Ministry of Agriculture and Food

Potato Cyst Nematodes

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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.

Hosts and Geographic Range

Almost all plants in the Family *Solanaceae* 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 and on Long Island in New York State, the United States of America (USA). In Canada, it was found in Newfoundland and the central Saanich Peninsula of British Columbia (B.C.), where it was first detected in 1965. It was also found in Quebec in 2006 on one farm. Since 1965 strict regulation and sanitation measures have prevented the spread of this nematode in soil to other parts of B.C. and Canada.

The pale cyst nematode is found in many places where potato is 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.

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.
Foliar 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 the swollen, 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 they appear as tiny, white, swollen objects. They are fertilized by the male nematodes in the soil. After fertilization, the females produce eggs and then 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 (Figure 1). 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.

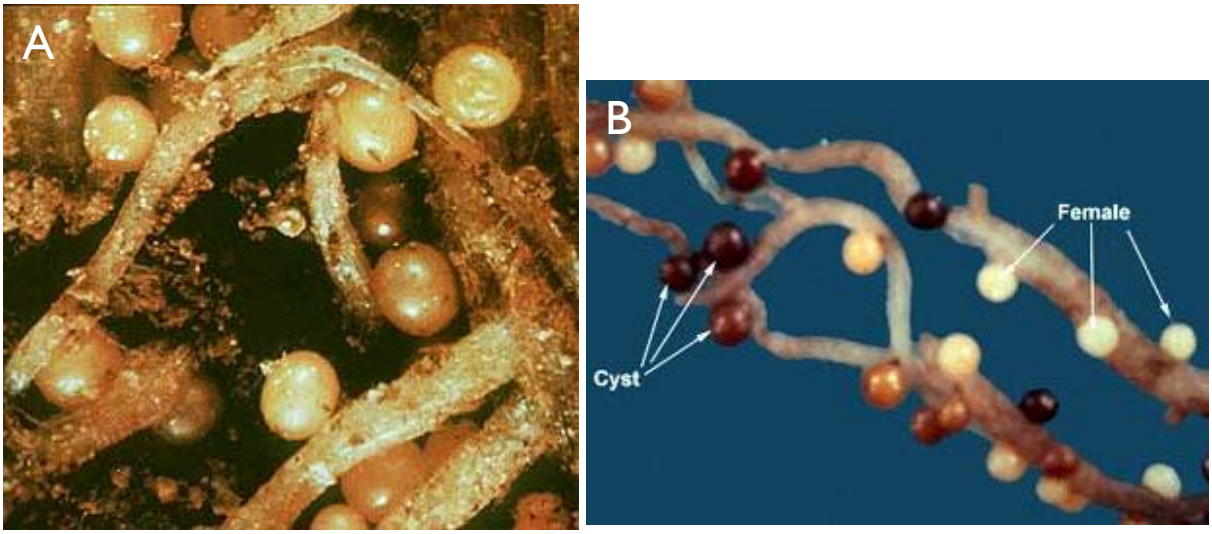

Figure 1. Golden nematode cysts on roots (A), Photo credit: Agriculture & Agri-Food Canada, and adult females and cysts on roots (B), Photo credit: Canadian Food Inspection Agency.

Regulations

Both the golden nematode and pale cyst nematode are regulated federally. The golden nematode is regulated provincially under the B.C. 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 the infested areas of the USA. 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 and Food.

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, B.C. in 1965. It was then detected in Quebec and Alberta. A recent survey conducted by the CFIA confirm the presence of golden nematode in the central Saanich Peninsula and, therefore, no changes to the

regulation have been made. The pale cyst nematode, *G. pallida*, was only found in Newfoundland. Strict quarantine measures are in place to prevent the spread of these pests.

Disease Confirmation and Regulatory Action

If the disease is suspected, please contact the local CFIA office or B.C. Ministry of Agriculture and Food, before submitting suspected samples to the Ministry of Agriculture and Food - Plant Health Laboratory or to a federal (CFIA) plant diagnostic laboratory.

For 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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