FACT SHEET

National Clean Plant Network

Start clean, stay clean.

Crown Gall of Roses

What is Crown Gall of Roses?

Crown gall is a bacterial disease caused by *Agrobacterium tumefaciens*. It has the ability to infect multiple genera and families of plants, most notably the Rosaceae family (apples, blackberries, cherries, roses, peaches, etc.). The distribution of the disease is world-wide.

What are the symptoms?

Symptoms may occur on any part of the plant, with the most common area being around the base of the plant near the soil line. Initially, the galls are small, light/pale green in appearance, spherical in shape and are comprised of soft tissue. They may occur on any area of the plant, including the roots as well as on higher branches, depending on the infection site. As the infection worsens, the shape of the galls becomes uneven, and they harden into a dark, woody mass. In heavily infected plants, secondary tumors may develop near the first gall. Furthermore, there may be several tumors affecting a single plant.

How serious is it?

Since galls can interfere with the transport of water and nutrients, the vigor of the plant is reduced. A plant that is weakened by an *A. tumefaciens* infection may be more susceptible to winter injury, and with a severe infection will die.

Can an infected plant be saved?

Unfortunately, once symptoms are visible the bacteria have spread throughout much of the plant. Thus an infected plant should be eliminated with as many of the roots as possible.

How does it spread?

Agrobacterium tumefaciens lives in the soil and can do so for years without infecting a rose. The *A. tumefaciens* bacteria enter the plant through fresh wounds caused by cultivation, pruning, machinery operations, freezing injury, growth cracks or insects. Once the bacteria have entered the host plant, it replicates rapidly causing the rose host tissue to form a gall at the wound site.

Galls are often found on a stem at the soil line, as shown in the photo above.

A young spongy gall forming on a rose branch.

How it is treated?

Prevention is the best method of control for this disease. Individuals should purchase only healthy looking plants that are free from obvious galls. Nurseries should inspect all shipments upon arrival and the entire shipment should be rejected if evidence of galls is present.

Cultural practices also play a crucial role in controlling the disease. As much as possible, avoid injuring the plant. For homeowners, sterilizing pruning tools (with a dilute solution of bleach) between cuts is recommended. For large scale production, sterilizing tools between plants or every few plants may be recommended. Furthermore, sterilization of work surfaces and tools is recommended to prevent the spread of crown gall disease.

In extreme/extensive infections, soil disinfection may be necessary. In commercial settings, the most effective approach to treat soil for bacteria is by heat (140-160°F) as common fumigants only reduce the bacterial population in the soil. In a greenhouse setting, the soil can be steamed (at 140°F for 30 minutes). Alternatively, the ground may be left fallow and planted with a non-host species for at least three years.

Currently, there are no chemical controls available for crown gall. However, biological controls are available and all contain *Agrobacterium radiobacter* strain K84 as a component. This bacterium is naturally occurring in the soil and outcompetes the crown gall causal agent.

Once a plant is known to have crown gall, the best practice is to destroy the plant and (if possible) remove the associated roots and surrounding soil.

Citations

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A dark woody gall with rough cracks at a pruning wound.

Small spherical gall on a lateral root.