

**Western Region Report - NRSP-6 Technical Committee  
David G. Holm**

During 2014, NRSP-6 supplied stocks to the following Western states: Arizona, California, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah and Washington (Table 1). Western Region USDA/ARS requests are not included in this report.

Twenty-eight entities via 40 requests ordered 1,380 units. Potato materials were requested by universities and research institutes (University of California, University of Idaho, Montana State University, and Oregon State University) and many private companies and farms (Table 1).

**Table 1. NRSP-6 Distribution in the Western Region - 2014.**

Name	Organization	City	State	Reported
Timothy Carrol	Simplot Plant Sciences	Boise	ID	
Gary Cass	Tom Wagner Seed	Paauilo	HI	
Stephen Facciola	Tom King Farms	Vista	CA	
Fahrettin Goktepe	SunRain Potato Varieties	Idaho Falls	ID	
Aymeric Goyer	Oregon State University	Hermiston	OR	
Christopher Homanics	Skipley Farm	Snohomish	WA	✓
Denise Hunter		Central Valley	UT	✓
Michele Krucker	J. R. Simplot Company	Boise	ID	✓
Joseph Kuhl	University of Idaho	Moscow	ID	✓
Rick Machado	Machado Farms	Menifee	CA	✓
Dusty Nugget		Oatman	AZ	
Anthony Palethorpe		Cottonwood Heights	UT	
Garry Pearson	University of California - Davis	Davis	CA	
Douglas Penning		Longview	WA	
David Rhode	Desert Research Institute	Reno	NV	✓
Caius Rommens	Nightshade LLC	Boise	ID	✓
Cristian Saldana		Porterville	CA	
David Sands	Montana State University	Bozeman	MT	
Vidyasaqar Sathuvalli	Oregon State University	Hermiston	OR	✓
Lura Schroeder	University of Idaho Extension	Aberdeen	ID	
Joseph Simcox	The Rare Vegetable Seed Consortium	Belen	NM	
John Stewart		Cashmere	WA	✓
Terry Tolbert	Escalante Interagency Office	Escalante	UT	
Peter van Hest	Bejo Seeds, Inc.	Oceano	CA	✓
Thomas Wagner		Everett	WA	✓
Gloria Welch		Mira Loma	CA	✓
Bill Whitson	Cultivariable Seeds	Moclips	WA	
Javier Zapata		Oakland	CA	

## General Reports

### Christopher Homanics

USDA GRIN is in my opinion a world-class genebank that supports public access in a way that makes it a viable model in a world of too often closed private or proprietary sources. GRIN is providing unique and precious germplasm to breeders to adapt material to modern needs in a world of climatic uncertainty.

In 2014, I requested 6 accessions of TPS of potato germplasm within the main potato complex that was found in the Bamberg frost study to have high frost tolerance. I requested the material and received it promptly but it was after my main seeding date, so I planted the material this year. I have transferred 54 seedlings to the field and will be evaluating them this season. In future seasons, the best clones will be crossed into existing late blight resistant lines, culinary lines, and high antioxidant lines.

The material had excellent germination rates considering that the seed lots were collected decades ago. I have personally never had any issue with requested seed and in particular NRSP6 had an extremely quick turn around time.

### Michele Krucker

Our team requested germplasm to use as controls for late blight resistance and drought tolerance. The material arrived in great condition and the Genebank Staff were extremely helpful. Some of the varieties requested could only be found at the Genebank and were very useful in our studies.

### Joseph Kuhl

All the material requested arrived in good shape. Seed germination rates were very similar to what was indicated for each accession. Tissue culture plantlets have been propagated without issue.

*Solanum acaule* and *S. chacoense* have been used as tetraploid and diploid *Solanum* standards for chromosome counts and flow cytometry. The five *Solanum tuberosum* lines were obtained for use as *Phytophthora infestans* differential lines and potato cyst nematode differential lines. These lines act as controls in infection experiments, needless to say the controls are important to completing the experiments successfully.

Requests were handled quickly and professionally. Any questions were answered immediately. I have no complaints regarding my orders or the quality of the germplasm. NRSP6 should continue to be funded so that they can continue this important work.

