United States Department of Agriculture

NRCS Great Basin Plant Materials Center

2025 Report of Activities

2055 Schurz HW, Fallon, NV 89406 | Telephone: 702-423-7959 | https://www.nrcs.usda.gov/plant-materials/nvpmc

This report highlights the major activities at the Great Basin Plant Materials Center (GBPMC) during 2025. For more detailed information, contact the GBPMC at 775-423-7957.

Studies

Cereal Rye Seeding Rate/Date Trial

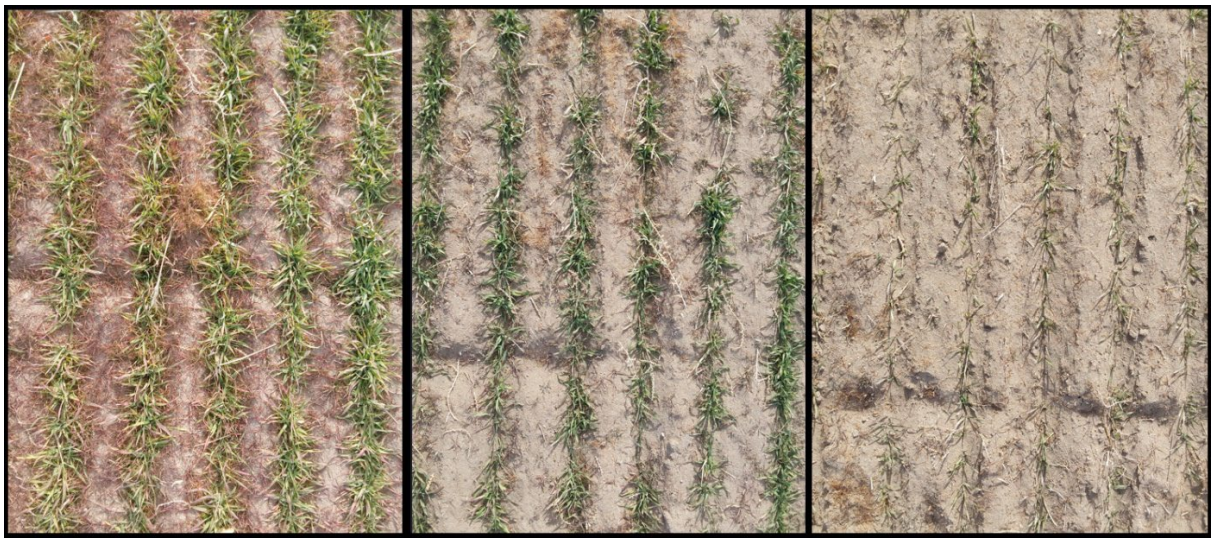

Figure 1: December cover for 120lb/a when planted on October 3rd (left, Oct 15th (center), or October 30th (Right).

The cereal rye seeding rate/date trial is a nationally coordinated evaluation of regionally adapted cover crop varieties. The objective of this study is to test the effect of seeding dates and rates on attributes such as canopy cover, plant height, and biomass production. At the GBPMC, 'Hazlet' cereal rye was chosen due to above average performance in a 2016-2017 national cover crop adaptation study and because it was readily available at local vendors. The seeding rates used were 15, 30, 60, 90, and 120 pure live seed (PLS) lbs/ac and it was planted in early, mid, and late October in a randomized complete block design.

This was year two of a three-year study. The temperature for both years was similar and did not differ much from historic averages. Precipitation was below the 4.4in annual average for both years, with year 2 receiving 2.1 inches during the study (October to June). The low precipitation stunted the growth of the cereal rye, especially with January and February receiving 0.04in and 0.09in respectively. Despite the reduced precipitation, all plots survived the duration of the study. The early seeding date and heavier seeding rates produced the most cover by the end of December. This was similar to year 1 and indicates that both seeding date and seeding rate are important for early cover. Year 2 seeding rate impacted cover at the end of the study, with 90 PLS lbs/ac and 120 PLS lbs/ac both at 100% cover. This differed from year 1 where both seeding rate and seeding date produced similar cover. Biomass for both years were highly variable but trended towards more production at higher seeding rates.

The preliminary results can be found on the Plant Material Center's technical documents webpage.

