

FACT SHEET

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THE NANTUCKET PINE TIP MOTH

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The Nantucket pine tip moth (*Rhyacionia frustrana* Comstock) is a small moth occurring throughout the pine forests of southern and eastern United States. In Texas, the larvae are responsible for an immense amount of damage to small pines in plantations, forests and ornamental plantings (See Figure 1). Although trees are seldom killed by its attacks, repeated infestations reduce the growth rate and cause deformation of the main stem, loss in wood quality and a bushy appearance. Open-growth trees less than 15 feet tall are most severely attacked. Of the native Texas pines, short-leaf and loblolly pine are especially susceptible to attack while slash and longleaf pine are very resistant.



Figure 1. Typical pine tip moth damage (right).

DESCRIPTION

The adult moth (See Figure 2) has a wingspread of about $\frac{1}{2}$ inch and is generally a reddish-brown

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color with silver-grey markings. Wings are folded over the abdomen when the moth is at rest and adults are quite inconspicuous on foliage because of their small size and protective coloration.

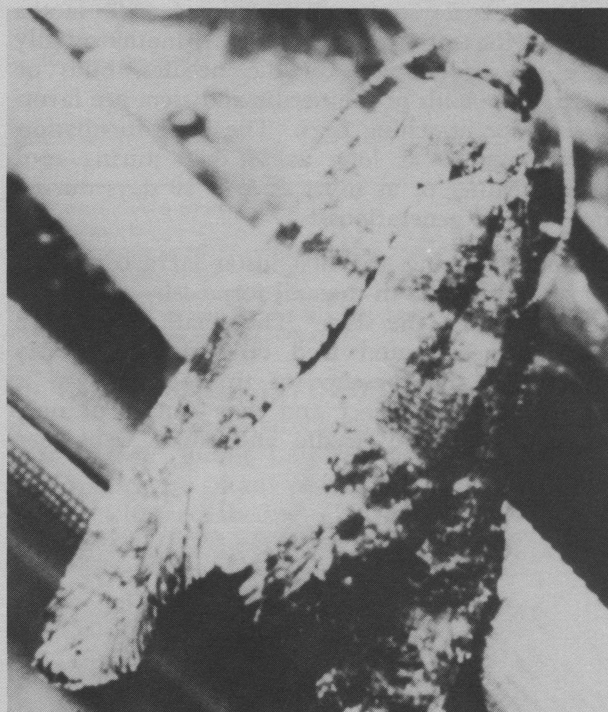


Figure 2. Adult Nantucket pine tip moth is reddish-brown in color with silver-grey markings.

The eggs are $\frac{1}{32}$ inch in diameter, white to orange in color. When young, the larvae are tiny, cream-colored caterpillars approximately $\frac{1}{16}$ inch long. The head is black. Full grown larvae reach a size of about $\frac{1}{4}$ inch in length and are colored light brown to orange (See Figure 3). The pupae, when first formed, are about the same color as the full grown larvae but become darker as they mature.

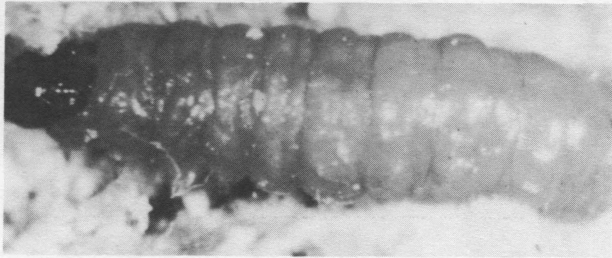


Figure 3. Although greatly magnified in this photo, the full-grown larva of the pine tip moth is only about $\frac{1}{4}$ inch in length and light brown to orange in color.

LIFE HISTORY

The tip moth spends the winter months as a pupa within the injured terminals and twigs of the tree. From early March in southern Texas until early May in extreme North Texas, the pupae, with the aid of a series of abdominal spines, work their way out of the infested tips. The adult moths are then free to emerge, leaving the empty pupal cases projecting from the twigs.

