

Spud bank stores world's varieties



Kristyna Wentz-Graff

John Bamberg, project leader of the United States Potato Genebank and a USDA plant geneticist, checks potato plant growth in the greenhouses.

By Meg Jones of the Journal Sentinel
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Sturgeon Bay - Stored inside a nondescript building and greenhouse in Door County is the equivalent of much of the world's potato blueprints.

Wisconsin is home to many things, but it's safe to say few know the globe's largest collection of wild and cultivated potato species are located here.

Most folks traveling past the Peninsular Agriculture Research Station just outside Sturgeon Bay have no idea the potato chips or french fries they gobbled at lunch were most likely developed through the efforts of the United States Potato Genebank. Potato germ plasm is sent from Sturgeon Bay to researchers throughout the world who are trying to figure out how to make potatoes more frost- and pest-resistant, easier to digest and even potatoes in different colors.

"Part of our business is to find things, characterize them as unusual, determine if there's interest, publish and see if anyone wants to run with it," said John Bamberg, director of the U.S. Potato Genebank.

The genebank is a repository of thousands of seeds and cultivars collected throughout the U.S. and world over more than six decades. The oldest potato seeds at the genebank, which was established by Wisconsin potato farmers in 1948, date back to the early 1950s.

The Sturgeon Bay facility, part of the National Plant Germplasm System preserving the genetic diversity of plants, is the only genebank based in Wisconsin. Genebanks are scattered across the country, including facilities for rice in Arkansas, soybeans and maize in Illinois, wheat in Idaho and tomatoes in California.

The genebanks are used to acquire, preserve and evaluate different plant varieties and then distribute them free to researchers. The potato facility houses about 5,000 seed populations and 1,000 clonal varieties. U.S. scientists and breeders outnumber international researchers seeking germ plasm by a 3-to-2 ratio. Plus horticulturists from companies such as Frito Lay work with potato germ plasm from the center.

Scientists such as Shelley Jansky need access to genetic diversity to develop new varieties that are resistant to pests and extreme weather. She's working on solving the problem of verticillium wilt, a common fungus in the soil. To solve the problem, potato farmers must inject chemicals in their farm fields before planting their crops.

Through the potato genebank, Jansky has found a wild species of potato from South America that's mostly immune to verticillium wilt.

"It's a tremendous resource that's right at my fingertips. I call them and say, 'Can you send me this, this and this' and they send me seeds in the mail," said Jansky, a U.S. Department of Agriculture research scientist and associate professor of horticulture at the University of Wisconsin-Madison.

Jansky also is looking at starch qualities of potatoes in an effort to combat the growing problem of obesity.

"What we're interested in doing is finding potato starch that's not as digestible, that acts more like a fiber than instant energy. It's more important for us to get fiber than instant glucose, and we're finding wild varieties that have different starches," Jansky said.

Why go to all this trouble? Because potatoes are the most valuable vegetable in the U.S. - \$4 billion in potato chips alone. And potatoes are considered the fourth most important crop worldwide, behind rice, wheat and corn.

At the genebank building, seeds are kept in small paper sacks in a walk-in cooler kept at 40 degrees. One room has rows and rows of test tubes filled with green potato plants snaking up toward the artificial light.

On a recent day, Bamberg checked test tubes labeled with names of potato varieties including jasmine, iris, red Pontiac, majestic, golden flesh and yema de huevo. The yema de huevo variety, which translates to egg yolk in Spanish, features a bright squash-like yellow potato, which is in demand among consumers in South America, Bamberg said.

South America, particularly an area straddling southern Peru and northwestern Bolivia, is where potatoes were first domesticated thousands of years ago. Scientists originally thought potatoes were farmed independently at many locations, but DNA research discovered most of the wild species could be traced back to a single origin.

David Spooner, a UW-Madison horticulture professor, has collected many of the potato varieties housed in the genebank. He has been a potato collector and taxonomist for 27 years, making 14 potato-collecting expeditions in the United States and Latin America. Now some countries no longer allow germ plasm collections, and that makes the Sturgeon Bay facility even more important because of its diverse pool of varieties.

"The idea is to classify them so we can know more about them and can advise potato breeders to use them in their breeding work," Spooner said.

The fungus that caused the Irish potato famine in the 1840s and 1850s - called late blight - is still a problem throughout the world. Potatoes still must be treated with fungicides to combat the disease, so if researchers can breed a potato resistant to late blight it would mean farmers would no longer spend much of their budget on chemicals.

