



# POTATO HELPS FARMERS WEATHER FROST

The frost-resistant spud is long and thin with brown skin, yellow flesh and is grown for the fresh market

In a country with more than 5,000 potato varieties, you might not expect the arrival of another one to be a big deal. But this is Peru, where the potato was first domesticated and still plays a vital role in national identity.

In Spanish you might call it *patrimonio* or *orgullo*; in English it translates to national pride or honor. Whichever way it is phrased, for the people of Peru, the concept is forever entwined with the potato, a totemic symbol of the indigenous cultures



A basket of Wiñay potatoes serves as the centerpiece at the main table of a ceremony to introduce the new potato variety in Puno, Peru. *Image courtesy of William Schaefer*

and heritage of their country and the surrounding Andes.

A trio of scientists from the University of Wisconsin (UW) College of Agricultural and Life Sciences (CAL S) has helped extend this rich tradition by introducing a frost-resistant variety that can help Peruvian potato farmers contend with difficult growing conditions caused by a changing climate.

It is the latest outcome of a decades-long collaboration with Peruvian researchers that is still going strong.

The three UW scientists—John Bamberg, Alfonso Del Rio and Jiwana Palta—worked closely with researchers from Peru’s International Potato Center (CIP) and the Instituto Nacional de Innovación Agraria (INIA), and with Peruvian farmers, to develop the variety, called Wiñay.

The word Wiñay means “to grow” in Quechua, one of Peru’s indigenous languages.

The frost-resistant potato is long and thin with brown skin and yellow flesh and is grown for the fresh market.

**Above:** Three women harvest Wiñay potatoes from trial plots at the Instituto Nacional de Innovación Agraria experimental station in Puno, Peru. *Image courtesy of William Schaefer*

It was developed to be cultivated in Peru’s Altiplano at elevations of up to 14,000 feet above sea level.

Palta, a professor of horticulture and plant physiologist with the Plant Breeding and Plant Genetics program, says many of the wild potato varieties found in the Altiplano are naturally hardy and can tolerate temperatures down to 14 degrees Fahrenheit.

## TOO BITTER

However, these potatoes are small and have a bitter taste due to high levels of chemical compounds called glycoalkaloids.

The need for a hardier, frost-resistant potato in Peru’s highlands stems, in part, from climate change, according to both Palta and Del Rio, a senior scientist in charge of the U.S. Potato Genebank research lab at the University of Wisconsin.



They say more frequent late season killing frosts are causing greater yield losses for Peru's farmers.

But developing a new potato variety to withstand such conditions is a time-consuming project, one that typically spans 10 to 15 years.

The devil can be in the genetic details when crossing potato varieties to develop a new one. And an effective frost-resistant potato also needs good commercial qualities, including appropriate size, yield and taste, and must be suitable for the growing conditions of the Altiplano.

Bamberg, director of the USDA Agricultural Research Service's U.S. Potato Genebank, in Sturgeon Bay, Wisconsin, and a professor of horticulture, compares the process to looking for a needle in a haystack.

"Sorting out the offspring, you get just a bewildering number of possibilities to select from," Bamberg says. "Breeders put out thousands and thousands of progeny and select

from them over decades to find that one better one."

### GOOD FROST TOLERANCE

The project began in 2005 using progeny of a Wisconsin potato clone that had good frost tolerance, yield, tuber size and eating quality.

The clone carried the genes for frost hardiness from a wild potato species called *Solanum commersonii*.

The progeny of this clone was selected in Wisconsin, but, when tested in frost-prone areas of the Peruvian highlands, it didn't perform well because the Peruvian summer days are shorter than the Midwest's.

"So, Jiwan, John and I discussed using some of the Peruvian potatoes we have in the collection at Sturgeon Bay," Del Rio says.

They chose seven Peruvian varieties. After crossbreeding with the Wisconsin frost-hardy clone, they sent about 20,000 seed potatoes to Peru for field trials at the INIA experimental station in the southern



**Above:** Jiwan Palta reviews data from field trials during the May 2018 harvest at the Instituto Nacional de Innovación Agraria experimental station in Puno, Peru. Image courtesy of William Schaefer

city of Puno.

With each passing year, they evaluated new progeny for the preferred qualities and traits and narrowed the pool until arriving at the one potato that came to be Wiñay.

*continued on pg. 50*

# SORTING & GRADING LABOR SAVING TECHNOLOGY

Products • Strategies • Solutions



Combi Units



Automated Pilers



Box Fillers



Redox **AG**



4, 6 and 8 Row Cup Planters

NOW is the time to plan ahead for  
**SPRING PLANTING**

**PARTS & SERVICE:**  
TEROG & AG PARTS • AVR/UNDERHAUG  
DOUBLE L (LL) NOFFSINGER BROEKEMA AND MORE!



TATRO IRRIGATION & POTATO

**CALL US WE CAN HELP!**  
1.800.225.9727 • [www.tipinc.net](http://www.tipinc.net)



1619 County Road K, Custer WI 54423 • Call: 715-592-4650 • Fax: 715-592-5063 • Email: [tip@tipinc.net](mailto:tip@tipinc.net)



## Potato Helps Farmers Weather Frost...

continued from pg. 49



“It might sound like we selected Wiñay and they tested it,” Bamberg qualifies, “but they selected it in Peru.”

