



Bagworms in Urban Landscapes

Oluwatomi D. Ibiyemi, Shimat V. Joseph, and Will Hudson
Department of Entomology, University of Georgia



UNIVERSITY OF GEORGIA
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Bagworms are pests of many urban ornamental trees and shrubs, including evergreens and various deciduous species. Although there are at least 28 species of bagworms in North America, *Thridopteryx ephemeraeformis* (also called the common bagworm or the evergreen bagworm) is the most encountered and reported species of bagworm in the Southeastern United States. They are the caterpillars (larvae) of a moth species that make spindle-shaped bags for shelter (Figure 1), which can become unsightly and have an effect on the aesthetic appeal of ornamental plants or trees. Bagworm larvae live and mature inside the bags (Figure 2) until they either emerge as winged males or remain in the bag as wingless, larva-like females. Bagworms have a broad host range and a high reproductive rate. Severe infestations of bagworms can lead to heavy defoliation of host plants (Figure 4), which affects plant health and ultimately leads to plant death. As a result, bagworms have become one of the most destructive pests of urban ornamental trees in Georgia.

Biology and damage

Bagworms have one generation per year. In May, the overwintering eggs hatch into small caterpillars. To search for food, the bagworms spin a silk thread so they can be carried by the wind toward nearby plants in an act called *ballooning*. Once they start feeding, the larvae construct bags out of silk and plant debris (Figures 1 and 2). The bag-like structures provide protection and shelter; the developing caterpillars are able to retract into them when threatened or disturbed. As the bagworm caterpillar grows, the bag increases in size and can become up to 2 in. long. During the late stages of development, the caterpillar permanently secures its bag to a twig and transforms into the pupa in a process that lasts 7–10 days.

It is worth noting that female bagworms do not exit the pupal casing within the bag because they have no legs, wings, or antennae. On the other hand, male bagworms emerge from the bag with wings and fly around, searching for a female during the fall. Once a mate is found, the male climbs and hangs upside down (Figure 3) from the female's bag to mate. Female bagworms then lay clusters of about 300–1000 eggs in their pupal cases, where they then overwinter. Both females and free-living males do not feed; they can only cause damage to host plants when feeding during the caterpillar stages. The males die within 2 days of mating, and the females die within the bag or drop to the ground a few weeks after laying eggs.



Figure 1. Spindle-shaped bagworm sacs on a pine tree. Photo: Pennsylvania Department of Conservation and Natural Resources Forestry, Bugwood.org.



Figure 2. Bagworm larvae hanging on a silk thread. Photo: Stanton Gill, University of Maryland.

Host plants

In urban landscapes, bagworms are most often found on Leyland cypress (*Cupressocyparis leylandii*), pines (*Pinus* spp.), junipers (*Juniperus* spp.), emerald green arborvitae or ‘Smaragd’ (*Thuja occidentalis*), maple (*Acer* spp.), willow (*Salix* spp.), Indian hawthorn (*Raphiolepis indica*), and other species.

Management

Scouting for bags on susceptible hosts (such as *Thuja* spp. or Leyland cypress) is a very important step for management. If the number of bags found on trees is low, they can be physically removed by handpicking and then drowning in soapy water. Handpicking can be done in the fall through the early spring, before the eggs hatch in mid-May.

Parasitic ichneumonid wasps (such as *Itopectis conquisitor*) are also known to attack the bagworms. Research has shown that bagworm parasitism rates increased when infested shrubs were surrounded by flowering plants. Biorational insecticides such as *Bacillus thuringiensis*—an insect-killing bacterium that is nontoxic to humans or animals—also have shown to be effective control when targeted at the early larval stages of bagworms.

Insecticides targeting young bagworm larvae are useful when handpicking is not feasible or when the host is severely infested with bagworms (Figure 4). In Georgia, application of insecticides can be carried out around June, when the larvae are still young and more vulnerable. Carefully follow the insecticide label before making any applications; insecticides could harm beneficial insects if they not used according to the label. Contact your county extension office for recommendations regarding insecticides.



Figure 3. Male bagworm moth mating with a female in its sac.
Photo: Jerry A. Payne, USDA Agricultural Research Service, Bugwood.org.



Figure 4. Defoliation after severe bagworm infestation.
Photo: Marie Garrison.

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