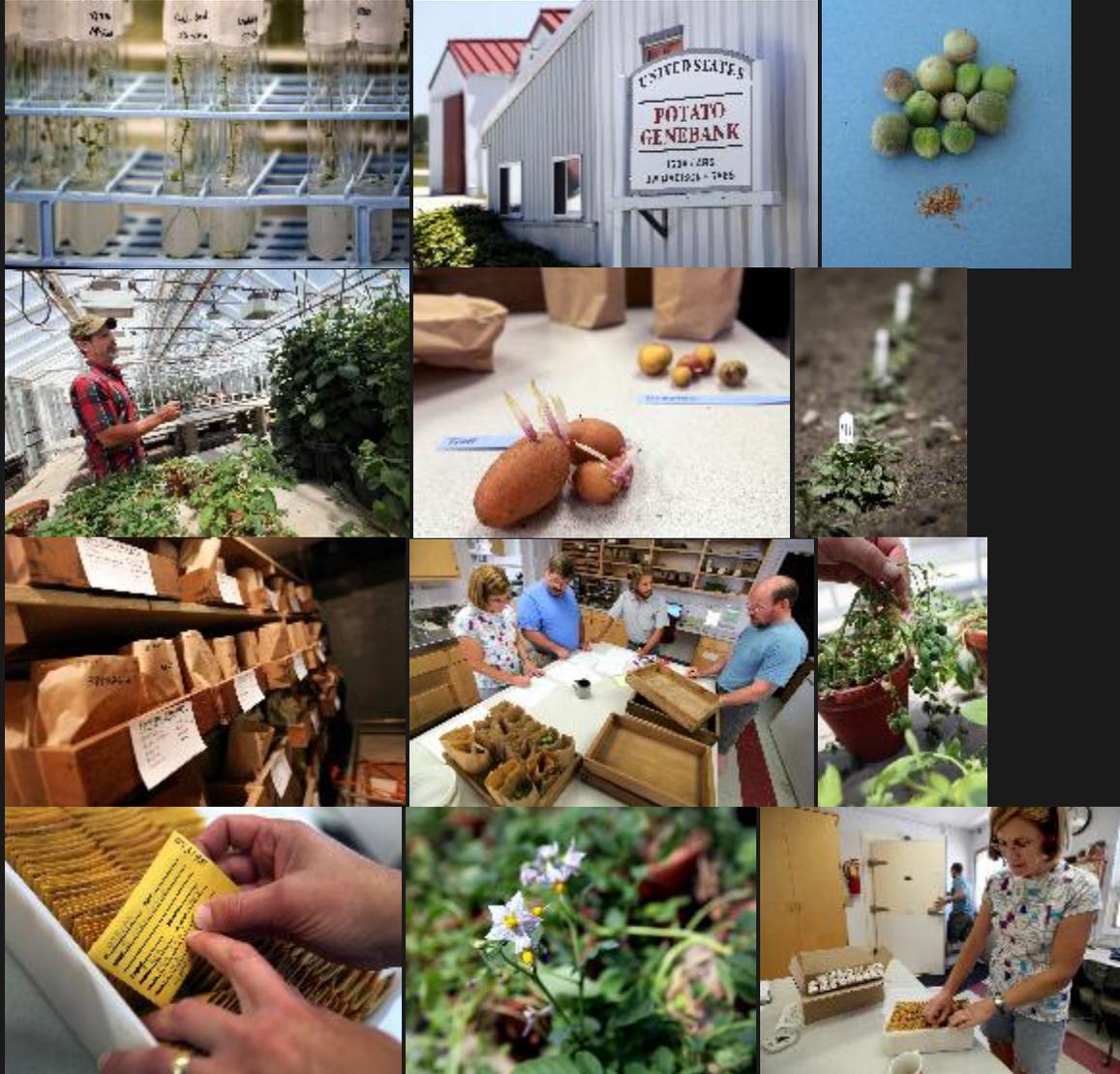
And a solution to a disease dubbed zebra chip - because it causes dark stripes in potatoes - might be found through the U.S. Potato Genebank. Zebra chip has moved from potato fields in Mexico into the U.S., and so far researchers are trying to find a wild potato variety that might prove to be hearty enough to withstand the disease.

"The only glimmer of hope so far is from things directly from us including some tough hybrids with non-tuber-bearing potatoes," Bamberg said.

Potato Genebank

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