About 2 days after emerging, female moths begin laying eggs. Flying at night, moths usually place the eggs singly on the needles, buds or shoots. The axils of the needle and stem are favorite sites for attaching eggs. The egg's incubation period may be as long as 31 days during cool spring weather or as short as 5 to 10 days during late summer generations.

Upon hatching, the first instar larva constructs a small silken web in the axil formed by a developing needle and the stem. The small larvae bore into the needle and feed on the stem. Early evidence of the presence of tip moth larvae is thus difficult to detect and may consist of only an occasional dead needle and small webs (See Figure 4).



Figure 4. Early evidence of pine tip moth infestation is webbing and an occasional dead needle.

As the larva develops, fecal material and resin exuded from the stems begin to accumulate on

the outside of the tips. Eventually the mining of the larva severs the conductive tissue of the tip and the affected portion turns brown. The bud seems to be the most desirable food of the new shoots. After the bud has been eaten, the larvae bore down the center of the young stem. It is not uncommon to find several larvae in a single shoot. The larvae feed for 2 to 4 weeks before pupation occurs in a silken cell within the injured terminal. In most areas of Texas, there are four generations each year with a fifth generation during the most favorable seasons. However, in extreme North Texas there are usually only two generations each year.

DAMAGE

The Nantucket pine tip moth may damage the tree by causing poor tree shape, stunting growth, reducing cone crops and, in severe instances, bring about the tree's death.

Repeated attacks of tip moths result in conspicuous damage to plants and cause them to become many-branched and very unsightly. The trees' value for ornamental purposes may be greatly reduced (See Figure 5).

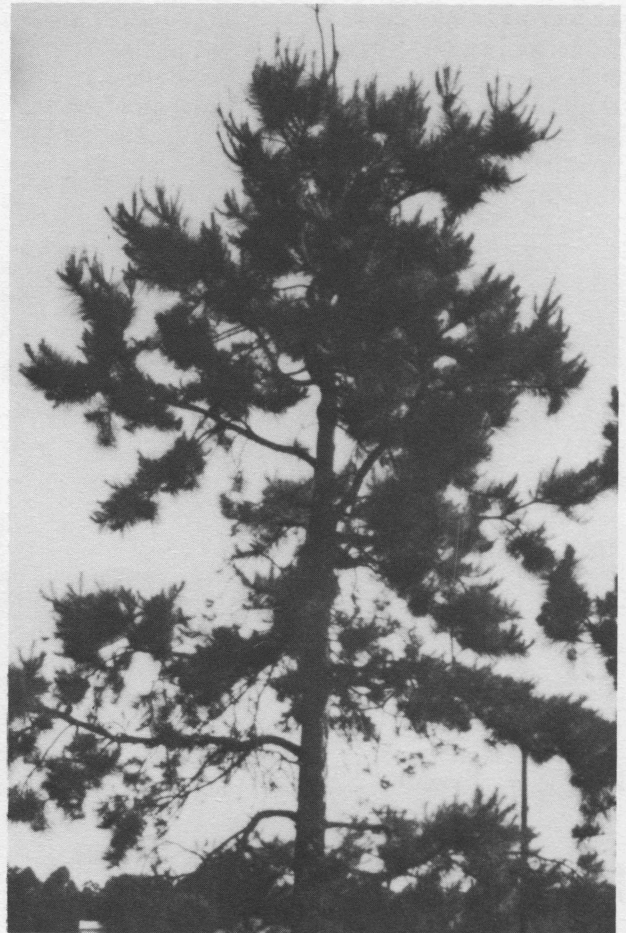


Figure 5. Unsightly, many-branched appearance of loblolly pine is result of pine tip moth attack.

The moth's economic impact on native pine forests is not known with certainty. A significant difference in growth of protected and unprotected trees during the early years of growth has been found in several studies. However, this difference in growth appears to lessen as the trees grow older. The final effect of tip moth attack when the trees are of merchantable size is unknown.

