

Forest Research Notes



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THE VIRGINIA PINE SAWFLY IN 1960 --A SPECIAL COOPERATIVE REPORT

An outbreak of the pine sawfly, Neodiprion pratti pratti (Dyar), has existed in Maryland since 1955. By 1959 the insect had spread throughout 14 million acres in the Coastal Plain and Piedmont of Virginia and into several North Carolina counties. Because egg surveys conducted in the spring of 1960 indicated a continuation of the epidemic, an aerial survey was conducted to further evaluate the situation. This report contains a summary of this latter investigation.

The aerial survey was conducted with funds and personnel contributed by the following organizations: Beltsville Forest Insect Laboratory, U. S. Forest Service; Maryland Department of Forests and Parks; North Carolina Forest Service; Northeastern Forest Experiment Station, U.S. Forest Service; Southeastern Forest Experiment Station, U.S. Forest Service; and Virginia Division of Forestry.

Procedure

The method used was an aerial strip survey along predetermined flight lines. County highway maps at a scale of 1 inch = 2 miles were used for base maps. Observers recorded conditions along 5-chain strips on both sides of the airplane, using the operation recorder system, which has proved successful for many years on similar surveys. Flight lines were spaced at 10-mile intervals, although the maps were

 LIGHT DEFOLIATION (5% or less of foliage removed)
 MODERATE DEFOLIATION (6-95% of foliage removed)
 HEAVY DEFOLIATION (96-100% of foliage removed)



Figure 1.--Pattern of defoliation by Virginia pine sawfly in Maryland, Virginia, and North Carolina. The map is based on an aerial survey made in 1960.

prepared to permit observations at 5-mile intervals where conditions varied or where additional data were required.

Fairly uniform damage was encountered over extensive areas; and, in several instances where defoliation was light, flight-line distances were increased to 20 miles. The locations of flight lines are shown in figure 1.

Three classes of defoliation were distinguished by the observers:

- Light - 5 percent or less foliage removed.
- Moderate - 6 to 95 percent foliage removed.
- Heavy - 96 to 100 percent foliage removed.

Along the flight lines, pine stands showing no visible insect feeding were also recorded.

The survey was begun on May 20 in North Carolina and was completed on May 27 in northern Maryland. In total, 15.6 hours of flying time were required.

In mapping the area, the following timber type designations were used:

- Pine - 50% or more of the stand in pine
- Pine-hardwood - 25 to 50% of the stand in pine.
- Hardwood - less than 25% of the stand in pine.

On the map, pine type is shown as a percentage of the land area observed in each 10-mile segment along the flight lines. For example, on the flight line above Roanoke Rapids, N. C. (bottom of map, in center), the number 48 indicates that 48 percent of the land area in that 10-mile segment had a forest cover of pine type.

Since the sawfly attacks pines just as severely in predominantly hardwood stands as it does in pine stands, the pine and pine-hardwood areas were combined in recording defoliation.

No effort was made to separate pine species in the type-mapping, even though it is recognized that loblolly pine is not a preferred host when Virginia pine, pitch pine, and shortleaf pine are available. Loblolly pine is a major component only in the forested areas along coastal Virginia and in southern Maryland.

Discussion

Figure 1 shows the distribution and intensity of defoliation by N. pratti pratti during 1960 within the three states included in this survey. The development of the outbreak for the years 1955-60 is presented in figure 2. An acreage summary for this period is shown in table 1.

Although the total acreage infested in 1960 has decreased by approximately 4 million acres from that recorded in 1959, the decrease is limited almost entirely to the periphery of the epidemic area, where only light feeding had been noted previously. Much of this reduction in infested acreage was in southeastern Virginia, where loblolly pine is the predominant species and the preferred Virginia pine occurs only as scattered trees. Egg surveys had shown that the sawfly was present in the peninsulas between the Potomac, Rappahannock, and York Rivers; but the flight lines were terminated as shown in these coastal areas because of the sparseness of Virginia pine.

This was the first year that an aerial survey was conducted over the entire outbreak area, and thus the limits of these forest types were better defined. Throughout the interior of the defoliated area, feeding injury has intensified and zones of heavy defoliation have doubled. For example, the areas of heavy defoliation have increased from $1\frac{1}{2}$ million acres in 1959 to 3 million acres in 1960.

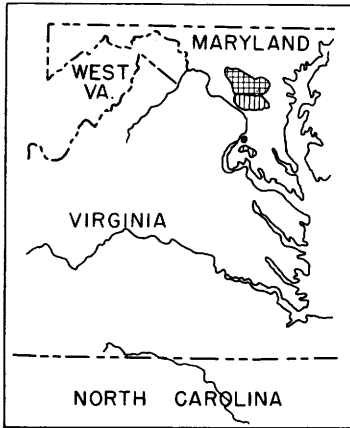
The aerial survey not only gives an accurate overall picture of damage to the susceptible pines, but also directs the entomologist to the areas where he can intensify his egg

Figure 2.--The trend of defoliation damage by the Virginia pine sawfly in Maryland, Virginia, and North Carolina, 1955-60.

