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Douglas-fir tussock moths

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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 esthetic 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 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 a several-year period (Figure 1).

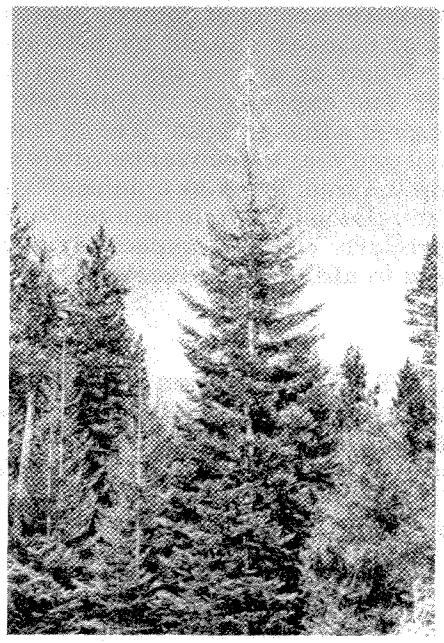

Figure 1: Damage to tree top caused by Douglas-fir tussock moth.

In forest situations, tussock moths outbreaks usually develop quickly, and then abruptly subside after about three years. In Colorado's residential environment, however, populations of the moth 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 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 in those areas has been unimportant to date.

Descriptions and Life Cycle

Young tussock moth caterpillars are blackish with very long body hairs, becoming ornamented with 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 (Figure 2). 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

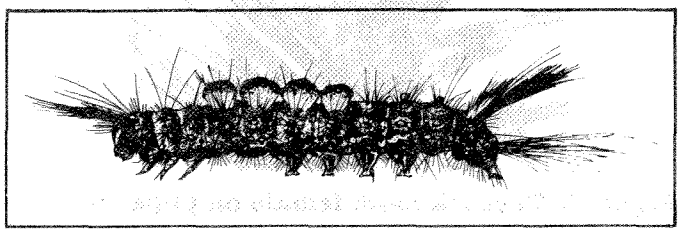

Figure 2: Tussock moth larva.

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first four, and last abdominal segments. There is an orange stripe on each side. The larval hairs are irritating to some humans and may cause a serious rash. The hairs are not normally considered unusually poisonous.

The cocoon is brownish gray and covered with hairs from the body of the larva. Cocoons usually are attached to the foliage, but also 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 (Figure 3). They have small thread-like antennae. Adult males are gray-brown to blackish moths with feathery antennae and 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, with the adults appearing from late July to early September. The insects overwinter in the egg stage, with the eggs hatching in late May or early June after new foliage has appeared.

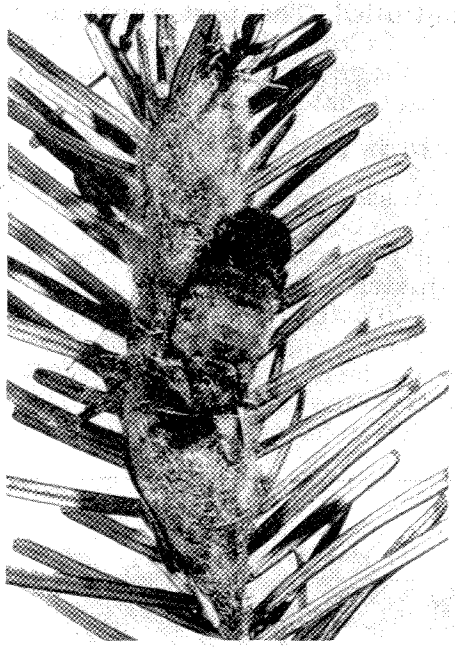

Figure 3: Tussock moth female on pupa case.

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. Thus, seriously damaged trees turn brown as the bare twigs are exposed. Severely defoliated trees normally experience growth losses and some mortality, although death is rarer than might be predicted based on the appearance of the trees. More commonly, the top of the tree is killed. Continued severe defoliation for several years does cause mortality, and any infestation may cause serious esthetic damage in residential situations.

Control

The Douglas-fir tussock moth has a number of natural enemies, including parasites, predators and pathogens, which probably act in conjunction with environmental factors to keep populations at low levels under most circumstances. However, tussock moth populations in Colorado urban areas seem to somehow escape these natural control factors for extended periods. 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 usually possible in the forest environment.

Applied control measures include some of the so-called "biological insecticides" such as *Bacillus thuringiensis* (Bt) but to date these materials have given only fair success. Standard chemical insecticides such as acephate (Orthene) or carbaryl (Sevin) applied when the new foliage first appears give good control of this pest.

One important aspect of control is the proper assessment of damage caused by tussock moth defoliation. 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. Such trees should be properly watered, especially in winter, and fertilized to aid them in recovery.

References

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