Although tip moth injury is generally most severe on trees less than 15 feet tall, heavy infestations of larger trees also are known. In their feeding activities, the larvae may sever cone-bearing branches preventing cone development. This damage is more important in pine seed orchards where genetically superior trees are grown for production of pine seed to meet reforestation needs.

Outright tree-killing by pine tip moths is uncommon. Where it does occur, trees are often growing on poor sites or under drought stress.

PREVENTION

Maintenance of high tree thrift is one of the most effective methods for reducing the incidence of tip moth damage. Management practices that promote rapid growth through the first 6 to 8 years of age will lessen the time spent in the susceptible stage of tree development. Shading tends to reduce tip moth injury. Pines grown in dense stands or under the canopy of older trees are less injured than are open-grown, unshaded pines. Homeowners can reduce tip moth injury by proper watering and fertilization of their ornamental pines. Plantings of slash and longleaf pines are highly resistant to the moth attacks.

CONTROL

Presently, there is no effective control of Nan-tucket pine tip moth for large forest areas. Even for the more restricted plantation areas, controls are not highly successful because of migration of moths from adjacent, untreated forest stands. For high value ornamental pines, control may be accomplished with repeated insecticidal treatments.

If a chemical spray is used, application timing is of utmost importance to obtain an effective kill. The spray should be directed at young larvae that are feeding on the exterior of the pine shoot. During the summer, larvae begin hatching 5 to 10 days after the peak of adult moth emergence. But when cool weather follows peak adult emergence in early spring, spraying should be deferred for about 14 days. In many areas of Texas, spray applications should be made about April 1, June 1, July 15 and September 1. However, in the northern most counties, sprays should be applied about May 15 and July 15. Exact spray timing will vary from season to season, although frequent tree inspection will aid in judging the proper time to spray.

Power sprayers are best for spraying standing trees. If these are not available, hand pressure type

sprayers of 1½ to 3 gallon capacity are suitable. Thoroughly cover the foliage and twigs, especially in the upper half of the tree crown. Sprays are more effective than dusts since they form a longer-lasting residue on the needles and shoots. If heavy rains occur within 2 days after spraying, re-spray the tree.

Home landscape pines can also be effectively protected from tip moth damage with a granular systemic insecticide. The formulation requires no special application equipment and is easy to use, but care must be taken to prevent poisoning animals and injuring plants. The granules should be spread uniformly under the canopy of the tree. They must then be worked into the soil and *watered thoroughly*. During most years, the systemic insecticide would be most effective if applied about March 15, May 1, June 15, August 1 and September 1.

Suggested insecticides include:

Insecticide	Formulation	Amount of Formulation
dimethoate ² (Cygon, De-Fend)	23.4 % EC ¹	4 teaspoons per gal. of water 4 pints per 100 gal. of water
disulfoton ³ (Di-syston)	2 % G ¹	Follow product label for application rates

¹EC - emulsifiable concentrate

G - granules

²U. S. Environmental Protection Agency regulations restrict use to ornamental plantings.

³U. S. Environmental Protection Agency regulations restrict homeowner use to granular products not specifically intended and labelled for commercial applicators.

INSECTICIDE SAFETY PRECAUTIONS

The Federal Environmental Pesticide Control Act of 1972 (Public Law 92-516) in part prohibits the application of any pesticide in a manner inconsistent with its labeling. This means that a pesticide cannot be used unless it is registered for the specific pest on the specific plant. Consequently, some chemicals formerly used by homeowners and pesticide applicators can no longer be used.

The status of insecticide label clearances is subject to change and changes may have occurred since this publication was printed. County Extension agents and Extension entomologists are notified as these changes occur.

The pesticide *USER* is always responsible for the effects of pesticide residues on his own plants as well as problems caused by drift from his property to other properties or plants. Always read and follow carefully all instructions on the product label.

Avoid prolonged chemical contact with skin. Wash exposed skin areas with generous amounts of soap and water.

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