## **Denise Hunter**

The nrsp6 was received in excellent shape. Seems were planted. Plant in small containers tell sprouts were three to four inches tall, with six to eight leaves. The seeds produced 8 healthy plants last year. 2015 spring they restarted and have multiplied I have counted 19 plants to this 6/5/2015. Individual potatoes are smaller than walnuts. We are transplanting them to the field this year to see if they will continue to produce so well.

## **Rick Machado**

We received tubers last year, and because of the GRIN program we have been successfully breeding potatoes for over 15 years now.

All tubers arrived healthy and on time for spring planting. They have all grown well the first year, and after we have multiplied the original tuber, we put the progeny through a series of heat/drought tests. These tests involve the limited use of water, using a summer growing season, not mulching, not fertilizing, using drip irrigation with emitters spaced a long distance away, and forcing them to grow and multiply far outside of their comfort zone.

As of now, we have about 10 entirely new varieties that perform from fair to well in these stress tests. Most of the new varieties have an s.chacoense background, and colors range from white to dark blue, with flesh color also changing from white to dark blue. We will further press forward with additional tests, which involve intensifying the soil temperatures. So far, we have grown modest size yields with temps up to 125f.

Without GRIN, it would have never been possible, period. The world is far richer for this program, and we continue to stay involved with them, and this year have several hundred plants from GRIN TPS. We thank them for their hard work, dedication and continued help.

## **David Rhode**

My request for germplasm in 2014 was a sample of *Solanum tuberosum* seeds to be part of a large seed reference collection. I incorporated this sample into the reference collection, which is geared toward identification of seed remains from archaeological sites. I have not had occasion to use the material in identification of archaeological specimens, but I appreciate having the material in the collection in case I will need it in the future.

## **Caius Rommens**

Material from the U.S. Potato Genebank is currently being used to develop varieties for the inland Northwest. The most important aspect of this material is a potato mini-core collection, which consists of 75 diverse accessions of ten different wild species. The mini-core collection was acquired from the Genebank early in 2015. Another aspect of

the material consists of 39 European varieties, tubers of which were provided by the Genebank during the spring of 2014. Some of the traits that are of particular importance include drought, heat and insect tolerance, as well as earliness. The Potato Genebank provides an essential resource to breeding programs throughout the United States.

### **Vidyasagar Sathuvalli**

#### 1. Field evaluation of primitive cultivars and foreign varieties:

Tubers from 56 different cultivars were obtained from Potato Genebank for their field performance at Hermiston Agricultural Research and Extension Center. They were planted as four hills. Two primitive cultivars and three foreign varieties looked promising as they produced nice tubers and performed well in storage. We plan on utilizing these clones in the breeding program

#### 2. Screening and identification of new sources of resistance to Columbia root knot nematode (CRKN) and Verticillium wilt (VW)

True potato seeds from 46 PI's from nine different *Solanum* sp. were obtained from Potato Genebank to screen for resistance to CRKN and VW. Our goal is to screen 10 plants per population for their resistance to CRKN and VW. Upon identification of potential resistant sources, the new sources will be further evaluated for their resistance to other major nematode pests of potato.

#### 3. Developing whole genome sequence resource for *Solanum bulbocastanum* clone SB22.

*Solanum bulbocastanum* clone SB22 is the source of resistance for CRKN and the resistance has been introgressed into russet potatoes by Dr. Chuck Brown. We are currently developing whole genome sequence resource for SB22 through illumina sequencing. A genome browser is being developed and will be available to public under [solanum.cgrb.oregonstate.edu](http://solanum.cgrb.oregonstate.edu)

#### 4. Introgression of high folate from wild *Solanum* germplasm to commercial potatoes

Dr. Goyer's group screened wild germplasm for high folate concentration in potatoes and identified few clones (~10) from *S. vernei* and *S. andigenum* with high folate concentrations. We are planning to introgress high folate genes from these clones to the commercial potatoes.

### **John Stewart**

All of the potato tuber germplasm we receive here at Gardens of Eden starts off in potted culture while we take slips and cuttings to build up our volume for field trials. The more vigorous varieties make it to the field in the first year, others we attempt to propagate until the next season if they are particularly slow growing or very small (as some of the primitive cultivars from the Andes are).

