is less tolerant of flooding than *H. brachyantherum*. The young growth provides good forage, but the older spikes can be objectionable. The prostrate form is highly palatable. It is also a good groundcover, providing considerable sod but requiring very little mowing. If mowing is appropriate, it tolerates it well. It also has a fair tolerance of fire.
Baltic rush: *Juncus balticus*

Detailed information about this species is on the other side.

Yolo County Resource Conservation District
(530) 661-1688
Common name: Baltic rush, Wire rush

Latin name: *Juncus balticus* Willd. subsp. ater (Rydb.) Snogerup

Former/other name(s): *Juncus balticus* var. *eremicus*, *J. Breweri*

Season of growth: Cool

Reproduction/spread: Seed and rhizomes.

Elevation range: 0-2,200 m (7,200 ft.)

Mature plant height: 30 -110 cm (12-43 in.)

Flower characteristics: Flowers appear to be on side of stem near top of plant with 5-50 in a loose to compact inflorescence up to 7 cm (2 in.) long; flowers sessile or with a short stalk, appearing late May through August; flowers straw-colored to dark brown at maturity.

Type: Panicle-like cluster.

Spikelets:

Awns:

Seed: Fruit gray-brown to dark brown, in a capsule; more or less the same size as capsule, 0.4-0.8 mm (0.01-0.03 in.), with a small but obvious beak and no appendages; ripens early to late August.

General description: Baltic rush is a common perennial, rhizomatous wetland plant that is primarily upright in nature though portions or all of the plant may lie down, especially in water current. The erect, sometimes wiry stems arise from a creeping, unbranched rhizome. Its roots may be as deep as 40 cm (16 in.), but most are within the first 20 cm (8 in.) of soil. The stems are 1-6 mm (0.04-0.2 in.) wide, generally cylindrical, sometimes twisted. Leaf sheaths are clustered at the base and are typically straw-colored to brown.

Habitat: Baltic Rush grows in both wetland and dry upland habitats, but typically can be found growing in the permanently or seasonally saturated soils of shallow marshes, pond edges, wet meadows, and seasonally inundated or saturated flats in addition to some tidal brackish habitats. It is widely distributed throughout California, and occurs eastward to the eastern United States and northward to Alaska.

Field use notes: Baltic rush is a common component of many wetland habitats. Its dense and relatively aggressive root system and high tolerance to both drought and extensive flooding make it valuable for erosion control and soil stabilization in areas prone to intermittent or long-term flooding. It is excellent for use along ditches and swales, grassed waterways, wet meadows and pond edges. It has been shown to fix atmospheric nitrogen, which makes it an important component in the nutrient dynamics of wetland plant communities. It has fair to good forage value for cattle and sheep when actively growing, or later in the season when other forage plants have declined. It is often more palatable as hay than when growing. It is tolerant to mowing and fire and provides good wildlife cover and food. Native Americans used this rush to make baskets and mats and ate the raw shoots. It can be used in horticultural settings but needs good drainage.
Junegrass: *Koeleria macrantha*

- Mature plant
- Seed heads
- Seeds (cm)
- Seedling

Detailed information about this species is on the other side.
Common name: Junegrass, Prairie junegrass, Koelersgrass

Latin name: Koeleria macrantha (Ledeb.) Schult.

Former/other name(s): Koeleria cristata (illegitimate) Koeleria pyramidata (misapplied)

Season of growth: Cool at low elevations. Warm at higher elevations.

Reproduction/spread: Seed and spreading tillers.

Elevation range: 0-3,500 m (11,500 ft.)

Mature plant height: 20-60 cm (8-24 in.)

Flower characteristics: Dense, narrow inflorescence, 3.8-15 cm (1.5-6 in.) long; 1-2 cm (0.8 in.) wide, tapering at both ends, the lower part often slightly separated from the rest; panicle shiny and pale green or purplish, flower clusters papery; flowers in June or July.
   Type: Panicle
   Spikelets: Spikelets very flattened, 4-6 mm (0.1-0.2 in.), 2-3 flowered, tan to purplish.
   Awns: None

Seed: Seed matures August to September and there are approximately 2,315,400 seeds/lb; if planted at 1 lb/acre there will be about 53 seeds/ft².

General description: Junegrass is a cespitose, green to gray-green perennial bunchgrass with very upright culms. The flat or slightly curved leaves arise mainly from the base and are typically smooth and prominently veined; 3-25 cm (1.2-10 in.) long, 1-3 mm (0.1 in.) wide. There may be fine hairs at the branch points and main axis of the inflorescence, and near the nodes. Leaf sheaths are rounded and distinctly veined.

Habitat: Junegrass can be found in dry, open sites, clay to rocky soils, shrubland, woodland, and coniferous and alpine forests in the Northwest, Modoc Plateau, Cascade Range, Sierra Nevada, Central Western California and the White and Inyo Mountains. It is also seen in the Transverse and Peninsular Ranges, from Northern Mexico to Alaska, the central and eastern United States to eastern Canada.

Field use notes: Junegrass likes disturbed, droughty sites, is an early colonizer, and is good for stabilizing soils. It is generally not found in wetlands. This is one of the most fire-resistant bunchgrasses; it tends to burn quickly, so little heat is transferred to the roots. Plants that survive fire may produce a greater number of seed stalks so Junegrass typically reoccupies a site after fire through seeding. Late spring fires can be more damaging than early summer fires. Seedlings may be slow to start and only small plants may be apparent the first year. By the second year, seed should be produced. It has excellent palatability and forage value for all classes of livestock, although its forage production is low. It is good for wildlife in spring and in the fall after curing, less palatable during seed production. Hay quality is fair to good. In horticultural settings it will respond to summer water with sustained growth but needs good drainage. It makes an excellent native lawn, requiring mowing every three to four weeks, watering only about once a month, and no fertilizer.
California oniongrass: *Melica californica*

Mature plant

Seed heads

Seedling

Seeds

Detailed information about this species is on the other side.
**Common name:** California oniongrass, California melic

**Latin name:** *Melica californica* Scribn.

**Former/other name(s):**

**Season of growth:** Cool, obligate summer dormant.

**Reproduction/spread:** Seed. Seedling vigor is weak

**Elevation range:** 0 - 2,100 m (0 - 6,890 ft.)

**Mature plant height:** 50 - 130 cm (20 - 51 inches)

**Flower characteristics:** Flowers in May

- **Type:** panicle, narrow, dense, 4 - 30 cm, whitish, sometimes purplish
- **Spikelets:** 5 - 15 mm, 2 - 4 florets
- **Awns:** none

**Seed:** Seed matures in mid-spring and can be collected for 2 - 4 weeks. There are between 210,000 and 250,000 seeds/lb. and if planted at a rate of 1 lb./acre there will be approximately 5.3 seeds/ft².

