



Circular 324
June 1999

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The Fall Webworm

A GUIDE TO RECOGNITION
AND HABITS IN ALABAMA

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First Printing 3M, June 1999

Information contained herein is available to all persons regardless of race, color, sex, or national origin.

The Fall Webworm

A Guide to Recognition and Habits in Alabama

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Introduction

THE FALL WEBWORM², a common native caterpillar, occurs throughout the United States and southern Canada. As the name denotes, it is a web-maker. Larvae feed in colonies on foliage of hardwood trees and spin grayish silk webs around leaves in the process. Typically, webs are located at the outer ends of branches (Photo 1A); however, when webworm populations are high, webbing is more extensive and may envelop the entire crown of the tree (Photo 1B). The webworm is capable of defoliating and causing damage to forest trees, but it is most important as a pest of shade and ornamental trees in urban and suburban areas.

There are two distinct forms of the fall webworm (1, 2, 4), generally referred to as orange and black (2), or red-headed and black-headed (4). The forms differ in coloration (the basis for the names applied) and, to an extent, in host preference, habits, seasonal activity, and geographical distribution. For example, in areas of the North, the webworm population is almost wholly black form, and only one

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²*Hyphantria cunea* (Drury). Order Lepidoptera, Family Arctiidae.

generation occurs each year (1). In much of the southern region, both forms are common and as many as three and four generations, may occur (2, 4). In early years, some workers viewed the two forms as separate species. Today, however, they are considered to be races of a single species, *Hyphantria cunea*.

Both races of the fall webworm occur throughout Alabama. The larvae are among our most common foliage feeders, and their webs are often familiar sights in the tree landscape during summer and fall. Data on occurrence and life history of this common web-maker have been recorded through several seasons during the study of tree insects at the Alabama Agricultural Experiment Station. The following describes the life stages of the fall webworm and its seasonal cycle and habits as found to usually occur in Alabama.³

Description

Fall webworm adults are small to medium-size moths with a wingspan of 1 to 1 1/2 inches. Moths are pure white (Photo 2A, B) or white with forewings dotted with small dark spots (Photo 2C). The spotted-forewing characteristic is associated primarily with race and sex, and possibly with region. In the northernmost region of the range, the black race is predominant and moths of the race are reported to be without spots (1). In Alabama and much of the southern region, both races occur and both solid white and spotted adults are found. Generally, females of both races are white and unmarked; moths with spots on the wings are males; and, spotted adults are more common in the black race than in the orange (2). Moths pictured in Photo 2 are representative of the majority of fall webworm adults usually encountered in our area.³

Eggs (Photo 2A, B) are small and greenish, and are found in masses lightly covered with white hairs from the body of the female. Egg masses may be single- or double-layered, and may be found on either the upper or lower surface of leaves, depending on race.

Larvae (Photo 3) can be identified readily to race by color. Orange-race caterpillars (Photo 3A) have reddish heads and orange

³Records and data included here were collected primarily in Lee and Macon counties in east-central Alabama; seasonal activity and events may vary some by areas within the state.

tubercles in rows along the body. Their bodies are tan throughout most of the developmental period but become darker in the last stage. Larvae of the black race (Photo 3B) have black heads and tubercles; body color is light greenish white. Caterpillars of both races are densely clothed with hairs that arise in clumps from tubercles. Full-grown webworm larvae are 1 to 1 1/4 inches long.

The pupa (Photo 4A) is dark brown and 1/2 to 5/8 of an inch long. Pupae are enclosed in thin brown cocoons (Photo 4B) made of silk with bits of trash or particles of soil interwoven.

