



United States Department of Agriculture

# Great Basin Plant Materials Center

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<http://www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/pmc/west/nvpmc/>

## 2015 Annual Progress Report of Activities

January 2016

Christopher Bernau joins the Great Basin Plant Materials Center as a Rangeland Management Specialist

The USDA NRCS is pleased to welcome Christopher Bernau to the Great Basin Plant Materials Center from his previous position as a Rangeland Research Specialist at the University of Arizona's V bar V Ranch Experiment Station.

Chris earned his Bachelor of Science degree in Biology, with a minor in Chemistry, from the University of Utah, and his Master of Science degree in Rangeland Ecology and Management from the University of Idaho.



His specialty is rangeland ecology with particular emphasis on the effects of fire in arid ecosystems. His experience includes work in education, research, and land management. Much of that work was done in the Intermountain West on fuel loads in the Sagebrush Steppe, including work on post-fire vegetation responses in western states. Chris is also active in the Society for Range Management, recently serving as Director North for the Arizona Section.

In other work experience, he has measured habitat quality for the Sonoran pronghorn, recorded, and relocated sea turtle nests, and he has studied exploding ants in a pristine tropical rainforest in Borneo. His outdoors activities included taking boy scouts on 21-day backpacking treks at Philmont scout ranch in the Sangre de Cristo Mountains of northern New Mexico.

### Cover Crops Demonstration at Great Basin Plant Materials Center

A key component of the national Soil Health initiative is the inclusion of cover crops in the crop rotation. Cover crops provide food and habitat for beneficial soil organisms, improve soil structure for better water and air infiltration, shade the soil to help conserve organic matter and reduce weeds, and contribute organic matter to sequester carbon. Legumes can also provide nitrogen fertilizer.

Plant Materials Centers across the country are participating in a national trial of cover crops to learn which of the currently available cultivars are

best adapted to the region each PMC serves. The high desert area served by the Nevada PMC has a short growing season and erratic weather patterns.

% Emergence	Cultivar	Crop
41.3	FL401	rye
27.5	Driller	daikon
26.9	Tillage	daikon
23.8	Nitro	daikon
23.1	Ecotill	daikon
20.0	Trical 888 check	triticale
17.5	Groundhog	daikon
17.5	Sunrise	crimson clover
11.3	Lunch	daikon
10.0	Dixie	crimson clover
10.0	Sodbuster blend	daikon
6.9	Cantea	crimson clover
5.0	Robin	crimson clover
4.8	Defender	daikon
4.4	Kentucky Pride	crimson clover
1.9	Survivor	winter pea
1.6	Groff	hairy vetch
1.3	Dunn	winter pea
1.3	Maxum	winter pea
1.0	Arvica	winter pea
0.9	Whistler	winter pea
0.6	Fixation	balansa clover
0.6	Frostmaster	winter pea
0.6	Sunup	crimson clover
0.3	TNT	hairy vetch
0.3	Windham	winter pea
0.1	Frontier	balansa clover

Emergence recorded 8 and 9 days after planting. Average of four replications for each cultivar.

This late fall trial will test winter hardiness of the cover crop cultivars. A second, identical trial will be planted into the same field next spring, beside the fall trial, to test summer survival and drought hardiness. Survivors of both the fall-planted and spring-planted trials will be rated for their ability to suppress weeds and for their general productivity.



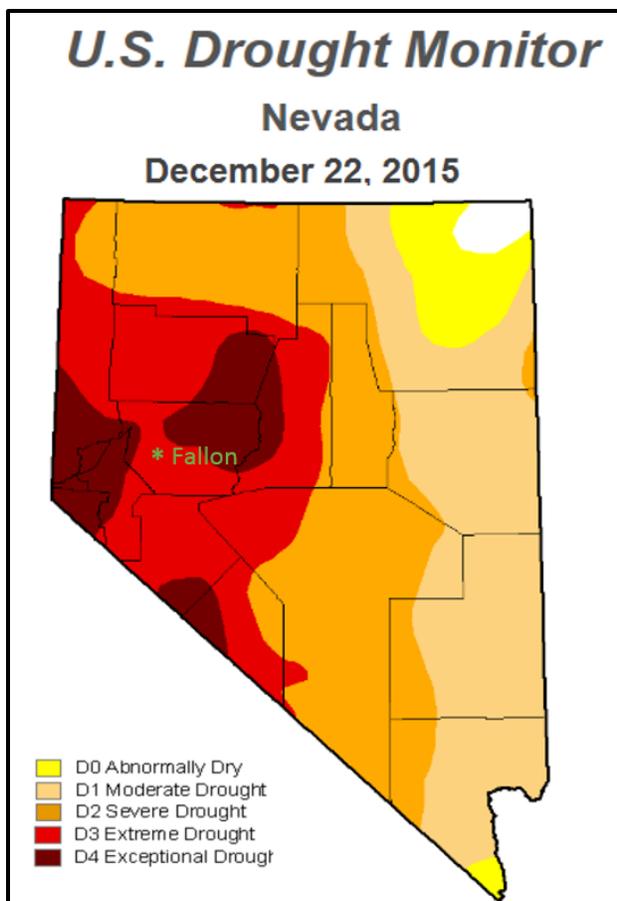
Drill rows of demonstration plots with emerging cover crops 16 days after planting into a stale seedbed using a cone seeder on a no-till drill.