**General description:** California oniongrass is a medium-sized, loosely tufted perennial with shiny, bright green leaves, 1 - 4 mm (up to .2 inch) wide, that are very attractive. Tiny, edible bulblets form at the base of the plant, and it also has short rhizomes. The leaf base may be smooth or hairy. It is very long-lived in some cases.

**Habitat:** This grass inhabits slopes and canyons of the foothills, oak woodlands, and sometimes meadows, brushlands, and pine forests at low to medium elevations. It is native to dry, exposed, rocky slopes and is found in Northwestern California, the Sierra Nevada foothills, the Tehachapi Mountain area, Central Western California, and the western transverse ranges. It prefers full sun to partial shade. Some ecotypes will grow on serpentine.

**Field use notes:** This species exhibits weak seedling vigor so it is often inconspicuous during the first year if included in seed mixes. It is frequently found as a colonizer of subsoil in areas of slips or road construction. It is fairly good forage for cattle, and sheep graze the young foliage early in season. It will tolerate freezing temperatures, fire, and mowing. It is not flood tolerant, however, and in fact requires well-drained soils. Avoid watering after it flowers. California melic does not mound up at the soil surface level, so after mowing it provides a smooth surface. Seeds are used by wildlife.
Coastrange melic: *Melica imperfecta*

Mature plant

Seed heads

Seedling

Seeds

Detailed information about this species is on the other side.

Yolo County Resource Conservation District

(530) 661-1688
**Common name:** Coastrange melic, Foothill melic, Coastrange oniongrass, Small-flowered melic

**Latin name:** *Melica imperfecta* Trin.

**Former/other name(s):**

**Season of growth:** Cool. Not obligate dormant.


**Elevation range:** 0 - 1,500 m (0 - 4,900 ft.)

**Mature plant height:** 50 - 110 cm (20 - 43 inches)

**Flower characteristics:** Flowers in May
- **Type:** Panicle. Extremely variable length: 5 - 36 cm (2 - 14 inches), narrow to wide
- **Spikelets:** 3.5 - 7 mm (.1 - .3 inches), commonly purplish
- **Awns:** None

**Seed:** Seed matures in mid-spring with a 2 - 4 week collection window. This is a small-seeded, grass, with slightly over 500,000 seeds/lb. If planted at a rate of 1 lb./acre, there would be approximately 11.5 seeds/ft².

**General description:** Coastrange melic is a medium sized, loosely tufted bunchgrass, found at low to medium elevations. It is slightly smaller than *M. californica*, its inflorescence is smaller, and it has fewer flowers. It is, however, long-lived and can be rhizomatous. It has shiny green leaves from 1 - 6 mm (up to .2 inch) wide. It is one of the first plants to green up in wintertime. It is also one of the first to go dormant without water, but it stays green with water, so is not obligate dormant. It is very drought tolerant and takes both sun and shade.

**Habitat:** This grass is found on dry rocky hillsides, chaparral, and in woodlands. It is native to the low to medium elevations of the inner Coast Ranges from San Diego County North to Lake County, and also the Central and South Sierra Nevada. In spite of its name, Coastrange melic also inhabits extremely dry, inland desert areas, such as the western edge of the Mojave. It prefers full sun to partial shade.

**Field use notes:** This species is a very valuable grass for revegetation in oak woodlands, and is easy to grow. It is an important inclusion in seed mixes for rocky, shallow, poor soils and south facing slopes where other grasses may have difficulty surviving, especially where long-term stabilization is important. Its extended green period makes it valuable for fire retardation along roadsides and other areas. It is long-lived, with green foliage that adds survivability and diversity to all coast-range and intercoastal range plantings. It provides valuable forage for all classes of livestock, with early growth being most palatable and succulent. Good stands have been greatly reduced by overgrazing. Its tolerance to mowing is poor if cut short and fair when mowed above 6 inches. It is not tolerant of flooding but is fairly tolerant to fire.
Deergrass: *Muhlenbergia rigens*

Mature plant

Seed heads

Seedling

 Seeds

Detailed information about this species is on the other side.
**Common name:** Deergrass, Basketgrass

**Latin name:** Muhlenbergia rigens (Benth.) Hitchc.

**Former/other name(s):**

**Season of growth:** Warm

**Reproduction/spread:** Seed. Seeds are sometimes difficult to germinate (cold stratify up to 2 months). Can be propagated by division in fall or spring. Seedling vigor affected by competition.

**Elevation range:** 0 - 2,150 m (0 - 7,054 ft.)

**Mature plant height:** 50 - 150 cm (20 - 59 inches)

**Flower characteristics:** Flowers September through October.

- **Type:** Panicle, long, whip-like, and dense, 15 - 60 cm (5.9 - 24 inches) long
- **Spikelets:** Numerous, grayish
- **Awns:** None, though sometimes a short point at the tip of the lemma

**Seed:** Seed matures in early to late fall. It may be collected for 4 - 6 weeks. There are approximately 185,500 seeds/lb., and if planted at a rate of 1 lb./acre, there will be 42 seeds/ft².

**General description:** Deergrass is a very large, showy and attractive perennial bunchgrass. It is very long-lived. The very tall culms are erect to widely spreading, lending to a full, graceful appearance. It is readily identified by its size and the long, whiplike panicle. The leaf blades are scabrous, long, and taper to a fine tip. It will stay green without summer water in many areas. It is very deep-rooted where deep soil moisture is available.

**Habitat:** This grass is found along streams, edges of meadows, seeps on hillsides, ditches, and roads from valley grasslands to the Sierra Nevada. It is native to both dry and wet places in the high Cascade Range, the outer southern Coast Ranges, the San Jacinto Mountains, and areas of the eastern Sierra Nevada, such as in the Mono and Owens Valleys. It can also be found from Monterey to San Diego County, in the Little San Bernardino Mountains and even in the Mojave Desert. It can live in dry, damp or moist conditions and in full sun to partial shade.

