



Sirex Woodwasp

Sirex noctilio Fabricius (Hymenoptera: Siricidae)

Introduction:

The Sirex woodwasp (SWW) is an exotic, invasive pest considered one of the top 10 most serious forest insect pests worldwide. SWW primarily attacks pine species and, having no natural controls outside its native range, causes extensive losses in areas where it is accidentally introduced. Commonly detected in wooden shipping materials at U.S. ports for years, the 2004 capture of a female in a field in Oswego County, NY, was the first sign an established population existed. With a history of large scale damage and numerous pine species attacked elsewhere, SWW could wreak havoc to the U.S. timber industry if not controlled.

U.S. Distribution/Spread:

As of September 2011, SWW have been detected in New York, Pennsylvania, Michigan, Vermont, Ohio, Connecticut, and the Canadian province of Ontario. Based on its native range in Eurasia, SWW could establish anywhere in North America where pines grow. Adults are strong fliers and spread rapidly, about 25-30 miles per year. SWW larvae are easily transported in infested wood products, with or without bark (e.g., pallets, wood packing materials, firewood).

Host Plants:

The preferred hosts of SWW are pine species, especially Scots, Red, and Eastern white pines in the U.S., and widely reported in Monterey and loblolly pines elsewhere. In its native range it attacks pines almost exclusively, but in the U.S. it also attacks spruce, fir, larch, and Douglas-fir.

Biology and Damage:

SWW usually produce one generation a year, but may take up to two years in cooler climates. This pest overwinters either as eggs or as larvae deep within a host tree. Newly pupated adults emerge from host trees from June-September, with peak emergence in August, boring characteristic round exit holes that vary in diameter according to the size of the wasps. Females are attracted to stressed pine trees and can lay 25-450 eggs over her 1-3 week life span.

The biology of SWW is a complex interaction between the woodwasp, a toxic mucus, a symbiotic wood-decaying fungus, and the host tree. Female SWW drill into the outer sapwood of host trees, inject toxic mucus, and deposit a single egg per drill. Drill holes are perfectly round, usually located on the sunny side of trees, and may occur singly or in clusters of 5-6 drills together. Female wasps usually pack one drill with spores of the symbiotic fungus, *Amylostereum areolatum*.

The toxic mucus disables the tree's vascular system, causing wilt and enabling the fungus to multiply and spread throughout the tree, leading to tree death. This creates ideal conditions for egg hatch and provides food for developing larvae: the fungus feeds on killed wood and larvae feed on the fungus. Larvae typically hatch after about 9 days, but eggs can remain dormant several months. As larvae grow, they bore galleries deep into the wood. Mature larvae pupate close to the bark surface, and adults emerge about 3 weeks later.



Adult male SWW, actual size. David R. Lance, USDA APHIS PPQ, Bugwood.org

Identification:

SWW are commonly called horntails because of the spear-shaped spike (cornus) located at the tail end of adults.

- Adults of both sexes have large, stout, cylindrical bodies, pointed at the tail tip. Woodwasps lack the narrow "wasp-waist" characteristic of many other wasp families.
- Female adults: head and body dark metallic blue/black; legs orange; beneath the cornus is a longer ovipositor and sheath extending straight back from the rear; up to 1.8" long (4.5 cm) including ovipositor.
- Male adults: head and thorax dark metallic blue/black; abdomen black at base and tail ends with middle segment orange; front two pairs of legs orange, hind pair black; 1-1.5" long (2.5-4 cm).
- Both sexes have black antennae typically over 0.8" long (20 mm), and four clear yellow/orange membranous wings.
- Eggs: sausage-shaped, creamy white, ~0.06" long (1.46 mm) and ~0.01" wide (0.3 mm).
- Larvae: cylindrical, legless, creamy white grubs, with distinct heads, up to 1.18" long (30 mm), with a distinctive dark spike (or spine) at the tail end.

What to Look For:

SWW are more likely to infest weak, injured, diseased, rapidly growing, or otherwise stressed living trees, and dead or fallen trees. Trees with smaller diameters (< 6" or 16 cm) are more likely to be killed, but SWW readily attack larger trees that are damaged or stressed.

Symptoms of SWW infestation include:

- Foliage wilts and needles point straight down.
- Needles turn light green/yellow to red/brown over 3-6 months.
- Resin beads or dribbles on bark from oviposition drill wounds.
- Drill holes: perfectly round, usually clustered in groups of 5-6.
- Drill sites are more common 10-30+ ft up (3-9+ m) on trees 6-8" (> 15 cm) in diameter and larger.



Foliage wilts, needles point straight down and turn light green/yellow to red/brown over several months. Dennis Haugen, Bugwood.org

- Meandering larval galleries 5-6" long (12-15 cm), tightly packed with frass, expanding in diameter as they progress, turning first inward then back out towards the bark.
- Larvae may be found in galleries beneath the bark, deep into heartwood, or in oviposition drill holes.
- Pupae are typically found in chambers about 2" (5 cm) below the bark surface.
- Fungal stains in cambial layer beneath bark: long, narrow, oval-shaped brown bands along the grain, with drill hole(s) at the center.
- Round exit holes 1/8-3/8" in diameter (3-8 mm) created by adults emerging in year two.



Damage to interior of tree: frass packed mines and fungal stains. Note larva protruding from tunnel. Paula Klasmer, Instituto Nacional de Tecnologia Agropecuaria, Bugwood.org

How to Report a Possible Sighting/Infestation

In Maryland:

University of Maryland Cooperative Extension Exotic Pest Threats Website:

<http://hgic.umd.edu/faq/sendAQuestion.cfm>

Maryland Department of Agriculture: call 410-841-5920 to report suspect pests; visit http://www.mda.state.md.us/plants-pests/invasive_species.php for information.

Nationally: USDA-Animal and Plant Health Inspection Service (APHIS)

http://www.aphis.usda.gov/services/report_pest_disease/report_pest_disease.shtml

Adult female SWW Actual Size:



Where to Get More Information:

UMD Cooperative Extension Exotic Pest Threats Website: <http://www.PestThreats.umd.edu/index.cfm>

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