

Federal Potato Programs

The Pacific Northwest produces more than half of all U.S. potatoes and provides the majority of U.S. potato exports. Potatoes are Idaho's largest source of crop revenue, with 2013 revenues estimated to be \$965 million, which generated \$7 billion of economic activity in the state. Funding to support the University of Idaho's potato-related research is vital to this important crop's health and development.

Potato Cyst Nematode

The potato cyst nematode (PCN), *Globodera pallida*, is an internationally recognized quarantine pest. Damage from PCN can be extensive; for every 20 eggs per gram (0.035 ounces) of soil there can be a 1-ton per acre yield loss. Left uncontrolled, this nematode can cause up to 80% loss in yield.



Nematodes survive away from the plant host as eggs inside of cysts. The narrow host range of cyst nematodes suggests that crop rotation could be effective for their control. But because of their obligate nature, cyst nematodes, and particularly *G. pallida*, hatch only in the presence of a suitable host that produces an appropriate chemical hatching factor. When a host is not present, cysts can persist in soil for years; this makes crop rotation ineffective for eradication of this pest.

The presence of *G. pallida* in Idaho is a concern for trading partners that import Idaho potatoes. Eradication of PCN is a top priority for the Idaho potato industry. PCN-infested and surrounding fields are regulated by USDA-APHIS and ISDA. Potatoes cannot be grown in infested fields. With the potential loss of the fumigant methyl bromide in the near future, regulators and growers need other effective strategies.

The University of Idaho potato cyst nematode program is based on research priorities identified by the Idaho Potato Commission, Northwest Potato Variety Development Program and the National Potato Council as well as federal and state regulatory agencies. The University of Idaho is one of two University facilities in the US that provides high-level biosafety laboratory and greenhouse facilities for researchers working on nematode eradication. An important function of the program is to conduct post-fumigation bioassays required to deregulate infested fields. Researchers also rear the nematode in a regulated greenhouse for research purposes.

Tri-State Potato Variety Development Program

Substantial increases in transportation, fuel, fertilizer, pesticide, and processing costs and changing consumer preferences have created a need for improved potato production efficiency and nutritional quality. Dominant varieties currently grown, such as Russet Burbank and Russet Norkotah, have serious production and quality limitations. Improvement depends on introducing new potato varieties.

Idaho is part of the Northwest Potato Variety Development Program, also called the Tri-State Program, and collaborates with the USDA Agricultural Research Service and university personnel in Oregon and Washington in developing and commercializing improved potato varieties for the Northwest. University of Idaho researchers participate in potato seedling



selection and evaluation, provide initial seed increases, complete in-field management research and post-harvest storage and quality evaluations, and coordinate commercialization efforts with industry.

The fresh market industry, French fry processors, and chippers have incorporated many potato varieties developed through the Tri-State Program into their production operations. Tri-State varieties such as Ranger Russet, Umatilla and Alturas were widely grown across the Northwest in 2013, accounting for 18 percent of planted percentage in Idaho, 39 percent in

Washington, and 41 percent in Oregon. Tri-State varieties were produced on more than 120,000 acres in the Pacific Northwest in 2013 with value to growers estimated at approximately \$500 million.

The new varieties use nitrogen fertilizer 20 to 40 percent more efficiently than standard varieties, potentially reducing the amount of nitrogen applied to the soil by more than 5 million pounds compared with Russet Burbank, with estimated savings to Northwest growers of over \$3.5 million. The Tri-State program also breeds varieties that feature antioxidant nutrients like vitamin C, anthocyanins, carotenoids, and phenolic acids. Several of the new potato varieties have substantially lower acrylamide levels than the current standard varieties.

Consequences of Reduced Funding

Continued funding of the University of Idaho's unique potato cyst nematode facility is critical for completing the bioassays necessary to deregulate infested fields in Idaho, as well as supporting research efforts to identify solutions to nematode infestations and protect the region's potato industry. Given the importance of eradicating the potato cyst nematode pest, reducing the program's funding could significantly damage the potato industry in the United States.

New potato varieties with improved production efficiency and higher nutritional value provide regional growers with a competitive advantage. The rapid adoption of varieties developed by the Tri-State Program demonstrates that market-based forces are encouraging producers to increase efficiency and sustainability through improved genetics. Funding reductions for the Tri-State Program will result in fewer new varieties being released, slowing the rate of adoption.

Request: Fund potato research special project at \$1.3 million for FY15 and direct additional funding into potato cyst nematode research.

Account: Agriculture, NIFA, Potato Research, and Potato Cyst Nematode

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