**Field use notes:** This species is easy to grow once germinated, but the seeds are not easy to start (see above). It re-seeds readily in areas of summer moisture such as along irrigation ditches and seeps. Once established, it tolerates extreme conditions, including short-duration flooding. It can be cut, as long as it is not too severe. The leaves have little forage value due to the coarseness of the mature clumps, but the tender, new foliage may be grazed. It is an excellent grass for border delineation and hedgerows, and is a good insectary plant. Ladybird beetles are highly dependent on deergrass for overwintering habitat and will form dense clusters in the core of the tuft. It is very tolerant to fire, and seed production can be dependent on occasional burns. Native Americans used the culms of this grass as foundations for basketry. The seed was also used for food.
Pine bluegrass: *Poa secunda* subsp. *secunda*

Mature plant

Seed heads

Seedling

Seeds

Detailed information about this species is on the other side.
**Common name:** Pine bluegrass, Sandberg bluegrass, One-sided bluegrass

**Latin name:** *Poa secunda* J. Presl subsp. *secunda*

**Former/other name(s):** *Poa scabrella, Poa secunda secunda*

**Season of growth:** Cool. Obligate dormant below 3,000 ft., early determinant in drier sites.

**Reproduction/spread:** Seed

**Elevation range:** 0 - 3,800 m (0 - 12,467 ft.)

**Mature plant height:** 15 - 100 cm (6 - 39 inches)

**Flower characteristics:** Flowers in April.
- **Type:** Panicle. Narrow, contracted, 2 - 25 cm (.8 - 10 inches), often more or less one-sided, linear and dense, with branches held close to main stalk of the flower. Spreads only when in flower.
- **Spikelets:** More or less cylindrical or a little compressed.
- **Awns:**

**Seed:** Seed matures from early spring to summer, variable, depending on elevation and ecotype. Seed can be collected over a period of 3 - 10 weeks. There are between 575,000 and 1,100,000 seeds/lb., and if planted at a rate of 1 lb./acre, there would be approximately 19.2 seeds/ft$^2$.

**General description:** Pine bluegrass is a very attractive, medium low-growing, tufted perennial bunchgrass with soft lower foliage. It is highly variable. Ecotypes from high elevations grown at low elevation are subject to rust. The culms emerge from a dense, often extensive tuft of soft, short, basal foliage. The leaf blades are usually .5 mm (.02 inch) wide and are folded or flat and may be rolled inward. They sometimes wither upon or shortly after flowering. Compared to other perennials, Pine bluegrass is very shallow rooted and has a dense rooting mass that extends beyond the perimeter of the bunch.

**Habitat:** This grass occupies many habitats throughout California, including plains, dry woods, and rocky slopes at medium and upper altitudes. It grows in semi-desert areas, foothills, grassy slopes, ridgetops, open timber, and well-drained parks. It is a common grass on dry, rocky, or sandy soils, showing luxurious growth in rich clay loam. It associates with other grasses, yarrow, pensetem, sagebrush, and rabbitbrush. Many habitats have distinct ecological subspecies and varieties. It grows in full sun, partial shade and on dry to moist soils, whether neutral, alkaline, or saline. It likes good soil and protected or open hillside sites. It needs more rainfall than the Nassellas.

**Field use notes:** *Poa secunda* is very adapted to sub-soils and shallow soils. It is also very important because of its high forage value. It is palatable and nutritious and provides good forage throughout the summer. Likewise, it tolerates mowing well. At low elevations it becomes dormant as hot dry summer approaches. It will mature early, then go into obligate dormancy after flowering in May, after which time it should no longer be watered. In cool mountains, it thrives from the time of snowmelt to late summer. Some ecotypes are associated with vernal pools and short duration flooding. It is generally unharmed by fire. The small bunch size produces little litter and early dormancy means this species “escapes” most fires. It generally increases in abundance after fire through reduced competition but fire may kill seeds in the upper soil layer. This grass is very shallow rooted. It was used by Native Americans as food.
Alkali sacaton: *Sporobolus airoides*

**Mature plant**

**Seed heads**

**Seeds (cm)**

**Seedling**

Detailed information about this species is on the other side.
Common name: Alkali sacaton, Dropseed

Latin name: Sporobolus airoides (Torr.) Torr.

Former/other name(s):

Season of growth: Warm

Reproduction/spread: Seed and tillers.

Elevation range: 0-2,100 m (6,800 ft.)

Mature plant height: 30-200 cm (12-79 in.)

Flower characteristics: Inflorescence often purple, variable in size but sometimes nearly half the entire height of the plant, 20-45 cm (8-18 in.) long, 15-25 cm (6-10 in.) wide; pyramid-shaped, the stiff slender branches and branchlets spreading widely, the lower portion may be enclosed in a sheath; flowers June to October.

Type: Panicle
Spikelets: 1-flowered, 1.3-2.8 mm (0.05-0.1 in.) long, floret breaking above the glume.
Awns: None

Seed: Fruit black, about 1 mm; approximately 1,758,000 seeds/lb; 40 seeds/ft² at 1 lb/acre; seed matures mid- to late-summer.

General description: Alkali sacaton is a large, densely cespitose perennial bunchgrass forming tough clumps. The culms are erect to spreading, 50-150 cm (1.6-5 ft.) tall, firm, shiny and hairless. The leaf sheaths are rounded and ordinarily have short hairs, sometimes longer hairs around the collar; the lower sheaths are bleached; the older ones remain around the crown. The leaf blades are flat or slightly curved inward, 5-45 cm (2-18 in.) long, 2-6 mm (0.08-0.2 in.) wide and pointed.

Habitat: Alkali sacaton is found in alkaline or saline soils in meadows and valleys, sandy soils of desert foothills or roadsides, and dry and gravelly slopes. It is most abundant on moderately or seasonally moist alkaline soils of bottomlands or plains where other species are not adapted. Its range includes the Sierra Nevada foothills, Tehachapi Mountains, southern Sacramento and San Joaquin valleys, the southern outer Coast Ranges, the southeast side of the Sierra Nevada and the desert to eastern Washington.

Field use notes: Alkali sakaton was a common element of the original California grasslands and may still occur in nearly pure stands. It provides good wildlife cover, withstands flooding, areas with high water tables, and considerable soil deposition, and is salt and drought tolerant. It has a moderate tolerance to grazing and fair to good forage value for cattle and horses. It makes fair hay when cut during or before flowering. It tolerates fire well because the loosely clustered, coarse culms burn quickly with little heat transfer to roots. It regenerates after fire through tillering and soil-stored seed. It is a good early colonizer for disturbed sites and stabilizes soil well. This is a fairly large grass and good for use in ornamental settings, similar to Deergrass, for borders or focal points.
Nodding needlegrass: *Stipa cernua*

Mature plant

Seed head

Seedling

Seeds

Detailed information about this species is on the other side.

