

Is a Key Species for Building Healthy Forests Getting Sick?

By **ERIKA EIDSON**

Top kill in young larch caused by wood-boring moths

Western larch is one of the most prized tree species in the region. It produces valuable timber, is resistant to fire, has a beautiful fall color, and is often recommended for planting by forest health professionals due to its limited problems with major insects and diseases.



Perhaps most importantly, planting western larch (along with western white pine) is often touted as the ‘cure’ for root disease. Although root disease can never truly be cured, western larch is one of the least susceptible tree species to *Armillaria* root disease, which is the most widespread root disease in the inland northwest. As such, larch is an important species for forest health restoration and over 100,000 western larch seedlings are planted each year in north

Idaho by state and federal agencies.

Recently, forest landowners and managers have been surprised to see healthy young larch trees exhibiting strange new damage. Tops were yellowing, then dying. In some cases, whole trees were killed. Right around the lower margin of the top kill, there were oozing trunk ‘blemishes’ where the bark was flattened and cracked. These symptoms have not been documented in larch before. Although the problem is not currently widespread, it is cause for concern.

When did we start seeing problems?

The Idaho Department of Lands (IDL) Forest Health team covers insect and disease issues across the state. The first suspected documentation of this problem in Idaho, ironically, occurred in the backyard of Tom Eckberg, IDL’s Forest Health Program Manager.

In 2014, Tom noticed his backyard larch tree had a trunk blemish, along with some red, sawdust-like material on the bark. A trained entomologist, he recognized the ‘sawdust’ as frass or insect poop. Tom looked under layers

of bark to find out who was invading his tree. He extracted a small caterpillar that looked like it belonged in the *Tortricidae* family, a very large family of usually small and drab moths.

Having never seen anything like this on larch before, he thought it was a fluke. Fortunately for Tom’s tree, his curiosity and quick action saved its life. To this day, it sports a healing scar, but it is doing well and shows no other signs of damage.

Four years later, in 2018, Tom received the first report of top kill, mortality, and trunk blemishes in otherwise healthy-looking western larch near Orofino, Idaho. Forest health professionals also received reports of similar damage in Spirit Lake, Coeur d’Alene, and eastern Washington. Peeling back the bark again revealed Tortricid-looking caterpillars in the affected trees.

What’s the damage?

So far, top kill and mortality have only been reported on western larch trees. The first noticeable symptom is yellowing from the top down. In most reports, top kill progresses down the trunk over several years, sometimes killing the entire tree. Attacks usually occur on young trees less than about 15 feet in height. Attacks have been reported on trees as small as 1.3 inches in diameter and as large as about 14 inches in diameter.

Affected stands are usually no more than about 30 years old. Damage typically occurs scattered throughout the stand or in small patches, and western larch mortality has been recorded in both pure and mixed species stands.

Attack sites can often be found less than 10 feet up the trunk and are usually located near small limbs. Typical trunk blemishes present with sunken, cracked bark exuding resin of varying viscosity. Thinner resin can give the blemishes a ‘bleeding’ appearance, whereas thicker, drying resin looks gummy. If the attack is recent, reddish frass may be visible from insect feeding, but rain will wash it away.

Excavating the trunk blemishes reveals a depression in the wood where feeding occurred, some callusing of

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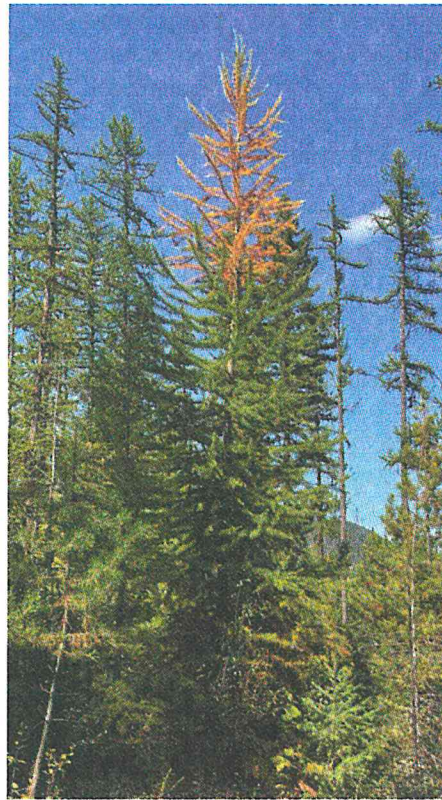
for capturing adult *Cydia laricana* complex moths. Further DNA analysis of collected specimens confirmed the identification of *Cydia laricana* complex at three sites in northern Idaho and northeastern Washington in 2021 and 2022.