### TAKING ROOT IN U.S.?

So, considering its good yields, frost hardiness and farmer and consumer acceptance, will Wiñay also take root in the United States?

“Frost damage can happen in different places and at different times across the United States,” Bamberg

allows. “In 2019, potato farmers in eastern Idaho alone lost about 30 percent of their crop to damage from unseasonable frost.”

“Cold temperatures can damage the quality of the potato itself, not just kill the leaves,” he adds, “making the potatoes produce poor chips and fries or sprout poorly as seed for the next crop.”

“This research illustrates the benefits of long-term germplasm

**Left:** John Bamberg works from his lab office in Sturgeon Bay, Wisconsin. *Image courtesy of William Schaefer*

**Right:** Dancers with potato planting tools entertain the audience during the formal introduction of the Wiñay potato in Puno. *Image courtesy of William Schaefer*

preservation, international cooperation and sharing,” Bamberg stresses.

“The most obvious benefit was to Peru in the short term,” he remarks,

A collage of agricultural images including a cow, a red barn, a hand holding potatoes, and a piglet. A large blue box with white text is overlaid on the center.

**WE PARTNER WITH YOUR TRUSTED ADVISORS**

As agriculture has evolved, the nature of the industry has become more complex and regulated. At Ruder Ware our attorneys act as legal counsel for producers and businesses providing products and services for the agriculture industry, and partner with a client’s current trusted advisors, such as accountants and lenders. Contact us today to see how our team approach yields the best results for your farm or business.

**Ruder ♦ Ware**

BUSINESS ATTORNEYS FOR BUSINESS SUCCESS®

ausau | eau claire | green bay ruderware.com

visit our blogs at [blueinklaw.com](http://blueinklaw.com)



“but what was learned will have broad application. The work at the U.S. Potato Genebank is returning benefits not just to the United States, but also to the countries that are the native homes of these wild stocks.”

After 10 years of field trials, the culling process, the final variety selection, and the naming of the potato, there came a time to celebrate.

In November 2018, near the shoreline of Lake Titicaca in Puno, Del Rio, Palta and Palta’s wife, Mari, participated in the public introduction of the Wiñay potato.

#### FOUR-HOUR FETE

More than 200 students, farmers, producers, scientists and industry and government officials attended the four-hour fete, which concluded with the distribution of Wiñay potatoes in brown paper bags.

Both Palta and Del Rio found the ceremony to be an enjoyable opportunity to recognize everyone’s hard work.

“It’s always heartening to see the end result of your labor,” says Palta. “Research, by definition, means you search again and again, and sometimes you hit a winner, and in this case, we have one. Scientists [in Peru] have evaluated it and feel good about it.”

Following the celebration, a jovial Jesús Arcos Pineda, senior potato researcher at INIA, says he is looking forward to more cooperation and interaction with the CALS research team.

Pineda is one of the CALS research team’s closest collaborators, along with Rene Gomez, senior curator at CIP’s gene bank.

In addition to the practical side of the potato ceremony, Del Rio says there is a spiritual gratitude for the potato’s role in Peruvian villages.

“The farmers receiving the potatoes, they appreciate whatever comes from Mother Earth,” Del Rio notes, “and potatoes have been such an important part in the life of these communities that they appreciate it very much.” **BCT**

*“The farmers receiving the potatoes, they appreciate whatever comes from Mother Earth.”*

**– Alfonso Del Rio,**

*senior scientist in charge of the U.S. Potato Genebank research lab at the University of Wisconsin*

## GFX-350™ Display

[ag.trimble.com/gfx350display](http://ag.trimble.com/gfx350display)

Trimble  
Connected  
Farm™


Transform  
the way you  
work **today.**




Connect  
your farm  
for the **future.**

Agricultural Intelligence  
in your hands.

Your **first step** into precision agriculture.

 Expandable functionality  
at a great price

 Simple, intuitive  
Precision-IQ™ platform to  
conduct all field operations

 ISOBUS-ready to control  
your implements

 Built-in Wi-Fi™ and  
Bluetooth® connectivity



**vantage**  
BY TRIMBLE AGRICULTURE

Vantage North Central  
P.O. Box 35  
W12680 State Rd. 73  
Plainfield, WI. 54966  
715-335-4474  
888-368-8447  
[www.vantage-northcentral.com](http://www.vantage-northcentral.com)