Know Your Natives:  A Pictorial Guide To California Native Grasses

Yolo County Resource Conservation District (530) 661-1688
Common name: Nodding needlegrass, Nodding stipa

Latin name: Stipa cernua

Former/other name(s): Nassella cernua Stebbins & Love

Season of growth: Cool. Facultatively dormant

Reproduction/spread: Seed

Elevation range: 0 - 1,400 m (0 - 4,593 ft.)

Mature plant height: 30 - 100 cm (12 - 40 inches)

Flower characteristics: Flower length ranges between 15 and 80 cm (6 - 32 inches). Flowering occurs from late April - May.
- **Type:** Panicle, open with slender, flexuous branches
- **Spikelets:** Readily deciduous
- **Awns:** 45 - 110 cm (18 - 43 inches), prominent, stout, slightly twisted, bent at the end, scabrous, distant segment wavy.

Seed: Abundant seed matures in mid to late spring, with collection possible for 2 - 3 weeks. There are between 118,000 and 250,000 seeds/lb., and if planted at a rate of 1 lb./acre, there will be approximately 4.3 seeds/ft². Sharp points on the seeds are augured into the soil by the twisting action of the awns.

General description: Nodding needlegrass is a long-lived, cool season tufted perennial bunchgrass. It is very similar to N. pulchra, but generally smaller, with finer leaf blades, and the terminal segment of the awn flexuous. It also produces more flower spikes. The basal leaf blades are numerous, narrow, and glaucus.

Habitat: This grass is especially adapted to sandy, well-drained, loamy soils, but will tolerate rocky soil. It is native to chaparral and dry slopes in the Sierra foothills, the inner North and South Coast Ranges, coastal sage scrub, and Valley grasslands from Tehama to San Diego Counties. It thrives in full sun, and also grows in partial shade. It will tolerate heat and wind.

Field use notes: This Nassella is commonly found in the same areas as N. pulchra, so it can be combined with it in planting mixes. It can sometimes be a better choice than N. pulchra for lower rainfall areas, while providing many of the same benefits. It is probably one of the best grasses available for use in harsh conditions such as subsoils, low fertility soils, hot, dry meadows, roadcuts and roadsides. Although it does well in disturbed sites, and is valuable for erosion control because of its strong root system (up to 1.5 m, 60 inches), it doesn’t tolerate disturbance after planting. Some ecotypes are serpentine adapted. It will go dormant after flowering without additional water (facultatively dormant), and does best with no summer water after the first year in the ground. Small amounts of regular water may keep it green all year, but may also kill it. It is very drought tolerant, and intolerant of flooding. In dense stands, it can completely prohibit certain weeds such as yellow starthistle, and it will also tolerate low doses of glyphosate herbicide (0.5 pints/acre). Abundant seed production is usually what helps maintain natural stands in non-grazed or lightly grazed areas. It provides good early forage for grazing animals. Plants need some protection from grazing during flowering to ensure seed formation and food storage in the crown. It will take mowing, especially after seed set and will take some traffic. Once established, it is generally fire tolerant, but not fire resistant. The season of a burn is the most important factor in determining the severity of the effects on the plants. It will re-sprout after spring or fall burns, but summer burns can be damaging. Smaller plants are often less damaged by fire than larger plants because they burn less intensely and don’t smolder for long periods of time.
Indian ricegrass: *Stipa hymenoides*

Mature plant

Seed heads

Seedling for this species was not available for photography (see text)

Seeds (cm)

Detailed information about this species is on the other side.
**Common name:** Indian ricegrass, Mountain-rice

**Latin name:** *Stipa hymenoides* Roem. & Schult.

**Former/other name(s):** Achnatherum hymenoides, *Oryzopsis hymenoides*

**Season of growth:** Starts growth in early spring. Flowers in late spring.

**Reproduction/spread:** Seed and tillers.

**Elevation range:** To 3,400 m (11,100 ft.)

**Mature plant height:** 25-70 cm (10-28 in.)

**Flower characteristics:** The inflorescence is more or less open and dichotomously branched with widely spreading spikelets on the branches. The entire flower is usually longer than 12 cm (5 in.).

- **Type:** Panicle-like
- **Spikelets:** Spikelets of Indian ricegrass have just one flower on a curved stalk which is 5-30 mm (0.2-1.2 in.) long, breaking at the joints above the glumes. Florets are 3-4.5 mm (0.1-0.2 in.) with the callus sharp. The lemma is hard, more or less spheric, with hairs 2.5-6 mm (0.1-0.23 in.). The palea is enclosed by the edges of the lemma.
- **Awns:** Short, 3-6 mm (0.1-0.23 in.), deciduous, sometimes bent and twisted

**Seed:** Indian ricegrass seed matures in late spring to early summer. There are approximately 97,000 seeds/lb. It may hybridize with other species, including *Oryzopsis bloomeri*, with offspring having narrower florets and awns from 12-16 mm (0.5-0.6 in.).

**General description:** Indian ricegrass is a slender, tufted (cespitose) perennial grass that is generally upright. The flower is mostly upright with open branches. The leaf blade is rolled and less than 1 mm in diameter.

**Habitat:** This grass is common in the arid and semi-arid regions of the West, including dry, well drained, often sandy soil, desert-shrub, sagebrush shrubland, and pinyon/juniper habitats. It is found in the Cascade Range, Sierra Nevada, southwestern California, throughout the Great Basin Floristic Province and Deserts to British Columbia, the Great Plains, Texas, and northern Mexico.

**Field use notes:** Indian ricegrass is very drought tolerant. It is highly palatable to cattle, sheep, horses, and wildlife. It is especially valuable for winter grazing because the plants cure well and the lower plant parts remain somewhat green. The seeds are high in protein. It is also moderately alkali tolerant. Seeds do not germinate readily in the horticultural setting; scarification or stratification needs are not well understood. Germination in field settings will typically occur after two years. It does best in full or nearly-full sun, requires excellent drainage, and will not tolerate frequent summer water. It is good for restoring degraded areas and is a good soil stabilizer. It was used by Native Americans to make flour.
Foothill needlegrass: *Stipa lepida*

- Mature plant
- Seed heads
- Seedling
- Seeds

Detailed information about this species is on the other side.
**Common name**: Foothill needlegrass, Foothill stipa

**Latin name**: Stipa lepida Hitchc.

**Former/other name(s)**: Nassella lepida

**Season of growth**: Cool. Facultatively dormant.

**Reproduction/spread**: Seed

**Elevation range**: 0 - 1,700 m (0 - 5,577 ft.)

**Mature plant height**: 30 - 100 cm (12 - 40 inches)

**Flower characteristics**: Flowering occurs from late April through May

- **Type**: Panicle, rather slender, loose and open, 9 - 55 cm (3.5 - 22 inches) long, branches distant
- **Spikelets**: Floret 4 - 7 mm (.2 - .3 inch)
- **Awns**: Indistinctly twice bent, about 2.5 - 4 cm (1 - 1.6 inches) long, rough to the touch, farthest segment wavy

**Seed**: Seed matures from mid to late spring, and can be collected for 2 - 4 weeks. There are from 233,500 to 415,000 seeds/lb. and if planted at a rate of 1 lb./acre, there would be approximately 7.4 seeds/ft². Seed shatters less than other Nassella species.

