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PVY and Seed Potatoes: an Update

Phillip Nolte

A sturdy building requires a strong, solid foundation and so does a healthy, productive potato crop. Vital to the soundness of the foundation for your potato crop is the quality of the seed potatoes that you use to plant it. Over the coming fall and winter, growers will be making contacts and making decisions about their seed potato needs for next season. On the long list of things to be concerned about, we still get a lot of calls about Potato virus Y (PVY). How important is this virus and what can we do about it?

Research here at University of Idaho indicates that relatively small percentages of PVY in seed (10% or less) are likely to have no discernable effect on the yield of a commercial crop. Studies performed on Russet Burbank, Russet Norkotah and Shepody indicated that 1% PVY in the seed lot would result in a yield reduction of about 1.5 cwt/acre for each of these varieties. If we take these numbers out to higher percentages of virus, 10% virus can be expected to result in a yield reduction of 15 cwt/acre. We have had several opportunities to test these predictions, and these numbers have, so far, held up pretty well.

On reason we have seen a renewed interest in PVY is that it is a difficult disease for seed producers to manage. As part of the effort to reduce PVY in seed potatoes, UI has just published a new Extension bulletin titled, *Potato Virus Y Management for the Seed Potato Producer* authored by Phillip Nolte, Juan M. Alvarez and Jonathan L. Whitworth. It contains information about the virus and recommendations for reducing the amount of virus in seed potatoes. For seed producers, or anyone else who might be interested, this publication is available online at: http://info.ag.uidaho.edu/catalog/detail.asp?IDnum=1535.

What has the Idaho seed potato industry done to combat PVY? At their annual meeting in October 2007, the seed potato producers of the Idaho Crop Improvement Association made a momentous decision: They voted unanimously to test the entire winter seed grow-out for PVY mosaic using a laboratory (ELISA) test. This dramatic change was done in an effort to reduce the amount of PVY in the seed system and ultimately in the State of Idaho in general. This new rule has been in effect for two seasons and the seed crop currently in storage will be the third since the change.

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The winter grow-out for the Idaho seed potato industry is currently conducted in the Imperial Valley of California near the city of Brawley. Samples from each of the approximately 600 seed lots produced in the state during the last season are collected during October, treated to break dormancy and planted during the first week or so of November. During the winter, each sample will be subjected to inspections and also tested for PVY.

As many of you know, seed potatoes have to undergo a battery of inspections before the standards for certification have been met. Some of the most important of these inspections are the two summer inspections and the winter grow-out. The summer inspections provide information for the seed producer on how much virus was in the seed that was planted. The winter inspection provides information on how much virus is in the seed that the seed producer intends to sell, either for commercial production or, in some cases, for recertification.

So, how successful has this PVY testing program been? The results over the last two seasons of seed production are looking very encouraging. We have seen reductions in the amount of PVY in Idaho seed over the last three seasons. One of the measures we have is the number of seed lots in the seed-production system that have low enough levels of mosaic virus that allow them to still be entered into the seed program and be recertified. Over the last three years since the winter testing program was re-instituted, the number of lots that are eligible for recertification has increased by 9.5%. ELISA testing of the winter grow-out appears to be having the desired effect. PVY levels have dropped for the last two years in a row. As this program continues to have its positive effect, the next few

years should see even greater reductions in PVY.

Management of PVY for the commercial producer is best accomplished by purchasing and using seed potatoes that contain very low or even undetectable levels of PVY. Some varieties, notably Russet Norkotah (all strains), Gem Russet, GemStar Russet, Shepody, Cal White, Silverton and others are so susceptible to PVY that obtaining seed with low levels of PVY could prove to be challenging. If you are contemplating producing of one of these varieties, you may wish to make your seed selection choices early. I would also advise you to make sure that the seed has been subjected to a winter test and that the PVY amounts have been determined by a lab test, such as ELISA, and not by a simple visual inspection.

Efforts to better understand PVY and how to minimize the impact that this disease has on potato production continues to be a research priority. One area that will require more research effort is the impact of new strains of the virus on the potato industry. Over the last ten years or so, the PVY^{O} or "ordinary" strain (that still remains the most common of the strains) has been joined by variants new to North American such as the PVY^{N} or "tobacco necrotic" strain and a number of other variants that are thought to be "recombinants" (often designated as $PVY^{N:O}$ strains) that have some characteristics of both the N and O types. It remains to be seen just what the advent of these newer variants will be on potato production. The best strategy is still to keep PVY to a very low level in the seed that you plant.

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Did You Know?

In the early days of plant virus research when there were no rules for naming viruses, the English virologist K.M. Smith proposed that plant viruses be named for the host plant and be designated by a letter. He then proposed the names "potato virus X" (PVX) and "potato virus Y" (PVY) for two of the viruses he was working on. The names are still used today but his naming system was not adopted.

UI Potato Conference

The annual UI Potato Conference will be January 20-21, 2010 at the Student Union Building on the Idaho State University campus, Pocatello. Visit http://www.extension.uidaho.edu/district4/Potato%20Conference/potato.html for more information.

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