AGRICULTURAL
MU Guide
PUBLISHED BY MU EXTENSION, UNIVERSITY OF MISSOURI-COLUMBIA muextension.missouri.edu

Insect and Mite Galls on Missouri Trees

Bruce A. Barrett, Department of Entomology

Galls are abnormal vegetative growths that can be found on practically every part of a plant, e.g., leaves, buds, twigs and stems, flowers, seeds and fruit, and roots. Galls typically result from the interaction between a chemical stimulus produced by the pest organism and the plant's hormones. The resulting gall is usually structurally strong and rich in protein, and provides protection and food for the occupant developing within.

There are more than 1,500 different species of gall producers, the majority being insects and mites. The primary gall producers are certain species of wasps, midges, eriophyid mites, aphids or plant lice, and psyllids or jumping lice. Galls formed by these arthropods are often very striking in their appearance and come in a variety of shapes, sizes, textures and colors. Some are irregularly shaped, bumpy, warty growths, while others are smooth, spherical formations. A specific gall producer often can be identified by the unique shape or color of the gall that develops around it, or by the host plant it is on. For example, most of the gall-producing wasps attack only oak, whereas midges can form galls on a wide variety of plants.

One of the most commonly asked questions about galls is whether they are harmful to the host plant. Despite their unsightly appearance on the foliage, which detracts from the normal beauty of a tree or shrub, galls generally cause little real damage. Infested leaves, which can be twisted or curled up, are usually able to carry out photosynthesis at near-normal levels. However, often the less striking and nonapparent galls that can occur on twigs, small branches and roots, can over time kill and weaken portions of a tree, as well as cause a general decline in plant vigor.

Common examples

Maple bladder gall. In spring, small bladderlike growths often appear on the foliage of red and silver maple. These galls are about ⅛ inch in diameter and at first are light green in color, but then turn red and finally black by the end of the summer. An extremely small mite (1/125 inch long) induces this type of gall. The adult mites overwinter under the bark and in other protective places on the host tree. They also may hibernate in the tree's buds. In early spring, the adults move to the developing, unfolding leaves and begin feeding. The leaf responds by rapidly producing a gall at the feeding site, enclosing the mite. The mite continues to feed and lays numerous eggs within the gall. Reproduction is prolific, and as the mites mature, they leave the gall and continue infesting new foliage until about July, when their activity starts to decline. The adult mites leave the foliage in the fall and move to overwintering sites.

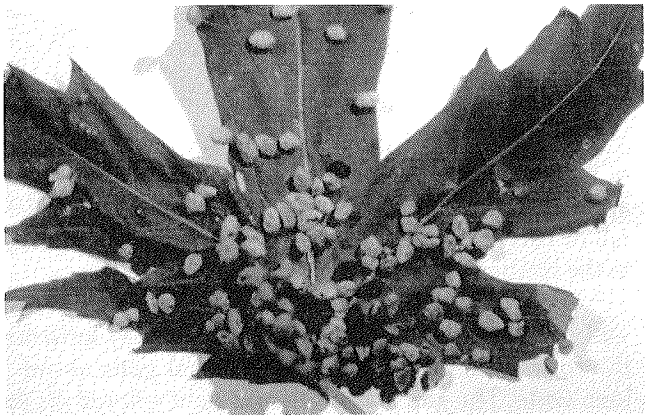

Figure 1. Maple bladder gall.

In high infestations, the maple bladder gall causes leaves to be disfigured and often results in early color change and leaf drop. However, these galls are rarely detrimental to the overall health of large trees. To control maple bladder gall, apply a dormant oil or insecticide spray in the spring just before the buds open.

Maple gouty vein gall. Often the veins on the lower leaf surface of sugar and red maple become enlarged or swollen. Such galls are caused by midges, small mosquito-like flies. The insect overwinters as a larva in the litter underneath the tree on which it developed the previous year. In the spring, the adults start to emerge and mate. Eggs are laid on the young, developing leaves. Upon hatching, the larvae collect in groups on the upper leaf surface along the veins. A larval stimulant causes the leaf tissue around the lower surface of the veins to swell, pushing upward and enclosing the larvae. Within these galls the larvae feed and develop. In the fall as the leaves are dropping and drying out, a narrow slit forms along the gall, permitting the mature larvae to escape and seek overwintering sites.

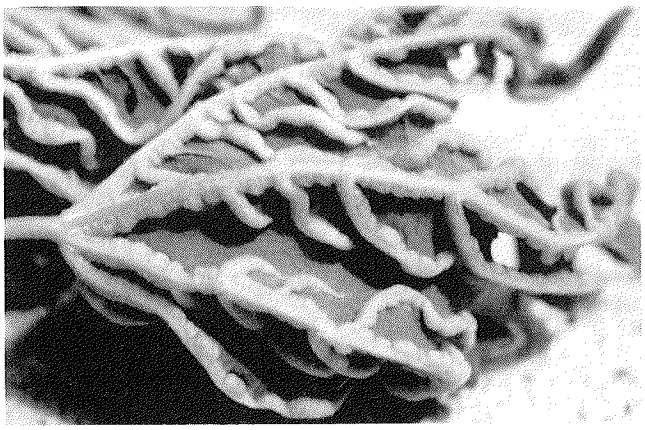

Figure 2. Maple gouty vein gall.