Most seasons we trial the primitive cultivars, as well as some of the other varieties that are deemed potentially suitable, in a traditional Andean tuber polyculture with *Lupinus mutabilis*, *Oxalis tuberosa*, *Tagetes minuta*, *Tropaeolum tuberosum* & *Ullucus*

tuberosus. In the future we hope to incorporate *Mirabilis expansa* into these polyculture field trials as well. Andean primitive cultivars and some of the older heirloom varieties are usually the best candidates for these trials as they often have similar daylength requirements as the other Andean tubers and crops. Of our 2014 accessions, Canasta PI 642439 and Tollocan PI 587067 performed well in these trials, we were able to maintain the germplasm throughout the season, and they will be continuing in the trials this season.

Varieties that are considered less appropriate for the Andean polycultures are subjected to rigorous field trials for adaptability to a semi-arid climate, cold hardiness and perenniality. Of our 2014 accessions, Clavella PI 527976, Myatt's Ashleaf PI 666142 and Saikai 35 PI 666964 performed well, was maintained, and will be continuing to this seasons trials.

All of the germplasm we have received from NRSP-6 has been in good to excellent condition and very acceptable. With the exception of Yari Blanco PI 611096 (requested 2015), which simply rotted, all tuber accessions have grown fairly well to exceptionally well.

I would like to take this opportunity to suggest that NRSP-6 consider adding some of the other Andean tuber crops to the collection of accessions maintained there. They should mostly all be similar to the primitive potato cultivars as far as cultivation requirements. As far as I know, all of the other Andean tubers being maintained in the US are exclusively in the private sector.

If possible, could these reports be taken care of through snail mail in the future? I live and work in the mountains, where I do not have regular internet access. There are times, especially in the growing season, when I am unable check my email for a month or more. It would be greatly appreciated and would make it easier to get these reports to you in a timely fashion.

### **Thomas Wagner**

I plant the tubers in various locations for the purpose of making crosses and to get open pollinated potato berries in order to extract tps.

I don't publish per se, but I do release germplasm ...mostly as tps from crosses and selfed pollinated berries.

Great quality and received in great shape.

I would like to help co sponsor imports through quarantine many in vitro potato varieties from places like CIP and Gross Lusewitz.

## **Gloria Welsh**

The only information that I can share with you for your statistics (being that I hadn't received my order) is that I intended to grow the potato seeds and share the information with other desert gardeners. I have a gardening blog in which I share and receive growing information from other's who are having the same problem with growing potato and other vegetables in extreme heat and in regions that have "Santa Ana Winds". Santa Ana's are winds that are hot and can be extremely damaging.

Two weeks ago we had Santa Ana's that peaked at 60 mph and I lost an entire bed of a particular lettuce yet a romain variety from Pakistan withstood the wind and heat. Seeking out particular varieties of seed is tedious yet, rewarding. Even though most fruits and vegetables, fish, poultry and beef are grown commercially here in California, folks in other states don't realize that we often pay more for them here. Most households here have some sort of garden, or have chickens or live stock. You'll find folks from Los Angeles to Palm Springs who grow a bit of something to offset the cost of commercial nutrition.

I'm sure my feedback doesn't help you much. I just wanted to let you know that I received your letter yet, I didn't receive any potatoes.

## **Peter van Hest**

In 2014 Bejo seeds, Inc. requested and received various clones and true seed lines from the collection of the Irish potato (*Solanum*) maintained by the **National Plant Germplasm System**. Typically 40 – 75 lines are acquired each year.

For more than a decade, Bejo seeds has received true seed, in vitro and in vivo material in this fashion in order to evaluate these lines in its breeding program to create true seed potato varieties.

Of the hundreds of clones received over the years, 31, or about 4% of total clones, have provided their genes towards potential parent lines which are currently being evaluated.

Because of the breadth of genetic material available from the **National Plant Germplasm System**, access to it is of utmost importance to Bejo Seeds, and it is highly appreciated to receive the material.

Over the years there has been a rare instance of questionable phytosanitary condition, but that is the rare exception rather than the rule. In addition, we were alerted to this possibility and to destroy the clone in question, which speaks of the high standards the NPGS follows.

In summary, Bejo Seeds, Inc, is very appreciative of the clones available from the Potato Genebank, and will continue with yearly requests.