**General description**: Foothill needlegrass is a fine bladed, medium sized, long-lived, perennial bunchgrass, with a tufted growth form. Its appearance is similar to Nassella pulchra and Nassella cernua, but has a finer texture and is more compact than N. pulchra. The culms are slender, and finely hairy below the nodes. Leaf blades are 10 - 30 cm (4 - 12 inches) long, flat, and 2 - 4 mm (.08 - .17 inch) wide, with slight hairiness on the upper surface at the base. It is perhaps the most attractive of the Nassella group of grasses.

**Habitat**: This Nassella species is adapted to the dry hills, chaparral, open woods, and rocky slopes. It is found in North Western California, Central Western California, the Coast Range along the length of California, the Channel Islands, and Baja California. It takes full sun and partial shade, and dry soil conditions. It is also adapted to disturbed sites.

**Field use notes**: Nodding needlegrass, N. pulchra, and N. lepida were probably the three most abundant grasses found in California grasslands. This Nassella takes more shade than the other two species. It handles both light and heavy soils. In seasonal riparian oak woodlands, it is an excellent bank stabilizer. It is generally fire tolerant and may benefit from fire every 2 - 4 years. The season of a burn may be the most important factor in determining the severity of the effects that the fire has on the grass. It will re-sprout after spring or fall burns, but may be damaged by mid-summer burns. Larger plants burn more intensely and are more susceptible to damage by fire than smaller ones. It is tolerant of mowing, but not of flooding. It will go dormant after flowering without additional water (facultatively dormant), and does best with no summer water after the first year in the ground. Small amounts of regular water may keep it green all year, but may also kill it. Its palatability to livestock is undetermined.
Purple needlegrass: *Stipa pulchra*

Mature plant

Seed heads

Seedling

 Seeds

Detailed information about this species is on the other side.
Common name: Purple needlegrass, Purple stipa  
Latin name: *Stipa pulchra* Hitchc.

Former/other name(s): *Nassella pulchra*

Season of growth: Cool. Starts growth in late fall or early spring. Facultatively dormant.

Reproduction/spread: Seed  
Elevation range: 0 - 1,300 m (0 - 4,265 ft.)

Mature plant height: 30 - 100 cm (12 - 40 inches)

Flower characteristics: Flowers April through May  
Type: Panicle. Loose to open 18 - 60 cm (7 - 24 inches), lower branches relatively long. Spreading and drooping when heavy with seed.  
Spikelets:  
Awns: Strongly twice bent, 3.8 - 10 cm (1.5 - 4 inches), with the end segment straight, rough to the touch, sometimes with short hairs to the second bend

Seed: Seed matures mid- to late spring, and can be collected for 2 - 4 weeks. It shatters very quickly during hot, dry weather. There are between 51,500 and 100,000 seeds/lb., and if planted at a rate of 1 lb./acre, there will be approximately 1.7 seeds/ft².

General description: Purple needlegrass is a densely tufted, long-lived, upright perennial bunchgrass with conspicuous awns. It has numerous basal leaves and a distinct nodding habit. The leaf blades are smooth to finely hairy. Basal blades are long, flat and 2.4 - 6 mm (.9 - .24 inch). It becomes dormant after seed production, but begins growth again with the first fall rains. *Nassella pulchra* is California’s state grass.

Habitat: This needlegrass species is found throughout the Central Valley and the surrounding foothills, the Central Coast and southward to San Diego County. It grows in oak woodland, chaparral, and grassland in areas receiving between 20 - 76 cm (8 and 30 inches) of rainfall. It is usually not found in dense stands, though it can be, even though it is widespread. It is well adapted to droughty soils and clay soils and grows well in full sun as well as partial shade. It is tolerant of extreme summer heat and drought conditions as well as serpentine soils.

Field use notes: This is a great plant for dryland restoration and pasture improvement because it is very long-lived and tolerates poor soils. It is valuable for erosion control because of its strong root system and it will establish well on disturbed areas and thin soils. In fact, it seems to profit from previously disturbed soils, because it is often seen sprouting on roadsides and on gopher mounds. However, the grass itself doesn’t like disturbance once it is established. It does not compete well with annual grassy or broadleaf weeds during its establishment phase because of its slow growth during the first year. It needs bare ground to re-seed, but re-seeds readily and increases its range once it is established. Stands are usually maintained by abundant seed production in non-grazed or slightly grazed areas. It greens up early in the season and provides good quality early forage for grazing animals. It needs some protection from grazing during flowering, however, to ensure formation of the seed and to allow food storage in the crown. The awns can cause livestock injury. After seeds are dropped the sharp points are drilled into the soil by the twisting and untwisting of the long awns. It has a good tolerance for mowing, especially after seed maturity, but it can be mowed earlier. Purple needlegrass is generally fire tolerant and it may benefit from a burn. In fact, it has been noted that seeds are produced more abundantly the year after a fire. The season during which the fire occurs may determine the effects on the grass. It typically will re-sprout after spring or fall burns, but not as well after summer burns. Larger plants often do not recover as well, due to higher crown temperatures. Some ecotypes have partial flood tolerance.
Desert needlegrass: *Stipa speciosa*

Mature plant

Seed heads

Seeds (cm)

Seedling

Detailed information about this species is on the other side.
**Common name:** Desert needlegrass  
**Latin name:** *Stipa speciosa* Trin & Rupr.

**Former/other name(s):** *Achnatherum speciosum*

**Season of growth:** Cool, late spring to early summer.

**Reproduction/spread:** Seed and tillers.

**Elevation range:** 1,200-2,200 m (4,025-7,200 ft.)

**Mature plant height:** Stems 30-60 cm (12-24 in.)

**Flower characteristics:** Flower white or tawny, narrow, dense and feathery-looking due to feathery awns, 10-15 cm (4-6 in.) long; flower usually partly enclosed by upper part of the sheath.