Moths that emerged from the logs in the rearing cages did so in May and early June, supporting the hypothesis that the attack period for this insect is in late spring. Very recently, relatively large caterpillar specimens (presumably more mature larvae) have been found actively feeding in western larch in September and October, which may also support this hypothesis.

Ongoing and future research on the *Cydia laricana* complex will focus on affected stand characteristics such as stocking density, slope, aspect, soil chemistry, and host tree seed source, as well as developing more information on overall biology and life history.

What can we do?

It is important to remember that research takes time. Although studies are underway, it will likely take years before forest health professionals can develop specific management recommendations for this presumably native insect. Until there is more information available on its life cycle, population drivers, and host tree susceptibility,



Larch topkill due to Cydia laricana complex, September, 2022.

management recommendations are purely speculative based on similar wood-boring moths.

In landscaped settings, the most effective treatment to protect trees from wood-boring moths is typically an insecticide. High concentrations of permethrin or other chemicals that



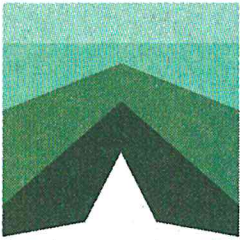
Cydia laricana complex attack site with caterpillar.

are appropriately labeled for treatment would be sprayed on the bark during the attack period (egg laying through egg hatch). However, due to the lack of information on the complex lifecycle of *Cydia laricana*, appropriate application timing has not been confirmed. Notably, imidacloprid, a popular soil drench systemic insecticide, is generally not an effective treatment against the larvae of most wood-boring moths.

In forest settings, bark-spray insecticides are often impractical and not labeled for widespread use. It is always important to read and follow the label when applying any pesticide. Promptly removing and destroying (chipping or



Excavated attack site showing Cydia laricana complex larva surrounded by frass and resin.



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burning) infested trees when symptoms first appear may help reduce populations of *Cydia laricana* complex within a stand, but population dynamics of this insect are not well understood.

Some evidence suggests that thinning may not be an effective means for increasing stand resistance to *Cydia laricana* complex. Several reports originated from young stands that had recently been thinned, but this is still being investigated. So far, the species composition of a stand does not appear to be a major factor for tree susceptibility, as the damage has been reported in stands even where larch is only a minor component.

Western larch has a very narrow seed transfer zone and is sensitive to drought. Planting larch from inappropriate seed sources, or on sites that are too dry, can increase stress. Stressed trees have compromised defense systems. Planting 'the right tree in the right place' may help to reduce stress and thereby improve resistance to the *Cydia laricana* complex.

The bottom line

Western larch is a valuable and important tree species, so any threat is concerning. We still have much to learn about the *Cydia laricana* complex. Why is it contributing to larch mortality now, when it hasn't been known to cause problems in the past? Why are some larch trees attacked but not others? Is it acting alone, or in concert with other insects, diseases, or climate conditions? This fall, up to three morphologically distinct caterpillars have been pulled from the same larch tree, suggesting multiple species may be at work. *Cydia laricana* complex has also been documented in larch trees along-

side the native larch engraver beetle (*Scolytus laricis*) and in trees affected by foliar issues such as needle cast, needle blight, and larch casebearer.

As more information becomes available, management recommendations can be developed. Fortunately, only small, and sporadic areas of larch have been affected and western larch is still recommended for planting. ■

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