Zimmerman Pine Moth

Reports of Zimmerman pine moth damage have been increasing during the last one to two years. This may be due to a regional build-up in Zimmerman pine moth populations. Entomologists in Indiana have also noticed an apparent increase in

Zimmerman pine moth damage. Increased Zimmerman damage does not bode well for growers since this is a very difficult insect to control with insecticides. Although this insect was identified and described in 1879, few scientists have studied it and little information on Zimmerman pine moth is available from scientific literature.

Figure 1. Zimmerman Pine Moth pitch mass on tree.

Zimmerman pine moth is known to attack several species of pines, including Scotch, Austrian, red, jack, eastern white, and Mugho pine. Scotch pine Christmas trees and Austrian pines planted as windbreaks or as ornamentals seem to be most frequently attacked, or at least seem to sustain the most severe damage.

Damage Symptoms

Symptoms of Zimmerman attack are easy to distinguish. Larvae will feed inside terminal shoots and mine inner bark virtually anywhere on the main stem. The first sign of infestation is the appearance of small, reddish pitch masses where larvae have bored under the bark. .one or several larvae may work beneath the same mass, pushing frass and resin out from a common opening. As larvae continue to tunnel and feed, more pitch bleeds from the tree. Large pitch masses mixed with coarse, reddish sawdust-like frass are the best indicator of Zimmerman attack. Masses will be soft and shiny when infestations are active; they become hard and dull as infestations age. Pitch masses will eventually lose their reddish color and fade to yellow or off-white (Figure 1). After two to three years of infestation, dead branches and tops can be observed.

Pitch masses are most commonly found where branches join the main stem, but can be also seen on large branches and terminal shoots. Frass may accumulate in loose webbing at the base of branches in the top whorl of trees when larvae bore into terminal shoots. Tree stems often become constricted below the point of feeding damage. Partial girdling of the stem may cause trees to develop large, burl-like growth above the girdling damage. Larval boring in the stem and branches will disrupt transport of food down from the canopy to the roots, but does not interfere with transport of water from the roots to the canopy. Therefore, tree growth continues above the girdle, but stops below the girdle. Trees are very prone to breaking at the point of girdling. Trees may break during strong winds, or more importantly, during" harvest.

Life Cycle

Eggs are deposited in mid to late summer on tree stems, under bark scales or in bark crevices. Eggs hatch within a few weeks. The young larvae (Figure 2) do very little feeding or traveling in the fall. Instead, they spin a tiny silk shelter called hibernacula under a bark crevice. The larvae remain dormant inside this shelter during the winter. In spring, larvae will move out of hibernacula and begin to feed. Larval activity begins early, usually by mid-to late April.

Larvae are exposed for only a short interval before they bore under the bark. Therefore, insecticide applications should be targeted at this critical period. Feeding in May and June may be most common in tree terminals and lateral branches. Infested terminals wilt and curve, taking on a shepard's crook appearance. By late June, most larvae will be tunneling in the branch whorls, girdling branches and the terminal leader. Larvae may tunnel as much as one to two feet down the stem. Larvae will tunnel and feed for eight to 12 weeks, usually through late July. Larvae pupate in an enlarged tunnel under .the bark or in a

resin mass. Adult moths emerge in roughly two weeks. Moths are not commonly observed, since they are active during late evening and night. Adults mate and females lay eggs about one week after emerging from pupal cases.

Management Considerations
Trees with severe Zimmerman pine moth damage should be removed and destroyed. There is some evidence that certain trees seem to act like "Brood" trees - they are attacked over and over, each year producing new Zimmerman pine moth broods. Large Austrian pines seem to be especially common "brood" trees. The presence of such brood trees suggests that there may be traits such as bark or resin characteristics that determine how resistant trees are.

Figure 2. Zimmerman Pine Larvae with hibernacula.

However, intensive research will be needed to determine if resistance traits can be manipulated through genetics, fertility or other treatments. Another interesting observation is that Zimmerman pine moth larvae appear to frequently bore into stem galls of trees infested with gall rust. Again, the reasons underlying this behavior and apparent preference for galled areas are not known.

If only a few trees are damaged, it may be possible to use a pocket knife and cut out the boring larvae in pitch masses. Infested leaders should be removed and destroyed during shearing in mid-summer. This will result in shoots being destroyed before new adults have a chance to emerge and oviposite. When damage is abundant and occurs repeatedly however, insecticides will likely be needed.

Effective chemical control of Zimmerman pine moth is difficult to achieve. The window of opportunity for applying insecticides is early in the season, just as larvae are starting to become active. Once larvae get under the bark, insecticides lose much of their effectiveness. Good coverage is also essential. Material must be applied so that stems and main branches are thoroughly wet - a difficult feat to accomplish on large Scotch pine trees with dense canopies.

Figure 3. Damage on tree caused by Zimmerman Pine Moth.

Another possible control opportunity may be the application of an insecticide to foliage in late summer when adults are present. A foliar insecticide application may be useful in controlling adults and preventing oviposition.

Information obtained through the Michigan State University Extension