



# FactSheet

Extension

## Ohio State University Extension Fact Sheet

### Entomology

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## Bagworm And Its Control

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The common bagworm, *Thyridopteryx ephemeraeformis* (Haworth), is an interesting caterpillar. The most commonly observed form of this pest is the spindle-shaped silk bag camouflaged with bits of foliage, bark and other debris (Fig. 1). Completed bags range from 1-1/2 to 2-1/2 inches long. The larva within the bag is brown or tan, mottled with black, and the bee-like adult males have clear wings and fur covered bodies. The females remain larva-like and do not emerge from the bag. The larva may stick its head and front legs out of the top of the bag to feed and move. When disturbed, the larva immediately pulls its head into the bag and holds the opening closed. Mature larvae may stay on their host plant or drag their bags some distance before firmly attaching the bag for transformation into the adult stage.

The bagworm occurs in the eastern United States from New England to Nebraska and south through Texas. The larvae seem to prefer arborvitae and red cedar but many other conifers and deciduous trees are attacked. These include: pine, spruce, cypress, juniper, willow, black locust, sycamore, apple, maple, elm, poplar, oak, and birch.



**Figure 1. Adult male bagworm (1.5X) mature bag (lifesize)**

A relative of the bagworm is the grass bagworm. This tiny caterpillar feeds on grasses and makes one-inch long silk bags with pieces of grass attached (Fig 2). When the grass bagworms pupate, the larvae may attach their bags to fences or the sides of buildings. No damage is done to the turf.



**Figure 2. Grass bagworm case attached to wall (2X)**

### **Types of Damage**

Bagworm females cannot fly and local populations can build rapidly when established on preferred hosts, especially arborvitae, cedar and juniper. Crowded larvae may eat the buds on these conifers causing branch dieback and open, dead areas. Excessive defoliation of these conifers may cause entire plant death during the following season. Moderate defoliation is unsightly. This pest rarely builds up large populations in forested areas.

The mature larvae usually attach their bags to a branch by wrapping extra silk, which does not decay rapidly. This band of silk may girdle the branch as it grows, resulting in dead branches several years later. Be sure to cut off this silk band when removing bags from a plant.

### **Life Cycle and Habits**

Bagworms have a single generation per year and overwinter as eggs inside the female bag. There may be 300-1000 eggs in a bag. The eggs delay hatching until late-May or early-June. As they hatch, the small blackish larvae crawl out the bottom of the bag and spin down on a strand of silk. These larvae on a string are often picked up by the wind and ballooned to nearby plants. When a suitable host plant is found the young larva immediately begins to form a new bag over its body. This bag is only about 1/8 inch long and is soon covered with sawdust-like fecal pellets.

As the larva feeds and grows it enlarges the bag and begins to incorporate bits and pieces of plant material. By mid-August, the larvae are mature and they often move to a sturdy branch or other structure where they attach the bag firmly with a strong band of silk. The larvae orient themselves with their heads down and pupate. The female pupa looks much like the larva while the male forms characteristic wing pads and other adult-like structures. Within four weeks the males emerge and actively fly about in search of females. Mature females call by releasing a sex attractant pheromone. After mating the female literally mummifies around the egg mass, which remains in place until the next spring.

## Control Measures

Bagworms are difficult to control because they are often unnoticed until mature. Mature larvae will often pupate early if they detect pesticides on the plant foliage. Though there are a few known parasites and predators, they are often not adequate in urban habitats.

**Option 1-Cultural Control-Mechanical Hand Picking** If the bags are few in number and easily reached they may be picked off the plant and squashed. This can be done easily in the late fall when deciduous foliage has been dropped or the bits of plant material on the bags turn brown and can be easily located on evergreens. Be sure to cut the attachment silk band so that the branch will not be girdled in the future.

**Option 2-Biological Control-Use the Bacterial Spray Bt** The bacterium, *Bacillus thuringiensis* (Bt), is effective against bagworms if it is used against young larvae. Applications should be made at the end of June after all the eggs have hatched and the larvae are through ballooning.

**Option 3-Chemical Control-Insecticide Sprays** Stomach insecticides are very useful for control of bagworms. Remember that the plant foliage is to be thoroughly covered because the larvae are protected from contact by being in the silk bag. Again, early sprays against young larvae are more effective than later applications. Products registered for bagworm control are: acephate (Orthene), bendiocarb (Ficam, Turcam)(\*), bifenthrin (Talstar), carbaryl (Sevin), chlorpyrifos (Dursban), cyfluthrin (Tempo)(\*), diazinon, dimethoate (Cygon), fluvalinate (Mavrik)(\*), malathion, nicotine sulfate, pyrethrum, permethrin (Pounce)(\*), rotenone and trichlorfon (Dylox, Proxol)(\*).

**Option 4-Chemical Control-Timed Sprays Using Degree-Day Emergence** Using a base temperature of 14.4 degrees C (57.9 degrees F) the median first emergence is 380 DD base 14.4 degrees C (716 DD degrees F) and the median last emergence is 572 DD base 14.4 degrees C (1062 DD degrees F). Allow for an extra week of ballooning after the last emergence mark has been reached before applying Bt or an insecticide. A less precise degree-day model uses a 50 degrees F base which calculates last emergence around 900 DD units.

\* = Restricted Use Pesticide

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This publication contains pesticide recommendations that are subject to change at any time. These recommendations are provided only as a guide. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. Due to constantly changing labels and product registration, some of the recommendations given in this writing may no longer be legal by the time you read them. If any information in these recommendations disagrees with the label, the recommendation must be disregarded. No endorsement is intended for products mentioned, nor is criticism meant for products not mentioned. The author, The Ohio State University and Ohio State University Extension assume no liability resulting from the use of these recommendations.

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