

Annual Report - July 1, 1978 to June 30, 1979

Research continued on the Oak Leaf Tier problem in eastern Franklin County, aerial and ground surveys were conducted for insect and tree disease problems and parasites were released in Gypsy Moth infested areas. Assistance was rendered in the co-operative program with the United States Forest Service for the application of the biological control of the Gypsy Moth with aeriually applied material known as Gypchek.

Three species of parasites were requested and received from the United States Department of Agriculture, Plant Protection and Quarantine Programs, Area Director and Program Co-ordinator. These species were *Exorista japonica*; a mid-instar parasite, *Brachymeria lasus* and *Coccygomimus disparis*; pre-pupal and pupal parasites. A total of twenty sites were selected in Franklin County. These were in the towns of Leverett, Wendell, Montague and New Salem on Metropolitan District Commission property at the Quabbin Reservoir. The twenty first site was in the town of Hudson in the Sudbury State Forest. Up to July 1, 1979 9,800 *Exorista*, 2,500 *Brachymeria* and 1,000 *Coccygomimus* were released. (Release of the pupal and pre-pupal parasites continued into July.) While releasing the *Exorista* in Wendell early in June large numbers of a *Calasoma* beetle were observed. This was identified as *Calasoma calidum*, a native predator of the Gypsy Moth. Several dozen of these were captured on a subsequent visit and released in a building Gypsy Moth population in Hudson, Mass. where no *Calasoma* had been observed on repeated visits.

Gypsy Moth egg masses collected in Sharon for evaluation of that area as a possible "Gypchek" spray area contained up to 27 % parasitized eggs. This egg parasite is *Anastatus* ^{new disparis} ~~bifasciatus~~. It emerges from the Gypsy Moth egg mass when the current years caterpillars are pupating and is present when the new egg masses are laid. There is one generation a year. In all the collections in Franklin County no *Anastatus* has been observed. After the general Gypsy Moth hatch in the Sharon area 2,300 egg masses were collected from there and then set out in Franklin County. Egg masses will be collected from these areas in 1980 to evaluate this transplant.

Sarcophagidae (*aldrichii*) was observed to be heavy in the Dry Hill-Country Hill area of Montague and the Schoolhouse Hill area of Hardwick in 1978.

In June 1979 an aerial survey for defoliation caused by the Oak Leaf Tier (*Argyrotoza semipurpurana*) was conducted over southern Berkshire and Franklin, Hamden and Hampshire Counties. A total of 103,670 acres of varying defoliation were recorded. (see attached list)

The July 1978 aerial survey for defoliators showed 146,337 acres affected. (see attached list). In addition to 63,042 acres of defoliation by the Gypsy Moth the following were recorded. Larch Sawfly - 110 acres, unidentified leaf roller complex - 2,140 acres, Pine Needle Miner - 6,560 acres, Turpentine Beetle - 230 acres, Diplodia - 400 acres, Pine Looper - 800 acres, total Oak Leaf Tier 73,575 acres and dead or dying trees - 3,685 acres.

In association with the Gypsy Moth caterpillar feeding the Forest Tent Caterpillar was observed in many areas. In addition to these another free feeder was abundant in the same areas. A large, heavy bodied looper that has now been identified as *Phigalia titea*, the Half Wing Geometer. In some areas in 1978 this was the major defoliator, particularly in Pelham, Mass.

Eastern Tent Caterpillar, *Malacosma americanum*, was heavy throughout the entire state in the spring of 1979. The Fall Webworm, *Hyphantria cunea*, continued to decline in 1978.

The plots established in 1977 for monitoring the tree condition, defoliation, egg deposition, vigor or growth loss, mortality or recovery due to attack by the Oak Leaf Tier were continually observed. 1979 is the sixth spring of defoliation by this insect in north eastern section of Franklin County. Several hundred acres have recently been reported in the Easton area of south eastern Massachusetts. The plots mentioned above are now being overrun by the Gypsy Moth from the infestation in the Connecticut River Valley.

An infestation of Wax Moth, *Chionodes* sp., is also present in the Montague and Wendell State forest area of the tier infestation. This is a mid to late summer feeder between webbed leaves of Red Oak.

The prediction of moderate to severe defoliation by the tier in Franklin County was accurate for the spring of 1979. Prediction is based on egg counts on 15" branch samples collected from the infested area. Independent egg counts by Parker Snowden of the U. S. Forest Service and this writer reached the same conclusion as to the expected defoliation.

In addition to the other data collected from the plots relative to the tier damage to red oak, stands an intensive survey was made using the C. F. I. plots. (continuous forest inventory) These plots were established two decades ago. The purpose of this survey was to determine crown condition decline and mortality. (see attachment) Sub plots were also established for this purpose on a ten chain grid between the C. F. I. plots. A similar survey is planned for 1979 for comparison. In two of the forest areas that have been attacked the longest and heaviest by the tier, Sears RD. and Carlton RD. in the Wendell State Forest, 20.5 % and 23.5% of the red oak stems over 5" d.b.h. were dead. In these same areas trees in crown condition class 4 & 5 that are in dying condition bring the mortality figure to 32.9% and 33.3%. These figures were arrived at by counting and estimating the crown condition on two one acre plots. It was noted in field observations that in areas of two or more years of 75 - 100 % defoliation that the trees were extremely slow to refoliate and that the Sears Rd. area showed no reflation.

Several weeks were spent in survey, evaluation and establishment of spray blocks for treatment with "Gypchek". Originally slated for the Sharon area the project was moved to the Sherborn - Wayland area when evaluation of the population and egg masses in the Sharon area proved unuseable. The prism point method of egg mass sampling was used to determine populations in the spray and check areas. The spray was applied in late May and early June by helicopter. Final evaluation will not be available until the fall egg surveys are conducted and the data tabulated.

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