



Great Basin Plant Materials Center 2011 Progress Report of Activities



A western pygmy blue butterfly (*Brepheidium exilis*) on its weed host prickly Russian thistle (*Salsola tragus*).

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The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Great Basin Plant Materials Center (GBPMC) located near Fallon, Nevada, was established in 2006. It is the newest of 27 Plant Materials Centers throughout the United States and is currently under development. The Great Basin Plant Materials Center was established to evaluate and select plant materials and techniques for resource conservation in the Great Basin hydrographic and ecological area. The Great Basin PMC is responsible for research on conservation plants and cultural techniques for their effective use within the Great Basin in Nevada, and portions of California, Oregon, and Utah. GBPMC serves eight 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. The mission of the USDA NRCS Plant Materials Program is to develop and transfer effective state-of-the-art plant science and technology to meet customer and resource needs. This report features some of the activities conducted by the staff of the Great Basin Plant Materials Center during 2011.

Cover Crops Demonstrations

The PMC began demonstrations of cover crops to improve the structure, fertility, and productivity of the soil in 2009. Cover crops protect highly erodible soils from wind erosion. Cover crops can help break the life cycle of weeds, pests, and diseases to prevent them from building up in the crop rotation. Cover crops grown at the PMC in 2011 included hard white winter wheat, beardless winter triticale, winter pea, and forage soybean.

Cover crops can be especially valuable in the transition to organic cropping systems. Legumes grown as green manure crops fix nitrogen to support the growth of subsequent cash crops. Beardless triticale can be grown for hay, silage, pasture, or harvested for high protein grain.

Increasing interest in organic local produce includes wheat and other grains for pasta, bread, and other baked goods. Hard white winter wheat is a new market class of wheat in the U.S., and can be used for high quality whole-wheat breads.



Hard white winter wheat cover crop demonstration.

Sandberg Bluegrass Common Garden Study



A Sandberg bluegrass (*Poa secunda*) common garden study was planted into fabric weed barrier row covers. Plants were started in the GBPMC greenhouse from seed collected by Humboldt-Toiyabe National Forest personnel. Sandberg bluegrass is an important native desert forage species. Currently available selections were derived from populations outside the Great Basin. US Forest Service hopes to find desirable accessions with local genetics. Plugs were started in the greenhouse of 181 maternal accessions of Sandberg bluegrass from Humboldt Toiyabe National Forest lands in Nevada. Plants will be evaluated for survival and growth compared to the check accessions 'High Plains' and 'Opportunity'. The ultimate goal is release of an accession for revegetation on National Forest lands

in Nevada. Seed from desirable accessions can be increased for further off-center tests.

Demonstration Garden

A demonstration garden was planted this year at GBPMC to show examples of plant releases from other PMCs in the western U.S., and plants collected by Seeds of Success interns in Nevada. Plants were started as plugs in the greenhouse and planted on raised beds into fabric weed barrier in the field.



A view of a section of the demonstration garden the day after the plugs were transplanted.

GBPMC Hosts ATV Safety Training



NRCS personnel who use all-terrain vehicles (ATVs) in their work have completed their mandatory ATV rider safety training at a second class held at the PMC in April. NRCS Soil Scientist Tom Champa, certified ATV Safety Instructor, says the GBPMC provides an ideal place to hold these training sessions.

Field Office Personnel Plant Materials Training

NRCS personnel from Field Offices around the state attended two training sessions given by the PMC this year. The first was held at the Elko NRCS Field Office and covered PMC principles and operation, and how to find and develop new plants for use in arid rangeland sites. The group then went to a revegetation site to see examples in the field.



Range revegetation site training near Elko

The second training was held at the PMC and covered the same topics. At the PMC Students also learned about some of the equipment and techniques used in native plant research and production.

Xerces Society milkweed project

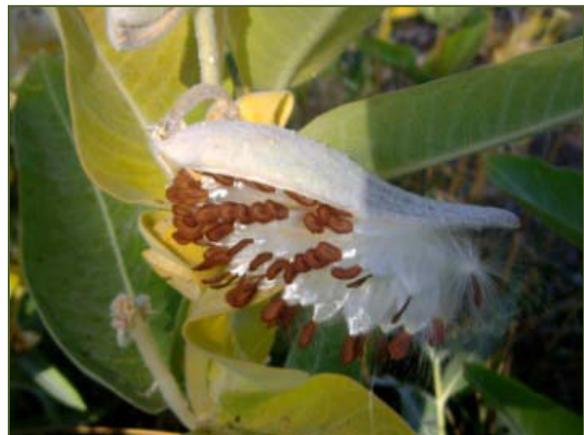
The GBPMC is cooperating with the Xerces Society for Invertebrate Conservation to study and produce seed of two species of milkweed that are used by monarch butterfly (*Danaus plexippus*) larvae and adults. Showy milkweed (*Asclepias speciosa*) and Mexican whorled milkweed (*Asclepias fascicularis*) were grown in the greenhouse and transplanted in the field.

Established populations at GBPMC were harvested for seed. The Flail-Vac was tested for Mexican whorled milkweed, and although it harvested the seed, too much additional material was accumulated, making the seed difficult to clean.



Flail Vac being tested for *A. fascicularis* seed harvest.

For showy milkweed hand harvesting proved to be an efficient way to produce clean seed.



Hand picking works well to gather seed for *A. speciosa* after the seed matures and pods open.

Bottlebrush Squirreltail Intercenter Strain Trial

The GBPMC established an intercenter strain trial to compare five accessions of bottlebrush squirreltail (*Elymus elymoides*) for growth parameters 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.

The trial is irrigated for uniform establishment, and then grown without further irrigation. Precipitation at Fallon is highly variable, but rarely exceeds 5 inches per year, and is frequently much less.

GBPMC provides an arid, cool-climate location to test these accessions.



A cone seeder attachment on a no-till drill was used to plant the bottlebrush squirreltail plots.

Cover Crops Test for Range Revegetation

A trial was initiated on October 25 to examine the feasibility of using cereal grains as cover crops to prepare critical areas. Crimped straw mulch had shown some benefits in previous research at the Rosaschi Ranch on the East Walker River.

Cooperating scientists from US Forest Service, US Agricultural Research Service, and US Fish and Wildlife Service hypothesized that before planting native grasses, forbs, and shrubs, an annual cover crop might stabilize the soil, provide organic material to hold moisture and stimulate microbial activity, and shelter seedlings from drying winds. The method has previously been used successfully on harsh sites such as road cuts and mine spoils.

Abandoned agricultural fields on the uplands along the East Walker River have not supported native vegetation after being taken out of crop production. The East Walker River is a popular catch-and-release fly fishing stream. The Rosaschi Ranch area is also potentially important brood rearing habitat for the disjunct bi-state population of the greater sage-grouse (*Centrocercus urophasianus*).

This trial compares a commercially available sterile triticale (*Triticum x Secale*), a conventional triticale,

wheat (*Triticum aestivum*), oat (*Avena sativa*), rye (*Secale cereale*), and barley (*Hordeum vulgare*). The objective of the trial is to see if these cereals can germinate, establish seedlings, overwinter, and grow on the soils at the site when planted in late fall.

Three separate sets of the same trial were planted on different fields, each in a randomized complete block experimental design with five replications.



Cover crop seeds for rangeland revegetation were planted using a cone seeder on a no-till drill.



Abandoned cropland along the East Walker River has sparse vegetation at a cover crop test site.

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