

Cynipid Gall Wasps on Oak

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Galls are formed when an external agent, such as an insect or fungi, causes plant tissue to swell. Galls can occur on any part of a plant. Gall formation on individual leaves or petioles are not typically associated with tree injury or death, but twig or trunk galls can lead to tree decline if infestations are severe. The insect family Cynipidae, commonly known as the gall wasps, are agents of gall formation on oaks and many other species of trees. Over 750 species of cynipid gall wasps occur in North America. The focus of this report will be cynipid gall wasps that cause galls on oak twigs and leaves. The larvae of gall-forming cynipid wasps develop inside of the galls, which protect them from parasitism and predation. The inside of the gall also provides an ideal internal temperature and food for developing larvae.

Description

Oak galls can be very showy. The horned oak gall wasp (*Callirhytis cornigera*) causes large twig galls with distinctive horns (Figure 1). The gouty oak gall is another showy gall that is formed by *C. quercuspunctata*. Oak leaf galls are generally inconspicuous, unless large infestations occur. For example, the jumping gall wasp (*Neuroterus saltatorius*) is hardly noticed in California where it is native, but in eastern states where it has been introduced, the insect can cause severe foliar damage leading to branch dieback. Adult cynipid gall wasps typically go unnoticed; therefore, the best way to identify a gall wasp is by the its gall and host plant species.

Lifecycle

The gall wasp life cycle and number of generations per year varies with wasp species and location of the gall on plant tissue. Gall wasps that develop in twigs generally require two or more years for complete development. Adult twig gall wasps can overwinter either as adults in locations away from its host tree or inside the gall. Spring bud break initiates host location and females will lay eggs (oviposit) in suitable host twigs. Developing larvae feed on the interior tissue of the gall until pupation.

Figure 1: Horned oak gall on pin oak



Gall wasps that develop inside leaf tissue generally have one to two generations per year. Adult females emerge in the spring and oviposit in leaf tissue. Some species, such as the jumping oak gall wasp, have a generation where females do not have to find a mate (parthenogenic) when they first emerge, but will have to find a mate in the second generation. Females of the jumping oak gall wasp lay eggs on the underside of oak leaves (Figure 2). In autumn, the second generation galls drop from the leaves and pupation occurs within the gall in the leaf litter.

Figure 2: Jumping oak gall on the underside of a white oak leaf with an emerging larva



Damage

Gall formation from cynipid wasps is a result of oviposition – the process of females injecting eggs into plant tissue. Cynipid gall wasp infestations usually do not result in tree mortality. However, severe infestations cause stress to the tree and possibly lead to branch dieback, making trees unsightly. Furthermore, trees experiencing major infestations become susceptible to other, more serious issues due to the stress imposed by the cynipid wasp galls.

Management

Managing gall wasps can be difficult because the insect lives within a protected home for most of its life cycle. The best management practice for twig gall wasps is to physically remove the galls during autumn and winter. The best management practice for leaf-infesting gall wasps is to rake up and destroy leaf material beneath oak trees prior to the following spring. These cultural practices will not completely remove the local population but prevent large infestations from building.



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