



**Great Basin
Plant Materials Center**
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<http://www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/pmc/west/nvpmc/>

2013 Annual Progress Report of Activities

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Mission and Objectives

The Great Basin Plant Materials Center (GBPMC) is operated by the United States Department of Agriculture Natural Resources Conservation Service. It is the newest PMC in the nationwide network of PMCs, bringing the total to 27. The mission of the Plant Materials Program is to develop, test and transfer effective state-of-the-art plant science technology to meet the nation's natural resource conservation needs.

To accomplish this mission, we identify superior accessions (collections) of adapted plants, which are then tested both on the PMC and in a variety of habitats at off-PMC sites. Superior accessions identified through the testing program will then be produced as seed, cuttings, or transplants, depending upon the type of plant and its intended use. Plant materials are then released for commercial production by local growers to be made available for conservation plantings. We also provide technical guidance in plant production and management techniques. Evaluation and use of native plant materials is emphasized.

Important conservation objectives addressed at the Great Basin PMC are to:

- Investigate native plant species for use in conservation practices in the Great Basin
- Control erosion on rangeland and crop land and stabilize critical areas
- Improve forage production on rangeland and pasture
- Improve habitat for fish, birds, insects, and other wildlife.

There are also national PMC priority mission objectives:

- Pollinator conservation and habitat improvement
- Transition to organic from conventional farming and ranching systems
- Biochar, carbon sequestration, and biofuels
- Soil Health and Cover Crops
- Greater sage grouse population recovery

About the Great Basin Plant Materials Center

GBPMC is on land that is leased from the University of Nevada, Reno. GBPMC has a land area of 95 acres with 80 acres irrigated.

Buildings completed for the GBPMC include a shop/warehouse building, a greenhouse with headhouse, and an equipment shelter. Smaller structures include a modular pesticide storage, a diesel fuel tank, and a flammables storage. A 14 x 19 ft. office space is inside the shop/warehouse building.

Tour for the State Conservationist's PMC Advisory Committee

An interested audience of about 30 people attended a field tour on May 30, 2013 in conjunction with the State Conservationist's PMC Advisory Committee Meeting. Members of the Advisory Committee toured the PMC to get an on-the-ground look at the current condition of the facility during the transition to a PMC. The group heard explanations on the uses of specialized equipment, and viewed presentations of ongoing plant research and production projects in the fields.



PMC Manager Eric Eldredge (left) presents the Bottlebrush Squirreltail Intercenter Strain Trial to the State Conservationist's Plant Materials Advisory Committee.

One concern identified by the STC Advisory Committee, in the meeting that followed the tour, was the need for seed of a greater diversity of native forbs to improve habitat conditions for greater sage grouse *Centrocercus urophasianus*. Sage grouse chicks need abundant forbs, and the lepidopterous larvae, ants, beetles, and other insects associated with those forbs, to achieve sufficient growth to survive their first winter. Native forbs need native bees if they are to reseed and persist in the landscape, and the pollinator population depends upon the nectar and pollen forbs provide. Historically, more emphasis has been placed on the development of native forage grasses for sage-steppe restoration.

Three Native Legumes at GBPMC

Two species of prairie clover *Dalea searlsiae*, Searls prairie clover, and *Dalea ornata*, Blue Mountain prairie clover 'Majestic', and one milkvetch *Astragalus filipes*, basalt milkvetch, were grown at GBPMC to test their adaptation to Great Basin soil and climate conditions. Legumes are an important component of the sage-steppe forb community because they improve the soil by fixing nitrogen and they provide nectar and pollen for native bees. Many of the native legumes are toxic to livestock, especially loco-weeds in the genus *Astragalus*. This *Astragalus* is relatively non-toxic. First year mortality of the basalt milkvetch was over 90 percent, suggesting that it is not well adapted to the sandy soil and hot, dry conditions at Fallon.



Astragalus filipes, between *Poa secunda* plants.

Both species of *Dalea* grew quite well, with 80 percent survival of Majestic and 95 percent survival of Searls.



Dalea searlsiae growing in weed barrier fabric.

