Figure 1. Small fescue in production for seed harvesting at Hedgerow Farms. *Photo: Hedgerow Farms*

SPECIES SPOTLIGHT: **Small Fescue (*Festuca microstachys*)**

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Showy wildflowers and perennial bunchgrasses are often the most prominent species in California grasslands and are commonly planted during grassland restoration efforts. However, annual grasses and forbs are also important components of grasslands and also have significant value for restoration. As you walk through your local grassland, a closer look between bunchgrass tussocks may reveal solitary stalks or tufts of a smaller grass with narrow inflorescences on which seeds may mature earlier in the season than any of the surrounding perennial grasses. In fact, at first glance, this grass may blend in with many of the nonnative annual grasses that now dominate many of our grassland communities.

Small fescue or three weeks fescue (*Festuca microstachys,* formerly *Vulpia microstachys*) is a cool season, annual grass native to California and the broader western U.S. There is still substantial uncertainty about the extent to which native annual grasses like small fescue occurred in historical California grasslands (Corbin et al. 2007). However, small fescue was likely a significant component of native grasslands, especially on drier soils (Howard 2006). Four co-occurring varieties of the species are recognized, based primarily on spikelet *indumentum* (pattern of fine hairs).

In present-day California, small fescue is typically common-to-dominant in valleys and low foothills, growing from 0–1,500 m in elevation, with a preference for open, often disturbed sites with thin or compacted soil (Heady 1977, Howard 2006). Small fescue is smaller than most perennial bunchgrass species, producing one to a clump of stems typically under 1 foot tall. Small fescue often co-occurs with the nonnative rattail fescue (*Festuca myuros*) and can be distinguished based on the length of the first glume; for *F. myuros*, the first glume is less than half as long as the second glume. Small fescue is a fast-growing, opportunistic species and responds well after fire and other disturbances (Harrison et al. 2003). Like many grasses, seed is primarily dispersed by wind (Albertson and Weaver 1944), although seed awns provide a means for dispersal by wildlife (Howard 2006).

Small fescue is almost exclusively *cleistogamous*—meaning it has flowers that self-fertilize without opening (Howard 2006). Small fescue has been studied as a model for the effects of the resulting extreme inbreeding on genetic structure. Interestingly, although populations have been found to have extremely low rates of outcrossing (less than 1%), significant genetic variation has been found in traits such as flowering time, height, and the rate at which tillers are produced (Kannenberg and Allard 1967). A follow-up study by Adams and Allard (1982) confirmed the high degree of selfing for small fescue but also

continued next page

Small Fescue *continued*

found evidence of occasional "bursts of outcrossing" that could generate significant genetic diversity. Interestingly, small fescue is often the dominant native grass on rocky, serpentine soils (Mooney et al. 1986), and there is evidence of phenotypic plasticity and localized adaptation to serpentine conditions at the seed germination stage (Jurjavcic et al. 2002). Small fescue has also been observed around vernal pools, which suggests additional local adaptation (Emily Allen, Hedgerow Farms, personal communication). Native seed suppliers have developed collections based on both inland valley and vernal pool sources (Fig. 1).

Small fescue is recommended for use in reclamation and emergency short-term erosion control while perennial plants establish (Howard 2006). For example, small fescue is a significant component of native seed mixes being explored for planting after many of the recent, large-scale fires this summer near Clear Lake and the newly designated Berryessa Snow Mountain National Monument. Emily Allen of Hedgerow Farms notes that "small fescue is frequently used in native erosion control mixes since it germinates and establishes quickly while acting as a nurse crop for slow-growing native species." More generally, small fescue is often included in diverse native grassland seed mixes in order to complement perennial grasses and forbs (Fig. 2). For example, bunchgrasses tend to have significant interspaces between tussocks after maturity. Small fescue can establish in these gaps, utilizing space and resources that might otherwise provide opportunities for noxious invasive weeds like medusahead (*Elymus caput-medusae*), barbed goatgrass (*Aegilops triuncialis*), or yellow starthistle (*Centaurea solstitialis*). In rangeland settings, small fescue readily reseeds and can provide nutritious, palatable forage at early growth stages (Sampson et al. 1951).

The next time you are exploring a grassland in late spring, keep an eye out for seedheads of small fescue peaking out between larger clumps of perennial grasses and flowers. Native annual grass species are important components of California grasslands and valuable additions in seed mixes for restoration.

Figure 2. Small fescue (*Festuca microstachys*) planted as part of a diverse seed mix for an ongoing rangeland restoration project in Sonoma County. *Photo: Jeff Wilcox*

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