- **Type:** Panicle
- **Spikelets:** Glumes 14-20 mm (0.5-0.78 in.) long, more or less equal in size, papery and gradually narrow to a point; florets 8-9 mm (0.3-0.4 in.) with sharp callus; dense short hairs at the base of the flower parts.
- **Awns:** 35-40 mm long, sharply bent once with the first section 1.5-2 cm (0.6-0.8 in.) long; hairs of the lower segment less than 8 mm (0.3 in.).

**Seed:** Seed matures in late spring to early summer; approximately 150,000 seeds/lb. Seed production is closely tied to water availability, with less set if soil moisture is low. Seeds germinate readily.

**General description:** Desert needlegrass is a tufted perennial bunchgrass that grows generally upright and produces numerous tall seed stalks. The sheaths around the stalks are brownish and may be either smooth or hairy to felty at the base. Leaves mostly originate from the base and are elongate; leaf blades are curled inward toward the upper surface of the leaf, about 1 mm (0.04 in.) in diameter and more or less deciduous from the outer and older persistent sheaths. Roots extend into the soil 1-1.2 m (3.3-3.9 ft.) with most located in the first 0.3 m (1 ft.).

**Habitat:** Desert needlegrass is found on rocky slopes, canyons and washes in the southern Sierra Nevada, Tehachapi Mountains, the outer South Coast ranges, southwestern California, east of the Sierra Nevada (e.g., Owens and Mono Valley), and the desert to Colorado, Mexico, and South America. It is an important grass species in the understory of pinyon-juniper woodlands, sagebrush steppe, the Great Basin desert scrub and the creosote-bush communities of the Mohave Desert.

**Field use notes:** Desert needlegrass produces considerable basal foliage and is good forage while young, with protein content increasing to between 6 and 7% through June. When mature, before seed drops to the ground, the sharp-pointed seeds with long, bent awns can injure the mouths and eyes of grazing animals. Trampling and concentrated grazing can remove it from an area. It can be an effective ground cover in areas of light disturbance, but is susceptible to excessive trampling. It can be good for restoring degraded areas and is somewhat fire tolerant. In a horticultural setting it needs excellent drainage and does best in full sun.
Know Your Natives: A Pictorial Guide To California Native Grasses

Seedling Comparison

- **Bentgrass**
  - *Agrostis exarata*
- **Three-awn**
  - *Aristida ternipes var. gentilis*
- **California brome**
  - *Bromus carinatus*
- **Tufted hairgrass**
  - *Deschampsia cespitosa*
- **Blue wildrye**
  - *Elymus glaucus*
- **Big squirreltail**
  - *Elymus multisetus*
- **Slender wheatgrass**
  - *Elymus trachycaulus subsp. trachycaulus*
- **California fescue**
  - *Festuca californica*
- **Idaho fescue**
  - *Festuca idahoensis*
- **“Molate” red fescue**
  - *Festuca rubra, “Molate”*
- **Meadow barley**
  - *Hordeum brachyantherum subsp. brachyantherum*
- **California barley**
  - *Hordeum brachyantherum subsp. californicum*
- **Creeping wildrye**
  - *Elymus triticoides*
- **Coastrange melic**
  - *Melica imperfecta*
- **Deergrass**
  - *Muhlenbergia rigens*
- **Nodding needlegrass**
  - *Stipa cernua*
- **Foothill needlegrass**
  - *Stipa lepida*
- **Purple needlegrass**
  - *Stipa pulchra*
- **Pine bluegrass**
  - *Poa secunda subsp. secunda*
Glossary

Following is a listing, along with definitions, of words used in this manual and others in the description and identification of grass plants.

- **anther**: the pollen-forming portion of a stamen
- **awn**: bristle-like appendage or elongated structure, usually at the tip of the seed
- **axis**: the main direction of growth or elongation, or the midrib of a leaf
- **blade**: the expanded portion of the leaf
- **bract**: a small leaf-like plant part that is part of the flower
- **bulblet**: a small bulb produced at the base of the plant
- **callus**: the enlarged base of the floret in some Poa species that can sometimes be hairy
- **cesiptose**: with densely clumped, tufted, or cushion-like growth
- **collar**: the back of a grass leaf where the sheath meets the blade
- **culm**: the specialized, jointed stem of a grass
- **floret**: a single flower and the bracts immediately below and attached to it
- **geniculate**: bent abruptly, as a knee
- **glaucus**: covered with a generally whitish or bluish waxy or powdery film that is sometimes easily rubbed off
- **glume**: two bracts that are the lowermost parts of a spikelet
- **inflorescence**: an entire cluster of flowers and their related parts
- **lemma**: the lower, larger of two bracts directly below the grass flower
- **ligule**: an appendage, that may be fringed or membranous, where the leaf sheath and blade meet
- **lodge**: to lay over or fall flat
- **native**: occurring naturally in an area and not as a result of human activity
- **node**: the point on the stem from which the leaves arise
- **palea**: the upper, smaller of two bracts directly below the grass flower
- **panicle**: a branched flower, the lower flowers usually opening first
- **perennial**: living more than 2 years or growing seasons
- **pistil**: the female reproductive structure of a flower, consisting of the basal ovary, the stigma at the tip and the style in between
- **rhizome**: elongated, underground
- **root**: the underground, branched structure of the plant that grows into the ground from the base, providing anchorage, water and nutrient absorption and food storage
- **shatter**: to break apart
- **sheath**: the often tube-like structure that surrounds the leaf base or culm
- **spike**: an unbranched inflorescence of flowers attached without a stalk
- **spikelet**: in a panicle, the smallest grouping of florets and their parts
- **stamen**: the male reproductive parts of a flower, usually consisting of a stalk-like filament with a pollen-producing anther on the end
- **stem**: the axis of the plant
- **sterile**: not producing seed that is viable
- **stigma**: the female flower part, generally sticky or hairy, that receives the pollen
- **stolon**: a thin, elongated stem that lies on the ground, forming roots and stems at the nodes


All other diagrams of plant parts: Reprinted with permission from the 1994 American Cyanamid publication “Weed Identification, Sales Training Guide.”
Seed Head Comparison

