

# MAPLE LEAF CUTTER

—*the Story of a Moth and its Mobile Home*

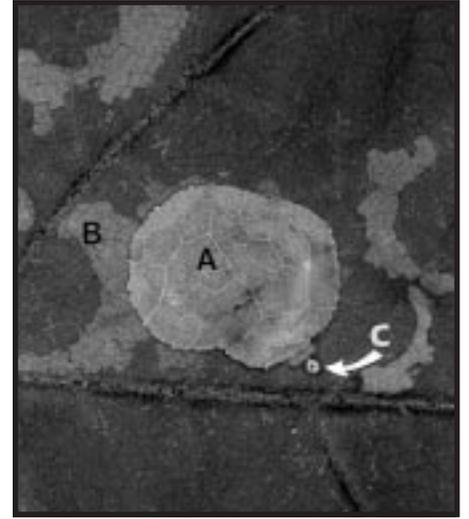
By Douglas C. Allen

**D**amage by this peculiar insect was first reported in New York during the 1850s by State Entomologist Asa Fitch. However, the first outbreak was not recorded until 1911 when it defoliated 25 acres of sugar maple in the vicinity of Lake George. The next significant episodes occurred in the early 1920s when a 12 acre sugarbush near Deposit in Delaware County and several sugarbushes in St. Lawrence County were severely damaged. More recently, outbreaks have appeared in New Hampshire (1970s), Vermont (1980s) and currently the northern New England states and New York report scattered areas (a few to several acres) of noticeable to heavy defoliation. To one degree or another, most of the northern hardwood stands I visited over the past few summers were infested. The Extension Office at ESF received several calls about maple leafcutter during 1997, as did many foresters in DEC. Because of its current prominence, bizarre habits and the fact that it has attracted the attention of many forest owners, I thought it was a timely subject.

**THE ADULT** is a metallic blue moth 0.2" to 0.3" long with a bright orange head. Even though striking in appearance when examined closely, it is easily overlooked due to its small size. At high population

densities, however, moths become more conspicuous, because they appear as innumerable dark bluish to black spots on top of foliage and are especially apparent on understory vegetation.

**LEAF DAMAGE** is the most striking evidence of an infestation and results from a combination of activities. When attempting to deposit eggs on the top of a leaf, the female often creates a row of tiny, light brown specks which terminate in a small, irregular and elongate necrotic spot (brownish, dead tissue). The specks represent unsuccessful attempts to embed eggs within the leaf tissue, and the blotch that follows is an area where egg laying succeeded and a newly emerged caterpillar fed within the leaf (*Fig. 1*). After ten days to two weeks, the caterpillar foregoes this **leafmining** habit and moves to the top of the leaf where it constructs an **oval case** from two circular pieces of tissue cut from the leaf blade and sewn together with silk. It resides within the pancake-like, portable "shelter" for the rest of its life (*Fig. 2*). As the caterpillar grows, it must cut new pieces of leaf to provide for a larger case. When doing this it creates **circular holes** and severs leaf veins causing the leaf, which is otherwise intact, to turn brown. The end result when populations are high, are **light to rusty**

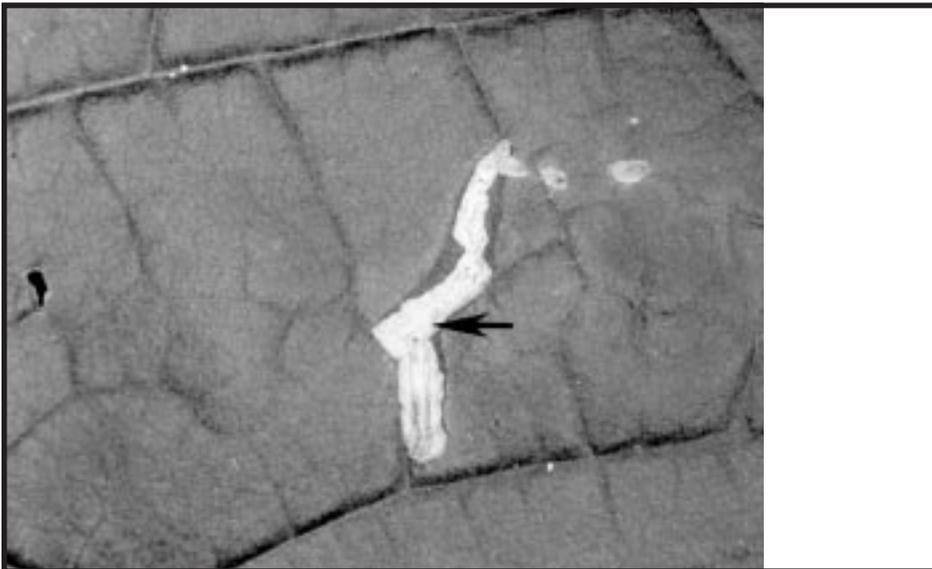


*Fig. 2. Leafcutter case (A—actual size 0.6" in long dimension), feeding ring (B) and head of caterpillar (C).*

