Bagworm

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The bagworm (*Thyridopteryx ephemeraeformis* (Haw.)) is sometimes called the evergreen bagworm. It is a native insect and occurs throughout the eastern half of the United States (fig. 1). Primarily a pest of trees and shrubs on city and town streets, in parks, and on private grounds, it is of little or no economic importance as a pest of forest trees. However, large populations have been reported in stands of eastern and southern redcedar and Atlantic white-cedar and in many black locust strip-mine reclamation plantings in Illinois, Kentucky, and Ohio.

Several other bagworm species occur, principally in the South and

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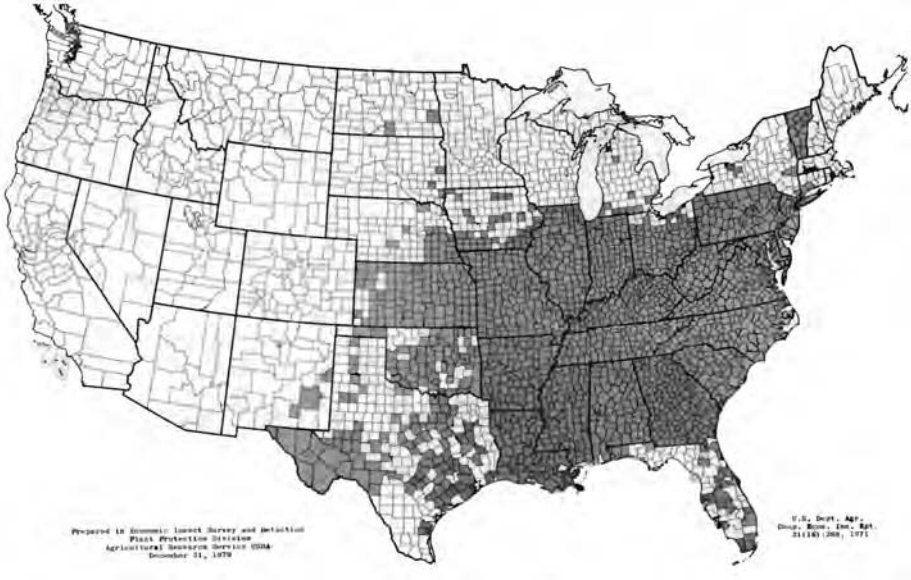

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Figure 1.—Distribution of bagworm (*Thyridopteryx ephemeraeformis* (Haw.)). (Map by Plant Protection Division, Agricultural Research Service.)

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Southeast. One of these, Abbot's bagworm (*Oiketicus abboti* Grt.), occurring in Florida, can be distinguished by the construction of the bag: Abbot's bagworm covers its bag with small, horizontally placed twigs as well as leaf fragments, whereas the evergreen bagworm generally uses leaf fragments alone.

Host Tree

Thyridopteryx ephemeraeformis feeds on a wide variety of trees, chiefly conifers, including arborvitae (a highly susceptible host), maple, boxelder, sycamore, willow, black locust, cedars, juniper, elm, linden, poplars, oak, apple, cypress, spruce, wild cherry, sassafras, and persimmon.

Evidence of Infestation

Young bagworm larvae are inconspicuous, and early stages of infestation are not very noticeable. The most conspicuous evidence is sudden defoliation of tree tops and many bags firmly attached to twigs and leaves where larvae are feeding (fig. 2). These bags differ in appearance according to host plant (fig. 3). Bags of very young larvae are not only small but are upright and conical. Bags of full-grown larvae are from 1¾ to 2 inches long and ½ inch wide through the widest diameter. Being topheavy, the large bags hang downward.

Economic Importance

The bagworm is of most concern when it attacks ornamental shrubs. Many arborvitae and juniper die after it completely defoliates them. Less severe attacks retard growth. Twig dying has been attributed to the tight silken band around the twig with which the larva attaches the bag. Every few years the bagworm becomes exceedingly abundant and may be found on shade, orchard, and forest trees of nearly

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Figure 2.—Bagworm cases are firmly attached to infested plants.

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Figure 3.—Bags differ in appearance according to host plant foliage used to make them. These were taken from arborvitae, pine, and black locust.

every kind. Then the bagworm draws more attention than any other defoliator.

Description

The newly hatched larva is $\frac{1}{25}$ inch long. The head, forward segments, and tail end are glossy black or brownish. The remainder of the body is pale amber. On hatching, the larva almost immediately begins to spin its bag, which is first observed as a garland of pellets on a silken thread around the larval body behind the legs. Leaf and twig fragments are added to form a bag (fig. 4) that is eventually about 2 inches long and $\frac{1}{2}$ inch in diameter.

The adult female is wingless and grublike and has minutes, useless legs. The male is a small, hairy-bodied moth with clear wings (fig. 5).

The eggs are yellow, spherical, and about $\frac{1}{32}$ inch in diameter.

