

Douglas-fir Needle Midges

(Determining a Spray Schedule Through Use of the Midge Trap)

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The Douglas-fir needle midge has caused serious damage to some Willamette Valley Douglas-fir Christmas tree plantations. Its presence has been noted in additional plantations west of the Cascade Range. With growth and development of Christmas tree plantations, these midges have attracted increased attention as pests of economic significance. Periodically, large portions of important producing regions have been severely infested, making the trees unsightly and unfit for market and resulting in substantial losses.

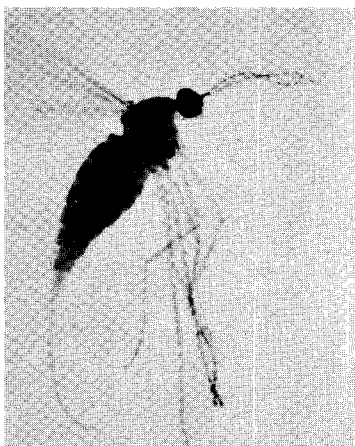
Description of midge

The adult midges are delicate, orange, two-winged flies about one-eighth inch long; females are stout and

have a long ovipositor. Larvae mine the needles and form gall-like structures and discolor the needles, causing them to be yellowish to purple. When mature, the larvae are about one-eighth inch long and yellowish, white, or orange in color. They leave the needles in the fall and overwinter in the soil.

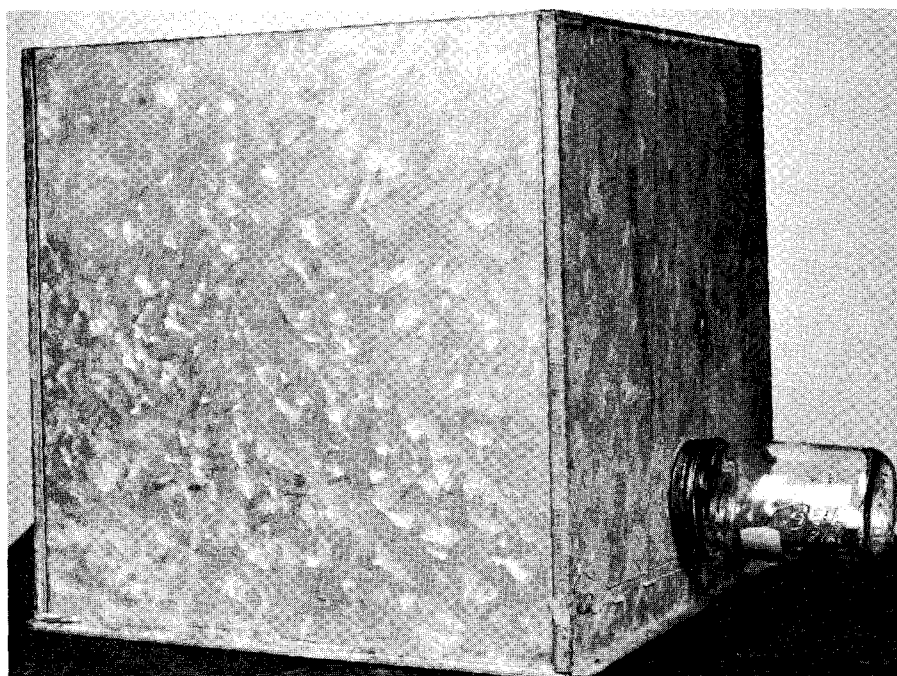
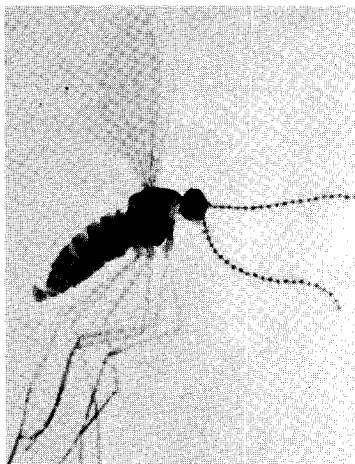
Relationship of emergence to control

Adults emerge from the ground beneath the host trees about the time Douglas-fir buds are bursting. Timing for application of Thiodan or other insecticides, however, should be determined not just by observing bud development, but by monitoring emergence. The emergence period is of relatively short duration, approx-



The female Douglas-fir needle midge (top left) can be distinguished from the male (lower left) by the long ovipositor and heavier body.

Constructed from galvanized sheathing, this midge trap is 15 inches square. Light attracts midges into wide-mouth pint or quart glass jar soldered to side of trap.



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imately 10 days. Since males emerge first and for a longer period than females, and since females emerge in a shorter time interval, *Thiodan should be applied following the several successive days of female emergence.* Because of the long interval of Douglas-fir bud break in Christmas tree plantations, lasting three weeks or more, needle length should not be used as a criteria. The most reliable means of determining emergence is the use of an emergence trap.

Description of the trap

The trap can be constructed with galvanized sheathing, making it 15 inches square and open on the bottom. Several inches from the bottom of one side of the trap, cut a circular hole slightly smaller than the lid of a Mason wide-mouth pint or quart glass jar. Then solder the open-center lid around the opening and screw the jar to the lid. When the trap is placed on the ground close to a tree, the emerging midges are attracted to the light and enter the jar. Condensation makes it necessary to place paper toweling in the jar. The trapped midges come to rest on the paper, and this facilitates counting. Set the trap where there has been heaviest damage to trees.

Daily checks of the trap will reveal if an increase in midges occurs. Trapping of midges should begin prior to first bud breaking of Douglas-fir to determine any sharp increase in emergence.

Control

Thiodan (ensulfodan) to date has been the best insecticide for controlling midges. Use either Thiodan 50% wettable powder or Thiodan two pounds per gallon of emulsifiable concentrate at the rate of two pounds actual toxicant per acre in 100 gallons of water. By aircraft, apply in 5 to 10 gallons of water per acre.

Thiodan E. C. can be purchased with or without a cottonseed oil mixture. Thiodan containing oil will be easier on equipment and may give longer needle protection. For maximum protection, wet trees thoroughly with the solution. If good control is achieved (and this can be determined in August or September), additional sprayings the second and third year may not be necessary. A decision on whether to spray the following year can be determined by the number of midges caught in the trap.

References: W. P. Nagel. Douglas-fir Needle Midge Control, *Northwest Lookout*, Nov. 1968.