- **Bentgrass**
  *Agrostis exarata*

- **Three-awn**
  *Aristida ternipes var. gentilis*

- **California brome**
  *Bromus carinatus*

- **Tufted hairgrass**
  *Deschampsia cespitosa*

- **Blue wildrye**
  *Elymus glaucus*

- **Big squirreltail**
  *Elymus multisetus*

- **Slender wheatgrass**
  *Elymus trachycaulus subsp. trachycaulus*

- **California fescue**
  *Festuca californica*

- **Idaho fescue**
  *Festuca idahoensis*

- **“Molate” red fescue**
  *Festuca rubra, “Molate”*

- **Meadow barley**
  *Hordeum brachyantherum subsp. brachyantherum*

- **California barley**
  *Hordeum brachyantherum subsp. californicum*

- **Creeping wildrye**
  *Elymus triticoides*

- **California oniongrass**
  *Melica californica*

- **Coastrange melic**
  *Melica imperfecta*

- **Deergrass**
  *Muhlenbergia rigens*

- **Nodding needlegrass**
  *Stipa cernua*

- **Foothill needlegrass**
  *Stipa lepida*

- **Purple needlegrass**
  *Stipa pulchra*

- **Pine bluegrass**
  *Poa secunda subsp. secunda*
Seed Mix and Seeding Rate Calculations

Nearly all of the grass species in this manual include information on the number of seeds per pound. This is a figure that should be available for every lot of commercial seed purchased. Along with it will be numbers referring to purity, such as 97%, and percent germination, such as 83%. These numbers are important in calculating the number of pounds of seed per acre needed, and the total pounds to purchase. Examples follow.

By dividing the number of seeds per pound by the number of square feet in an acre (43,560), you will arrive at the number of seeds per square foot when planted at a rate of 1 lb./acre.

Assume you were to plant 20 acres with a seed mix that includes Bromus carinatus, using seed which has approximately 80,000 seeds/lb., an 80% (.80) germination rate, and is 97% (.97) pure. You want 10 to 12 seeds/ft² of the Bromus on your planted site (there will be additional seeds in each square foot of other species as well). Typically, if planted at a rate of 1 lb./acre there would be 2 Bromus seeds/ft². Make your calculations as follows:

\[
\frac{80,000 \text{ seeds/lb}}{43,560 \text{ ft}^2/\text{acre}} = 2 \text{ seeds/ft}^2
\]

Desired: 12 viable seeds/ft²

\[
\frac{12 \text{ seeds/ft}^2}{(2 \text{ seeds/ft}^2)(.80)(.97)} = X \quad \text{where } X = \text{ number of pounds/acre}
\]

7.73 lb. = X

On 20 acres that would total (7.73 lbs.) (20 acres) = 154.6 lbs. of Bromus carinatus.

Do this calculation for each of the species in your mix, then total them up. If you are including 5 to 6 species, each having different percentages in the mix, you may end up with a total of 25 to 40 lbs./acre of seed mix on that 20 acres, or between 500 and 800 lbs. total.

Another useful calculation is the percent mix of a given species. This refers to the portions in a mix you want each species to represent. If you wanted 150 lbs. of a seed mix that included percentages by weight of the following: 30% Nassella pulchra, 15% Nassella lepida, 20% Elymus glaucus, 20% Elymus trachycaulus, and 15% Poa secunda, you might make your calculations as follows:

<table>
<thead>
<tr>
<th>Desired Species</th>
<th>Seeds/lb</th>
<th>Desired %</th>
<th>Calculation</th>
<th>No. lbs.</th>
<th>lbs. x 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stipa pulchra</td>
<td>75,000</td>
<td>30</td>
<td>30,000</td>
<td>0.4</td>
<td>40</td>
</tr>
<tr>
<td>Stipa lepida</td>
<td>300,000</td>
<td>15</td>
<td>15,000</td>
<td>0.05</td>
<td>5</td>
</tr>
<tr>
<td>Elymus glaucus</td>
<td>100,000</td>
<td>20</td>
<td>20,000</td>
<td>0.2</td>
<td>20</td>
</tr>
<tr>
<td>Elymus trachycaulus</td>
<td>80,000</td>
<td>20</td>
<td>20,000</td>
<td>0.25</td>
<td>25</td>
</tr>
<tr>
<td>Poa secunda</td>
<td>800,000</td>
<td>15</td>
<td>15,000</td>
<td>0.02</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100,000</td>
<td></td>
<td>0.92</td>
<td>92</td>
</tr>
</tbody>
</table>

An important consideration is, again, the percent germination, and purity. In the above example, on each line, divide the answer in lbs. by the germination percent and purity. This will increase the seed amount enough to correct for any impurities in the seed and the reduced germination rate. For example, if the Nassella pulchra above was 98% pure and had an 83% germination rate, do the following calculation:

Nassella pulchra: \[\frac{45 \text{ lbs.}}{(0.98)(0.83)}\] 55 lbs. Net seed weight for your mix

Alternatively, you may want a percent mix based on number of seeds (rather than weight). A simple way to think of this is to assume you want a total of 100,000 seeds, and your desired percentages of each species will be the same as in the example above. For Nassella pulchra, for example, 30% of 100,000 seeds is 30,000 seeds. To find out what part of a pound you must weigh out to get 30,000 seeds, divide 30,000 by the number of seeds per pound, in this case 75,000. Thus, if the Nassella has 75,000 seeds/lb., you would need to measure out 0.4 lb. to get 30,000 seeds. This 0.4 lb. will be combined with the other amounts of seed, once measured, to total 100,000 seeds. Since these may be quantities that are too small to work with, try multiplying each portion of a pound times 100. The result is a more workable quantity for both weighing and commercial seeding.
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Seed Comparison

Bentgrass
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Deergrass
Muhlenbergia rigens

Nodding needlegrass
Stipa cernua

Foothill needlegrass
Stipa lepida

Purple needlegrass
Stipa pulchra

Pine bluegrass
Poa secunda subsp. secunda
California Native Plant Nurseries and Seed Suppliers

Bay Natives
10 Cargo Way
San Francisco, CA 94124
415-287-6755
www.baynatives.com

California Flora Nursery
2990 Somers St.
Fulton, CA 95439
707-528-8813
www.californianursery.com

Capitol Wholesale Nursery, Inc.
2938 Everdale Dr.
San Jose, CA 95123
408-239-0589
www.capitolwholesalenursery.com

Central Coast Wilds
2336 Golf Club Dr.
Santa Cruz, CA 95060
831-459-0656
www.centralcoastwilds.com

Califlora Nursery
P.O. Box 515
Oregon House, CA 95962

Central Coast Wilds
114 Liberty Street
Santa Cruz, CA 95060
831-459-0656
www.centralcoastwilds.com

CNL Native Plant Nursery
254 Shoreline Hwy.
Mill Valley, CA 94941
www.cnpsmarin.org/native-plants

Cornflower Farms
P.O. Box 896, 9811 Sheldon Rd.
Elk Grove, CA 95759
916-689-1015
www.cornflowerfarms.com

