Aspen Leaf Miner

James Kruse, Forest Entomologist; Angie Ambourn, Biological Science Technician; and Ken Zogas, Biological Science Technician, USDA Forest Service, Alaska Region, State and Private Forestry.

Additional information on this insect can be obtained from your local Alaska Cooperative Extension office, Alaska State Forestry office, or from:

Forest Health Protection
State and Private Forestry
USDA Forest Service

2770 Sherwood Lane, Suite 2A
Juneau, Alaska 99801-8545
Phone: (907) 586-8883

3301 “C” Street, Suite 522
Anchorage, Alaska 99503
Phone: (907) 743-9455

3700 Airport Way
Fairbanks, Alaska 99709
Phone: (907) 451-2701

www.fs.fed.us/r10/spf/fhp/fhpr10.htm

***Cover Photo**. Aspen trees with silvery appearing foliage caused by the Aspen leaf miner.*

Aspen Leaf Miner

USDA United States Department of Agriculture | Prepared by Forest Service Alaska Region | R10-PR-14 June 2007

Introduction

The aspen leaf miner is a transcontinental pest of trembling or small tooth aspen. This species, *Phyllocnistis populiella*, is found across Alaska wherever poplar species are found. An outbreak of the aspen leaf miner has been occurring in Alaska since 2000. Acres of infested aspen identified during annual aerial surveys have increased from nearly 300,000 acres in 2000, to more than 659,000 acres in 2006. This is the second recorded outbreak exceeding 500,000 acres in Alaska (the first large recorded outbreak occurred during the late-1970s). Infestations of aspen leaf miner were noted along the Alaska Highway in Canada as early as the 1950s, and this insect also reaches outbreak proportions in the western United States. Outbreaks of aspen leaf miner rarely occur in eastern North America.

Life History

Adults are minute white moths with subtle brown or blackish markings on their lanceolate-shaped wings. Adults overwinter under the bark scales of both hardwood and conifer trees. Adults emerge, mate, and feed for approximately two weeks in early spring. Adults can often be seen resting on the sides of homes, windows, and cars. Flight begins before aspen trees break bud (see figure 1). Single eggs are deposited on the edge of newly emerged aspen leaves and the adult then folds the leaf edge over to form a protective shelter for the egg until the larvae hatch. Usually one or two eggs are laid per leaf when populations are low, but up to

***Figure 1**. Adult moth on aspen leaf bud.*

seven eggs per leaf have been found during outbreaks. When the new larvae hatch, they bore into the leaf and begin feeding between the epidermal tissues. Larvae are small, white, and very flat, reaching about 5 mm long. The larvae develop through four instars, and pupation occurs inside the mines. New adults emerge slightly before or during leaf senescence in late August and September. There is one generation per year.

Detection and Damage

Leaf mining damage is caused by the larval feeding or “mining” the leaf tissue, or mesophyll, between the upper and lower leaf surfaces. Host plants of the aspen leaf miner in Alaska include trembling aspen, balsam poplar, and occasionally willow and ornamental trees and shrubs in the genus *Prunus*. The aspen leaf miner causes a serpentine or

sinuous mine that is typically confined to one side of the mid-rib. These mines give the leaf a silvery appearance (see cover photo). The majority of the feeding is done by late instar larvae and happens within a two week period. This feeding eventually causes the leaf to desiccate, turn brown, and drop prematurely. When looked at closely, leaf miner frass is

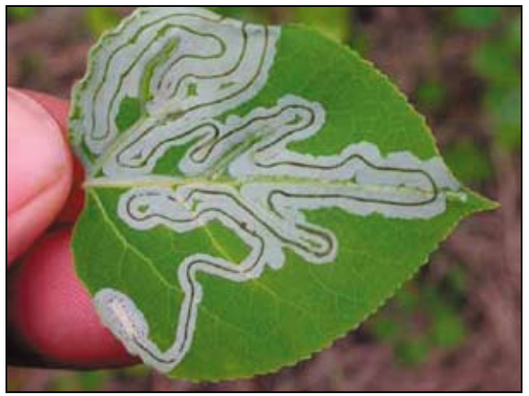

Figure 2. Mined aspen leaf. Note the serpentine mining and the frass—a thin black line in the mine.

commonly observed in the hollowed out mine track leaving a thin black line in the center of the mine (see figure 2). Generally, the most obvious negative effect of this leaf mining is aesthetic. A reduction in tree growth due to reduced photosynthetic area, branch die back and top-kill are the suspected outcomes of sustained annual defoliation. Heavily damaged leaves have been shown to have lost up to 75 percent of their photosynthetic capability.

Control Measures

There are no effective control measures for large scale outbreaks of aspen leaf miner. As with many leaf mining insects, disease, parasitoids, and predators are the main causes for outbreak population crashes. Cannibalism can also occur if populations are so high that larval mines cross each other. It is also suspected that climate is influential in determining aspen leaf miner populations. Leaf mining insects tend to thrive in years associated with warm and dry weather. Thus, years with cold, wet weather may help lower populations of aspen leaf miner.

Keeping trees in good health through fertilizing, watering, proper planting and pruning techniques, can help reduce the impacts of insect pests in general. Pruning may be effective for high value yard trees that are severely infested, as long as infected leaves and branches are removed or destroyed. Contact insecticides are not effective against leaf mining insects during their most damaging stage because they are protected inside the leaf. Some insecticides that are carried systemically through the tree can be effective in controlling leaf mining insects. Please contact your local Cooperative Extension office for more information and recommendations for insecticide treatments.

Photos Credits:

Figure 1 by Patricia Doak, University of Alaska–Fairbanks.
Figure 2 by Ned Rozell, Anchorage Daily News science writer.
Cover photo Forest Service, Ken Zogas.

CAUTION: Pesticides can be injurious to humans, domestic animals, desirable plants and fish, or other wildlife—if they are not handled or applied properly. Use all pesticides selectively and carefully. Since approved uses of a pesticide may change frequently, it is important to check the label for current approved and legal use. Follow recommended practices for the disposal of surplus pesticides and pesticide containers. Mention of a pesticide in this publication does not constitute a recommendation for use by the USDA, nor does it imply registration of a product under Federal Insecticide, Fungicide, and Rodenticide Act, as amended. Mention of a proprietary product does not constitute an endorsement by the USDA.