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<p>Management Guide for</p> <h1>Douglas-fir Needle Midges</h1>
<p><i>Contarinia pseudotsugae</i> <i>C. constricta</i> <i>C. cuniculator</i> Condre</p>

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<p>From a distance, damage looks like western spruce budworm defoliation.</p>	<p>Host: Douglas-fir</p>
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- Key Points**
- These three midges work together as a complex on Douglas-fir trees
 - Maggots cause galls on current year's needles, causing them to fall off.
 - Christmas tree plantations and entire crops can be ruined.

Damage

Maggots cause galls on current year's needles, causing them to fall off. Nearly 100 percent of needles can be destroyed. After years of consecutive defoliation, twig dieback can occur. From a distance, damage looks like western spruce budworm defoliation. Economic damage occurs in Christmas tree plantations and entire crops can be ruined.

These three midges work together as a complex on Douglas-fir trees, but *C. pseudotsugae* is the most abundant. Severe infestations occurred during 1952 and 1963 in northern Idaho and western Montana. Scattered infestations were found all over Montana in 1960, and there were outbreaks in the late 1960's in both states.

Life History

The life cycles of all three midges are fairly similar to that of *C. pseudotsugae*. The mature larvae (maggots) over winters in the soil under host trees. The larvae pupate in soil in late April and early May. Adult flies emerge and lay eggs on newly extending needles. Maggots bore into needles and remain first instars until early August. By late September most larvae are in the third and final instar. Larvae leave the galls from mid-October to December, drop to the ground, and spin cocoons in which to hibernate.

Identification

Look for gall on new needles. 6 weeks the gall becomes dilated and flattened. *Contarinia*. Galls of *C. pseudotsugae* are swollen on the lower surface and colored on both-surfaces with yellow, pink or purple. *Contarinia*. *cuniculator* galls affect mainly the upper needle surface. The upper side is dirty yellow with a glossy, waxy appearance. Frequently needles are bent at site of injury. *Contarinia*. *constricta* galls first appear as a patch of yellow discoloration with a dark purplish spot visible on both surfaces of the needle. After about



Needle midge damage on fir.

For more identification photos go the ***Field Guide to Diseases and Insect Pest of Northern and Central Rocky Mountain Conifers in menu on first page.***

Management

Chemical controls have not been registered in the Northern Region. However, acceptable control was achieved with:

- endosulfan,
- dimethoate,
- lindane,
- liquid carbofuran
- Temikâ.

Endosulfan gave the best control when applied to foliage and soil just prior to female midge emergence but at median budburst.

During years of heavy midge populations:

- Christmas trees should be harvested at elevations above 3,000 feet.
- Midge-damaged trees should be left uncut to recover for future harvest.
- Sites for Douglas-fir plantations should be carefully selected to avoid a severe midge problem.
- Evidence indicates that synchronism of adult emergence with host development is an important factor in the successful establishment of *C. pseudotsugae*.
- Selecting planting stock with late bud burst might have some merit.

Other Reading

Condrashoff, S. F. 1961. Three new species of *Contarinia*. (Diptera: Cecidomyiidae) in Douglas-fir needles. Can. Ent. 93(2): 123-130, illus.

Condrashoff, S. F. 1962. Bionomics of three closely related species of *Contarinia* Rond. (Diptera: Cecidomyiidae) from Douglas-fir needles. Can. Ent. 94: 376-394.

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