Texas Agricultural Extension Service
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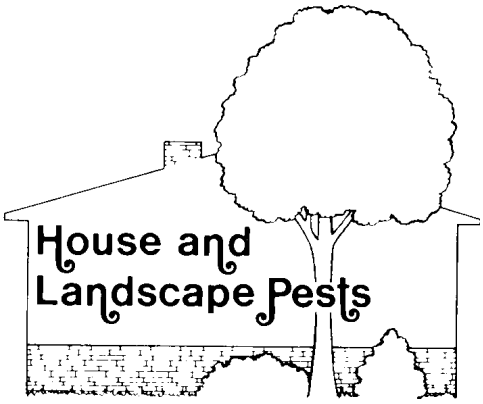
Gall-Making Insects and Mites



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Galls are the result of the abnormal growth of plant cells. They are caused by insects, mites, nematodes, bacteria or fungi. Insects that cause galls include certain small wasps (cynipids), jumping plant lice (psyllids), aphids, thrips, moth caterpillars and beetles (**Table 1**). The most common galls on ornamental plants are those caused by insects and mites. Galls develop characteristic sizes, shapes and colors. Some galls have been used to produce inks and dyes, and some are acceptable food for animals and man.

Figure 1. A gall-making cynipid wasp.

Biology

The biology of gall-making wasps can be complex. Some wasps form different types of galls in alternating generations. In some species, the adults and galls are similar in the first and third generation, while very different in the second generation. The two generations of the mealy oak gall wasp are described below as an example of a common gall-making insect.

Asexual generation: Spherical galls, 1/8 to 1 inch in diameter, appear on branches and twigs of live oak in late summer and early fall. When first formed, they are pink to pinkish brown and the yellow-green tissue inside is moist and soft. Adults emerge by chewing holes in the bases of galls during December. All adults are female; they do not mate before laying eggs on swollen leaf buds.

Figure 2. Mealy oak galls on post oak produced by the asexual generation of the mealy oak gall wasp.

Sexual generation: Eggs laid by adults of the asexual generation hatch in early spring as leaf buds begin to open. Larvae develop quickly in leaf tissue and stimulate the development of small, beige-colored galls resembling kernels of wheat. Adults of both sexes emerge from these galls after a few weeks. After mating, females

lay eggs in post oak twigs and branches. These eggs remain dormant for 3 to 5 months. They then hatch and stimulate the formation of galls of the asexual generation.

Gall formation

Gall tissue is formed when a plant reacts to some stimulus from insects and mites. This stimulus might be : 1) a fluid injected by adults laying eggs; 2) the presence of the insect or mite in or on plant tissue; 3) insect or mite saliva; or 4) insect excretions. Genetic changes in the plant tissue also may occur during gall formation. After a brief period of growth gall development stops completely. The insects or mites inside galls become surrounded by their food source and are protected by the gall.

Damage

The biggest problem with gall-infested plants is that they may seem unsightly. However, some people consider certain galls attractive and use them in flower arrangements and other crafts. Galls don't usually damage plants, although leaves with insect-induced galls may fall from the plant earlier than non-infested leaves. Twig and stem galls usually persist for more than a year. They can weaken stems and twigs and cause them to drop during storms. In the case of pecan stem phylloxera, this can reduce pecan yield.

Common plant galls and their inhabitants

Galls occur on a wide variety of plants. Some plants are hosts for only one or two species of gall-forming insect or mite species, while others such as oak and hackberry trees can be hosts to many species (**Table 1**). Certain plants and plant varieties are particularly attractive to gall-forming insects and mites.

Galls commonly occur on leaves and stems, but also may occur on flowers, fruits, twigs, branches, trunks and roots. Some of the common galls are easily recognizable. Common terms used to describe galls are blister galls, bud galls, bullet galls, erineum galls, flower galls, fruit galls, leaf galls, leaf spots, oak apples, pouch galls, roly-poly galls, root galls, rosette galls and stem or twig galls.