Hosts

Many species of forest, shade, ornamental, and fruit trees are listed as hosts of the fall webworm (2, 4). Hosts are almost wholly hardwoods but at least one conifer, baldcypress, is included. Food trees preferred by the webworm vary by region and, in the southern region where both races occur, also by race. In Alabama, the most common host trees are pecan, persimmon, black cherry, "oriental cherry," sourwood, sweetgum, willow, and red mulberry. During years of normal infestations, these are the trees on which webs are usually most common. Webs on pecan, persimmon, the cherries, and sourwood are predominantly, or wholly, orange race, and those on sweetgum, willow, and mulberry are black race. The black race also infests pecan and persimmon but to a lesser extent than the orange race. Several other species of trees serve as hosts for the webworm in Alabama but are infested somewhat less frequently. Colonies of both races have been found feeding on elderberry, hickories, and sycamore, and black-race colonies have been recorded on ash, blackgum, elm, redbud, and baldcypress. Baldcypress, a host of the black race in Louisiana (2), is the only conifer from which the webworm has been recorded in Alabama.

Trees listed above are considered to be primary hosts of the fall webworm, i.e., trees where eggs are deposited and where larval development is usually completed. In several instances, however, larvae of the black race have been observed to feed and develop on foliage of other plants intermixed with primary hosts. For example, larvae (black race) from eggs laid on red mulberry fed first on mulberry, then leaves of



Photo 1 - Fall webworm webs (orange race) at ends of branches of pecan (A) and enclosing the entire crown of sourwood (B).



Photo 2 - Adults of the fall webworm. (A) White, unmarked black-race female and eggs on redbud. Typical of this race, eggs are being deposited in a single layer on the under surface of the leaf. (B) White, spotless female of the orange race ovipositing on the upper surface of sourwood leaf. (C) Black-race male with spotted forewings.

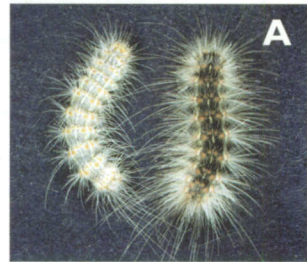


Photo 3 - Fall webworm caterpillars: (A) orange race; (B) black race.



Photo 4 - Pupa (A) and cocoon (B) of the fall webworm.

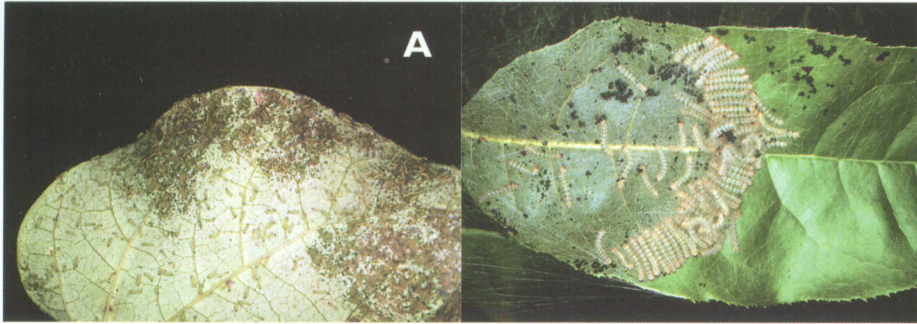


Photo 5 - Typical leaf damage caused by surface feeding characteristic of early stage larvae. (A) Left, newly hatched black-race larvae on the lower surface of redbud leaf; right, orange-race larvae on the upper surface of a sourwood leaf. (B) Mulberry leaves completely skeletonized by young black-race caterpillars.



Photo 6 - (A) Early stage orange-race larvae feeding within the web during daylight hours. (B) Foliage outside the main web destroyed by late-stage webworms of the orange race feeding at night. Typically, early stage larvae of this race feed inside the web during the day; late-stage larvae remain inactive in daylight and move outside at night to feed.



common greenbriar climbing the mulberry stem, and subsequently completed development on wild rhododendron interconnected to mulberry by greenbriar.

Life Cycle and Habits

The basic life cycles of the two races do not differ fundamentally; however, there are some distinct differences in seasonal activity and behavior. Both races overwinter as pupae in cocoons (Photo 4) among leaves and trash on the ground or in the upper layer of soil. Adults emerge in spring with time of emergence varying by race. Moths of the black race generally become active in the Auburn area of eastern Alabama during mid- to late April; early stage larvae and small webs have been found on sweetgum in Lee County as early as the last week of April. Orange-race moths begin activity four or five weeks later, usually in late May and early June (oviposition by the moth in Photo 2B began the night of June 9).