Seed of both species was harvested multiple times using a modified shop vacuum. Searls seed could be cleaned on a clipper, while Majestic needed a preliminary pass through a brush machine to separate the seed from the calyces.



Dalea ornata growing in weed barrier fabric.

Over 9 pounds of cleaned seed of Majestic, and 2 pounds of cleaned seed of Searls prairie clover

were returned to the USDA Agricultural Research Service Forage and Range Research Laboratory at Logan, UT. The *Dalea* plantings at GBPMC are separated by more than 1,500 ft. to reduce the possibility of cross-pollination. The plants will continue to be evaluated for their long-term survival and seed productivity.

Xerces Society Pollinator Short Course

On May 3, 2013, a pollinator short course with over 60 attendees was held at the Western Nevada Community College in Fallon. Jessa Guisse and Jennifer Hopwood of The Xerces Society for Invertebrate Conservation gave classroom presentations on methods to increase nectar and pollen resources, create nesting sites, and reduce risks to pollinators from insecticides. The PMC manager gave a presentation on pollinator plant selection and seed sources. Following the day of classroom instruction, the course was concluded with a tour of the PMC.



GBPMC Manager Eric Eldredge explains a tool used for burning the planting holes in weed barrier fabric to the tour group on the Xerces Society Pollinator Short Course. The bed-forming implement that installs the weed barrier fabric is in the foreground.

An Unusual Plant Found on the PMC

A unusual plant was found growing in a highly saline area at GBPMC in July, in association with saltgrass *Distichlis spicata*, and common purslane *Portulaca oleracea*. It was found by Mat Humphrey, the Biological Science Technician at the GBPMC, and was identified by the PMC Manager as desert horsepurslane, *Trianthema portulacastrum*, a succulent, prostrate, branching annual in the Aizoaceae. This native halophyte was not previously

reported in Nevada north of the Mojave Desert in southern Clark County.



Desert horsepurslane growing with common purslane *Portulaca oleracea*, shown with a dime in the foreground for scale.

Desert horsepurslane can be a weed in some cropping systems in southern states. The plant is distributed worldwide and is used as a salad vegetable or potherb in some cultures, although it contains oxalic acid. Herbarium specimens were collected and prepared by the University of Nevada Reno botanist, Jerry Tiehm. USDA PLANTS database personnel were notified of the discovery to update the distribution map. Its presence on the PMC is a mystery, but one explanation may be that the seed could have been transported north by migratory waterfowl such as the mallard ducks *Anas platyrhynchos* or white-faced ibis *Plegadis chihi* that visit the field in large flocks during, and for about a day after, flood irrigation.

Investigation of Milkweed Stand Decline

Showy milkweed *Asclepias speciosa* is an important host plant for the Monarch butterfly *Danaus plexippus*. Showy milkweed is also a host for several species of milkweed beetles. Reports in the literature suggest that the four-eyed milkweed beetle *Tetraopes tetraphthalmus* does not reduce milkweed stands in the Great Plains. In the Great Basin, the red-femured milkweed beetle *Tetraopes femoratus* is more common. Results shown in the following series of pictures taken at the Great Basin PMC suggest that in this environment, the feeding by *T. femoratus* larvae in the rhizome system, and associated secondary decay, can cause decline of a showy milkweed population.



Several individuals of cobalt milkweed beetle *Chrysochus cobaltinus*, on a milkweed along with a red-femured milkweed beetle *Tetraopes femoratus* (note striped antennae).



Discoloration and wilt symptoms on inflorescences.



Healthy showy milkweed as it looked in 2011.



An adult *Tetraopes femoratus* shares an *Asclepias speciosa* with a *Danaus plexippus* larva.



Severe decline in the milkweed stand as seen in 2013.



A rhizome split open to show secondary decay associated with the larval feeding gallery, and two larvae, at the 5 and 11 on the cm scale.



Typical wilt symptoms on a milkweed ramet.



Tetraopes femoratus; adult, pupa, and four larval instars.

For additional information visit GBPMC website at: <http://www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/pmc/west/nvpmc/>