Late-Season Management of Bagworms
Eric J. Rebek, Extension Entomologist

Bagworms are among many landscape pests that are abundant some seasons but not others. The summer of 2020 has proven to be a “boom year” for bagworms in Oklahoma. In this pest alert, I present information on the biology and life history of these caterpillar pests and focus on management in late summer when fully grown larvae cause heavy feeding injury to host trees.

Description: The common bagworm, *Thyridopteryx ephemeraeformis*, is found most frequently in its larval form, feeding on trees from within a silken bag it constructs from foliage and other plant tissues (hence, the common name of bagworm) (Fig. 1A). Adult males are small moths with a black, hairy body and clear wings with a wingspan of about 1 inch (25 mm) (Fig. 1B). Adult females are wingless, have no functional legs, eyes, or antennae, and are almost maggot-like in appearance. The female’s body is soft, yellowish white, and practically naked except for a circle of woolly hairs at the posterior end of the abdomen. Females remain in their silken bags, where mating occurs and eggs are laid. Mature larvae are about 1 inch (25 mm) long and have a dark brown abdomen, while the head and thorax are white with black spots (Fig. 1C).

Figure 1. The bagworm, *Thyridopteryx ephemeraeformis*: (A) Bagworm casing on juniper; (B) adult male moth; and (C) larva removed from bag. Photo credits: (A) Eric Rebek, Oklahoma State University, Bugwood.org; (B) Pennsylvania Dept. of Conservation and Natural Resources – Forestry, Bugwood.org; and (C) Eric Rebek, Oklahoma State University.
Distribution: Bagworms are found in most states east of the Rocky Mountains. This pest is most common from Pennsylvania to Nebraska and south to Florida and Texas. It is commonly encountered throughout Oklahoma.

Life Cycle: Overwintered eggs are contained within the bags made by females from the previous generation. Eggs begin to hatch in late April or early May and young larvae feed on foliage and construct bags immediately. The first evidence of an infestation is normally a small bag, about 1/4 inch (6.5 mm) long, standing almost on end. As larvae grow, silk and fragments of the host plant foliage are added to the bag until it reaches 1.5 to 2 inches (38 to 51 mm) long. Mature larvae use silk produced from modified salivary glands to fasten the bag to a plant stem. Pupation occurs in the bag in late summer and males emerge late summer to early fall. They engage in a mating flight in search of the wingless females, who remain inside their bags. Each newly mated female lays several hundred white eggs inside of old pupal cases, drops from the bag, and dies. There is one generation per year.

Hosts: In Oklahoma, the most common hosts are eastern red cedar, other junipers, and arborvitae. Bagworms will also feed on true cedars, pine, spruce, bald cypress, maple, boxelder, sycamore, willow, black locust, oaks, and roses. Their host range includes about 130 different plant species in various parts of the United States.

Damage: Bagworm larvae damage their hosts by feeding on the foliage (Fig. 2). Dense infestations can completely defoliate small plants and heavy defoliation can kill hosts such as red cedar and other junipers. Broadleaf hosts are not easily killed by bagworms, but they may be weakened and become more susceptible to woodboring insects and pathogens.

Management: Regardless of which season bagworms are encountered, infestations can be reduced by removing bags by hand. The removed bags should be destroyed immediately, even in the winter because eggs overwintering within each bag remain viable. When larvae become active in spring, bagworms can still be removed by hand if the numbers are small and the infested tree isn’t too tall.

There are several naturally occurring parasitic and predatory wasps that attack bagworms. Certain fungal pathogens may play an important role in natural control of bagworms as well. The activity of these natural enemies apparently explains the fluctuation in bagworm populations observed from year to year.
Chemical controls are most effective if applied early when larvae are small. In Oklahoma, it is normally a good practice to make insecticide applications by early June. Products containing Bacillus thuringiensis subsp. kurstaki (Bt), a bacterium that produces a toxin specific to caterpillars, are reported to provide good control of bagworms. Other effective reduced-risk products include those that contain the active ingredient spinosad (spinosyns A & D). Both of these active ingredients are most effective against small, young larvae.

Late in the season, large, older larvae are not as susceptible to Bt and spinosad. Thus, bagworms must be sprayed with broad-spectrum, contact insecticides. Homeowners can look for products containing the active ingredients carbaryl (Sevin) or malathion that are labeled for caterpillar control on ornamental plants. An arborist certified with the International Society of Arboriculture (ISA) should be hired to combat bagworm infestations on large trees with tall canopies. Contact your county extension office for assistance with locating an ISA-certified arborist in your area.

References:


Hale, F., B. Klingeman, and K. Vail. The Bagworm and Its Control. University of Tennessee Extension Fact Sheet, SP341-U.