



The Gall of it All

Galls are the enlargement of plant tissue caused by injury or irritation by parasitic organisms such as insects, mites, nematodes, fungi and bacteria. They are also interesting looking — knotty, lumpy and sometimes colorful. Learn which ones are common in your garden.

Story & Photography By Douglas A. Spilker, Ph.D.

The common definition of a “gall” is an “abnormal swelling of plant tissue caused by insects, microorganisms or external injury.” Due to the hideous nature of galls, it may be more appropriate to use the verb definition of gall — “to injure; to harass; to vex; to annoy.” Some of the growths, like the pink-colored pouch galls, can be quite interesting and attractive, but many others cause trees and shrubs to be deformed, unsightly and ultimately weakened. The “annoyance” is not only to the tree, but to the homeowner as well.

Galls are the enlargement of plant tissue caused by injury or irritation by parasitic organisms such as insects, mites, nematodes, fungi and bacteria. Important gall-makers include mites (arachnids) and insects such as aphids, midges, psyllids and wasps. Galls can also be stimulated by fungi (cedar-apple rust), nematodes (root knot) and bacteria (crown gall).

There are hundreds of types of galls recorded, each identified with a specific host (woody and herbaceous plants) and the pest producing it. Symptoms can be distinctive growths on the leaves, branches or twigs of many different plants, but especially on maples, oaks, elms, hackberries and cherries. Galls are caused by different orders of insects but are commonly produced in response to actions by parasitic wasps (*Hymenoptera*).

The abnormal growths are the result of the plant responding to the injury inflicted during feeding or egg-laying by the gall maker. The combination of the injury and insect secretions (saliva) incite the production of plant growth hormones. This increase in



Above: Elm finger galls tend to develop along the midrib of expanding leaves. **Middle:** Goldenrod stem galls can often be seen along abandoned fields. The adult fly emerges from a tiny hole in the gall. **Top:** Recently developed gouty oak galls are smooth, but turn hard and woody over time as seen here.

Did You Know?

Oak galls are high in resins and tannic acid and have been used as folk medicine by many cultures around the world, and as a source of dye and tanning material. Many tribal groups use oak galls for a variety of decorative and curing uses including pottery, leatherworking and basketry.



Maple bladder gall is very prevalent throughout the Midwest on silver maple trees (*Acer saccharinum*).

plant hormones causes rapid cell division and abnormal cell growth of the plant meristematic tissue (active growth area) causing gall development. The resulting galls provide a protective environment where the eggs can hatch, the larvae can grow and the pupae can develop. For gall formation to occur, the feeding or egg-laying must happen while the leaves and plant parts are rapidly growing, usually in early to late spring.

One of the most common galls found in the Midwest is the maple bladder gall, a pouch-like growth on the leaves of maples, especially silver maple, caused by an eriophyid mite. Clusters of small galls form on the leaf surface as they expand in spring. The galls change color from light green to a bright red and eventually to black as the season progresses. The elm finger gall is also caused by an eriophyid mite.

No matter where oaks occur, they are attacked by a group of tiny wasps (cynipids) that stimulate galls on leaves, stems and twigs. While most galls are relatively harmless to trees, both the horned oak gall and the gouty oak gall can cause serious damage, even killing younger trees. Extensive galling can cause twig dieback and branch breakage in younger trees. The large spherical woody galls can swell up to 2 inches in diameter, and can coalesce to form long masses on branches. These two twig galls look similar, but the horned oak gall has small horns protruding all around the gall, whereas the gouty oak gall is smooth.

The very common hackberry nipple gall is caused by psyllids (jumping plant lice). They appear as columnar-shaped swellings on the undersides of leaves and surround the developing insect. Elm pouch gall is similar, but is formed by an aphid. The elongated pink pouches usually occur singly on the upper leaf surfaces.

Galls do not only occur on woody plants, but on herbaceous plants as well. If you have ever gone hiking along abandoned fields, you may have noticed the ping-pong-ball-size goldenrod stem gall, caused by a small fly. The expanded host tissue provides a secure environment and a ready food source for the developing maggot, which eventually emerges as an adult from the gall to start the cycle all over again.

The good news about leaf galls is the majority do little or no damage to trees. Although high populations might cause a ragged appearance to the foliage and cause premature leaf drop, leaf galls rarely result in long-term injury to the tree; therefore, no treatment is needed.

Management of twig and stem galls, like oak galls, is limited at best. For younger trees, it might be possible to prune out the affected branches and dispose of them. Pruning and treatment of larger trees is much more difficult and might require the assistance of a professional arborist. Timing of chemical sprays is difficult since they must be initiated at adult insect emergence, that is, before gall formation begins. Late spraying may kill the gall maker, but the plant-initiated gall will continue to grow. Professional application of systemic insecticides has shown some promise, but further research is needed. The best treatment is prevention and stress reduction to encourage healthy new growth, including proper fertilization, deep watering, avoiding mechanical damage and alleviating soil compaction. 🐞

Douglas A. Spilker, Ph.D., is a consulting ornamental plant pathologist and entomologist, garden writer and lecturer. Dr. Doug can be reached at askdrdoug@gmail.com.