

ABNORMALITIES

(crown gall, root gall, blisters)

Crown Gall

Crown rots refer to when fungi attack the plant at or near the soil line. Symptoms may appear as a dark water-soaked region on herbaceous plants and dark, cracked or watery areas on woody species. If the organism invades the crown, the plants eventually die. Cankers, mushroom formation and sap bleeding are common aboveground symptoms of crown rots on woody species. Occasionally, white fuzzy mycelial sheets can be seen at the base of the plant.

The bacteria *Agrobacterium tumefaciens* and *A. rhizogenes*, cause plant cells to grow and multiply abnormally. Small overgrowths on the stem and roots near the soil line enlarge to form irregular swellings surrounding these areas. Tumors may be spongy, or they may be woody and hard, looking knobby or knotty, and reaching sizes up to 30 centimeters in diameter on some species. At first the growths resemble calluses but quickly become dark brown to black.

Life Cycle

The bacteria are able to infect the plant at new wounds from propagation, grafting, insects, etc. Once inside, they cause the cells at the wound to divide repeatedly, often producing galls further up the stem. Tumors become visible two to four weeks after inoculation if plants are actively growing. As the gall becomes weathered, the bacteria are returned to the soil, completing the disease cycle. Crown gall bacteria may remain in the soil on root fragments for several years.

Common Hosts

- Chrysanthemum*
- Euonymus*
- Juglans*
- Malus*
- Pelargonium* (geranium)
- Prunus*
- Rosa*
- Vitis*



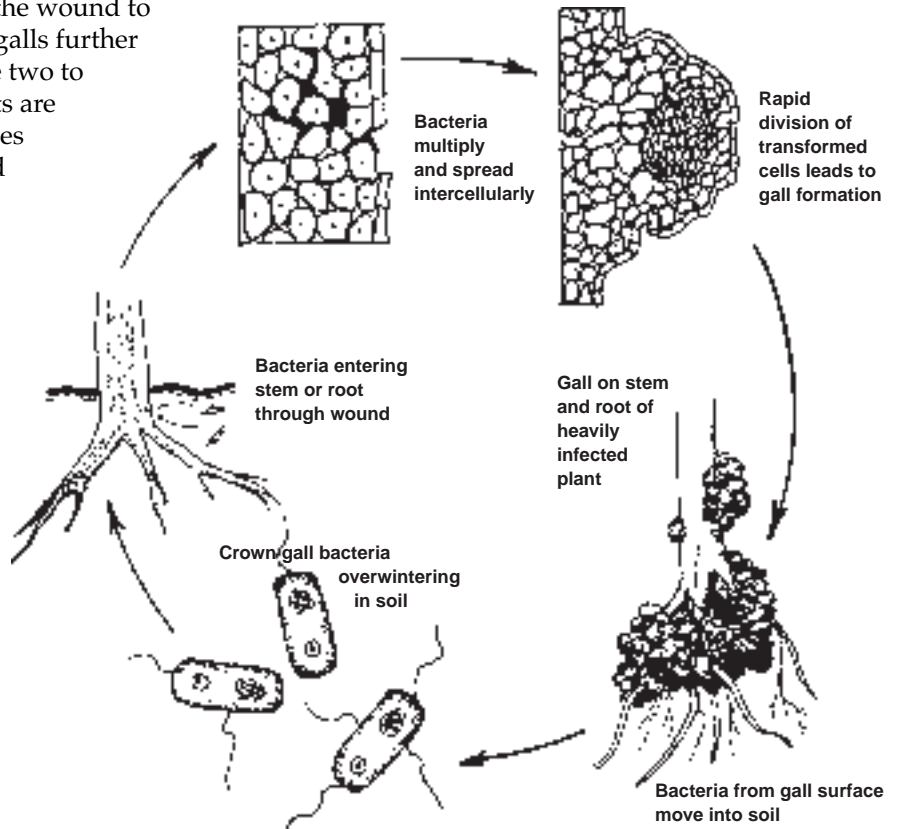
Cherry Crown Gall



Crown Gall of *Rubus*

Agriculture and Agri-Food Canada

Crown Gall Life Cycle



Azalea - Leaf Gall (*Exobasidium vaccinii*)

Results in thickened fleshy leaves, flower parts, and stems that turn pale, becoming covered in white spores. Thickening gradually increases to form an irregularly shaped, white, fruit-like gall. Fungus overwinters on azalea bark and bud scales, infecting opening buds in spring. Where leaf gall has been a problem, avoid overhead watering.



Exobasidium Leaf Gall on Azalea

Forsythia - Stem Gall (*Phomopsis* spp.)

Galls appear as a number of nodules pressed together along stems; galls increase in size annually. On small twigs or branches, dieback above gall occurs. Cutting off and burning branches and canes with galls may prevent it.