PMC Rangeland Germplasm Observational Planting

Figure 2: Year 1 of the Observational study. Greenhouse plugs have been planted and gone to seed.

This year GBPMC initiated a four-year observational study in collaboration with the Montana, North Dakota, and Washington PMCs. The objective is to evaluate the performance of PMC-released plant material throughout the upper northwest to update the potential area of adaptation. Each PMC established varieties in the greenhouse and planted them in non-replicated rows over the summer. The GBPMC grew varieties of blue grama (*Bouteloua gracilis*), western wheatgrass (*Pascopyrum smithii*), Alkali sacaton (*Sporabolus airoides*), Indian Ricegrass (*Achnatherum hymenoides*), and James galleta (*Pleuraphis jamesii*). Plant height, survival, and vigor will be collected over the next three years, and results will be used to update tech guides, release notices, and planting recommendations.

Plant Materials Demonstration Garden

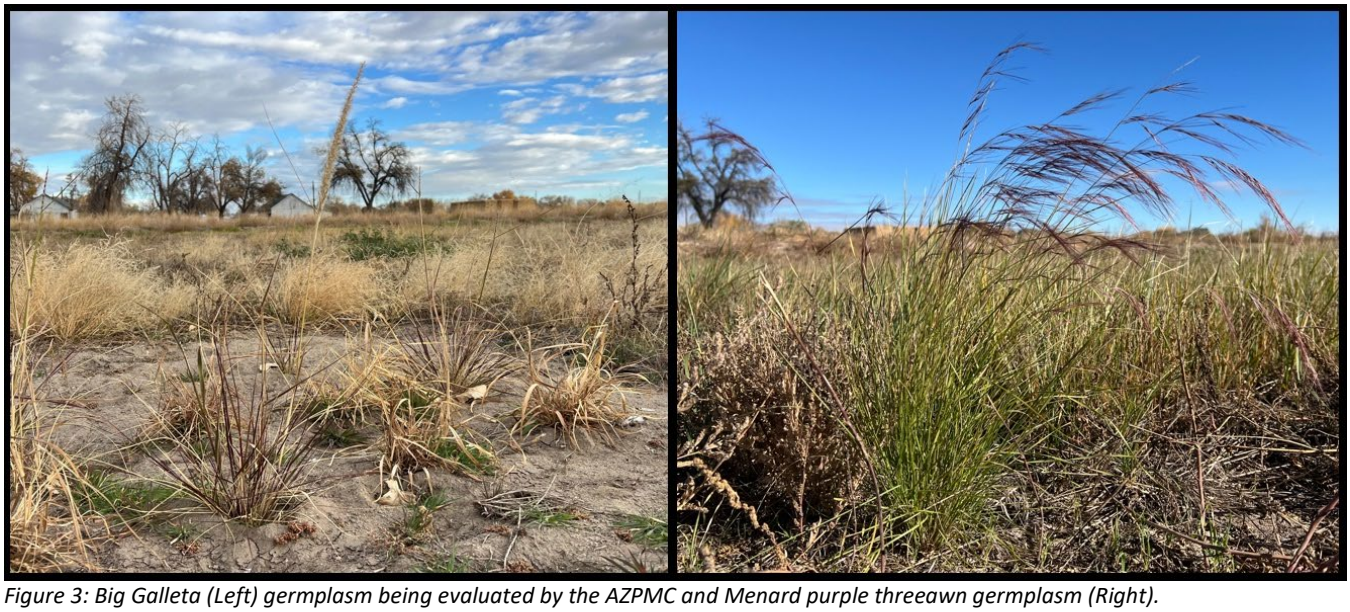

Figure 3: Big Galleta (Left) germplasm being evaluated by the AZPMC and Menard purple threeawn germplasm (Right).

In 2025, GBPMC established a demonstration garden of plant materials available for rangeland conservation in the Great Basin. Species and varieties were selected in collaboration with several partners including: Lockeford, CA, Corvallis, OR, Tucson, AZ, Aberdeen, ID, Knox City, TX, and Pullman, WA PMCs; Nevada NRCS Resource staff; NRCS West National Technology Support Center; ARS Forage and Range Research Laboratory in Logan, UT; ARS Great Basin Rangelands Research Unit in Reno, NV; Texas Native Seeds; and the Nevada Department of Agriculture. Seeds were acquired from the above sources where available, with special thanks to the staff at the ARS Forage and Range Research Lab who were a great help in recommending varieties and providing plant materials, including the brand new Basin and Wasatch bluebunch wheatgrass germplasms.