Females lay their eggs in groups of 300 to more than 1,000 on foliage of host trees. The black-race female deposits eggs in a single layer on the underside of the leaf (Photo 2A). Females of the orange race oviposit primarily on the lower surface, but some also lay eggs on the upper surface of leaves (Photo 2B). Orange-race females may lay eggs in either single or double layers.

Eggs usually hatch in 7 to 10 days. Newly hatched larvae of both races feed initially on the lower or upper surface of leaves (Photo 5A). Larvae feed in colonies, and webbing of foliage begins with onset of feeding. Feeding by early stage caterpillars is usually confined to one surface of the leaf (Photo 5A), but as larvae develop, both surfaces are consumed leaving only a network of leaf veins (Photo 5B). Webs are enlarged to enclose additional leaves as webworms feed and grow. Webs of the two races differ structurally; in general, webs of the black race are thin and flimsy, those of the orange race are dense and multi-layered.

Caterpillars of orange-race colonies feed within the web during daylight hours until they are about one-half grown (Photo 6A). Thereafter, late-stage larvae rest in the main web during daylight and move outside at night to feed (Photo 6B). Orange-race larvae remain closely associated with the web until fully grown, then move to the ground and pupate.

Black-race larvae feed as a colony in a common web (Photo 7A) until about one-half grown, then tend to separate into smaller

groups in smaller webs (Photo 7B). Subsequently, late-stage larvae generally abandon webs and feed outside until they leave the foliage to pupate (2).

Duration of the larval stage is usually 4 to 6 weeks. Among the orange-race colonies observed in 1998 on sourwood in Lee County, eggs (see Photo 2B) began hatching on June 15. Larvae fed in colonies until about the first of August (approximately 45 days) then left webs to pupate. Larvae of the black race present on red mulberry, redbud, and elm in August and September disappeared from webs 25 to 30 days after hatching. The habit of abandoning webs to feed outside during the last instars prior to pupation is apparently typical of black-race larvae in the southern region (2). The cycle from egg to adult for either race is usually completed in about 50 to 60 days.

Occurrence and Seasonal Activity

Fall webworm populations vary greatly over the years. Typically, populations are low or “normal” in most years; webs are few and generally scattered among a few of the most common host trees. Periodically, however, “outbreak” populations occur; webs become numerous; a greater number of species of trees become infested; and the increase in webbing and loss of foliage attract attention and cause concern (one such outbreak occurred in some areas of the state in 1997). Outbreaks usually last one or two years, then populations subside to normal levels.

In Alabama, webworm activity begins in April and may continue into October³. Seasonal records indicate that two generations occur in most years. Both races are represented, and three separate caterpillar broods usually develop each season. In the Auburn vicinity, the initial brood, which is black race, occurs in late April, May, to early June. In many years, this first brood is light and may go unnoticed. The first orange-race brood develops during the period mid-June, July, early August (the outbreak population noted in July and August of 1997 was orange race). A second black-race brood (second generation) occurs in

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A

Photo 7 - (A) Common web of young black-race larvae. (B) Web typical of an older black-race colony; note tendency of web to be separated into small units.



B

Photo 8 - Parasitized webworm larva with cocoon (Arrow) of a parasitic wasp (*Apanteles*).

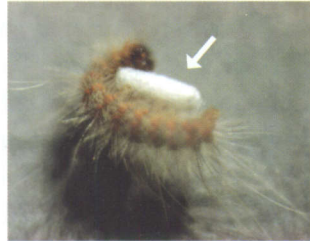


Photo 9 - Assassin bug (wheel bug, *Arius cristatus*) nymphs preying on black-race fall webworm caterpillars.



late August, September, and early October. In some years, a second brood of the orange race may possibly occur in some areas.