Life History and Habits

The bagworm overwinters in the egg stage inside the tough, silk-lined female bags, fastened to twigs. Eggs hatch during May or June, the time varying somewhat with geographical location and seasonal weather fluctuations. The time the larvae mature varies with location and somewhat with type of host plant. In Ohio and the vicinity of Washington, D.C., this is generally in late August.

In September or October adult males emerge from their bags and begin their mating flight in search of the wingless females. The female remains inside her bag and mating takes place at the bag entrance. The bag also contains the

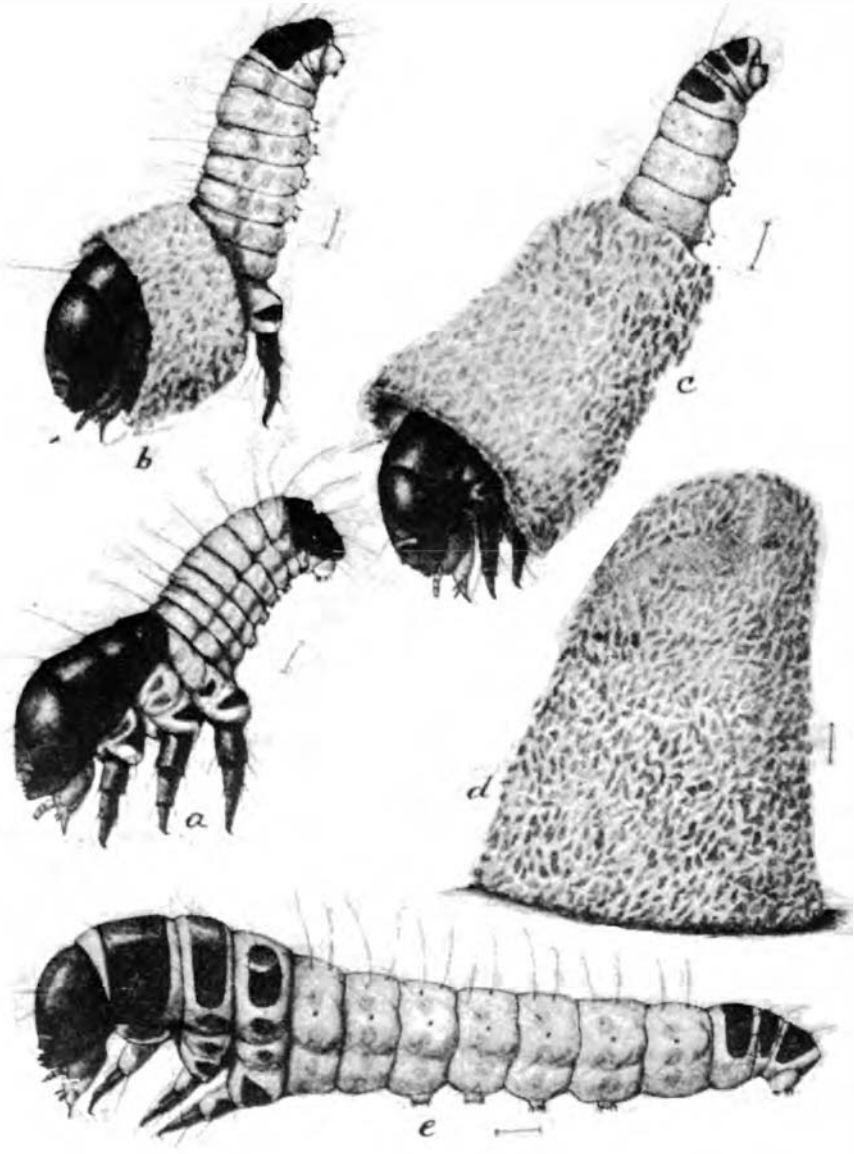

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Figure 4.—*a*, Newly hatched bagworm before making its case; *b*, same, just beginning case, *c*, same, with its case nearly completed; *d*, completed case, insect concealed within; *e*, larva after first molt. Highly magnified. (From Howard and Chittenden.)

