

About the Great Basin Plant Materials Center

The Great Basin Plant Materials Center (Great Basin PMC) is operated by the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) in cooperation with University of Nevada, Reno, College of Agriculture, Biotechnology and Natural Resources. The purpose of the Plant Materials Program is to collect, select, and release plant materials for conservation use; develop techniques for successful use and management of conservation plants; facilitate the commercial increase of conservation plants; provide effective plant science-based technology to solve conservation problems; and use plant sciences and technology to meet the goals and objectives of the USDA and NRCS.

To accomplish this, NRCS operates 27 Plant Materials Centers nationwide. The Great Basin PMC is the newest center, established in September 2006. The Great Basin PMC serves the Great Basin of Nevada and additional adjoining desert regions. Our service area is bordered on the east by the Bonneville Basin in Utah; on the south by the Mojave Desert; to the southwest it includes parts of Owens and Death Valleys in California; to the northwest, it includes the Modoc Plateau in California; and to the north, it includes the Lake and Harney Basins in south-central Oregon.

The mission of Great Basin PMC is to develop, test, and transfer plant science and technology for conservation programs in our Service Area. To fulfill this mission, Great Basin PMC is conducting field trials of native plants representing Great Basin genetics for Nevada conditions. Great Basin PMC projects include conducting pollinator conservation work with Xerces Society; an Inter-Center Strain Trial of bottlebrush squirreltail grass selections developed by western PMCs; an adaptation trial of Searls prairie clover in cooperation with USDA Agricultural Research Service (ARS) Forage and Range Research Lab, Logan; and a Sandberg bluegrass common garden study in cooperation with USDA Humboldt-Toiyabe National Forest. Other studies include revegetation research at the Rosaschi Ranch on the East Walker River, demonstration plantings, a People's Garden, and cover crop and alternative crop trials.

Habitat for Native Bees and Butterflies

Great Basin PMC is collaborating with the Xerces Society on pollinator habitat for the Great Basin. Milkweeds (genus *Asclepias*) are the host plant for the monarch butterfly (*Danaus plexippus*), that is in serious decline nationwide. Great Basin PMC provided seed of two species of milkweed that Xerces has used to start commercial seed production. Two publications, one on milkweeds of the Great Basin and another on pollinator plantings for Nevada, are currently in final review stages. Great Basin PMC collaborated with the Corvallis PMC on a plant fact sheet for showy milkweed (*Asclepias speciosa*). Great Basin PMC personnel plan to harvest seed of showy milkweed for Xerces Society again this year.



Out-Competing Invasive Range Weeds

Great Basin PMC is participating in a regional field test of five bottlebrush squirreltail (*Elymus elymoides*) accessions, each a genetically distinct subspecies selection associated with a different ecoregion. It is hoped that among these perennial rangeland grasses there may be one or more with sufficient vigor and broad adaptation that seedlings will have the ability to establish and compete in Great Basin rangeland areas infested with two annual weeds: cheatgrass (*Bromus tectorum*) and medusahead rye (*Taeniatherum caput-medusae*).

The entries in this trial are 'Fish Creek' Selected Germplasm (*E. elymoides* ssp. *Elymoides*), 'Wapiti' Germplasm (*E. elymoides* ssp. *Brevifolius*), '9099275' (*E. elymoides* ssp. *Brevifolius*), 'Toe Jam' Selected Germplasm (*E. elymoides* ssp. *Californicus*), and 'Tusas' Germplasm (*E. elymoides* ssp. *Brevifolius*).

The Upper Colorado Environmental Plant Center (EPC) provided seed for this trial of an experimental accession of bottlebrush squirreltail 9092275 that shows promise for potential release. The Upper Colorado EPC and ARS released Wapiti in 2005. ARS and NRCS released the Selected Germplasm accessions Toe Jam and Fish Creek in 2003. Tusas Germplasm was released in 2001 by NRCS and New Mexico State University. Seeds were planted at the Great Basin PMC in September 2011 in a randomized block design with three replications using a cone seeder on a no-till drill. This trial is one location of an identical trial planted at PMCs in Colorado, Idaho, Montana, and New Mexico. Plots were irrigated for establishment and have been grown without irrigation this year.



Adapted Native Plants for Range Improvement

Legumes are valuable for rangeland revegetation in the Great Basin because they provide food for insects, birds and other wildlife, and forage for livestock, as well as benefitting the soil by fixing nitrogen. Many native legumes are toxic loco-weeds and could kill cattle if planted, but Searls prairie clover (*Dalea searlsiae*) is a non-toxic, perennial legume. It was first collected in 1871 near the Pahrangat Mountains in southeastern Nevada. Plants produced at the ARS Forage and Range Research Lab at Logan, Utah were brought to Fallon by Dr. Doug Johnson, ARS, who collected the seed in southern Nevada in 2005. Although the plant has been studied extensively at Logan and grown at other locations, this is the first time this plant material has been grown for research in Nevada. To test adaptation at this location, after this establishment year, no further irrigations will be applied.



Dr. Doug Johnson, in background using the dibble, was accompanied by his graduate student Zhao Fan, center foreground. Albert Mulder, NRCS State Agronomist (on left) from the Nevada State Office assists with the planting, and Mat Humphrey (on right) Biological Science Technician with GBPMC is laying out rows of seedling plants in nursery cones.



Searls prairie clover grows well transplanted into weed barrier landscape fabric in the sandy soil at the Great Basin PMC. Over 90 percent of the transplants established, flowered, and are producing seed. The small purple flowers are very attractive to honey bees and native bees. Seed production looks good in this first year.

Native Grass to Restore Forest Land After Wildfire

The USFS Humboldt-Toiyabe National Forest is supporting a common garden study of Sandberg bluegrass (*Poa secunda*) for potential seed production for restoration after wildfire. Sandberg bluegrass seed that is currently available commercially originated from plants collected outside of the Great Basin. In order to establish a supply of locally-adapted seed, Forest Service personnel collected seed of Sandberg bluegrass from National Forest lands in Nevada. The seed and funding for this project were provided through an Interagency Agreement. Seeds of 190 maternal plants from 38 locations were grown in the greenhouse in February 2011. Two commercially available PMC releases, 'Opportunity' and 'High Plains', were grown as check varieties. Plants from the greenhouse were transplanted into landscape fabric in the field in early June 2011 to evaluate growth at this location. The field was flood irrigated during the summer, and plants looked good at the end of the irrigation season. Dry winter weather (see graph, below right) killed most of the plants. The survivors were evaluated for growth and vigor in early May 2012.

The harsh, dry winter provided a first round of selection by eliminating plants that could not survive the climate and soil conditions at the Great Basin PMC. Several of the survivors exhibited greater growth, vigor, and survival percentage than the check varieties. Seeds of the surviving check variety plants and the surviving entries in the trial were harvested by hand in June 2012. In August, seeds from the two check varieties and 18 survivors were planted into 1 cm cells, 80 cells per maternal plant. The seedlings will be transplanted to cone-tainers after their roots have developed enough to form a firm plug. The cone-tainer plugs will be transplanted into row-cover fabric in the fall. The common garden will be flood irrigated as needed to promote growth and root establishment until the end of the irrigation season.

