

# Sand Hollow Germplasm

## big squirreltail

*Elymus multisetus* M.E. Jones

Sand Hollow Germplasm is a selected class, natural-track, pre-variety germplasm of big squirreltail released by the USDA-ARS, the Utah Agricultural Experiment Station, and the USDA-NRCS in 1996.

### Description

Big squirreltail is a cool-season (C-3) bunchgrass native to the western United States. Plants are short, 6 to 24 inches tall, with culms erect to ascending. 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. Big squirreltail self-pollinates and can hybridize with other species of *Elymus* as well as with members of *Hordeum* (barley) and *Pseudoroegneria* (bluebunch wheatgrass). Big squirreltail can be distinguished from other squirreltails by its glumes, which are always 3- or more-cleft.

*Elymus multisetus* grows at low to middle elevations in the western states. It is typically found in mesic sites in and near mountain foothills.

### Source

Sand Hollow Germplasm was collected from the driest portion of big squirreltail's distribution at a site in Gem County, Idaho. The collection site is at 2,720 feet with an estimated annual precipitation of 11 inches. The area is classified as Major Land Resource Area (MLRA) 10 (Snake River Plains) along the transition with MLRA 11 (Central Rocky and Blue Mountain Foothills), and as Level III Ecoregion 12 (Snake River Plain).

### Conservation Uses

Potential uses of Sand Hollow Germplasm big squirreltail include rangeland restoration, rehabilitation, or reclamation. Big 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 annual grasses.

### Area of Adaptation and Use

Sand Hollow Germplasm big squirreltail is recommended for use in the Snake River Plain of Idaho and adjacent regions in Nevada, Oregon and Utah. It is adapted to sandy soils but has performed well on silt loam and silty clay loam soils. Sand Hollow Germplasm was released as a selected class germplasm for high seed production, higher-than-average seed weight, and late heading date. No intentional genetic selection has been practiced on the original collection.

### Establishment and Management for Conservation Plantings

For pure stands, the recommended seeding rate for big 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 big squirreltail in a pound.

Big 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.



Figure 1. Sand Hollow Germplasm big squirreltail. Photo by Dale Nielson, USDA-ARS.

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.

### Ecological Considerations

Squirreltails are 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. Seed harvest requires close attention because of big squirreltail's tendency to shatter. 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.

Big squirreltail produces a large amount of inert material (awns and glumes) and is a very time-consuming species to clean. Care must be taken in debearding to avoid seed damage. Thresh with a hammermill 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:* Sand Hollow Germplasm big squirreltail is available from the commercial seed market.

*For seed or plant increase:* Seed of the G2 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. Generations 3 and 4 are eligible for seed certification. Small quantities of seed are available for researchers upon request.

### Citation

Release Brochure for Sand Hollow Germplasm big squirreltail (*Elymus multisetus*). 2022. USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center. Aberdeen, Idaho.



Figure 2. Collection location of Sand Hollow Germplasm big 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/>



*Helping People Help The Land*

USDA IS AN EQUAL OPPORTUNITY PROVIDER, EMPLOYER AND LENDER.