Desert Natives Nursery
www.desertnativesnursery.com

East Bay Wilds Native Plant Nursery
www.eastbaywilds.com

El Natio Growers, Inc.
200 S. Peckham Rd.
Azusa, CA 91702
626-969-8449
www.elnativogrowers.com

Elderberry Farms Native Plant Nursery
2140 Chase Dr.
Rancho Cordova, CA 95670
www.sacvalleycups.org

Floral Native Nursery
2511 Floral Ave.
Chico, CA 95925
530-892-2511
www.floralnativenuery.com

Flourish
Placerville, CA 95667
530-919-1478
www.flourishontheweb.com

Freemontia Horticultural
10401 E. Riverside Dr.
Ontario, CA 91761
909-673-0600
https://freemontiahorticultural.com

Gold Rush Nursery
3625 N. Main St.
Soquel, CA 95073
831-359-9291
www.goldrushnursery.com

Grassroots Ecology Native Plant Nursery
3923 East Bayshore Rd.
Palo Alto, CA 94303
650-419-9880
www.grassrootsecology.org

Greenbelt Growers
2005 Harrison St.
Riverside, CA 92503
951-688-4091
www.greenbeltgrowers.com

Grow Native Nursery
Rancho Santa Ana Botanic Garden
1500 N. College Ave
Claremont, CA 91711
909-625-8767 x 404
www.rsabg.org/grow-native-nursery/gnn

Hahamongna Native Plant Nursery
4550 Oak Grove Dr.
Pasadena, CA 91103
323-405-7326
www.arroyoseco.org

Hedgerow Farms
21740 Co. Road 88
Winters, CA 95694
530-662-6847
www.hedgerowfarms.com

High Country Nursery
38460 Bailiff Rd.
Anza, CA 92539
951-837-1905
www.highcountrynursery.com

High Ranch Nursery
P.O. Box 1410, 3800 Del Mar Ave.
Loomis, CA 95650
916-562-9261
www.hrinsky.com

Intermountain Nursery
30443 Auberry Rd.
Prather, CA 93649
559-855-3113
www.intermountainnursery.com

J. L. Hudson, Seedsman
P.O. Box 337
La Honda, CA 94020-0337
www.jlhudsonseeds.net

Jug Handle Creek Farm
1501 N. Highway 1
Cazadero, CA 95420
707-964-4630
www.jughandlecreekfarm.org

Kamprath Seeds
205 Stockton Street
Manteeca, CA 95337
209-823-6242
www.kamprathseed.com

Larner Seeds
P.O. Box 407, 235 Grove Rd.
Bolinas, CA 94924
415-868-9407
www.larnerseeds.com

Las Pilitas Native Plant Nursery
3232 Las Pilitas Rd.
Santa Margarita, CA 93453
805-438-5992
www.laspilitas.com

Native Here Nursery
101 Golf Course Drive
Berkeley, CA 94708
510-549-0211
www.nativetherenuery.org

Pacific Coast Seed
53 Hawthorne Place
Livermore, CA 94550
925-373-4417
www.pcoseed.com

Rana Creek Nursery
7480 Williams Ranch Rd.
Carmel, CA 93923
831-659-2830
ranacreekdesign.com/nursery

Valley Transplants
2300 Brulata Rd.
Acampo, CA 95220
209-368-6093
native grass transplants

Yerba Buena Nursery
12511 San Mateo Rd.
Half Moon Bay, CA 94019
650-851-6688
www.yerbabuenanursery.com

Yolo County Resource Conservation District
(530) 661-1688
<table>
<thead>
<tr>
<th></th>
<th>Seedling Tray Comparison</th>
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<tbody>
<tr>
<td>1</td>
<td>Purple needlegrass</td>
</tr>
<tr>
<td></td>
<td><em>Stipa pulchra</em></td>
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<td>2</td>
<td>California oniongrass</td>
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<td></td>
<td><em>Melica californica</em></td>
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<td>3</td>
<td>Pine bluegrass</td>
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<tr>
<td></td>
<td><em>Poa secunda</em></td>
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<td>subsp. <em>secunda</em></td>
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<td>4</td>
<td>Idaho fescue</td>
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<td><em>Festuca idahoensis</em></td>
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<td>5</td>
<td>Big squirreltail</td>
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<td><em>Elymus multisetus</em></td>
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<td>6</td>
<td>Blue wildrye</td>
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<td></td>
<td><em>Elymus glaucus</em></td>
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<td>7</td>
<td>Tufted hairgrass</td>
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<td></td>
<td><em>Deschampsia cespitosa</em></td>
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<td>8</td>
<td>California brome</td>
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<td><em>Bromus carinatus</em></td>
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<td>9</td>
<td>Creeping wildrye</td>
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<td></td>
<td><em>Elymus triticoides</em></td>
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<tr>
<td>10</td>
<td>Meadow barley</td>
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<td></td>
<td><em>Hordeum brachyantherum</em></td>
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<td>subsp. <em>brachyantherum</em></td>
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<tr>
<td>11</td>
<td>California barley</td>
</tr>
<tr>
<td></td>
<td><em>Hordeum brachyantherum</em></td>
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<tr>
<td></td>
<td>subsp. <em>californicum</em></td>
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About The Yolo County Resource Conservation District

Major resource concerns for Yolo County farmers are winter storm drainage and related erosion, noxious weed management, soil fertility, and water quality and availability. Within the county there are pockets of saline and alkaline soils (associated with historic settling basins), as well as those with unique nutrient deficiencies that create limitations for some farmers, many of whom leave such areas fallow or in dryland crops. The western hilly and mountainous ground with shallow or rocky soils primarily supports annual rangeland and dryland grains.

According to our mission statement: “The Yolo County RCD is committed to protecting, improving, and sustaining the natural resources of Yolo County. We promote responsible stewardship by:
1. Demonstrating conservation practices through cooperative land users,
2. Educating the public in resource conservation and enhancement, and
3. Providing information and expertise.”

The RCD’s lines of business include education, land treatment, resource assessment, and future planning. The Board consists of local farmers and landowners, all of whom actively undertake conservation practices on their ranches and work within the community to promote resource conservation. It is their overriding concern about the degraded quality of wildlife habitat and how improvements can be made in the working farm landscape to promote wildlife in Yolo County which set the tone for the RCD’s first major grant award, the Model Farms Project. The RCD has produced a video entitled, “Working Habitats for Working Farms” which effectively presents the RCD’s concerns and vision for local agricultural and rural land management. The RCD continues to work actively toward its land stewardship goals through the numerous additional programs that support integrated resource management within the Willow Slough Watershed.

References