Importance, Damage, and Control

Outbreak populations of fall webworm can completely defoliate host trees. Healthy hardwoods usually survive and recover without permanent injury. However, several consecutive defoliations can cause dieback in the crown, and may contribute to the death of weak, declining trees.

The webworm is not usually a serious pest in natural forest stands. Infestations are of greatest concern on shade, ornamental, and urban forest trees. Here, loss of foliage and unsightly webs seriously reduce the aesthetic and environmental values of the trees. In this circumstance, control of the webworm may be desirable. Control recommendations are available from appropriate extension personnel.

The fall webworm has many natural enemies, i.e., predators, parasites, and disease. These play an important part in maintaining webworm populations at low levels during many years. Included are birds and predaceous and parasitic insects. Common insect enemies encountered in Alabama populations are parasitic wasps⁴ (Photo 8) and predaceous assassin bugs (Photo 9).

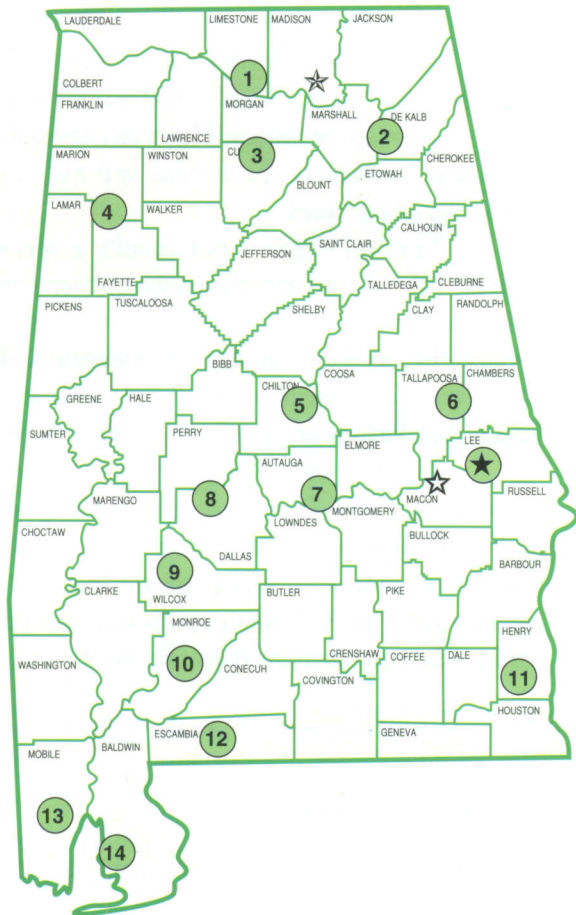
⁴Two common species are *Apanteles hyphantriae* and *Meteorus hyphantriae*.

Selected References

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Alabama's Agricultural Experiment Station AUBURN UNIVERSITY

With an agricultural research unit in every major soil area, Auburn University serves the needs of field crop, livestock, forestry, and horticultural producers in each region in Alabama. Every citizen of the state has a stake in this research program, since any advantage from new and more economical ways of producing and handling farm products directly benefits the consuming public.



Research Unit Identification

- ★ Main Agricultural Experiment Station, Auburn.
- ☆ Alabama A&M University
- ☆ E. V. Smith Research Center, Shorter.

1. Tennessee Valley Research and Extension Center, Belle Mina.
2. Sand Mountain Research and Extension Center, Crossville.
3. North Alabama Horticulture Station, Cullman.
4. Upper Coastal Plain Research Station, Winfield.
5. Chilton Area Horticulture Station, Clanton.
6. Piedmont Research Station, Camp Hill.
7. Prattville Experiment Field, Prattville.
8. Black Belt Research and Extension Center, Marion Junction.
9. Lower Coastal Plain Research Station, Camden.
10. Monroeville Experiment Field, Monroeville.
11. Wiregrass Research and Extension Center, Headland.
12. Brewton Experiment Field, Brewton.
13. Ornamental Horticulture Station, Spring Hill.
14. Gulf Coast Research and Extension Center, Fairhope.