**brown leaves** with many holes accompanied by circular cases attached to the upper surface (*Fig. 3*). The larva feeds by attaching its case to the leaf surface with silk and sticking its head out of the shelter to feed around the margin. The end result is a ring of **feeding damage** surrounding an area of intact leaf which was positioned beneath the case (*Fig. 4*). Often this uneaten circle of leaf eventually falls out, because tissue in the feeding ring dies, dries and becomes brittle enough to dislodge. Therefore, holes are the result of two activities, case construction and feeding. The largest holes, made by full grown caterpillars, are about the size of a nickel.

The **PRINCIPLE HOST** is sugar maple, though in heavy infestations the insect may feed inadvertently on American beech, red maple and hornbeam.

**OUTBREAK HISTORY** for maple leafcutter is similar both in Canada and the northeastern United States. Severe damage (browning of foliage) usually is restricted to scattered, small areas of a few to several acres for five to seven successive years. One of the most extensive outbreaks on record materialized in Vermont during the mid-1970s when susceptible stands throughout approximately 40,000 acres were affected. **Cont'd**



*Fig. 1. Leaf mine (arrow) made by young caterpillar of maple leafcutter.*

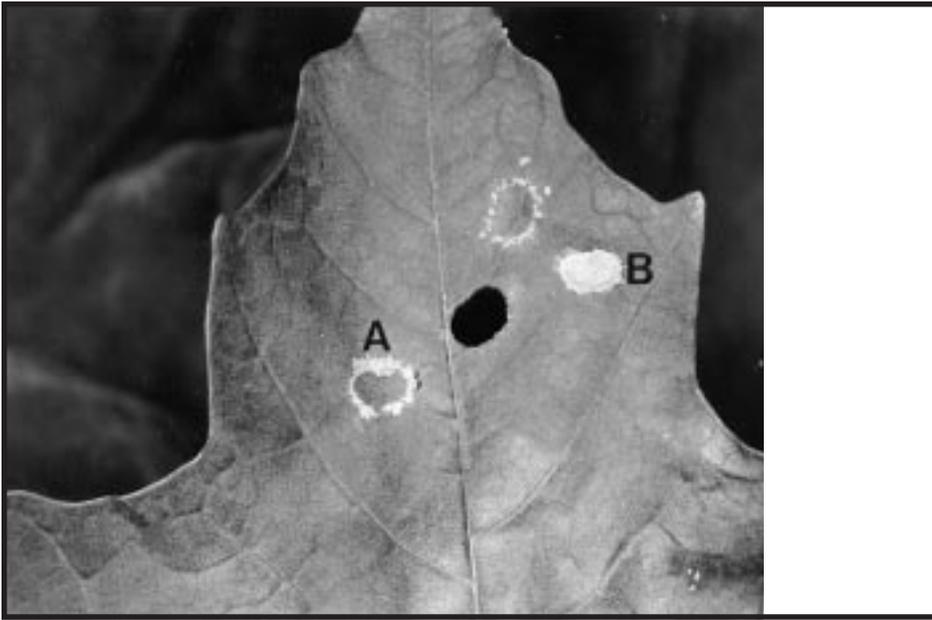


Fig. 4. Sugar maple leaf heavily damaged by maple leafcutter.

Another unusually persistent and widespread outbreak occurred in southern Quebec and eastern Ontario from 1939 through 1947.

The **LIFE CYCLE** begins in late May and early June at which time adults emerge from the litter where the insect overwintered as a pupa (pew-pah) within the silk-lined case. Though life stages tend to overlap during the summer, leaf mines generally are prevalent from late May to mid-July, and cases may be present as early as the first week in June. The fifth, final and largest cases first appear in mid-August and feeding ceases when full grown caterpillars, along with their cases, vacate trees in

September. This event is quite a spectacle to behold, because tree boles can be covered with caterpillars carrying their circular cases to the ground. Sometime before cold weather sets in the larva pupates (pew-paytes) within the case.

The principle **CONSEQUENCES OF HEAVY AND PROLONGED DAMAGE** are discolored foliage which is unsightly and may detract from stand appearance in the summer as well as reduce the quality of fall colors. Also, in infested sugarbushes operators may notice a significant drop in the quantity and quality of sap produced following heavy, repeated damage (browning of foliage). Occasionally temporary



Fig. 3. Feeding ring with its center of intact leaf (A), case (B - note intermittent, whitish silk threads around margin of case) and hole where leaf tissue was removed.

crown dieback occurs and sugar maples in the understory may be killed, but rarely is mortality of overstory trees associated with outbreaks. ▲

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