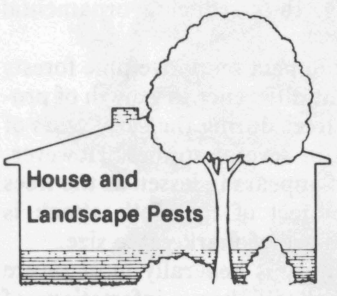


# Texas Agricultural Extension Service

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## The Nantucket Pine Tip Moth

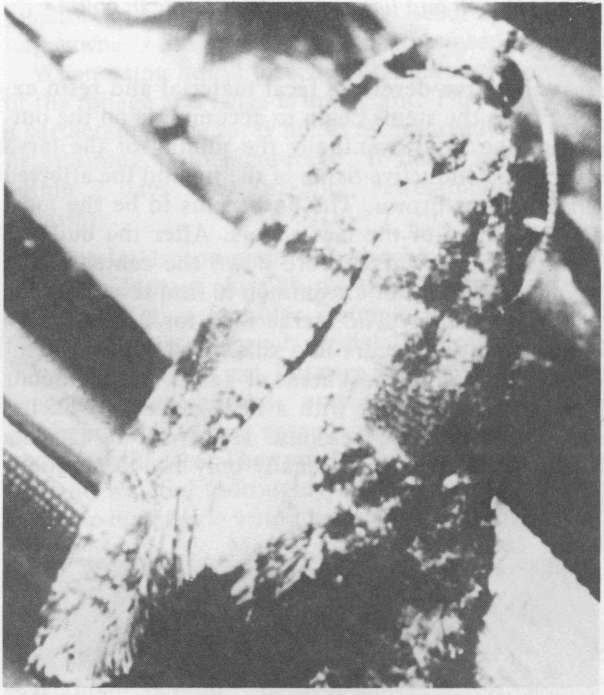
James V. Robinson\*

The Nantucket pine moth (*Rhyacionia frustana* Comstock) is a small moth occurring throughout the pine forests of southern and eastern United States. The larvae are responsible for an immense amount of damage to small pines in plantations, forests, Christmas tree production and ornamental plantings in Texas. Although trees are seldom killed by its attacks, repeated infestations reduce the growth rate and cause deformation of the main stem and loss in wood quality. Severely infested trees develop a bushy appearance over time. Open-growth trees less than 15 feet tall are the most severely attacked. Of the native Texas pines, shortleaf and loblolly pine are especially susceptible to attack while slash and longleaf pine are very resistant. The Virginia pine, grown for Christmas trees, is highly susceptible to damage.

### Description

Adult moths have a wingspread of about 1/2 inch and are generally a reddish-brown color with silver-grey markings. When the wings are folded over the abdomen the moth is at rest. Adults are quite inconspicuous on foliage because of their small size and protective coloration.

The Nantucket pine tip moth develops through four growth stages: egg, larva, pupa and adult. Eggs are 1/32 inch in diameter, white to orange in color. When young, the larvae are tiny, cream-colored caterpillars approximately 1/16-inch long. The head is black. Full grown larvae reach a size of about 1/4 inch in length and are colored light brown to orange. Pupae, when first formed, are about the same color as the full grown larvae but become darker as they mature.



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

### Life History

The tip moth passes the winter as a pupa within the injured terminals and twigs of the tree. Moths emerge from these pupae as early as February in Southern Texas, but may not emerge until April in North Texas.

During any generation throughout the year, female moths are capable of laying eggs about 2 days after

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emergence. Most eggs are laid on the axils of needles and stems. Incubation is from 5 to 31 days depending on temperature. During warm summer months, this period is usually 5 to 10 days.

Upon hatching, the young 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.



*Although greatly magnified in this photo, the full grown larva of the pine tip moth is only about 1/4 inch in length and light brown to orange in color.*

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.