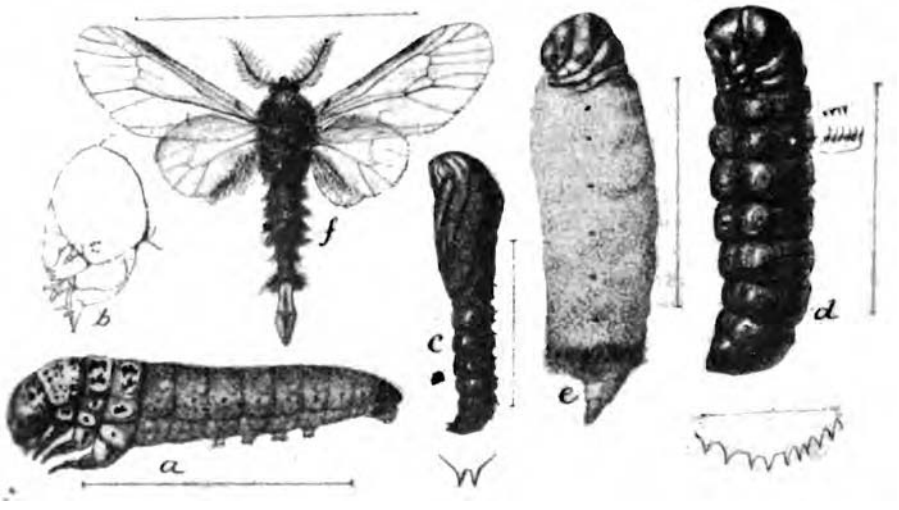

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Figure 5.—Bagworm (*Thyridopteryx ephemeraeformis*): *a*, Full-grown larva; *b*, head of same; *c*, male pupa; *d*, female pupa; *e*, adult female; *f*, adult male. All somewhat enlarged. (From Howard and Chittenden.)

empty pupal case from which the female emerged. After mating, she lays her eggs in this case where they remain over winter (fig. 6).

The wide distribution of the evergreen bagworm can be explained despite the female's lack of wings. Importation of plants with undetected infestation is believed to account for the recent appearance of three old-world species of bagworm in widely different places in America. Wind dispersal is possible over short distances. Young larvae are especially adapted for air transport because they spin long silken threads that make them buoyant. Adaptations aiding survival include ability to go without food for long periods, acceptance of many different plants for food, use of any support for the necessary attachment of the bag for pupation, and production of many eggs by a single female.

Natural Control

The population of the bagworm varies widely from year to year. Outbreaks in Missouri subsided as natural enemies gained the upper hand. In Ohio internal parasites were found to be the primary control agents; low winter temperature and bird predation on young larvae contributed to control. Three wasp-like parasites commonly attack the bagworm and are largely responsible for the briefness of outbreaks.

Applied Control

On small lawn trees and other landscape plantings, a simple method of control is to pick off and burn the overwintering bags. If the bags are not destroyed but merely discarded on the ground, eggs will hatch in spring and larvae may crawl back on trees.

Heavy infestations may be controlled with pesticides. Several pesticides are registered for the control of bagworm. For the recommended controls in your State, call your county agriculture agent, State agricultural experiment station, or local forester.

Pesticide Precautions

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key—out of the reach of children and animals—and away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or when they may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicides from equipment, do not

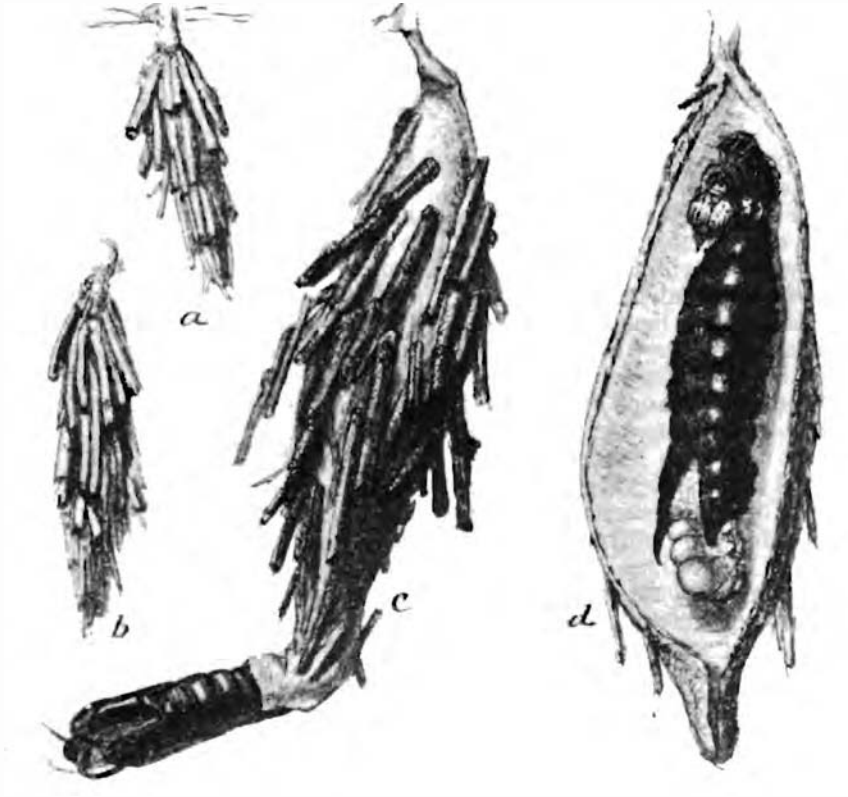

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Figure 6.—*a*, *b*, *c*, Bagworm at successive stages of growth; *c*, male bag; *d*, female bag. About natural size. (From Howard and Chittenden.)

use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary land-fill dump, or crush and bury them in a level, isolated place.

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