



TREES & SHRUBS

Douglas-Fir Tussock Moths

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by R.E. Stevens, D.A. Leatherman and J. W. Brewer ¹

Quick Facts...

Douglas-fir tussock moths are important defoliators of spruce, Douglas-fir, true fir and other conifers in the Rocky Mountain region.

The insects cause serious aesthetic damage to Colorado blue spruce in urban landscapes.

Continued heavy infestations may cause death of the tree top or even the entire tree.

Chemical control may be used to prevent damage to high-value trees.

The Douglas-fir tussock moth, *Orgyia pseudotsugata* (McDunnough), is an important defoliator of spruce, Douglas-fir, true fir and rarely other conifers in the Rocky Mountain region. Feeding by the larvae can cause complete defoliation of heavily infested trees. Damage usually appears first in the tops of trees and progresses downward, sometimes over several years.

In forests, tussock moth outbreaks usually develop quickly and then abruptly subside after about three years. In Colorado's residential areas, however, populations seem to remain relatively stable at higher than normal levels for long periods of time.

In urban areas the tussock moth primarily is a pest of Colorado blue spruce, where it commonly causes top kill and sometimes even whole-tree mortality if not controlled. The pest apparently occurs throughout Colorado's spruce-fir forests, but serious damage has been restricted to a few Front Range areas. It appears this insect is occurring in native forest areas at an increasing rate and it should be anticipated there.

Description and Life Cycle

Young tussock moth caterpillars are blackish with long body hairs. They sprout brightly colored tufts of hair as they grow larger. A mature larva is 1.2 to 1.4 inches long, with a gray to brown body and shiny black head. Two long tufts of black hairs project forward from the head, and a similar tuft projects backward from the rear of the body. Dense, light brown patches of hairs and red spots occur on the first four and the last abdominal segments. There is an orange stripe on each side. The larval hairs are irritating to some people and livestock and may cause a serious rash. The hairs are not normally considered poisonous.

The cocoon is brownish gray and covered with hairs from the body of the larva. Cocoons usually are attached to foliage but may be found on tree trunks, rocks or other objects.

The adult moth is .5 to .8 inch long. The female, usually found in the vicinity of her pupal cocoon, has rudimentary wings and cannot fly. Females normally are grayish with the tip of the abdomen much darker. They have small thread-like antennae.

Adult males are gray-brown to blackish moths with feathery antennae and a wing spread of approximately 1.2 inches. The forewings are rusty brown and the hind wings grayish brown.

The egg mass, laid on the female pupal cocoon, contains about 300 white spherical eggs in several layers, all covered with a frothy substance intermixed with body hairs from the larvae. There is one generation per year. The adults



Figure 1: Tussock moth larva.



Figure 2: Tussock moth egg mass on female pupal cocoon.



Figure 3: Damage to tree top caused by Douglas-fir tussock moth.

¹R.E. Stevens, entomologist, former Rocky Mountain Forest and Range Experiment Station; D.A. Leatherman, forester, Colorado State Forest Service; and J.W. Brewer, former Colorado State University professor, zoology and entomology.

appear from late July to early September. The insects overwinter in the egg stage. Eggs hatch in late May or early June after new foliage has appeared.

Damage

Larvae first feed on the new needles, killing them but not consuming the entire needle. The dead needles remain on the tree, giving it a reddish cast for a short time. Later, the reddish appearance is lost as the damaged needles drop.

As the larvae mature, they begin to feed on older foliage. A heavily infested tree may be completely defoliated. Seriously damaged trees turn brown as the bare twigs are exposed.

Severely defoliated trees normally experience growth losses and some mortality, although death is restricted to trees losing more than 90 percent of their foliage. More commonly, the top of the tree is killed. Severe defoliation for more than one year does cause mortality. Any infestation may cause serious aesthetic damage in residential situations.

Control

The Douglas-fir tussock moth has a number of natural enemies, including parasites, predators and pathogens. These enemies, along with environmental factors, keep populations at low levels under most circumstances.

However, tussock moth populations in Colorado urban areas seem to somehow escape these natural control factors. Perhaps the artificial nature of these urban “forests,” and the associated stresses on the trees, allows the tussock moth to survive at higher levels than is possible in a natural forest.

Control measures include biological insecticides such as *Bacillus thuringiensis* (Bt) and spinosad (Conserve), but to date these have shown only fair success.

Standard chemical insecticides such as acephate (Orthene), cyfluthrin (Tempo), bifenthrin (Talstar, Onyx), carbaryl (Sevin), deltamethrin (DeltaGard), lambda-cyhalothrin (Scimitar) and permethrin (Astro) applied when the new foliage first appears, give good control. Check to see which ones are legal in your area. Certain Front Range forests with tussock moths also contain the endangered Pawnee montane skipper butterfly. Spraying is carefully controlled in such situations.

One important aspect of control is the proper assessment of damage. When is a tree top, or entire tree, really dead? The experience of Colorado urban foresters suggests that a “dead” tree or tree top be given at least one year to recover before removing or reshaping the tree. Trees as much as 50 percent defoliated have been known to recover. To help them recover, such trees should be properly watered, especially in winter, and fertilized.

References

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