



Potato Virus and Virus-Like Disease Management

This project identified and characterized new potato disease problems; standardized testing methods for potato viruses; shared information with the U.S. and Canadian potato industries; strengthened relationships with state certification programs; and developed cooperative strategies to obtain funding for potato virus and virus-like disease management.

Who cares and why?

Virus and virus-like diseases in potatoes in the western U.S. create a costly situation requiring limited-generation seed programs and the use of multiple pesticides to minimize yield and quality losses in commercial crops. Substantial yield losses and rejections of seed lots for certification have resulted in tremendous dollar losses to growers. Public and environmental concerns surround the use of pesticides on potatoes. In addition, potato growers face potential registration cancellation of key pesticides and the difficulties of developing new information for re-registration or development of new pesticides. Pest resistance to current pesticides is always of concern. Loss

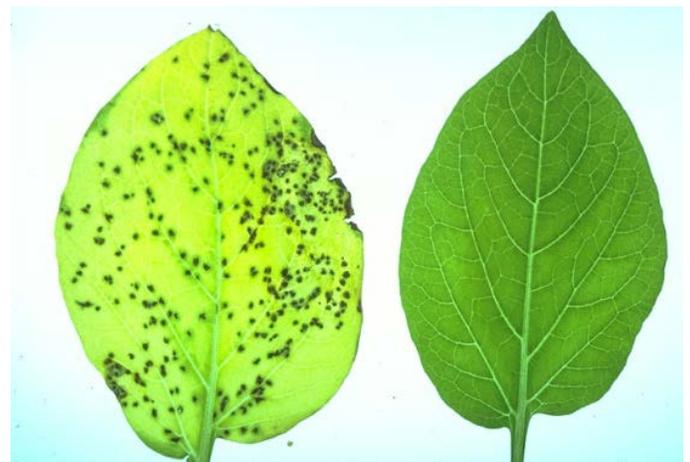
of pesticides or pesticide effectiveness will increase yield and quality losses if alternative solutions are not developed. This group provides a regional forum for collaboration among potato virus disease researchers and the dissemination of information on control strategies. The group also advises regional and national organizations, evaluating concerns, recommending policies, and reviewing quarantine and seed certification issues with the goal to improve plant health and crop sustainability.



Potatoes infected with zebra chip develop unsightly dark lines that resemble the stripes of a zebra. Photo by Joseph Munyaneza, USDA-ARS.

What has the project done so far?

Members have organized annual meetings to discuss current concerns regarding virus and virus-like diseases occurring in potato crops. This forum has also included presentations of ongoing research on potato viruses and virus-like diseases, their vectors, and alternate hosts. In addition, participants have considered research priorities for upcoming years. Sub-groups have been formed to work on specific projects throughout the year, including development of educational materials, presentations, and reference sheets.



The potato plant leaf on the left shows symptoms of potato virus Y infection compared to the healthy leaf on the right. Photo courtesy of Southern IPM Center

Impact Statements

Helped to prevent disease spread and serious damage by responding to reported findings of viruses (including new and uncommon strains) in potato fields, quickly diagnosing the problem, and implementing the appropriate control tactics.

Characterized new strains of potato virus Y (PVY) and assessed the impact of infection by these different strains of PVY on the yield and quality of potato varieties.

Identified the components of the tuber necrotic complex and developed new diagnostic tools that allow heightened confidence that potato seed with internal necrosis due to PVY will not be used for planting commercial potatoes. The PVY survey and the Canadian quality assurance survey have provided additional information about the health status of potato seed.

Found that hairy nightshade is a significant source of potato virus and the aphids which can transmit the disease, leading to new potato disease control strategies that include managing the various hosts and vectors of PVY.

Determined that younger plants are more susceptible to the potato purple top disease, giving potato growers in the Pacific Northwest much-needed information for using timely and appropriate insecticide applications to control the beet leafhopper insect that carries the disease, thereby preventing yield losses and reductions in potato processing quality.

Discovered that zebra chip, a new and damaging potato disease in the southwestern and central U.S., Mexico, Central America, and New Zealand, is associated with a previously undescribed species of the bacterium *Liberibacter* and is transmitted by potato psyllid insects. Development of effective management strategies for the potato psyllid is under way to minimize damage caused by this potato disease.



Potato plants showing symptoms of potato virus Y infection. Photo by Nina Zidack/Montana State University.

What research is needed?

To improve long-term plant health and crop sustainability, scientists must continue to provide a regional forum for the exchange of ideas and collaborative research on potato virus and virus-like diseases. Scientists need to continue to assist with the implementation of knowledge, methods, and resources that control potato virus and virus-like diseases. Furthermore, scientists need to share research results and advise regional and national organizations and help them evaluate concerns, review quarantine and seed certification issues, and develop policies that relate to potato viruses or virus-like organisms and their control.

Want to know more?

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