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Pine tip moths:

characteristics and control

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Quick Facts

- Tip moths are caterpillars that feed on and kill back new growth of various pines.
- Damage by tip moths is conspicuous but rarely threatens tree health.
- The southwestern pine tip moth that commonly infests Scots, ponderosa and mugho pines is best controlled with insecticides applied as new needles are elongating.
- Tip moths on pinyon overwinter in or on the terminal growth of the tree.

Pine tip moths feed on and destroy new growth (terminals) of pines grown throughout most of Colorado. Injury often is quite conspicuous and infested plants may appear unattractive. Although little real injury to the health of the infested tree results from pine tip moth attacks, tree growth can be delayed and the form altered to a more bushy growth.

Tip moth injury can be diagnosed during early to midsummer by examining suspect shoots that have dried and shriveled. At this time the damaging stage of the insect, or old discarded skins left behind, can be detected. If the insect is not present examine the damaged terminal growth to see if there is evidence of internal tunneling typical of most tip moth injuries.

Insects Involved

The southwestern pine tip moth, *Rhyacionia neomexicana*, is the species mainly responsible for damage to young ponderosa, mugho and Scots pines. Other tip moths in the same genus (*R. bushnelli, R. zozana, R. fumosana*) are found in the state but are much less common and damaging than the southwestern pine tip moth.

A different set of tip moths infests pinyon pine. Tip moths in the genus *Dioryctria* (primarily *D. albovitella*) damage pinyon in a manner typical of other tip moths, although it often is associated with a pinkish mash of pitch. Damage by other species, the pinyon pitch nodule moth (*Petrova arizonensis*), is more distinctive and produces a large, smooth nodule of purple-brown pitch as it feeds on pinyon terminals.

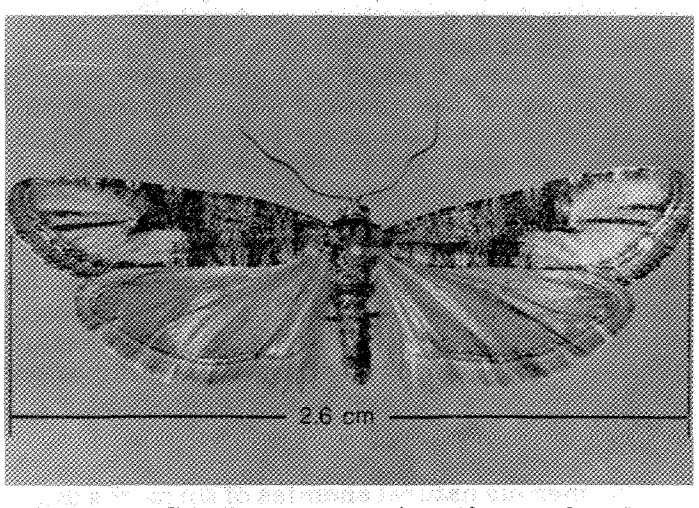

Figure 1: Southwestern pine tip moth adult, *Rhyacionia neomexicana.*

Life History

Pine tip moths have typical moth life histories, passing through four life stages—egg, larva/caterpillar, pupa and adult moth. It is the feeding of the larval stage that damages the trees. New infestations originate with eggs laid by the adult female moths, one generation per year.

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Eggs of the southwestern pine tip moth are laid on buds and new shoots of pines in the spring, April and May. Eggs hatch about the time new shoots emerge from buds and the tiny larvae immediately begin to bore into the fresh young shoot tissue. The larvae feed and grow within the developing shoots through May, June and July causing tip growth to die back beyond the feeding site.

When feeding is completed, the full-grown caterpillar leaves the shoot to crawl down the trunk. On the side of the trunk just below the soil line it forms a white, plaster-like silken cocoon for pupating. Winter is spent in this stage with adult moths of the southwestern pine tip moth emerging the following spring on return of warm weather.

Tip moths infesting pinyon overwinter as partially grown larvae either in stem tissue or on the bark. Eggs of the common tip moth (*D. albovitella*) are laid during mid-summer. The larvae emerge shortly afterwards but do not feed, instead they form a silken cocoon (hibernacula) on the bark for the winter. The larvae resume activity in May, boring into the base of unopened buds. Often the larvae will destroy the initially infested bud and move to a new shoot or developing cone, which it will also mine. Irregular pitch masses often form at the injury site, superficially resembling those of the pinyon pitch nodule moth. Pupation occurs within the infested area, with the adult moths emerging to mate and lay eggs.

The pinyon pitch nodule moth lays eggs on the base of needles during early summer, after the new growth has formed. Eggs hatch by early August and the young caterpillars tunnel into a new shoot. While feeding they form a distinctive smooth silk-lined pitch nodule and spend the winter as an almost full-grown caterpillar. Pupation occurs wedged in an opening in the nodule.

Control

Numerous natural enemies of tip moths exist that often reduce infestations to acceptable levels. In particular, various parasitic wasps develop within tip moth larvae killing a large percentage of the population. As a result of these natural controls, tip moth infestations can vary widely from season to season. Trees taller than 10 feet often become less susceptible to tip moth injuries.

If necessary, tip moths can be controlled with insecticides. The systemic insecticides acephate (Orthene) and dimethoate (Cygon) appear to be particularly effective for tip moth control. Chlorpyrifos (Dursban) also is effective for pine tip moth control. Proper timing of these sprays is very important. Treatments for the southwestern pine tip moth should be applied when new shoots are elongating but before the needles are more than 1/2 inch in length ("candling stage"). For most pines this typically occurs from late April through early May.

Figure 2: Tip damage from larvae of pinyon pine tip moths.

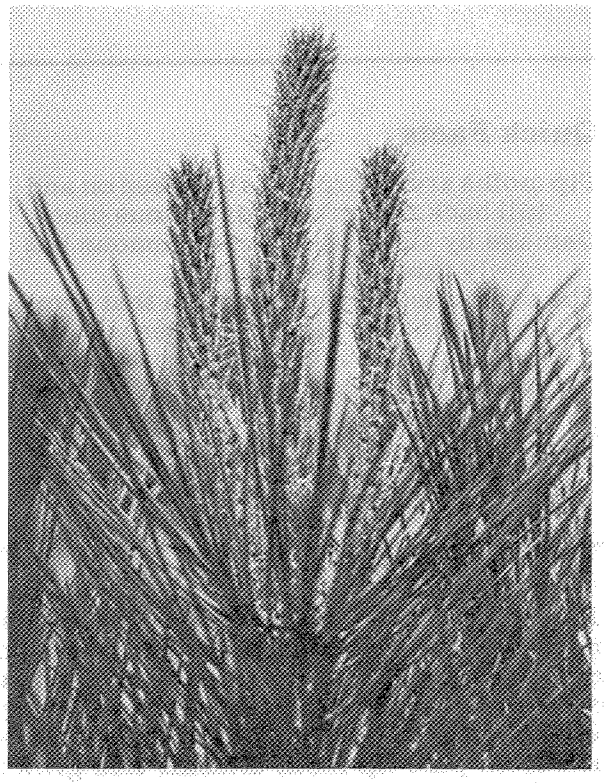

Figure 3: Stage of shoot elongation to apply insecticide treatment for southwestern pine tip moth control.

Treatment timing for the pinyon tip moths are less well known. Thorough insecticide treatment in May should be effective if applied to new growth before overwintering *Dioryctria* larvae enter buds. Somewhat later treatments can still be effective at killing larvae moving from buds to developing shoots. Mid-summer applications coinciding with egg laying in late July appear to be most appropriate for pitch nodule moth control.