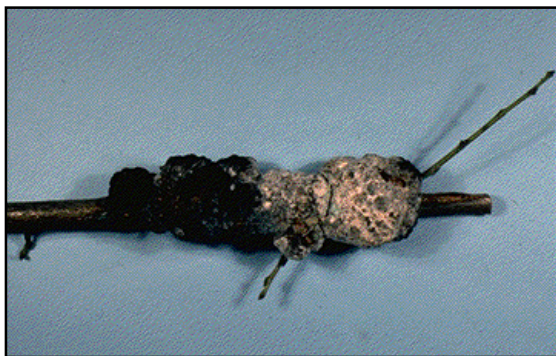
Exobasidium vaccinii Gall on Azalea

Populus - Leaf Blister (*Taphrina* spp.)

This fungal disease causes brown spots, and yellow to brown blister-like distortions on leaves that resemble damage caused by eriophyid mites (see mites). Spores overwinter on twigs or among bud scales, infecting young tissue in spring and throughout the season during warm, moist weather.

Prunus - Black Knot (*Apiosporina morbosa*)

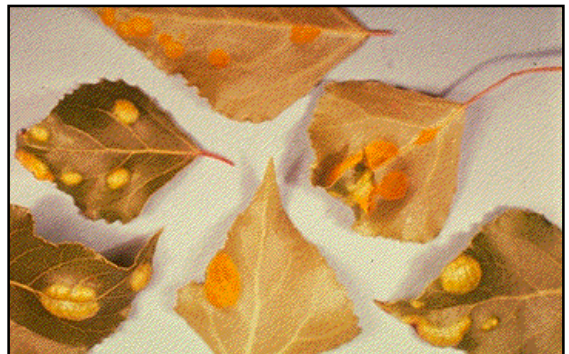
Causes black, rough, cylindrical galls around twigs. Infections occur through wounds in the bark of current year's twigs, progressing into branches and trunk, forming a large wound. Girdling may occur with branches dying back. A velvety, olive-green layer of spores forms over surfaces of knots in spring, spreading to other plants.



Black Knot of *Prunus*



Forsythia *Phomopsis* Galls



Taphrina Blister of *Populus*

Prunus - Peach Leaf Curl (*Taphrina deformans*)

This disease, which infects only peaches, is most severe in cool, wet areas. Unfolding leaves and shoots become puckered, curled, and thickened, changing from green to yellow, then reddish with a white coating of spores. Leaves fall prematurely, with new growth appearing later in the summer. Overwinters on bark and twigs, infecting buds during late winter. Infected leaves can be removed before sporulation in summer where practical.



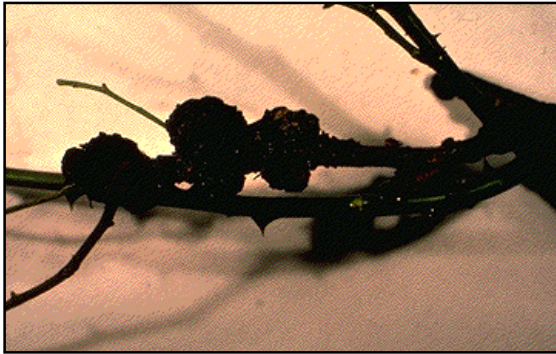
Cherry Leaf Curl

Rosa - Crown Gall (*Agrobacterium tumefaciens*)

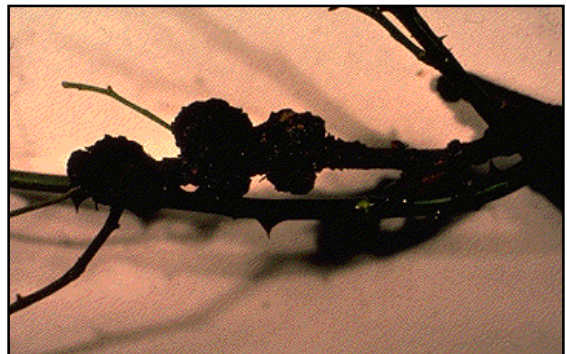
Results in rounded, irregular galls or tumours at or just below the soil surface in the basal or crown region. New galls are light green or nearly white and soft and older galls become darkened and woody. Plants become stunted and fewer blossoms form.



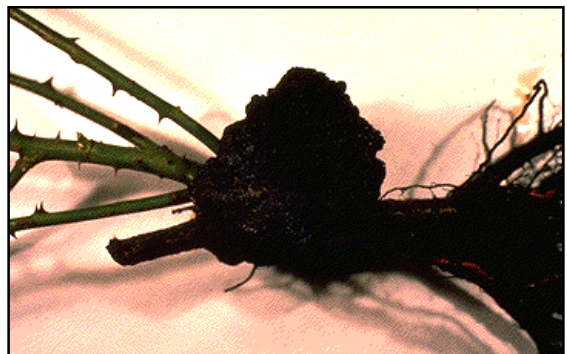
Peach Leaf Curl



Rosa Crown Gall



Crown Gall on Rosa



Crown Gall on Rosa