Management of gall-forming insects and mites

Prevention. To avoid gall-forming insects, choose plants that are not known to be hosts to these pests. If planting a susceptible plant, select a good site and plant it properly. Should a susceptible plant already be in place, good horticultural practices will help keep it healthy. Gall-forming insects must attack the host plant at a very precise stage of plant development in order to form galls. Occasionally, certain trees will bear more galls than adjacent trees of the same species. Studies have shown that oak trees whose buds opened earlier than those of nearby trees had many more galls, because the wasp causing the galls needed open buds in which to lay its eggs.

Tolerance, hand picking and pruning. Since most galls and gall-forming insects are not a threat to plant health, attempts to suppress them are not usually warranted. Learning to recognize different galls and the insects or mites responsible may even be one way to enjoy nature! If galls are unsightly, they can be hand picked, or infested plant parts pruned and discarded. However, this may not prevent infestations the following season. Removing the host plant and replacing it with a non-susceptible plant is the only sure method of control.

Biological control. Several kinds of wasps parasitize gall-forming insects and limit the number of galls formed. These wasps are natural biological control agents and should be encouraged. To protect these beneficial wasps, don't use insecticide when they are searching for their insect hosts (particularly from late spring through early summer).

Newly planted susceptible plants may have galls for a year or so before parasites find the galls and begin their attack on gall-forming insects.

Adult gall-forming insects leave galls through exit holes. The vacated space is almost immediately occupied by small spiders and beneficial insects such as lacewing larvae, ants or parasitic wasps. Thus, old galls house beneficial organisms that feed on the harmful insects. The honeydew-like substances associated with some galls attract ants, wasps and bees.

Chemical control. Although some pesticides (insecticides and miticides) are registered for controlling gall-making insects, their use is generally unwarranted and ineffective. Unless these products can be applied when adults are actively laying eggs, they give no control. Once galls begin to form, the insects and mites inside are protected and can not be killed with either a surface-applied pesticide or a systemic pesticide. Once gall growth begins it cannot be stopped with insecticides.

Table 1. Common gall-making insects and mites in Texas.

Host plant(s)	Type of gall(s)	Classification/pest
apple	galls on roots and twigs	wooly apple aphid
cypress	swellings on growing tips	gall midge fly
elm	bladder or finger-type leaf galls	mite (*Eriophyes ulmi*)
ficus	leaf folding and rolling	cuban laurel thrips
grape	galls on roots	grape phylloxera
hackberry	blister, nipple, petiole, bud gall and others top-shaped galls on undersides of leaves	*Pachypsylla* spp. cecicdomyid fly
hickory, pecan	petiole and leaf stipule galls	*Phylloxera* spp.
oaks	leaf vein pocket gall	fly gall
	woody twig galls	gouty oak and horned oak gall wasps
	leaf galls with orangish “hair”	hedgehog gall wasp
	sticky, spongy galls on twigs with seed-like structures inside	wool sower gall wasp
live oak	woody twig and stem galls	mealy oak gall wasp
	leaf galls	wooly leaf gall wasp
red oak	spherical, spongy-filled galls	oak apple wasp
poplar, cottonwood	pocket galls on leaves, leaf bases and petioles	aphid
willow	cone-like gall on terminal	willow cone gall fly
yaupon holly	pocket galls on leaves	yaupon psyllid gall wasp

Figure 3. Galls produced by the gall midge fly on cypress.

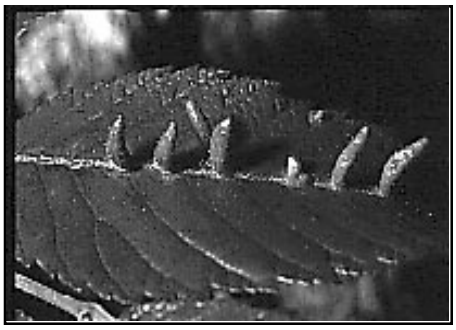

Figure 4. Elm finger gall.

Figure 5. Hackberry nipple galls induced by the jumping plant louse or psyllid. *Pachypsylla* spp.

Figure 6. Galls caused by the oak apple wasp on red oak.

Figure 7. Leaf pocket gall on cottonwood.

Figure 8. Pocket galls on yaupon.

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