

Nassella Notes



By

David Amme

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Nassella is a genus that is native to the western hemisphere. *Nassella* includes 116 species, making it one of the largest genera in the tribe Stipeae (Barkworth and Torres 2001). Argentina has the largest number of species with over 72 species. The rest of the *Nassella* species are spread out over the rest of South America, Central America, Mexico, the United States and Canada. Mexico has eight native species, five of which grow in the United States (California, New Mexico and Texas). There are five *Nassella* species growing in California, three native and two introduced. The native purple needlegrass (*N. pulchra*), nodding needlegrass (*N. cernua*) and foothill needlegrass (*N. lepida*), are confined to California and northern Baja California. The introduced *Nassella* species include *N. manicata* and *N. tenuissima*. *N. manicata* is from Chile and was misidentified by Barkworth in the Jepson Manual as *N. formicarum* (Barkworth and Torres 2001). *N. tenuissima*, known as Mexican feathergrass is native to the dry open woods of Texas, New Mexico, and northern Mexico as well as Argentina. In addition to California's three *Nassella* species, and the Mexican feathergrass, there are two other native *Nassella* species north of the Mexican border: Green needlegrass (*N. viridula*) of the western plains of the United States and Canada, and Texas needlegrass (*N. leucotricha*) of the dry open grasslands of Oklahoma, Texas and central Mexico, with a grand total of 6 native *Nassella* species north of the Mexican border.

Purple needlegrass (*N. pulchra*), our state grass candidate, has been taking the center stage of late, as indeed it should. *N. pulchra* is perhaps the most widespread native bunchgrass in California. In northern California it grows in the grasslands along the north coast and coastal hilltop "balds", and is common throughout the valley grasslands of the north coast range, the Sacramento Valley and the northern and central Sierra foothills. South of the Bay Area, *N. pulchra* is a main component of the coastal terraces and valleys of the central coast range extending south to the coastal and mesa grasslands of San Diego County and Baja California. Purple needlegrass is a medium-large, long-lived bunchgrass tolerant to summer drought and heat. It thrives in deep clayey soils, establishes itself on disturbed cut slopes and thin soils and, as a bonus, it thrives on serpentine soils as well.

N. cernua is similar to purple needlegrass in size, longevity, and drought tolerance. It is not quite as widespread as purple needlegrass and grows primarily in the inland north, central, and inner coast ranges from Tehama County, south to Baja California. Only in a few places does nodding needlegrass come close to the coast where it can mingle with purple needlegrass. Both needlegrasses grow sympatrically in the Berkeley Hills and at Elkhorn Slough near Monterey Bay.

For the untrained eye, it is difficult to distinguish nodding needlegrass from purple needlegrass. For many years both were considered *N. pulchra* (Jepson 1925, Hitchcock 1935). Ledyard Stebbins and Merton Love (1941) finally set things straight and split *N. cernua* from *N. pulchra*. The seed (caryopsis) of nodding needlegrass is narrower or more "linear" than purple needlegrass, generally smooth or glabrous, and the awn is generally longer and thinner (or finer) with a slight curl near the end. The color of the nodding needlegrass glume is pink rather

than purple, giving the mature flowering plant a pleasing pinkish hue. The seed of purple needlegrass is conspicuously wider in the middle, or from the center to the part of the seed near the base of the awn. To the neophyte, the seed appears to have a guppy-like belly. The awn of *N. pulchra* is thicker and stiffer. The seed size of nodding needlegrass is quite variable from 4-12 mm in length while that of purple needlegrass ranges from 8-10 mm in length. The awn of nodding needlegrass expresses a lot of variability (50-110 mm) reflecting the corresponding variable seed size (Figure 1). The awn of *N. pulchra* is more consistent in length ranging between 70 to 100 mm in length. *N. cernua* has a finer leaf than *N. pulchra* and is a prolific seed producer with a profuse amount of flowering culms. *N. cernua* is especially adapted to dry sandy to loamy, well-drained soils and has strong, reliable seedling vigor. Like purple needlegrass it is adapted to many harsh growing conditions including sub soils, road cuts, and disturbed soils. Sterile hybrids between purple and nodding needlegrass do exist in nature where the two species overlap. Spontaneous hybrids were observed also by Green and Bentley (1957) in a dry-range seedling trial of the two species at the San Joaquin Range Experiment Station.