### Drought Persists in the Great Basin

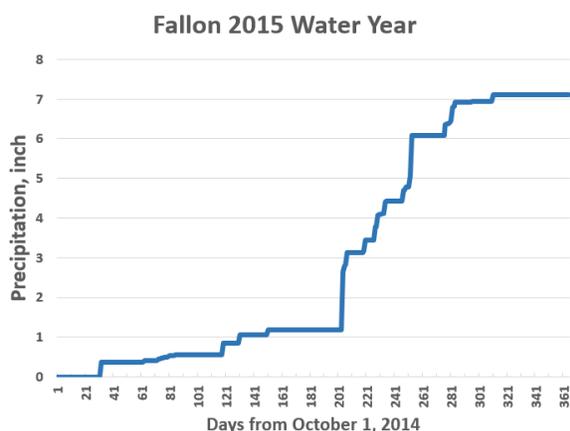
2015 was the fourth water-short year in a row for the Great Basin Plant Materials Center, due to low snowpack on the east slope of the Sierra Nevada Mountains and resulting low storage in Lahontan Reservoir on the Carson River. The irrigation allocation was 17%, or 7.1 inches per acre. Our full allocation would be 42 inches per irrigated acre.

Compounding the problem of reduced allocation was the short window of availability. We were one of the first water users to apply an irrigation on May 27, after emergency repair on the Truckee Carson Irrigation District main canal delayed the start date for water delivery. We postponed our second, and final, irrigation until June 30, at the end of water deliveries.

Fallon is in the region of Extreme Drought on the U.S. Drought Monitor map, due to the low irrigation water supply. However, 2015 was a wet year with regard to precipitation at Fallon. We received 7.11 inches of precipitation for the water year from October 1, 2014 to September 30, 2015, as measured by the U.S. Bureau of Reclamation AgriMet weather station at GBPMC. The mean annual precipitation at Fallon is 4.9 inches.



The U.S. Drought Monitor map of Nevada for December 2015, showing the location of Fallon in relation to the regions of extreme drought and exceptional drought.



Our strategy was to use the scant and brief supply of irrigation water to maintain our high value plantings, and to establish a cover crop of forage

soybean on selected fields. The soybean acreage was treated with glyphosate to control weeds.

We also planted an additional 60 acres, which were not irrigated, to hard white winter wheat in March. The wheat emerged after 1.94 inches of rain fell during the three-day period from April 22 to 25. Subsequent rains grew a good stand of vegetative wheat as a cover crop to stabilize the soil and help control weeds. An additional 3.81 inches of rain was received through the end of July. The wheat acreage was treated with herbicides to reduce seed production by broadleaf weed species.

### Great Basin Plant Materials Center Pollinator Objectives

The GBPMC manager was invited to give a presentation to the Mason Valley Bee Keepers Conference last February in Yerington, NV. The topic was Plants for Arid Lands Honey Production. The presentation was well received and generated much interest in the Plant Materials program and the work the Great Basin PMC has been doing with pollinator plants.

Since 2009 GBPMC has been actively supporting pollinator conservation. For sage grouse restoration the wildflowers essential for nutrition of pre-laying hens and newly hatched chicks do not persist in the landscape if pollinators are absent. Restoring habitat after wildfire requires nectar and pollen resource plants for pollinating insects. Some of the insects, especially lepidopterous larvae, are also important in the sage grouse chick diet.

The success of the presentation to beekeepers led to an invitation to give another presentation to local growers and gardeners on milkweed plant production. The venue for that presentation was the U.S. Fish and Wildlife Service Backyard Gardeners Program held at the Nevada Division of Forestry Washoe Nursery in May. The information in the presentation was summarized in Nevada Technical Note 58 Milkweed Pollination Biology, which can be accessed on our website at:

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/pmc/west/nvpmc/>