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

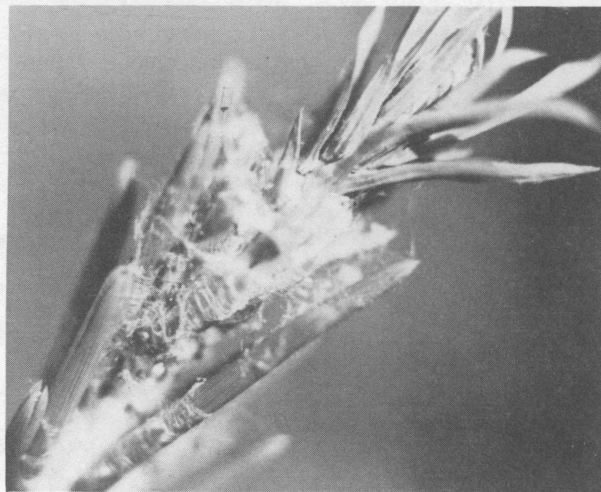
## Damage

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

Repeated attacks of tip moths result in conspicuous damage to plants and cause them to become multi-branched and unsightly, thus reducing ornamental value.

The moth's economic impact on native pine forests is uncertain. 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 is unknown when the trees are of marketable size.

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.



*Typical pine tip moth damage (right).*

This insect is a key pest of Virginia pine and other *Pinus* species grown for Christmas trees in Texas. The larvae attack the terminals of the tree and interfere with proper tree shape. Severe tip moth infestations have occurred on Virginia pine in Texas, especially in August through October resulting in a poor quality tree.

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





*Unightly, multi-balanced appearance of loblolly pine is the result of pine tip moth attack.*

## 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 Nantucket pine tip moth for large forest areas. Even for the more restricted plantation areas, controls are not highly successful because of moth migration from adjacent, untreated forest stands. For high value ornamental pines and Christmas trees, control may be accomplished with repeated insecticidal treatments.

If a chemical spray is used, the timing of applications is of utmost importance to obtain an effective kill. Sprays should be applied to control young larvae that are feeding on the exterior of the pine shoot. During the summer, larvae begin hatching 5 to 10 days after peak adult emergence. But when cool weather follows peak adult emergence in early spring, spraying should be deferred for about 14 days. Generally, in many areas of Texas, spray applications should be made about April 1, June 1, July 15 and September 1. However, in the northern 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.

Hydraulic power sprayers capable of developing 100 to 300 pounds of pressure when rigged with a handheld spray nozzle are best for spraying large trees. This type of sprayer can also be adapted with a spray boom to treat Christmas trees. However, some Christmas tree producers are using speed sprayers and controlled droplet applicators which utilize rotary spray nozzles. Compressed air sprayers or hose-on applicators are ideal for spraying seedlings or for homeowner's use where only a few trees need treating.

When using liquid insecticides, thorough coverage of the foliage and twigs is important. The addition of a surfactant to the spray mix is recommended to assist in attaining proper coverage. If heavy rains occur within 2 days after spraying, retreatment may be necessary.

Home landscape pines can also be protected from tip moth damage through the use of disulfoton (Disyston® 2G), 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.

Foliar applied insecticides recommended for homeowners include acephate (Orthene®), and dimethoate (Cygon® or DeFend®).

Suggested insecticides for seed orchards, timber plantations and Christmas tree plantations include: acephate (Orthene®), azinphosmethyl (Guthion®), carbaryl (Sevin®), carbofuran (Furadan®), carbophenothion (Trithion®), dimethoate (Cygon® or De-Fend®), disulfoton (Di-Syston®), fenvalerate (Pydrin®), permethrin (Pounce®) and trichlorfon (Dylox®). These chemicals are manufactured into various formulations. Most are sprayable materials, but some are soil applied systemics. Prior to purchase, read the product label to determine if the chemical can be safely used in your situation.

A more detailed discussion of control of the Nan-

tucket pine tip moth for Christmas trees can be found in the Extension publication, *Texas Christmas Tree Producers Handbook*. This publication is for sale and available through your local county Extension office.

### **Insecticide Safety Precautions**

The Federal Environmental Pesticide Control Act of 1972 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. Consequently, some chemicals formerly used by homeowners and pesticide applicators can no longer be used.

The status of insecticide label clearance 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. Do not contaminate food, dishes, utensils or food preparation area with insecticide.

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