

Arborvitae Leafminer: A New Insect Pest in Tennessee's Nurseries and Landscapes

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The arborvitae leafminer (ALM) is a native pest of eastern arborvitae (*Thuja occidentalis* L.). This pest is native to eastern Canada and the U.S., generally as far south as Maryland and west to Missouri. It is an invasive pest in Europe. In the last few years, the UT Soil, Plant and Pest Center (SPPC) in Nashville has received ALM samples from Knox, Sullivan, McMinn, Blount, Claiborne, Cumberland and Davidson Counties. Although ALM is not common in Tennessee, it appears that this pest of nursery-grown and landscape arborvitae is expanding its range within the state.

Most of what we know about the life cycle of ALM comes from the northeastern U.S., where it is a common pest. ALM only has one generation per year and most of its life is spent as a larva within a mine (tunneled foliage). We suspect that the overwintering ALM larvae actively feed and develop into moths earlier during the spring in Tennessee than in the Northeast.

After emerging from the mine, the tiny ALM moth lays eggs on the new arborvitae foliage in the spring. Soon after hatching, the larvae tunnel into the new foliage at the tip of the branches. Once inside the foliage, the larvae feed and hollow out the foliage, causing it to turn yellow and eventually brown (Figure 1).



Figure 1. Arborvitae leafminer damage to arborvitae.

The browned foliage does not resemble typical leafminer damage and can be confused with winter injury. In late fall or early winter, the larvae push the frass (excrement) to one end of the mine and overwinter. In the spring, the frass is ejected to the outside while the larvae feed and extend the mine toward the interior of the foliage. Prior to pupation, the larvae will make tiny, round holes from which the moths will later exit the plant (Figure 2). The larvae then pupate in the mines and the moths emerge soon after. The exit hole is visible to the naked eye but can be seen more easily with a magnifying lens.



Figure 2. Arborvitae leafminer moth exit hole in mined arborvitae foliage.

The tiny, slender moths are 3/16-inch long with a 5/16-inch wingspan. The wings are silvery white with brown markings (Figure 3). In the spring, if you suspect that you have ALM, shake the foliage in late April to May to detect the small and glittering moths. Also, see if you can find any of the minute, round exit holes made by the larvae in the spring. Another trick is to cut off some of the dead foliage in early April. Put the brown foliage in a plastic bag with 25 or more pin holes so that any insects can have air to breathe. Store the bag outdoors behind the shrubs on the north side of a house, barn or other structure so it is out of direct sunlight, which could overheat the contents of the

bag. Check the bag for moths a couple times a week or more. If emerged moths are found in the bag, shake the foliage of nearby arborvitae to see if you can detect the moths there, too. You can then time spraying your foliage with an insecticide to occur a few days after the moths start to emerge.



Figure 3. Arborvitae leafminer moth.

A sample of ALM received at the SPPC on May 1, 2015, from Knox County contained moths that were already emerging. Thus, we can surmise from that year's data that egg laying should be occurring by early May, and protective insecticide spray applications should be made at that time. The emergence of the moths can vary from year to year depending on spring temperatures and the number of heat units that have accumulated. The warmer the spring, the faster the ALM develops and the earlier the moths emerge.

Systemic insecticides applied as foliar sprays are preferred since they can provide control of both the adult moths to prevent much of the egg laying and any new larvae from developing within the mines. Two spray applications of these systemic insecticides made two weeks apart should provide effective control.

Another effective control option is the use of a soil-applied systemic insecticide. The browned foliage can be examined under a dissecting microscope for the presence of this pest. If the pest and damage are detected in the fall through winter, a single soil drench application of a recommended systemic insecticide can be made in March-April.

Nonsystemic or weakly systemic insecticides are another option. Three to four sprays on a weekly interval should provide protection during the full flight period of the moths.

For insecticide control recommendations, see PB 1589: extension.tennessee.edu/publications/Documents/PB1589.pdf.

A good cultural practice in the fall through early spring is to remove the brown, infested foliage and place it in a trash bag. The plant material should be disposed of off-site. This practice is also suggested for controlling light infestations.

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