Virus diseases in potato: The problem has come home to roost in New York

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In the past decade Potato virus Y (PVY) has re-emerged throughout the U.S. seed potato production areas as a major disease problem and has been responsible for downgrading and rejection of about 20% of the seed lots grown in the US. New strains of PVY are emerging that cause tuber necrosis in some cultivars, but ironically induce milder foliar symptoms in most potato cultivars. These new strains have caused problems with international trade and rejections of potatoes at processing plants and fresh market facilities. The reasons for the emergence of the new PVY strains are becoming clear from the ongoing research and involve several contributing factors including widespread planting of symptomless carriers of PVY, the mild foliar symptoms induced by the new strains, and an increased distribution of aphids that allow infections to occur later in the growing season. All of these contribute to a decrease in the ability of seed certification programs to effectively observe and calculate accurate virus levels in seed lots, therefore the amount of virus in the system has been increasing. Inadvertently the dependence of visual symptoms to assess virus levels in the crop have selected for the new strains of PVY. Furthermore we have evidence that the new strains of the virus are more efficiently transmitted by aphids, they are more efficiently translocated to tubers, and they appear to be more fit than the older strains of the virus. If the incidence and distribution of the emerging tuber necrotic strains continues unabated, PVY will become a disease affecting the quality and salability of commercial potatoes as well as seed potatoes. Fortunately, a majority of the potato cultivars widely grown in North America are not susceptible to tuber necrosis, although we find many of the yellow flesh, round white cultivars are extremely susceptible. Many of the US potato breeding programs are now looking for PVY resistance, but the development of industry and consumer accepted PVY resistant potatoes is years in the future so short term management strategies will be key to keeping the necrotic strains of PVY at bay in the coming years. Good management practices will include the planting of certified seed with little or no PVY based on post harvest test rather than summer inspection data, the knowledge that any PVY in the certified seed is not the tuber necrotic PVY, and the rejection of any seed lot with detectible levels of the tuber necrotic strain of PVY for recertification. Planting of any seed lot with detectible levels of the necrotic strains of PVY for commercial production should be isolated from other potatoes, especially seed potatoes. Aphid management can be an effective tool for the management of PVY in small seed lots, but it is not an appropriate strategy for PVY management in commercial plantings or large seed fields. Seed certification can manage PVY if they can better identify virus levels in the crop and if the tolerance limits for PVY in the seed remain low. The planting of certified seed with low or no detectible virus will be the key to long term success.