

# Potato Cyst Nematodes

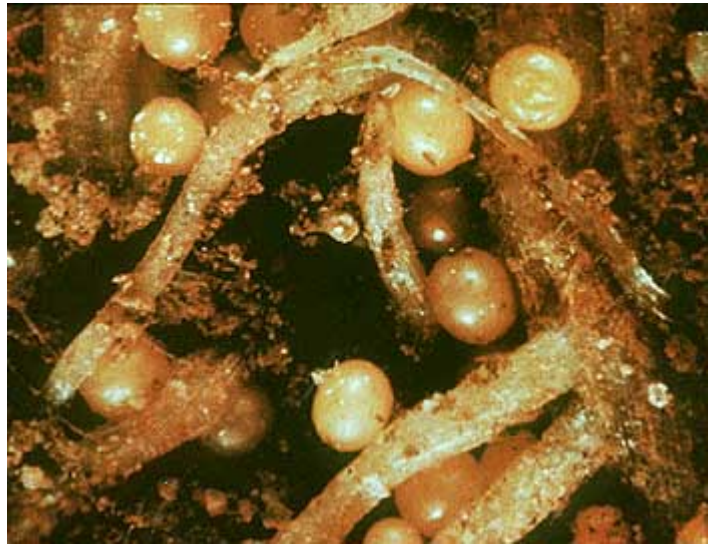
March, 2016

Two species of plant-parasitic nematodes, *Globodera rostochiensis* (the golden nematode) and *Globodera pallida* (the pale cyst nematode) are commonly referred to as “cyst nematodes”. Both species feed on and produce cysts on potato roots, thus causing substantial damage to potato crops. They also cause damage to tomatoes and eggplant and can also attack other members of the Solanaceae plant family, such as nightshade.

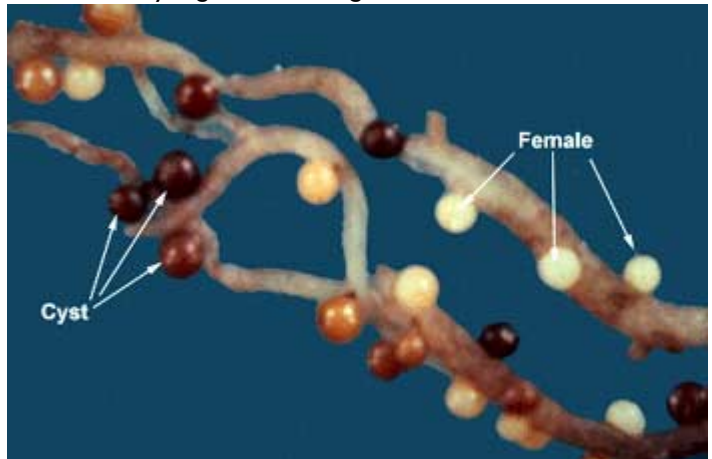
## Regulations

Both the golden nematode and pale cyst nematode are regulated federally. The golden nematode is regulated provincially under the British Columbia Plant Protection Act; Golden Nematode Regulation (Reg. 253/79) which prohibits the transportation of soil and plants, or farm equipment with soil, either within the municipality of Saanich or from the municipality of Saanich to other parts of the province. The Canadian Food Inspection Agency (CFIA), under Directive 96-05, prohibits importation of all potatoes from infested areas of the United States. For further information, please refer to the federal and provincial regulations under the *Plant Protections Acts* or contact the CFIA or B.C. Ministry of Agriculture.

In Canada, the golden nematode (*G. rostochiensis*) was first found in Newfoundland and Labrador and the central Saanich Peninsula (municipality of Saanich) on Vancouver Island, British Columbia in 1965. It was then detected in Quebec and Alberta. The pale cyst nematode, *G. pallida*, was only found in Newfoundland. Strict quarantine measures are in place to prevent the spread of these pests.



Golden nematode cysts on roots.  
Photo courtesy: Agriculture & Agri-Food Canada.



Golden Nematode - adult females and cysts.  
Photo courtesy: Canadian Food Inspection Agency

## Symptoms

Plants are stunted and yellow, and may die off completely, usually in patches in the field. Potato tubers from affected plants are usually small, but show no other symptoms.

The symptoms of cyst nematode damage are similar to those caused by other pathogenic soil-borne nematodes and other soil/environmental factors, such as compaction, flooding, drought, herbicide injury or nutritional deficiency, so are not diagnostic. A laboratory examination is needed to positively identify this nematode pest.

On heavily infested plants, the cysts of the golden nematode can often be seen on the roots with the naked eye. Cysts are white to golden to dark brown in colour, shiny and round and are attached to the root by a short stalk.

## Life Cycle

The **golden nematode** cyst is actually the swollen body of a dead female nematode. Each cyst contains up to 500 nematode eggs that hatch when they are near the roots of a host plant. After hatching, young (juvenile) nematodes, also called larvae, enter the plant's roots where they feed on plant nutrients and grow to maturity. Male nematodes then leave the root. Females extrude from the roots but remain attached and at this stage appear as tiny, white, swollen objects. They are fertilized by the male nematodes in the soil, which then die. After fertilization, the females produce eggs and also die, forming a hard wall around the eggs with their bodies, resembling "cyst" like structures attached to roots. Cysts are white at first, but gradually darken to a golden yellow or dark brown colour. The **pale cyst nematode** has a similar life cycle, however the female remains creamy white in colour as it matures. Cysts detach from the roots and can survive up to 20 years or longer in soil.

## Hosts and Geographic Range

Almost all plants in the *Solanaceae* family are hosts of potato cyst nematodes. They do not feed or reproduce on other plant species. However, cysts can be transported in soil from infested areas.

The golden nematode is widely distributed in Europe, Africa and Asia and occurs in many countries of South America. In North America, it occurs in parts of Mexico, on Long Island in New York State and in Canada only in Newfoundland and the central Saanich Peninsula of British Columbia, where it was found in 1965. It was also found in Quebec in 2006 on one farm. Since 1965, rigorous adherence to strict sanitation measures has prevented the spread of this nematode in soil to other parts of British Columbia and Canada.

The pale cyst nematode is found in many places where potatoes are grown, including Europe. It was reported for the first time in Idaho in April, 2006. Prior to that report *G. pallida* was only known to occur in Newfoundland.

## Further Information:

- Potato Cyst Nematode Information Page (Canadian Food Inspection Agency)
- B.C. Plant Protection Act, Golden Nematode Regulation (unofficial version)

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