Ninety-six different varieties were planted: 48 native cool season bunchgrasses, 16 non-native cool season bunchgrasses, 16 native warm season bunchgrasses, and 16 shrubs/forbs (Tables 1 and 2). All cool season grasses germinated, but drought conditions may have negatively impacted establishment of some species. All Squirreltail and Sandberg bluegrass varieties failed to survive the winter and will need to be replanted. All shrub/forb plots had difficulty establishing and will be removed to focus the demonstration on grasses. Warm season grasses were planted in June and are being observed for winter survival and will be reseeded where necessary.

Figure 4: NRCS Intern Hannah Mitchell planting greenhouse grown galleta for the demonstration.

Table 1: Shrub/Forb and Grass Species and varieties planted in the demonstration

Shrubs/Forbs	Warm Season Grasses	Introduced Cool Season Grasses
Snowstorm Kochia	Jim's Desert Panicgrass	Roadcrest Crested Wheatgrass
Immigrant Kochia	GBPMC James Galleta	Hycrest II Crested Wheatgrass
Soda Springs Parsnipflower Buckwheat	Jim's Big Galleta	Nordan Desert Wheatgrass
Basin Utah Sweetvetch	Viva James Galleta	Vavilov 2 Siberian Wheatgrass
Majestic Western Prairie Clover	Vaughn Sideoats Grama	Stabilizer Siberian Wheatgrass
Eagle Common Yarrow	Nogal Black Grama	AC Saltlander Green Wheatgrass
NBR-1 Basalt Milkvetch	Alma Blue Grama	Newhy Green Wheatgrass
Tonopah Globemallow	Bonita Plains Lovegrass	Jose Tall Wheatgrass
Maple Grove Lewis Flax	Moapa Alkali Muhly	Luna Intermediate Wheatgrass
Fanny Searl's Prairie Clover	El Vado Spike Muhly	Mustang Altai Wildrye
Tailcup Lupine	Vegas Alkali Sacaton	Bozoisky II Russian Wildrye
Amethyst Hoary Tansyaster	Salado Alkali Sacaton	Bozoisky Russian Wildrye
Appar Blue Flax	Derrek's Sand Dropseed	Volga Mammoth Wildrye
Derek's Gumweed	Cochise Spike Dropseed	Fawn Tall Fescue
Rocky Mountain Bee Plant	Windbreaker Big Sacatone	Paiute Orchard Grass
Yellow Beeplant	Saltillo Cane Bluestem	Arsenal Meadow Brome

Table 2: Cool season bunchgrasses planted in the demonstration.

Native Cool Season Grasses	Native Cool Season Grasses	Native Cool Season Grasses
Paloma Indian Ricegrass	Starlake Indian Ricegrass	White River Indian Ricegrass
Lahontan 2 ACHY	Smith Creek ACHY	Fish Creek Squirreltail
Nezpar Indian Ricegrass	Ribstone Indian Ricegrass	Rimrock Indian Ricegrass
Secar Snake River Wheatgrass	Pueblo Squirreltail	Wapiti Squirreltail
Arlingon Blue Wildrye	White Pass Blue Wildrye	Tusas Squirreltail
Elkton Blue Wildrye	Bannock Thickspike Wheatgrass	Critana Thickspike Wheatgrass
Sodar Streambank wheatgrass	Bannock II Thickspike Wheatgrass	Charleston Peak Slender Wheatgrass
Discovery Snake River Wheatgrass	Shwendimar Thickspike Wheatgrass	First Strike Slender Wheatgrass
Magnar Basin Wildrye	Continental Basin Wildrye	Tetra Basin Wildrye
Trailhead II Basin Wildrye	Trailhead Basin Wildrye	Shoshone Beardless Wildrye