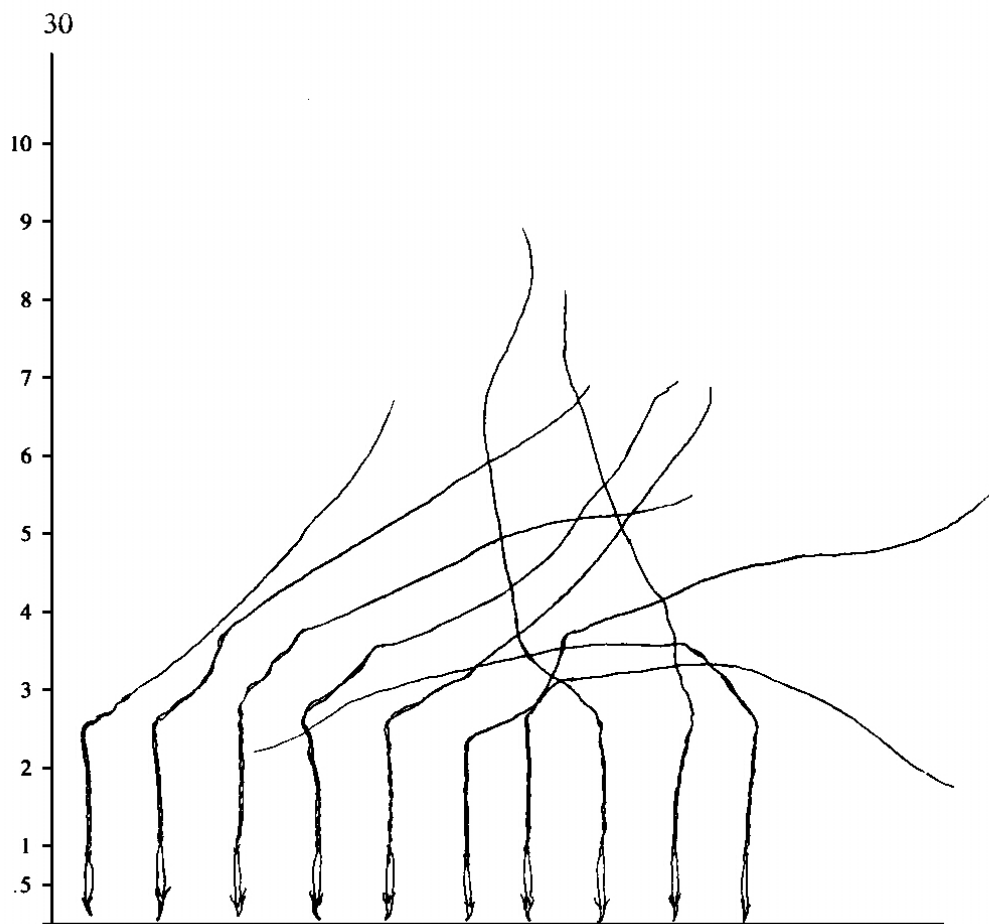


Figure 1. Variability of nodding needlegrass (*N. cernua*). Measurements are in centimeters. Illustration by Tracy Brinton

N. lepida, is a small to medium-sized bunchgrass with even finer leaves than *N. cernua*. It is commonly found in and along the margins of soft and hard chaparral brushlands in the Coast Range the length of California's coastal ranges from Humboldt County to Baja California. It is known to grow on serpentine soils. A beautiful, almost robust ecotype of foothill needlegrass is found on the serpentine ridge of Ring Mountain in Marin County (Anderson pers. comm.) Foothill needlegrass establishes quickly on disturbed sites but does not persist on clayey or loamy soils, seemingly to prefer the well-drained and rocky chaparral soils. It sometimes grows sympatric with *N. pulchra*, and occasionally forms sterile hybrids. Foothill needlegrass has the smallest seed and awn of the California native *Nassella* species. The seeds are often dark, almost black in color and range from 4-7 mm in length. The awn is rarely longer than 40 mm.

N. manicata (common name unknown) was first recognized as a different *Nassella* by the author in 1987 along the Sonoma County coast north of Jenner. It was immediately given the epithet "*Stipa* X" (Amme and Edwards 1988). Later Amme observed it on Angel Island. Everett Butts, the California Native Grass Association's current eldest elder from Lincoln, found a healthy pure stand of an interesting *Nassella* in a wet grassy swale near Humbug Creek south of Folsom, California, which turned out to be *N. manicata*. Another large stand was soon observed by a State Parks ecologist in a wet swale just east of Folsom Lake and southwest of Flagstaff Hill. Dr. Mary Barkworth, editor of the new Manual of Grasses of the United States, collected samples and initially identified it as *N. formicarum* native to Argentina and Uruguay (Hickman 1993). *N. manicata* has apparently hitched a ride to the golden state with South American vaqueros and their livestock looking for greener pastures.

