



Annual Progress Report of Activities 2012

USDA NRCS Great Basin Plant Materials Center
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A new dawn for the headhouse and greenhouse at the Great Basin Plant Materials Center.

Sandberg Bluegrass Common Garden Study

Sandberg bluegrass *Poa secunda* is an important native desert forage species. The USDA Forest Service is working with Great Basin PMC to find desirable accessions with local genetics. Currently available accessions are derived from Sandberg bluegrass populations outside of the Great Basin. Humboldt-Toiyabe National Forest personnel collected seed of 181 maternal plants of Sandberg bluegrass from 32 native populations in Nevada. Plants were started in the GBPMC greenhouse and a common garden study was planted in June 2011 and irrigated into November. Two NRCS releases were used as check varieties; 'High Plains' from Wyoming and 'Opportunity' from Montana. All of the plants looked quite healthy going into winter.

Winter precipitation at Fallon from October 1, 2011 to March 31, 2012 totaled 1.36 inches. Due to the dry winter, 96.3 percent of the plants died. Of the 25 surviving plants, four were the check variety

'Opportunity' (out of ten planted), two were the check 'High Plains' (out of ten planted) and the 19 other surviving plants were from the Nevada collections. By June, 2012, two of the survivors in the Nevada collections had greater survival, growth, and vigor than either of the check varieties.



The check 'Opportunity' compared to entry 129.

In June 2012, seed was collected from the surviving plants, including the two check varieties, and planted in the greenhouse in August. The seedlings were grown in the greenhouse until October 24, when they were planted into row-cover fabric in the field in a new common garden study.



Planting Sandberg bluegrass in fabric row cover.

Plants will be evaluated for survival and growth compared to the check accessions 'Opportunity' and 'High Plains'. The ultimate goal is release of an accession for revegetation on National Forest lands in Nevada. Seed from desirable Nevada germplasm Sandberg bluegrass selections will be increased for further off-center tests in rangeland and forest sites.

Searls Prairie Clover Adaptation Trial with ARS

USDA Agricultural Research Service, Forage and Range Research Laboratory, Logan UT, collected seed of Searls prairie clover *Dalea searlsiae*, in south-central Nevada in 2005. Plants grown in Logan were brought to Great Basin PMC by Dr. Doug Johnson of the ARS to test the growth and longevity in the sandy soil and arid environment of the Great Basin in Nevada. Additional species provided by ARS for evaluation at this site were basalt milkvetch *Astragalus filipes*, and 'Majestic' western prairie clover *Dalea ornata*. Approximately 1000 plants of each species were planted into row cover fabric. The two species of prairie clover grew well, particularly the Searls prairie clover.



Searls prairie clover in flower, summer 2012.

Each species will be evaluated for regrowth in the second year, and long-term survival without irrigation will be monitored in subsequent years.

Field Day in Conjunction with the University of Nevada Reno Cooperative Extension

The PMC held a Field Day on September 6, 2012, in conjunction with University of Nevada Cooperative Extension. PMC topics included specialized farm equipment used by the PMC, greenhouse plant production, and field trials of native plants for conservation uses. Cooperative Extension showed alternative crops including a canola trial at the PMC, and teff, hops, and tomato production in high tunnel hoop houses at off-site locations.



Dr. Eldredge explains the benefits of row cover fabric beds for native plant research at GBPMC.

Modifications to the Cone Seeder Attachment for a No-Till Drill

During winter of 2012, extensive modifications were made to a cone seeder attachment for the no-till drill. The main improvement was to re-position the cone seeder assembly higher and farther forward to make the seed drop tubes more vertical. A work surface was built around the cone, and brackets to carry rods of prepared seed envelopes were added.



Cone seeder is interchangeable with the seed boxes.

These improvements will greatly improve the ability of Great Basin PMC to conduct replicated field trials of conservation plants for rangeland reseeding.

Xerces Society Milkweed Project

The GBPMC is cooperating with the Xerces Society for Invertebrate Conservation to study and produce seed of two species of milkweed that are used by monarch butterfly *Danaus plexippus* larvae and adults; showy milkweed *Asclepias speciosa*, and narrowleaf milkweed *Asclepias fascicularis*.

