

Toe Jam Creek Germplasm bottlebrush squirreltail

Elymus elymoides (Raf.) Swezey ssp.
californicus (J.G. Sm.) Barkworth

Toe Jam Creek Germplasm is a selected class, natural-track, pre-variety germplasm of bottlebrush squirreltail released by the USDA-ARS, the Utah Agricultural Experiment Station, the USDA-NRCS, and the USDI-Bureau of Land Management in 2003.

Description

Bottlebrush squirreltail is a cool-season (C-3) bunchgrass native to the western United States. Plants are short, 6 to 22 inches tall, with culms erect to spreading. Leaf blades are flat to involute, 0.04 to 0.24 inches wide, often hairy throughout, but occasionally glabrous. The inflorescence is a spike from 0.8 to 6.7 inches long, not including the bristly awns. Awns may grow as much as 4 inches long. Plants flower from late May to August. Bottlebrush squirreltail is a self-pollinating allotetraploid that can hybridize with other species of *Elymus* as well as with members of *Hordeum* (barley) and *Pseudoroegneria* (bluebunch wheatgrass).

Elymus elymoides ssp. *californicus* grows at middle to alpine elevations in the western states. Five or six non-bifurcated glumes will be present at each node in the spike, distinguishing ssp. *californicus* from other *E. elymoides* subspecies.

Source

Toe Jam Creek Germplasm bottlebrush squirreltail was selected from a collection made in Elko County, Nevada. The collection site is classified as Major Land Resource Area (MLRA) 25 (Owyhee High Plateau) and as Level III Ecoregion 80 (Northern Great Basin). The collection site is at 6,000 feet with an estimated annual precipitation of 12 inches.

Conservation Uses

Potential uses of Toe Jam Creek Germplasm bottlebrush squirreltail include rangeland restoration, rehabilitation, or reclamation. Bottlebrush squirreltail is a short-lived perennial that can act as an early-seral species by competing with and replacing annual weedy species following disturbance. Its ability to germinate in late fall and very early spring allow it to compete with cheatgrass (*Bromus tectorum*) and other invasive weeds.

Area of Adaptation and Use

Toe Jam Creek Germplasm bottlebrush squirreltail is recommended for use in the Great Basin of Nevada, Oregon, Idaho, and Utah and the Lower Snake River Plain of Idaho. It is adapted to loam and sandy loam soils receiving 8 to 14 inches of annual precipitation.

Establishment and Management for Conservation Plantings

For pure stands, the recommended seeding rate for bottlebrush squirreltail is 7 pure live seed (PLS) pounds per acre if planted with a drill and approximately 14 PLS pounds per acre if broadcasted. Seeding rate should be adjusted to reflect desired percentage in the seed mix. There are approximately 190,000 seeds of bottlebrush squirreltail in a pound.

Bottlebrush squirreltail seed can be planted in early spring, but late fall dormant seeding is recommended for best competition with cool-season annual weeds. Seed should be planted into a firm, weed-free seedbed at a depth of ¼ to ½ inch. Broadcast seeding should be followed with a cultipacker to provide good seed to soil contact.

Protect new plantings from grazing for at least two growing seasons. Mature stands should be protected from heavy grazing, especially during flowering, to ensure sufficient seed production to maintain the stand.



Figure 1. Seed production field of Toe Jam Creek Germplasm bottlebrush squirreltail. Photo courtesy of Paul Herrman, L&H Seeds, Connell, WA.

Ecological Considerations

Bottlebrush squirreltail is known to be susceptible to rust, but this is only a major concern for commercial seed production.

Seed and Plant Production

For seed production, plant in 36 inch rows at a rate of 2.4 PLS lb/ac for 30 PLS per foot of row. Soil should be kept moist during the germination phase (14-28 days). No fertilizer should be applied during the first year to discourage annual weed competition. Broadleaf weeds can be controlled with herbicide while general weed control can be achieved with between-row cultivation. Fertilize established fields at approximately 100 pounds nitrogen and 40 pounds phosphorus per acre in mid-September. Soil testing is recommended to ensure appropriate rates of fertilizer application.

Seed is ready to harvest in about mid-July of the second growing season. Harvest by windrowing followed by combining to reduce seed loss. Flail-vac and seed stripping harvesting equipment have also been used with varying degrees of success.

Bottlebrush squirreltail produces a large amount of inert material (awns and glumes) and is a very time-consuming species to clean. Toe Jam Creek Germplasm produces a lighter awn mass than other squirreltails, making it easier to clean. Thresh seed through a hammer mill to remove awns. Follow with a clipper or other separator.

Seed yields under irrigated conditions average approximately 200 lb/ac. Harvested seed should be dried to 12% or less moisture before storing. Storing seed in a cool dry environment will sustain viability for several years.

Availability

For conservation use: Toe Jam Creek Germplasm bottlebrush squirreltail is available from the commercial seed market.

For seed or plant increase: Seed of the G3 generation is maintained by the USDA-ARS Forage and Range Research Laboratory, Logan, UT, and is available to growers for production through the Utah Crop Improvement Association. The original release allowed for production through G6; however, due to high demand, production was extended to G9 by USDA-ARS. Genetic shift from the extended generations is unlikely as this is a self-pollinating species. Seed through the G9 generation is eligible for certification, but sale of Toe Jam Creek Germplasm seed beyond the G9 generation is expressly prohibited. Small quantities of seed are available for researchers upon request.

Citation

Release Brochure for Toe Jam Creek Germplasm bottlebrush squirreltail (*Elymus elymoides* ssp. *californicus*). 2022. USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center. Aberdeen, Idaho.



Figure 2. Collection location of Toe Jam Creek Germplasm bottlebrush squirreltail.

For additional information about this and other plants, please contact your local USDA Service Center, NRCS field office, or Conservation District <<http://www.nrcs.usda.gov>>, and visit the PLANTS Web site <<http://plants.usda.gov>> or the Plant Materials Program Web site <<http://www.plant-materials.nrcs.usda.gov>>

For more information, contact:

Aberdeen Plant Materials Center

1691 A South 2700 West, Aberdeen, ID 83210

Phone: 209-397-4133

<https://www.plant-materials.nrcs.usda.gov/idpmc/>



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