Cherry Scallop Shell Moth

By Douglas C. Allen

Since 1991, defoliation by cherry scallop shell moth has increased annually in western and northern New York. The last major outbreak in our region occurred from 1968 to 1972. At that time, black cherry was defoliated over tens of thousands of acres throughout the state. We took advantage of this previous outbreak to learn more about the insect’s biology and impact on cherry.

The current problem is centered in western New York where cherry over an area of approximately 15,000 acres experienced heavy defoliation (i.e., > 60%) during 1992 and (or) 1993. Cherry throughout a large area of Rensselaer County in eastern New York was defoliated heavily during 1991 and 1992. The insect is very prevalent in northern parts of the state as well, though widespread heavy defoliation has not occurred.

THE INSECT’S HABITS

Cherry scallop shell moth belongs to the family Geometridae (Geo-metri-dee). The latter may not be familiar to you by name, but the insects that comprise the family are well known to most people. The larval stage (caterpillars) are called loopers, inchworms, spanworms, or measuring worms. These common names are derived from the manner in which larvae walk with a looping motion, rather than crawling like a typical caterpillar; that is, they tend to “loop” or “inch” along.

Unlike most geometrids, however, caterpillars of scallop shell moth are gregarious and live in nests that contain a few to several individuals. The colony constructs an elongate structure of silk and leaves that are attached to one another and often wrapped around the twig on which the foliage occurs (Fig. 1). Larvae feed within the nest on the upper surfaces of the leaves. Leaves are folded around the twig and (or) each other in such a way that the underside of the leaves are exposed to the elements and the upper surfaces line the nest.

GENERAL APPEARANCE

The moth’s wings have a characteristic pattern of alternating brown and white transverse, wavy lines; 12-15 on the front wing and as many as 8 on the hind wing (Fig. 2).

The common name is derived from the appearance of the wings. The forewings span 1.0 - 1.25" from tip to tip. When emergence is at its peak from early June through mid-July, it is common to see large congregations of resting moths during the day.

Full grown caterpillars are 0.75 - 1.0" long. The body is pale yellow with dark grey to black dorsal stripes with an orange-brown head.

DAMAGE

After two to three years of heavy defoliation, crown dieback and even tree mortality may occur. Radial growth of defoliated trees always is reduced the year following the first year of heavy defoliation and remains depressed until one year after defoliation ceases. Our earlier studies associated mortality with stands that were predominantly black cherry (i.e., essentially pure stands) occurring on poorly drained sites. A key element associated with tree mortality was the presence of peach bark beetle. This secondary insect occurs in all cherry stands where it usually breeds in weakened branches, damaged trees and stump sprouts. During the outbreak of 1968 - 1972, in certain locations large numbers of this bark beetle invaded the boles of heavily defoliated cherry and killed many overstory trees. At the beginning of the outbreak, scrub cherry in open grown stands were hit first and suffered the most damage. However, as the outbreak progressed, commercially valuable cherry also was affected.

MANAGEMENT RECOMMENDATIONS

We do not know what triggers an outbreak of cherry scallop shell moth. This makes it impossible to determine when and where outbreaks are likely to occur. However, as mentioned above, stands or spots within stands that are predominantly black cherry appear to be most susceptible.

We know that after two years of heavy defoliation an egg parasite specific to this defoliator will attack and severely damage 60 to 100% of the egg masses. This wasp often is responsible for population collapse. However, for trees of low vigor, this natural mortality may not occur soon enough to avoid loss of overstory trees.

We have very limited experience with chemical control, but a knowledge of the insect’s life history and behavior indicate that proper timing of a chemical treatment may be difficult. The most effective application would occur at the time of or shortly after egg hatch. In northern New York this is in late June or early July. However, egg laying occurs over several weeks, even months, due to an extended period of adult emergence. Another shortcoming of this early treatment is that it could substantially reduce populations of the beneficial egg parasite. Wasps are very active at about this time.

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If one is managing for black cherry sawtimber and the scallop shell moth threatens, and particularly if a stand has experienced one year of heavy defoliation, the landowner might consider protecting foliage with an appropriate insecticide. By appropriate, I mean one that is registered for the pest and one that will remain on the foliage in a toxic state long enough for insects to contact it. Even though a portion of the population may be protected within the nest at the time of treatment, eventually new leaves must be incorporated into the structure to replenish the food supply. It is at this time that the remaining segment of the population will encounter the chemical. If treatment areas are small, say not more than 50 acres or so, any mortality that might occur to populations of the egg parasite probably would be compensated for by the influx of wasps from adjacent untreated areas.

Based on what we know at present, I suspect that trees growing on poor sites (e.g., too much or too little moisture, poor soil, excessive stand density, etc.) will be the most vulnerable to mortality.

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