Service Sandberg Bluegrass	Menard Purple Threeawn	P7 Bluebunch Wheatgrass
Rosana Western Wheatgrass	Recovery Western Wheatgrass	Arriba Western Wheatgrass
Reliable Sandberg Bluegrass	Canbar Sandberg Bluegrass	Opportunity Sandberg Bluegrass
Whitmar Beardless Wheatgrass	Sherman Sandberg Bluegrass	FS-GBPMC Sandberg Bluegrass
Wasatch-STZ3a Bluebunch Wheatgrass	Basin-STZ4 Bluebunch Wheatgrass	Goldar Bluebunch Wheatgrass
Bromar Mountain Brome	Columbia Bluebunch Wheatgrass	Anatone Bluebunch Wheatgrass

Technology Transfer

Presentation: Adaptation of Warm Season Cover Crops to the Arid Southwestern US

Figure 5: Photos of a summer cover crop study at the AZ, CA, and NV PMCs.

In September, Margaret Smither-Kopperl of the California PMC gave a warm season cover crop presentation to the Soil and Water Conservation Society's 2025 International Meeting. This presentation discussed millets, cowpeas, and sunnhemp and reported on three years of collaborative work with the California, Nevada, and Arizona PMCs. The final slide from the presentation is below (Fig 6), and reports can be found online for California, Arizona, and Nevada.

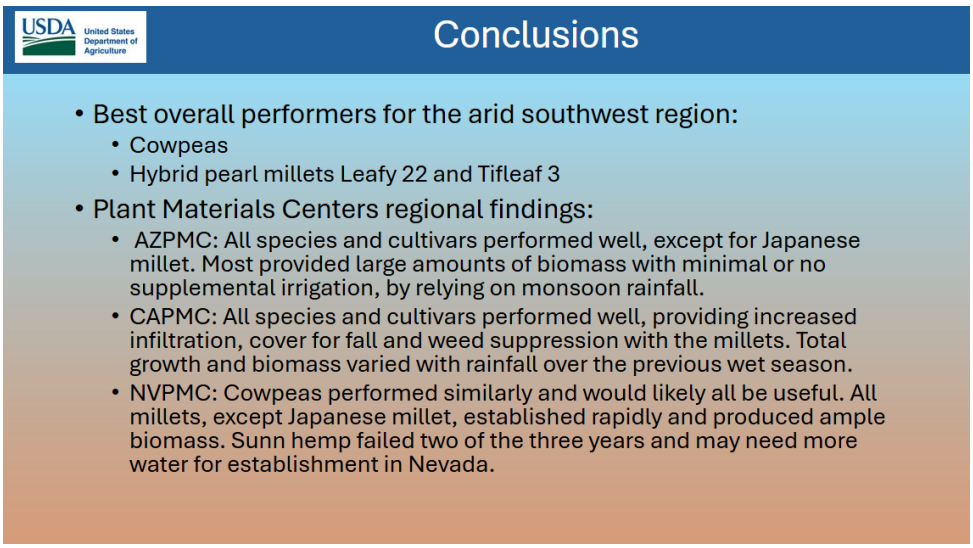

Figure 6: Conclusions for the Southwest regional collaborative summer cover crop study

The Great Basin PMC: Who We Are

The GBPMC is one of 25 PMCs operated by the United States Department of Agriculture-Natural Resources Conservation Service (NRCS). Each center is strategically located in an ecologically distinct area, creating a network of PMCs uniquely positioned to address local, regional, and national natural resource concerns. Our objective is to evaluate plants and vegetative technologies to support NRCS conservation programs and practices. The GBPMC is specifically tasked with resource concerns in the Great Basin, with a focus on rangeland restoration, soil health, and water conservation.

Figure 7: A Photo at the GBPMC. Background includes an equipment shelter, greenhouse, and fields.

The GBPMC opened in 2006 and is the newest PMC in the nation. We are located in a cold desert in the rain shadow of the Sierra Nevada mountains where we receive a mean of 4.9 inches of annual precipitation, mostly in the winter. We manage 79 flood irrigated acres, 3 non-irrigated acres, and we conduct off-center field trials as needed.

PMC Staff

Manager: Christopher Bernau
(Phone: 775-423-7957 ext. 4; Email: Christopher.Bernau@usda.gov)
Study Lead: Vacant
Farm Foreman: Mathew Humphrey

Helping People Help the Land