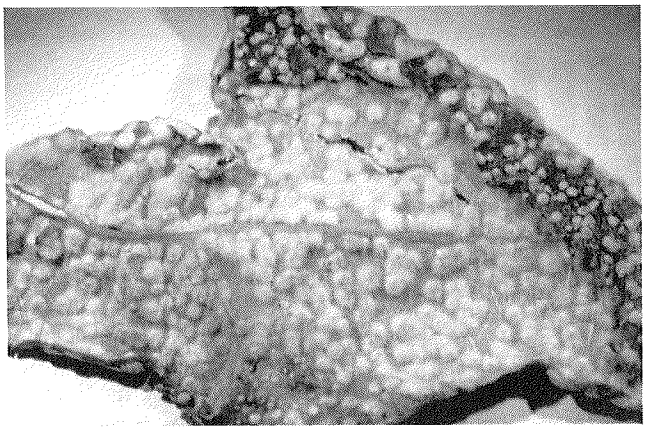

Figure 3. Oak flake gall.

This type of gall does not seriously affect the health of the tree. Control can be achieved with an insecticide applied to ground litter under the infested tree in late fall or early spring, or to the surface of the new foliage in the spring before the veins begin to swell.

Oak flake gall. In the spring, a female gall wasp will lay eggs on newly formed oak leaves, inducing the formation of small, hemispherical galls about ⅛ inch wide. The gall is smooth and light colored on the upper leaf surface and thickly covered with white woolly hairs on the lower leaf surface. Heavily infested leaves curl and become disfigured.

Gouty oak gall. One of the more conspicuous galls is the gouty oak gall, a growth commonly seen infesting the twigs and smaller limbs of scarlet, pin, and black oak. The gall is irregularly spherical and can get 3 to 4 inches long and 1½ inches in diameter. It is solid and woody and has many larval cells or chambers near its center. The galls often grow side by side and can extend the length of a small branch.

The life cycle of the tiny wasp (1/16 inch long) that forms this gall is complicated and involves two areas of the host plant. In the spring, female wasps emerge from the galls and fly to the foliage to lay eggs. This results in small, blisterlike galls near the veins. By midsummer, adult male and female wasps emerge from these leaf galls. After mating, the females lay eggs in young twigs, inducing the plant to produce the large, woody twig galls. The wasps living within the woody twig galls may take a couple of years to mature.

During heavy infestations of gouty oak gall, twigs, portions of branches, or entire trees may die. For control, prune out and burn infested twigs and branches.

Marginal fold gall. This gall, often found on pin and red oak foliage, is formed by a midge. Larvae feeding activity stimulates the formation of a tubular roll and swollen area on the margins of the leaf, which may house several larvae. After completing development, the larvae leave the gall and drop to the ground where they overwinter until the following spring. Foliage galls of this type rarely harm the host plant.

Gall control

It should be remembered that **despite the unattractiveness of galls, their presence usually is not harmful to the host plant**. Consequently, a control response with chemicals in most situations is not recommended.

Gall producers are usually kept in check by natural enemies. However, in some situations where gall density has been heavy for several consecutive seasons, a chemical response may be advised. But effective insecticidal control of gall producers can be very difficult. Nonsystemic insecticides are virtually useless once the gall has been formed. In addition, the critical periods in the pest's life cycle when sprays would be most effective, such as during spring emergence and egg-laying periods, are still unknown or vague for many important gall-producing insects and mites.

Some control can be achieved on species that overwinter on the tree by a dormant oil spray early in the spring or an insecticidal treatment just after the leaves start to develop. Some of the insecticide/miticides currently recommended for certain types of gall control include carbaryl, permethrin, imidacloprid, dicofol, horticultural oil, acephate, bifenthrin and spinosad.

Before using any chemical, please read the label carefully for directions on application procedures, appropriate rate, first aid, and storage and disposal. Make sure that the chemical is properly registered for the intended use.

UNIVERSITY OF MISSOURI Extension

■ Issued in furtherance of Cooperative Extension Work Acts of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. Thomas A. Henderson, Interim Director, Cooperative Extension, University of Missouri and Lincoln University, Columbia, MO 65211. ■ University of Missouri Extension does not discriminate on the basis of race, color, national origin, sex, sexual orientation, religion, age, disability or status as a Vietnam era veteran in employment or programs. ■ If you have special needs as addressed by the Americans with Disabilities Act and need this publication in an alternative format, write ADA Officer, Extension and Agricultural Information, 1-98 Agriculture Building, Columbia, MO 65211, or call (573) 882-2792. Reasonable efforts will be made to accommodate your special needs.