



Douglas-fir Needle Midges

Forest Health Fact Sheet

September 2017



Jill O'Donnell, MSU ext.

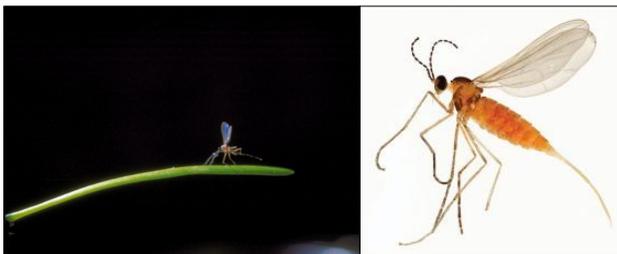
Needles damaged by Douglas-fir needle midge

Several species of midge (flies) attack Douglas-fir needles including *Contarinia pseudotsugae*, which is most abundant, and *C. constricta* and *C. cuniculator*. Adults lay eggs on current-year needles and larvae create galls that can cause premature needle drop. Severe attacks can cause 100% loss of current-year needles; several years of attacks can result in twig dieback. Douglas-fir needle midges are mostly pests of Christmas tree farms and other conifer plantations rather than in forest stands. Other species in this genus, such as Douglas-fir cone gall midge (*C. oregonensis*), may attack needles and sometimes cones of other conifer hosts.

Host

- Douglas-fir

These insects occur down from Canada to California and across to Montana.



USFS, Bugwood.org and ODA

Douglas-fir needle midge adults are 2mm long

Biology

A complex of more than one of the Douglas-fir needle midge species at a time is possible. Adult flies emerge from the ground, where they have overwintered, around May and lay eggs on new needles. Eggs may be yellow-brown or orange and can be seen with a hands lens. Maggots hatch from the eggs, bore into needles, and remain first instars until early August. Two more molts

occur by late September. From mid-October to December larvae drop to the ground and spin cocoons to hibernate. There is one generation per year.

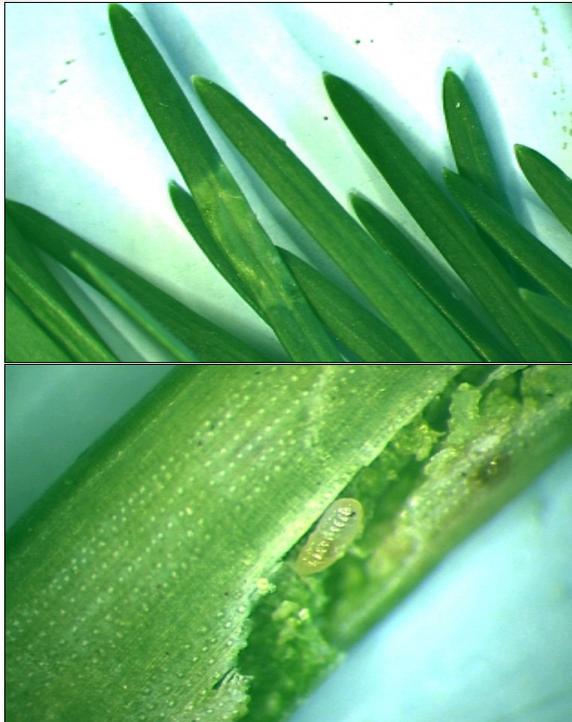
Damage

Evidence of attacks can be readily seen in needles. Maggots form galls (swellings) in the needles that are slight but cause discoloration on top and sometimes the bottom of the needle. The areas around these galls is yellow with areas of brown or purple. Needles may be bent at the gall site. Often several maggots will feed within a single needle.



Beth Willhite, USFS, Bugwood.org

Needles damaged by Douglas-fir needle midge maggots



Rayanne Lehman, P.A Dept. of Ag., Bugwood.org

Initial gall formation (top) and maggot within (below)

Management highlights

- Destroy heavily infested trees in early fall
- Sprays must be applied before adults fly in around May
- Adult emergence can be predicted using degree-day models or monitored using traps

JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
					SYMPTOMS						
			MONITOR								
				MANAGE -1			MANAGE -2				

 Swollen, yellow needles
 Place emergence traps.
1 Apply spray control measures based on monitoring.
2 Remove infested trees.

Douglas-fir needle midge management calendar provided by Oregon State University extension (Publication PNW659)

Management

Silvicultural

Selecting plant stock with later bud burst *might* alter the synchrony between midge emergence and budburst that triggers attacks. Destroy heavily infested trees in early fall before larvae drop to the ground.

Insecticides

Various chemical sprays may be used to control adult midge populations if applied at the correct time (before dropping to the ground). Pesticides registered for use on Douglas-fir needle midge can be found in the [Pesticide Center Online \(PICOL\) database](#). Use degree-day models for this pest or monitor adult emerge using traps to correctly time sprays. Note that many other types of similar-looking, non-damaging flies may be collected in traps.

When using pesticides, always read and follow the label

More information:

Oregon Dept. of Forestry, Forest Health
<http://tinyurl.com/odf-foresthealth>
 2600 State St. Bldg. D, Salem, OR 97310
 503-945-7200

Other references:

USFS Forest Health Protection
www.fs.usda.gov/goto/fhp/fidls

OSU Forestry Extension
<http://extensionweb.forestry.oregonstate.edu/>