

# November 2010

## Invasive Species of the Month Potato wart (*Synchytrium endobioticum*)



Images showing the effect of potato wart disease on potatoes. Photo credits: Central Science Laboratory, Harpenden Archive, British Crown, Bugwood.org (left), Canadian Food Inspection Agency (top right) and USDA APHIS PPQ (lower right).



**What?** Potato wart is a soil borne disease of potatoes caused by a single celled fungus, *Synchytrium endobioticum*. Disease symptoms usually appear only on tubers and stolons (underground stems). Above ground symptoms are usually not obvious, although a reduction in plant vigor may occur. On infected tubers, the eyes develop into characteristic warty, cauliflower-like swellings that start out the color of the potato skin and then gradually darken with age. The tuber may be entirely consumed by warts. Warts on stolons are similar to those on tubers and may be visible if the stolon is exposed above ground. *S. endobioticum* has a complicated life cycle that is favored by cool, wet soil conditions. The fungus produces two spore types, a resting (or winter) sporangium and a swimming spore. The winter sporangium is a thick-walled spore that can survive for 30 years in the soil; these spores are released into the soil when warts disintegrate. When environmental conditions are right, the winter sporangium germinates to release hundreds of swimming spores into the soil. These spores swim through soil water to reach and then infect susceptible potato tissues such as the eyes. The swimming spores perpetuate the life cycle by multiplying within the plant tissue and inducing the plant cells to divide uncontrollably into the warts. Potato wart disease is spread by mainly by the movement of infected tubers. The movement of contaminated soil on machinery, equipment, tires, and shoes is also an important means of spread. Although varieties of potato have been developed that are immune to some strains of this disease, the most effective control is to prevent the introduction of *S. endobioticum* and, if it is introduced, to adopt measures to prevent further spread.

**Where?** This disease is present in Asia, Europe, Africa, South America, and New Zealand. In North America, the disease has been reported in Newfoundland and Prince Edward Island, Canada, and in Maryland, Pennsylvania, and West Virginia. The infestations in Maryland, Pennsylvania, and West Virginia are all considered officially eradicated by the USDA Animal and Plant Health Inspection Service. Canada has adopted containment measures and a long-term management plan to prevent further spread of the disease and to minimize impacts on trade.

**Lookalike?** Symptoms of powdery scab, caused by *Spongospora subterranea* f. *sp. subterranea*, and of bud proliferation can mimic potato wart symptoms.