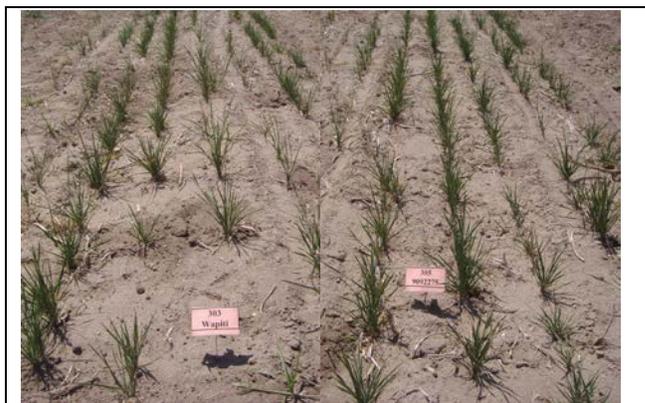
GBPMC and Xerces Society prepared a Technical Note on Great Basin Native Milkweeds and their benefits to pollinators which is online: <http://plant-materials.nrcs.usda.gov/nvpmc/publications.html>.

Seed from the Monarch Waystation at GBPMC was harvested again in 2012, the third consecutive year

we have provided this valuable assistance. The seed was sent to Xerces Society in Portland, OR, for final cleaning and yielded 590g of showy milkweed seed and 118g of narrowleaf milkweed seed. Xerces Society distributes the seed to conservation partners who will establish milkweed plantings to benefit butterflies, native bees, and other pollinators.

Bottlebrush Squirreltail Inter-center Strain Trial

The GBPMC established an inter-center strain trial to compare five accessions ("strains") of bottlebrush squirreltail *Elymus elymoides* for growth and productivity in the Great Basin. Regional adaptation of the accessions will be compared to results of identical trials conducted at other PMCs throughout the West.



Comparison of Wapiti and 9092275 plots in their first year at Great Basin Plant Materials Center.

Seeds were planted at the GBPMC in October, 2011 in a randomized block design with 3 replications using a cone seeder on a no-till drill. The plants were irrigated for establishment in the fall and were not irrigated in summer of 2012. The trial will receive no further irrigation at this site. This trial is one of identical trials planted at PMCs in Arizona Colorado, Idaho, Montana, and New Mexico. Each entry is a genetically distinct selection associated with a different ecoregion.

1. Fish Creek Selected Germplasm (*E. elymoides* ssp. *elymoides*) ARS and NRCS release in 2003.

2. Wapiti Germplasm (*E. elymoides* ssp. *brevifolius*) Upper Colorado Environmental Plant Center and ARS release in 2005.
3. 9092275 (*E. elymoides* ssp. *brevifolius*), Upper Colorado Environmental Plant Center, experimental.
4. Toe Jam Selected Germplasm (*E. elymoides* ssp. *californicus*) ARS and NRCS release in 2003.
5. Tusas Germplasm (*E. elymoides* ssp. *brevifolius*) NRCS and New Mexico State University release in 2001.

We hope to find among these releases one that will establish and compete in arid rangelands infested with the annual weeds cheatgrass *Bromus tectorum* and medusahead rye *Taeniatherum caput-medusae*.

Great Basin Plant Materials Center Mission

The Great Basin Plant Materials Center (GBPMC) located near Fallon, Nevada, was established in September, 2006. It is the newest of 27 Plant Materials Centers throughout the United States.

The Great Basin PMC is responsible for research on conservation plants and cultural techniques for their effective use within the eight Great Basin Major Land Resource Areas: 1) the Klamath and Shasta Valleys and Basins, 2) Malheur High Plateau, 3) Humboldt Area, 4) Owyhee High Plateau, 5) Carson Basin and Mountains, 6) Fallon-Lovelock Area, 7) Central Nevada Basin and Range, and 8) the Southern Nevada Basin and Range.

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