

# 1994 - The Year of the Defoliator

By Douglas C. Allen

This past year New York's hardwood forests experienced extensive defoliation by a number of native defoliators. Forest landowners throughout the state understandably are concerned about the effect that damage by these insects will have on their woodlots. Though some of the comments that follow may be repetitious of information discussed in previous articles, I thought it might be worthwhile to summarize the current situation and attempt to answer the most commonly asked questions.

## THE DEFOLIATORS INVOLVED

By far the most prevalent hardwood problem in New York during 1994 was forest tent caterpillar. Our current situation represents the most extensive (geographic distribution) and intensive (level of defoliation) outbreak of this early season defoliator that the state has witnessed since the early 1950s.

In many areas of Central and Southern Tier regions, elm spanworm, fall cankerworm and cherry scallop shell moth (species of inchworms or loopers) also caused conspicuous defoliation to a variety of broadleaved trees.

## THE CONCERN

Certainly crown dieback and tree mortality are the most visible immediate effects associated with forest tent caterpillar defoliation. The historical record in both Canada and the United States indicates that "typical" outbreaks last for 2-4 years before natural mortality returns numbers to sparse levels. This scenario usually causes crown dieback (the tree's response to stress), a degree of mortality in all host size classes, reduced growth of surviving trees, and lower quantity (volume/tree) and quality (% sugar) of maple sap.

With this experience as a background, it was surprising when in the early 1980s extensive sugar maple mortality occurred in Delaware county after only a single year of heavy defoliation (75-100%). We speculated that this rapid mortality resulted from the interaction of two stresses that occurred simultaneously; defoliation and drought. Observations following previous episodes of tent caterpillar indicate that defoliation immediately before, during or following other stresses (e.g., a second insect defo-

liation later in the same season, drought, thinning) can be lethal to most northern hardwoods. Even knowing this, however, the extent of mortality that occurred in this Delaware Co. outbreak was surprising.

Another unusual event occurred during 1994 in parts of northeastern Pennsylvania where tent caterpillar defoliation apparently was followed by a severe outbreak of anthracnose, a fungal disease of sugar maple foliage. This one-two punch assured that affected maples were unable to retain uneaten foliage; or heavily defoliated trees could not produce a new compliment of leaves for the remainder of this growing season. It remains to be seen what the end result will be; but because of these combined stresses extensive mortality is anticipated on some sites after a single year of heavy defoliation.

## WHAT TO DO?

Forest landowners can take steps to minimize or even prevent significant damage by forest tent caterpillar:

1. Be able to recognize its life stages (see Sept./Oct. 1992 issue of Forest Owner, call ESF Extension [315-470-6751] for a copy of Pest Leaflet No. 9). Early warning allows adequate time to assess and plan.

2. Look for early signs of a building population (e.g., light feeding, ragged leaves in the crown margin) in your woodlot and (or) adjacent areas. Ordinarily, light to spotty defoliation is evident to the careful observer a year or two before significant defoliation occurs. Also, observing an unusual abundance of caterpillars resting on tree boles during daylight hours or on foliage may indicate a general increase in population density.

3. Determine whether or not your woodlot has experienced another major stress or stresses during the past year or two. For example, drought, forest management events such as a major thinning, or significant defoliation by another agent. If you believe your woodlot was stressed recently, this may increase your need (depending on management or ownership objectives) to take action. The purpose being to prevent compounding effects of stresses. That is, it may be dangerous to allow heavy defolia-

tion to follow on the heels of or occur along with another major disturbance.

4. If forest tent caterpillar is present in large numbers (i.e., you did not detect the population buildup until moderate to severe defoliation occurred) look for signs of natural mortality; abundance of "wilted" (diseased) caterpillars, small irregular egg masses. Symptoms such as these may indicate that severe defoliation is not likely to occur next year.

5. With the help of a consulting or DEC forester, estimate egg mass density. This is best done in late fall or winter when masses are most visible on branch tips. This information is more difficult to obtain, but it can provide the most accurate information about the likely course of future events.

## MAKING A PEST MANAGEMENT DECISION

Results of a general assessment such as that outlined above must be weighed against individual ownership objectives. In terms of how quick one should react, concern over sugarbush values require the most immediate response. One must protect foliage in the summer to get adequate quality and quantities of sap the following spring.

Next, certain wildlife values may require relatively quick attention. For example, if the landowner is concerned about nesting success of song birds that typically occur in northern hardwood stands it may be desirable to protect foliage.

Generally, a sawtimber objective will not be affected until at least two years of heavy defoliation so if this is your principle goal control may be delayed. However, it must be remembered that there have been exceptions to this rule of thumb. If you have reason to believe that the woodlot is of poor vigor due to a previous or concurrent stress or it is characterized by generally poor site conditions for northern hardwoods, treatment may be desirable to reduce the danger of growth loss, crown deterioration and (or) mortality.

## AVAILABLE TOOLS

Several "hard" chemicals are available

(Cont'd)

8 for direct control of forest tent caterpillar. The choice of which material to use should be made after consulting with DEC personnel and a professional pesticide applicator.

The bacterium *Bacillus thuringiensis* (commonly referred to as "Bt") is another option that can be very effective and is more compatible environmentally. Formulation, timing of application relative to pest and host plant development, and weather conditions at the time of application are more critical when applying Bt than when using one of the chemicals. However, forest tent caterpillar is very susceptible to this biological and when the material is applied properly it does an excellent job of protecting foliage. Again, one should discuss the characteristics of this material, including cost, relative to hard chemicals before making a decision.

[I thank Phil Sanders, Paul Trotta and Peter Innis, Department of Environmental Conservation, Stamford, NY for reviewing this article.] ▲

*Douglas C. Allen is Professor of Forest Entomology in the Faculty of Forestry at the State University of New York, College of Environmental Science and Forestry (SUNY/ESF); 146 Illick Hall, One Forestry Drive, Syracuse, NY 13210.*