



# FOREST HEALTH NOTE

August 1999

## Douglas-fir Tussock Moth (*Orgyia pseudotsugata*)

### Hosts:

Forests - Douglas-fir, white fir, grand fir, and sub-alpine fir.  
Ornamental conifers – Colorado blue spruce, Engelmann spruce.

### Importance:

The Douglas-fir tussock moth is a major defoliator of true firs and Douglas-fir in the western United States. Tussock moths occur in most forests in Oregon, but episodes of severe defoliation are restricted to the Blue Mountains of northeast Oregon, and Klamath and Lake Counties (Figure 1). Defoliation by this insect can cause top kill, reduce radial growth, and result in up to 40 percent tree mortality.



Figure 1: Typical Douglas-fir tussock moth defoliation in the Blue Mountains.



Figure 2: One of the first signs of a tussock moth infestation is a small tent of silk at the top of host trees.

### Look For:

#### June – Mid-July

- After egg hatch in late May or early June, young larvae aggregate at the tops of trees and produce silk threads that are attached to foliage. These threads separate from the foliage and allow the larvae to be carried by the wind to adjacent trees. The residual silk at the top of the tree forms a small tent that is one of the first visible signs of a tussock moth infestation (Figure 2).

- Larvae feed initially on the current year's foliage, causing it to shrivel and brown (Figure 2).



Figure 3: Mature larvae (1-1/4" in length) have distinctive dark tufts of hair and a body color that is usually a light cream or a dark brown.

### Mid-July – August

- Maturing larvae gradually develop the tufts of hair or tussocks from which they get their name (Figure 3). In July, larvae consume both new and old foliage, which completely strips

the crown of some infested trees. The Douglas-fir tussock moth life cycle in Oregon is shown in Figure 4.

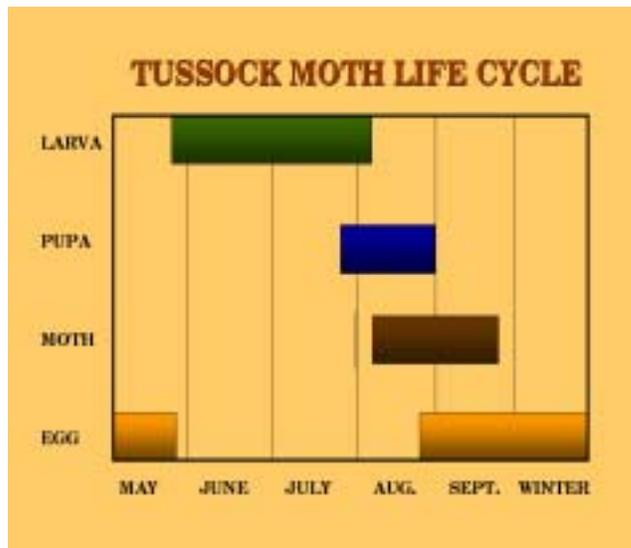


Figure 4: The typical Douglas-fir tussock moth life cycle in Oregon is shown at left. Egg hatch is synchronous with bud burst and shoot elongation (the appearance of new foliage) at a particular site.

### Infestation Characteristics:

Isolated infestations on ornamental trees, particularly spruce, are common one or two years before a major outbreak. On forest land, outbreaks develop suddenly over hundreds to thousands of acres and collapse after one or two years of intense defoliation (Figure 5). Infestations do not spread significantly because the female tussock moth is flightless.

Sites with severe defoliation often contain host trees >50 years old and are located on upper slopes and ridge tops. Tree defoliation by this insect is particularly destructive because larvae consume both old and new foliage. When trees are stripped of most of their foliage, they may die or suffer top-kill. Trees that survive the outbreak in a weakened condition are often killed by bark beetles two or three years later.

### Human Health Concerns:

Tussock moth larvae are covered with tiny irritating hairs that produce an allergic reaction in humans called “tussockosis”. Symptoms of “tussockosis” can resemble those of hay fever, but more intense reactions such as welt-like rashes also occur. Because of the allergic reaction to these hairs, visitors shun campgrounds and recreation areas affected by tussock moth defoliation.

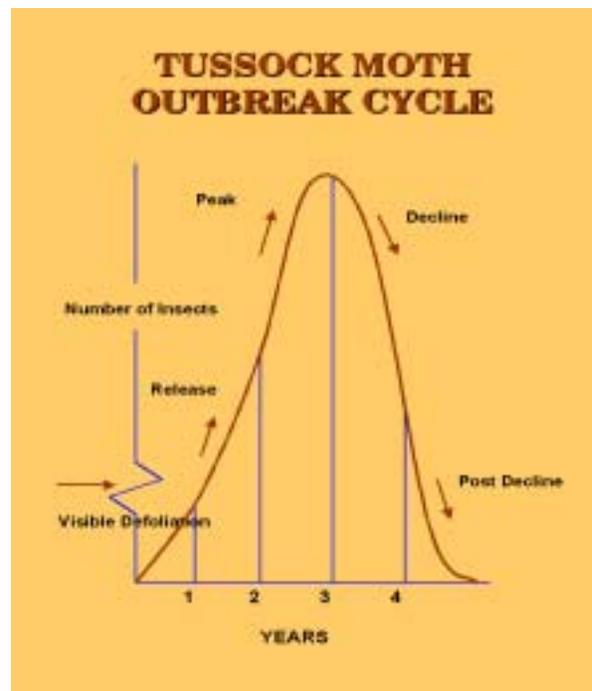


Figure 5: The four phases of a tussock moth outbreak are shown above. Outbreak populations decline naturally after 1-2 years of tree defoliation.

## **Control:**

**Natural** – Douglas-fir tussock moth outbreaks normally collapse in one or two years from the combined effects of parasites, predators, disease, and starvation. Birds, ants, and spiders are known to be important tussock moth predators.

**Silvicultural** – Stand susceptibility to defoliation can be avoided by converting stands from fir to pine where fire suppression and logging practices have allowed firs to become the dominant tree. On true fir sites, non-host species such as western larch should be favored during thinning operations.

Do not thin stands during or immediately after an outbreak. There is no way to identify which trees will fully recover from defoliation and escape bark beetle attack.

**Insecticides** – Insecticides should be applied near the release phase of the outbreak cycle (Figure 5) to minimize tree damage. A pesticide application after newly hatched larvae have dispersed to new foliage and begun to feed is most effective in reducing larval populations and preserving foliage. The following insecticides are registered for tussock moth control:

- **Aerial application to forest trees**  
Bacillus thuringiensis (B.t.)  
carbaryl  
diflubenzuron  
nucleopolyhedrosis virus (USFS sole source)
  
- **Ground application to ornamental trees**  
Bacillus thuringiensis (B.t.)  
acephate  
cyfluthrin  
bifenthrin  
diflubenzuron

**WARNING: REMEMBER, WHEN USING INSECTICIDES  
ALWAYS READ AND FOLLOW THE LABEL**

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