

DOUGLAS-FIR TUSSOCK MOTH

THE INSECT

The Douglas-fir tussock moth is an important native defoliator of true firs and Douglas-fir. Outbreaks of the Douglas-fir tussock moth sometimes develop almost explosively but, after a year or two, may subside abruptly. However, some outbreaks have persisted at low levels for as long as 8 years. The average life of an outbreak is 5 years.

The life history of the Douglas-fir tussock moth is interesting because the female is wingless. After mating in September, she lays her eggs on the cocoon from which she emerged. An egg mass usually has about 130 eggs but may contain up to 250 eggs. The eggs are bound together in a frothy, gelatinous substance with hairs from the female's body. After overwintering in the egg stage, the young caterpillars or larvae begin hatching in May. These young larvae can be carried long distances by the wind because they are very light and hairy. The caterpillars start feeding immediately and continue feeding until late August. Then they construct hairy cocoons, enter a resting stage, and emerge as moths in September.

DAMAGE CAUSED

The Douglas-fir tussock moth kills trees quickly. Complete tree defoliation may occur in a single season. In heavy infestation centers the needles of all conifers present are destroyed. Defoliation by the tussock moth not only retards tree growth but also kills trees.

In 1946 a severe epidemic of the Douglas-fir tussock moth broke out in Benewah, Latah, and Clearwater Counties in northern Idaho. In some areas, the tree mortality was almost 100 percent, while in other areas the 1947 spray program, virus, and parasites prevented severe losses.

THE CURRENT OUTBREAK

It is not known why tussock moth outbreaks occur. In 1964 extensive areas were infested in California, Oregon, Washington, Idaho, and Montana.

The current tussock moth infestation was first detected in 1961 in and near several towns in northern Idaho. These infestations were kept under surveillance during 1962 and 1963. It was suspected that the outbreak might decline before spreading into extensive forest stands. However, intensive ground and aerial surveys in 1964 detected tussock moth egg masses on 320,000 acres of forested lands in Benewah and Latah Counties. The older infestations in Bonner, Boundary, and Kootenai Counties remained static or appeared to be declining.

BIOLOGICAL EVALUATION

The 1964 biological evaluation of the Benewah-Latah tussock moth infestation indicates that heavy defoliation will occur in 1965 and that extensive tree mortality and damage will result on about 130,000 acres.

Some polyhedrosis virus is present in parts of the infested area. To obtain a better knowledge of the amount of virus present, egg masses were collected and reared in the Forestry Sciences Laboratory at Corvallis, Oregon. Virus was present in several areas south of the Palouse River, but is not considered in sufficient amounts to control the infestation this year.

STAND VALUES

The infested stands represent some of the most productive and accessible forest lands in Idaho. The annual yield per acre ranges between 200 and 250 board feet. The current stumpage value is about \$5 per thousand. The growth loss alone after 2 years' defoliation would more than pay for the cost of the project. In addition to growth loss, heavy tree mortality will occur in patches throughout the 130,000 acres of moderate to heavy infestation. The currently thriving Christmas tree industry will be lost for several years if no control action is taken. It is estimated that the total dollar loss per acre would average between \$15 and \$20 if no control action is taken. This means that the total stand loss would be 15 to 20 times the cost of control. In addition, there would be a considerable loss in esthetic values plus the high forest fire hazard potential created by the dead trees.

OTHER VALUES

Within the spray area the fishing streams and reservoirs will be given special treatment. The tussock moth infested area is, for the most part, well stocked with elk, deer, and upland game birds.

Project plans call for an intensive monitoring program by all related State and Federal agencies. Prespray and postcontrol samples of fish and wildlife populations will be taken by trained biologists. Some residue analyses will be obtained from sensitive areas.

CONTROL METHODS

Most entomologists believe that 1965 control efforts should be concentrated on the 130,000 acres of moderate to heavy infestation where tree mortality will occur in 1965.

The only proven control method for the tussock moth is the aerial application of DDT at the rate of three-fourths pound in 1 gallon of fuel oil per acre. This spray will be applied by both fixed-wing planes and helicopters.

Control through the aerial application of a polyhedrosis virus has good potential, but has not been fully perfected and tested. Enough polyhedrosis virus is available to use on an operational pilot test. The Troy watershed will be sprayed with virus.

Treatment with virus may control the tussock moth, but the degree of defoliation that will occur during the period of control is not known.

FOLLOWUP ACTION

It will be necessary to keep all Douglas-fir tussock moth infestations in the Northern Region under close surveillance during 1965 in order to determine what control action may be required in 1966.

USDA - Forest Service
Northern Region
Missoula, Montana
April 1965



1870

1870

1870