Neodiprion Taedae Linearis: A Sawfly Pest of Loblolly and Shortleaf Pines

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The sawfly *Neodiprion taedae linearis* Ross in recent years has become recognized as one of the most serious insect pests in loblolly and shortleaf pine stands in the South-central States. Although the attacks seldom, if ever, kill trees, the larvae of the insect cause huge losses by destroying needles, thus retarding growth.

This sawfly was first observed in 1940 on loblolly pine in southern Arkansas. During a 3 million-acre outbreak in Arkansas from 1945 to 1948, studies produced the first evidence that attacks markedly reduce diameter growth.

The insect has since been found in eastern Oklahoma, southeastern Texas, southeastern Missouri, northern Arkansas, central Louisiana, and northern Mississippi. Large-scale infestations occur in these areas periodically, the most recent on 750,000 acres in southern Arkansas in 1964 and 1965.

Hosts

In Texas, Arkansas, and Louisiana, the chief host tree for this sawfly is loblolly pine. Shortleaf pine is seldom more than lightly infested even when growing in mixture with severely defoliated loblolly. In other areas, these two pines and occasionally longleaf pine are attacked indiscriminately. Medium or large trees in forests are preferred, but occasionally open-growing stands of saplings are attacked.

Injury

Newly hatched larvae feed in groups, often with five or six tiny, black-headed larvae completely encircling each needle. They girdle the needle by consuming the soft outer tissue, leaving the remainder to turn reddish brown. Twigs on which the needles have been thus damaged and discolored are aften called "flags" because they can be observed easily from the ground or from low-flying aircraft. Older larvae feed singly or in pairs and consume the entire needle, leaving short stubs on the branch. They still retain their gregarious habit, however, and move in feeding groups from branch to branch (fig. 1).

Usually only the older foliage is eaten, but on shortleaf pine the terminal buds and tender bark on the new growth also are occasionally

[1] The author is indebted to Dr. L. O. Warren and his associates at the University of Arkansas, Fayetteville, Ark., for information on areas infested, certain aspects of the insect's biology, and all data relative to the use of insecticides.

U.S. DEPARTMENT OF AGRICULTURE
Forest Service

Revised May 1968
Slightly revised April 1970

F—486627

Figure 1.—Larvae feed in groups, defoliating one twig after another.

consumed. In heavily infested areas (fig. 2), trees may be completely defoliated early in the spring before the new shoots and needles have developed. New foliage restores the trees to a nearly normal appearance within a few months, and so far, no trees are known to have died from defoliation by this sawfly. Diameter growth, however, may be reduced by 50 percent or more for several years following one heavy defoliation.

Description

The female adult is about 3/8 of an inch long with four wings, an orange and black body, and threadlike antennae. The male is about 1/4 of an inch long with four wings, an entirely black body, and feathery antennae.

The newly hatched larva has a shiny black head and a gray-green body. Older larvae have dull green bodies with heavy black stripes along each side and often two lighter stripes below the heavy ones. When full grown, the feeding larva is about 1 inch long and has a dark brown head. The capsule-spinning larva, the final nonfeeding stage, has a brownish body and gray head.

Life History

There is only one generation each year. The eggs hatch from early March until mid-April, depending upon local weather conditions. A larva completes its development in 30 to 40 days then drops to the ground to spin a mahogany-colored capsulelike cocoon in the topsoil or litter. Most larvae pupate and emerge from the cocoons in October and November, but a small portion may remain as long as two autumns before completing development. Mating and egg laying begin soon after adult emergence. The female cuts or "saws" from 1 to 20 pockets

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Figure 2.—Mature trees, as well as open-grown saplings, may be completely defoliated by this sawfly.

in each of several needles and deposits a small whitish-yellow egg in each slit. The distance between the egg slits on the needle is about the length of the female's body. Each female lays from 90 to 120 eggs, often all in the needles of one twig. The egg is the overwintering stage.

Control

An important natural control agent is a polyhedral virus that sometimes destroys many of the larvae. Sustained low temperatures and rain in the spring also render the larvae inactive; many probably die from starvation or disease. Some-

times rodents destroy many cocoons. Very little predation by birds has been observed.

More than 20 species of parasites have been collected or reared. Perhaps the most important of these parasites is a parasitic fly, *Villa sinuosa sinuosa* (Wied.), and an ichneumon wasp, *Exenterus canadensis* (Prov.). No egg parasites have been collected.

Since this sawfly is found chiefly on medium or large trees in forest stands, aerial spraying is the most economical form of control. For best results, insecticides should be applied as soon as possible after the eggs have hatched in the early spring.

Two insecticides that have recently been successful in aerial application against this sawfly are:

Diazinon[2] AG-500 (½ pint of the emulsifiable concentrate in 2 gallons of water per acre).

Dimethoate[2] 4 E (¼ pint of the concentrate in 2 gallons of water per acre).

Caution:

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key—out of the reach of children and animals—and away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Diazinon is toxic to fish and wildlife and should be kept out of lakes, streams, and ponds. Dimethoate is toxic to birds and other wildlife. Care should be exercised in not exceeding the recommended dosage. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary land-fill dump or crush and bury them in a level, isolated place.

NOTE: Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the U.S. Department of Agriculture, consult your county agricultural agent or State Extension specialist to be sure the intended use is still registered.

PROTECT

Use Pesticides Safely

FOLLOW THE LABEL

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[2] The use of trade names in this publication is for the information and convenience of the reader. Such use does not constitute an official endorsement or approval of any product by the U.S. Department of Agriculture to the exclusion of others which may be suitable.

U.S. GOVERNMENT PRINTING OFFICE: 1970 O—375-070