Distinguishing *N. manicata* from *N. pulchra* is not easy. The seed, although similar in shape to that of *N. pulchra*, is slightly smaller and, like that of *N. cernua*, mostly glabrous. The awn is generally shorter than *N. pulchra* ranging from 40 to 80 mm in length (Figure 2) (Barkworth 2003). A pronounced and unmistakable feature of *N. manicata* is the smooth constricted neck situated at the top of the seed, just below the awn. This feature is harder to distinguish as the material dries, however, the neck remains white in color. The white, glabrous constricted neck feature is also shared with the Texas needlegrass (*N. leucotricha*). Ecologically, *N. manicata* continues to grow as long as there is moisture and thrives with irrigation, whereas, *N. pulchra* displays more summer dormancy. Under moist meadow or coastal conditions, *N. manicata* plants grow to be quite robust with many flowering culms surpassing 1.5 meters in height. In the summer season, when typical purple needlegrass plants are dormant, the *N. manicata* plants are exhibiting new growth and form two or three secondary branched flowering culms from the nodes of the main flowering stem. On sites that are ungrazed (e.g., coastal terraces and moist flats near Folsom Lake) the individual bunches of *N. manicata* are difficult to distinguish and the plants grow in large continuous stands in swales and depressions. The largest population of *N. manicata* in California is in Sonoma County between the Russian River at Jenner to the beginning of Meyers Grade Road north of Russian Gulch. Tall plants are conspicuous along the side of Highway 1. Most of the open grassland at the beginning of Meyers Grade Road is dominated by *N. manicata*. *N. manicata* is not likely to invade typical summer drought grasslands, but mesic grasslands and possibly jurisdictional wetlands will need close monitoring.

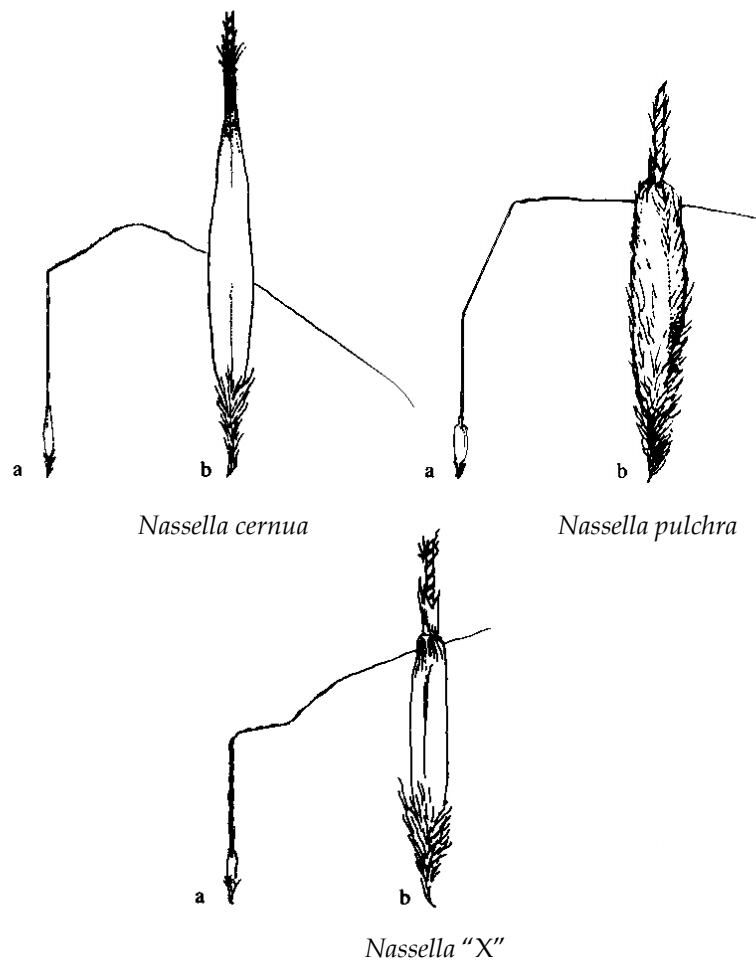


Figure 2. Comparative illustration of *N. cernua*, *N. pulchra*, and *N. manicata*: (a) caryopsis and awn x 1; (b) caryopsis detail x 6. Drawing by Tracy Briton.

N. tenuissima (Mexican feathergrass) has made its way to California through a circuitous route which the author may have had a pivotal role, having fallen in love with and collected seed of this needlegrass at Britain's famous Kew grass garden in 1987. A batch of plants soon made its way to John Greenlee, California's preeminent ornamental grass man. Within a year the horticultural trade was abuzz with this "new" ornamental wonder and the rest is history. It is easy to tell the difference between *N. tenuissima* and the native *Nassella* species. It is an attractive fine textured clumping grass that forms tufts to 60 cm (2 ft.) tall. In mid-summer the soft airy flowering culms grow only slightly above the foliage. The tufts gradually mature from a deep green to a golden brown. The seed is plump and quite small, between 1.5 and 3 mm long. The awn is thin and wispy, rarely longer than 70 mm. Mexican feathergrass is a short-lived grass, gradually falling apart with age and rarely lives longer than three years. However,

in cultivation, if there is any open disturbed ground nearby the plants quickly germinate from seed and produce many seedlings. Mexican feathergrass is now quite common in the horticultural trade with several growers producing plants in 4 inch and gallon can size containers. So far, *N. tenuissima* is an urban grass and has not established itself in the wild. It cannot compete in California's annual grasslands, but there is always a possibility that it could venture outside the garden in California's temperate coastal regions or venture into our National Forests.

Citations

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