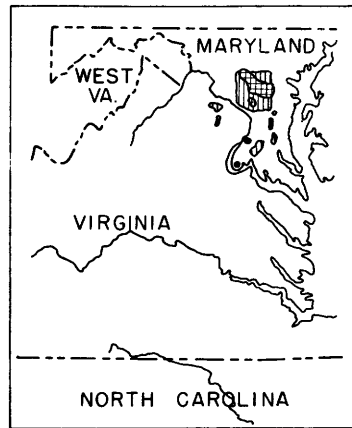
||||| LIGHT

||||| MODERATE

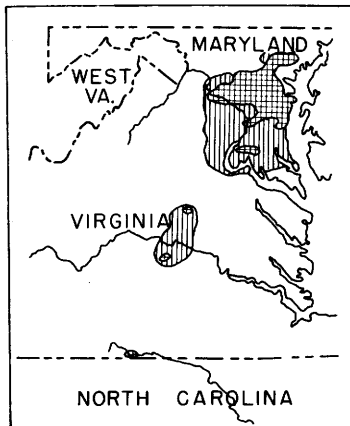
||||| HEAVY



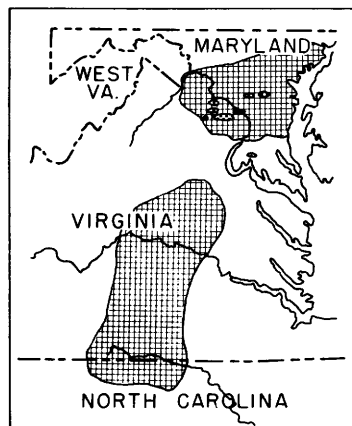
1955



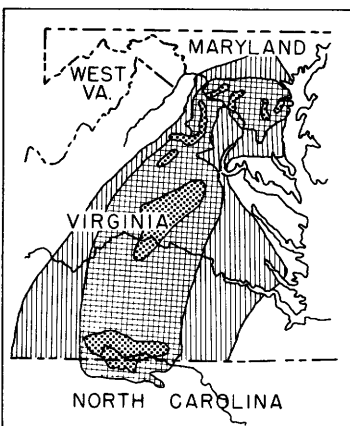
1956



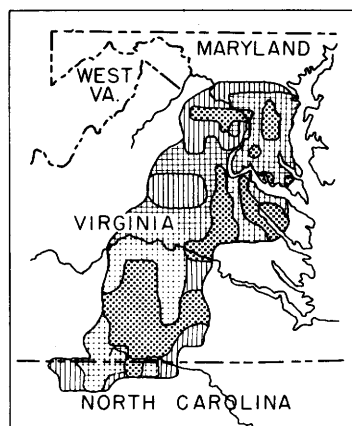
1957



1958



1959



1960

Table 1.--Virginia pine sawfly defoliation, 1955-60

(In thousands of acres)

Year	Light			Moderate			Heavy			Total
	Maryland	Virginia	North Carolina	Maryland	Virginia	North Carolina	Maryland	Virginia	North Carolina	
GROSS ACREAGE ¹										
1955	156	--	--	170	--	--	--	--	--	326
1956	258	40	--	86	--	--	--	--	--	384
1957	921	1,372	--	929	69	--	--	--	--	3,291
1958	--	--	--	2,625	4,473	652	100	--	--	7,850
1959	642	5,835	--	817	5,141	365	142	1,341	48	14,331
1960	252	1,404	331	975	3,487	298	262	2,750	58	9,817
NET ACREAGE ²										
1955	15	--	--	14	--	--	--	--	--	29
1956	19	4	--	9	--	--	--	--	--	32
1957	129	262	--	130	13	--	--	--	--	534
1958	--	--	--	315	1,131	13	12	--	--	1,471
1959	77	1,476	--	98	1,301	31	17	339	11	3,350
1960	32	355	84	360	882	75	72	696	15	2,571

¹Includes all forest types and land areas where defoliation was recorded.²Based on percentage of pine type and pine-hardwood type, from aerial survey or Forest Service inventory records.

surveys and biological appraisals. Thus he can bolster his prediction of what the sawfly can be expected to do in 1961 and what areas need particular attention. One additional benefit arises when figure 2 is reviewed; here the accrued defoliation of past years can be determined at a glance and a more intelligent decision can be made as to the effect that continued heavy defoliation may have on stand vigor and growth loss.

--T. McINTYRE¹
R. C. HELLER
C. L. MORRIS

¹Mr. McIntyre is Entomologist, Laurel Research Center, Northeastern Forest Experiment Station, Forest Service, U.S. Department of Agriculture, Laurel, Md.

Mr. Heller is Research Forester, Beltsville Forest Insect Laboratory, Forest Service, U. S. Department of Agriculture, Beltsville, Md.

Mr. Morris is Chief, Forest Insect and Disease Investigations, Virginia Division of Forestry, Charlottesville, Va.