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PINE SAWFLY LARVAE, NEODIPRION SPP., IN FLORIDA[1]

(HYMENOPTERA:DIPRIONIDAE)

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INTRODUCTION: Pine sawfly larvae, Neodiprion spp., are the most common defoliating insects of pine trees, Pinus spp., in Florida. Sawfly infestations can cause growth loss and mortality, especially when followed by secondary attacks by bark and wood-boring beetles (Coleoptera: Scolytidae, Cerambycidae, Buprestidae). Trees of all ages are susceptible to sawfly defoliation (Barnard and Dixon 1983; Coppel and Benjamin 1965).

DESCRIPTION: Adult female (Fig. 1) length 8-10 mm; head with narrow antennae; body stout, thick-waisted, light to dark brown background color, and yellow - red - white markings common; 2 pairs of wings, clear to light brown with prominent veins. Adult male length 5-7 mm; head with broad, feathery antennae; body slender, thick-waisted, generally brown to black color; wings similar to female. Egg small (0.5 mm wide X 1.8 mm long), green - yellow - white color, and ovoid. Mature larva length 18-25 mm (Fig. 2); coloration variable (Table 1). Pupa length similar to adult. Cocoon light brown to dark reddish-brown, papery, and 3.5-6.0 mm wide X 7.1-10.0 mm long (Coppel and Benjamin 1965; Thatcher 1971; Wilkinson 1965).

DISTRIBUTION: Neodiprion spp. are indigenous to Florida. Host tree specificity and location will bear on sawfly distribution statewide.

HOSTS: All southern pines, Pinus spp., are susceptible to sawfly infestation.

BIOLOGY: Mature sawfly larvae spin cocoons in the duff or pine litter, mineral soil, or under bark scales. Adult sawflies emerge by removing a cap at one end of cocoon. After mating, female sawflies lay eggs in slits sawed in pine needles. Small larvae feed on outer needle tissues; larger larvae consume entire needles. Most species prefer older foliage, but all foliage is susceptible at end of growing season. Larval colonies may migrate from one tree to another, especially upon complete defoliation of the host tree or high feeding competition. The number of sawfly generations (1-4) varies from year to year and according to species. Larvae may diapause (a survival behavior for adverse conditions) for more than 1 year (Coppel and Benjamin 1965, Wilkinson 1980).

SURVEY AND DETECTION: Early damage is evidenced by reddish-brown strawlike remains of needles that are incompletely consumed by young larvae; older larvae leave only short stubs. Partially defoliated branches often have a "bottle brush" appearance (Fig. 3). Sawfly colonies may consist of a few to over a hundred individuals. Upon disturbance, larvae may drop from branches or assume a u-bend by raising head and abdomen. An oral exudate, which can paralyze insectan parasites and repel predators, often accompanies such displays (Barnard and Dixon 1983; Coppel and Benjamin 1965).

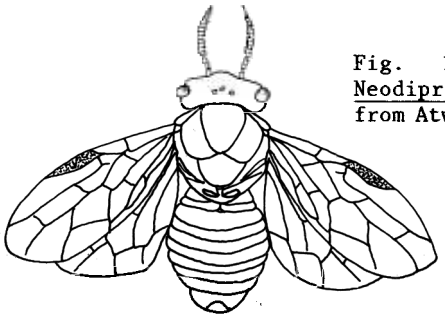

Fig. 1. Adult female Neodiprion sp. (Adapted from Atwood 1961).

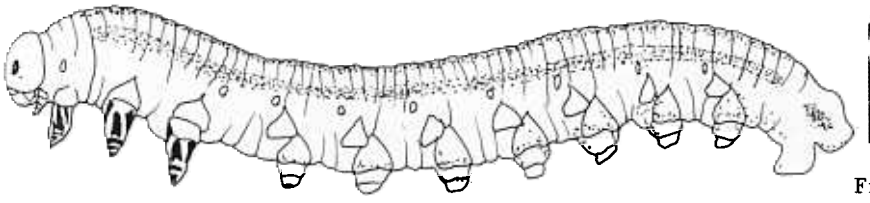

Fig. 2. Mature larva of Neodiprion merkeli Ross.

Fig. 3. Characteristic late summer feeding damage by sawfly larvae. DPI Neg. No. 702906-21. Photo credit: W. N. Dixon.

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Table 1. Description of pine sawfly larvae, Neodiprion spp., in Florida.

Common Name	Species	Description	Host Trees[1]
Slash pine sawfly	Neodiprion merkeli Ross	Two-tone head (red above, black below); yellow-green body with 2 faint black stripes and a large black spot on hind end of each side	Slash pine
Redheaded pine sawfly	Neodiprion lecontei Rohwer	Red head; whitish or yellowish green body with 3 rows of irregular black spots; large black spot on hind end of each side	Longleaf pine Slash pine
Blackheaded pine sawfly	Neodiprion excitans Rohwer	Shiny black head; olive-green body with 2 black stripes and row of black spots; large black spot on hind end of each side	Loblolly pine Pond pine Sand pine Spruce pine
Virginia pine sawfly	Neodiprion pratti pratti (Dyar)	Black head; pale green body with 2 black stripes and a row of black spots on each side of the body	Loblolly pine Choctawhatchee sand pine
A pine sawfly	Neodiprion virginianus Ross	Black head; row of distinct, nearly square black spots on each side of the body	Ocala sand pine
Spruce pine	Neodiprion warreni Ross	Black head; 2 dark stripes on each side of the body	Spruce pine
Abbot's sawfly	Neodiprion abbotii (Leach)	Brown-black head with a white spot on the front; yellow to pale green body with 2 dark green stripes on each side of the body	Loblolly pine Longleaf pine Shortleaf pine Slash pine

[1]Choctawhatchee sand pine = Pinus clausa var. immuginata D. B. Ward; Loblolly pine = Pinus taeda L.; Longleaf pine = Pinus palustris Mill.; Ocala sand pine = Pinus clausa var. clausa (Chapm.) Vasey; Pond pine = Pinus serotina Michx.; Shortleaf pine = Pinus echinata Mill.; Slash pine = Pinus elliottii Engelm.; Spruce pine = Pinus glabra Walt.

CONTROL: Suppression of sawfly populations by insecticides is usually successful. However, consideration should be given to conserving natural enemies (small mammals, birds, insects) through minimal insecticide use and preservation of cypress-hardwood pond stands around pine plantations. The appearance of numerous dead larvae hanging from needles, i.e., virus-infected, usually signals the collapse of a sawfly outbreak. Sawfly outbreaks are cyclical - an 8-10 year interval is common. A fully stocked stand and promotion of early crown closure minimizes risk of sawfly damage in pine plantations (Wilkinson 1980).

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