

# Northern Plains POTATO GROWERS ASSOCIATION



## State Board of Agricultural Research and Education (SBARE)

The Northern Plains Potato Growers Association representing 300 potato producers in North Dakota and Minnesota strongly support the hiring of a virologist to work with the "Potato Team" at North Dakota State University (NDSU).

Together each year Minnesota and North Dakota plant approximately 137,000 acres of potatoes. Total production numbers for the two states is 4,400,000,000 lbs. of potatoes. This makes North Dakota and Minnesota the 3<sup>rd</sup> largest producing region in the United States. This generates \$366 million in income for potato producers and when multiplied across agricultural jobs and processing you can see the importance of the potato industry to North Dakota and Minnesota.

Potato virus Y (PVY), which used to be called common mosaic virus, has plagued potato growers for many years with its potential to cause severe yield reductions. In the last two decades the problems caused by PVY have grown due to a combination of factors – including emerging strains that damage tuber quality and make the potatoes unmarketable. Today, managing PVY is more important than ever.

Recently most of the potato-producing areas in North America have been experiencing high PVY levels for several reasons. One of the most important factors is the emergence of new strains of PVY, which are necrotic strains.

"Necrotic" strains are strains that cause dead spots somewhere in the plant. For example, PVYntn causes potato tuber necrotic ringspot disease in susceptible cultivars – the tubers get brownish necrotic rings. This serious problem is compounded by the fact that PVYntn causes only very mild symptoms in the plant's foliage so that infected plants may go undetected. In contrast, PVY<sub>o</sub>, which is the "ordinary" strain of PVY, can cause very obvious foliar symptoms in many cultivars, such as mottling, crinkling and dropping of leaves, and stunted plants. This foliar damage can reduce yields, but the obvious symptoms also make it easy for growers to "rogue" (identify and dispose of) infected plants and for seed potato inspectors to visually identify infected plants.

A second factor is the introduction and widespread use of several potato varieties that exhibit mild or no foliar symptoms when they carry PVY<sub>o</sub>. they could be called "latent varieties." Without clear symptoms, it's very hard to identify infected plants and take them out of the system.

Another issue that can make it difficult to identify infected plants is when the infection occurs late in the season. It takes about two to three weeks or longer after infection for the disease to cause foliar symptoms. If the virus is transmitted at about the end of July to the middle of August, then by the time the symptoms would be appearing, the plants are old or the foliage has been top-killed. You are unable to see the foliar symptoms, even though the tubers may be infected.

A fourth factor is an increasing problem with aphids, which are an important vector for PVY – they acquire the virus from infected plants and spread it to other plants. There's been more aphid activity in recent years, possibly because of climate change, or new aphid species are coming into the system, or some different aphid species are transmitting the virus. Insecticides may help to reduce aphid populations within the infected crop, but aphids entering the crop still have enough time to contribute to the spread of virus, because the insecticide action is not rapid enough to kill a virus-carrying aphid alighting on the crop prior to virus transmission.

We are finding that it is not just potato-colonizing aphids that can carry PVY; most aphid species are able to transmit PVY. It has become easier for PVY-infected plants to remain as undetected sources of the virus and easier for the virus to spread. And the potential impacts on potato production have become even more serious.

Potato Mop Top Virus (PMTV) is also spreading throughout the US potato producing areas. PMTV is seed and soil borne vectored and is the casual agent of powdery scab on potatoes. Once established in fields, powdery scab can persist in the soils for up to 18 years in the absence of potatoes. PMTV is of economic importance to potato producers because it may affect tuber quality and may be transferred from seed potatoes to the new crop. PMTV has many other potential hosts including eastern black nightshade, hairy nightshade, common lambsquarters and sugar beets.

Tobacco rattle virus (TRV) is a pathogenic plant virus. Over 400 species of plants from 50 families are susceptible to infection. The virus causes the plant disease tobacco rattle in many plants. It causes the disease corky ringspot in potatoes. The disease manifests in various ways, and signs can include brown rings and arcs on the surface of a potato, and discolored spots on the interior. Nematodes are vectors of the virus. The nematode introduces the virus when it feeds on the roots of potatoes. The virus can also be mechanically and seed transmitted.

The US potato industry is under threat from newly emerged potato viruses that render potatoes unmarketable. Our goal is to reduce the impact of these tuber necrotic viruses by working with all sectors of the potato industry to develop and implement new practices leading to a healthier potato crop and higher farm income. A virologist at NDSU will work with the plant pathology department to develop improved diagnostic methods to rapidly determine the type of virus and amount of disease on a farm. Technologies will be transferred to growers and seed inspectors so they can better make appropriate disease management decisions. Host plant resistance to virus disease is the best management option, but few virus resistant potato varieties exist. A NDSU virologist will work with the NDSU potato breeder to develop molecular markers to shave years and considerable cost off the development and release of new virus resistant potatoes.

The North Dakota and Minnesota potato industry looks forward to working with a new virologist located at NDSU. We believe this relationship will be extremely valuable to the agricultural industry and university system.

Thank you,



Chuck Gunnerson, President