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BUREAU OF INSECT PEST CONTROL
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On a Collision Course

Two major concerns in this day and age are meeting head on and the outcome has not yeat been resolved. Justifiable concern has been voiced by certain individuals and groups regarding actions of the Massachusetts Pesticide Board in restricting the use of these pesticides.

On the other hand Massachusetts has been beset by insect outbreaks of major proportions and many outbreaks of minor proportions during the past few years. These too, are of major concern to residents of the Commonwealth. There are very few things more discouraging and more awesome than to watch ones tree or trees being, slowly at first, and then suddenly swiftly devoured by hordes of insects. Equally as heart breaking is the knowledge that ones tree has a disease from which it may never recover.

Discounting the hysteria and fear evoked on both sides of the question and viewing the total situation rationally one finds much that needs doing. There must be approaches that can satisfy both extremes. If these approaches develop as a result of this collision we will all benefit. The Department of Natural Resources is the State agency most concerned with the environment. The impact of any pest outbreak on the total environment must be weighed against the possible damage a control measure may incur on this same environment. At times the decision is not an easy one to make.

Major Outbreaks

As long as trees are grown there will be pests of those trees. This year was no exception. In certain areas the oak and pine have been severely attacked by the gypsy moth. The sugar maple, birch and beech has been under attack from the saddled prominent. The pitch pines in southeastern Massachusetts and Cape Cod have suffered from three different insect pests - the pine needle miner, the Nantucket pine tip moth and the pine looper. Red oaks, and to some extent white oaks, in eastern Massachusetts have been defoliated by the oak leaf skeletonizer. Although there is no significant difference in intensity this year over past years the Dutch elm disease continues to take its toll of elms throughout the State. Beech contines to die as a result of the combined attack of the beech scale and the nectria disease.

Insect and Disease Highlights

Gypsy Moth

The aerial survey, conducted in July of 1970, to determine the current defoliation by the gypsy moth indicated signs of a rise in the extent of infestations during the next few years. Areas of the State that in the past have sustained serious outbreaks now show visible areas of defoliation again. Total defoliation was in the vicinity of 7,500 acres.

If we can judge by past history Massachusetts is due, within the next year or two, for an outbreak of major proportions. The last general outbreak ended in 1964. Normally outbreaks reoccur every seven or eight years.

In the fall of 1970 those communities, particularly those on Cape Cod, which showed defoliation were carefully surveyed on the ground for egg masses. Bureau personnel assisted in this work. During this same period Nickerson State Park was also surveyed. Much of the park showed egg mass counts of 20,000 or more egg masses per acre. It should be noted here that 400 to 500 egg masses per acre in growth such as can be found in Nickerson will result in complete defoliation during the next summer.

Plans were formulated during the winter to aerially spray the park during the following spring. The decision was made to spray at the rate of one pound of Sevin per acre by means of helicopter. The proposal was accepted by the Pesticide Board and proposals to bid were sent to helicopter applicators licensed to work in Massachusetts. No replies to the proposal were received. The experience of last year ruled out the possibility of satisfactory control by means of ground equipment. The park was to remain open despite the known population of gypsy moth.

The decision to remain open was cause for great concern to the Plant Protection Division of the U. S. Department of Agriculture. This agency is charged with the responsibility for preventing the spread of the pest to areas of the United States and Canada not now infested with the moth. Camping trailers and camping equipment in general make ideal vehicles for the inadvertent transportation. Large larvae, pupae and egg masses are often found on or under such things.

The suggestion was made by the Federal agency that it contract for the application of Gardona, an organophosphate registered for this use. Application at the rate of one pound per acre was made on June 16 and 17, 1971. The project was only moderately successful. There would seem to be two major reasons for

this: (1) the enormous population of gypsy moth pr sent on the area and (2) the lateness of the spray in relation to the larval development. The end result was the decision to close Areas 6, 6A and 7 until August 1, 1971 at which time the hazard will have subisded. It is quite evident at this writing that we will be confronted with the same problems next year at Nickerson.

New approaches to the control of gypsy moth are being attempted by the Federal Government in cooperation with various state agencies. Two of these cooperative tests are being conducted in Massachusetts assisted by this Bureau. The first of these is the application of various strengths of Bacillus thuringiensis by mist blower. The results have not been finalized at this writing. The second is the application of the synthetic gypsy moth sex attractant, Disparlure, to two hundred acres of gypsy moth infested woodland in the vicinity of the Quabbin Reservoir. Again the Bureau is cooperating. The aim of this particular project is one of confusing the male moths and preventing mating. Results should be evident this coming fall.

Biological Control

The Bacillus thuringiensis experiment was carried out in Whately under the direction of Dr. Franklin Lewis of the Forest Insect and Disease Experiment Station of the U. S. Forest Service. Cooperators were the Department of Entomology, University of Massachusetts and the Bureau of Insect Pest Control.

Three forest plots of about one acre each were sprayed with various formulations of Bt by members of the Bureau with a Bureau mist blower. The applications were repeated three times.

Larval counts were taken following each of the applications. The method used was one which would lend itself to the peculiarities of the gypsy moth. During the day gypsy moth larvae tend to seek out niches in which to find shelter. An artificail shelter was provided by wrapping burlap around the test trees. The simple procedure of counting the dead and alive larvae under the burlap would give a relative indication of the efficacy of the spray material.

Egg mass counts in the test plots compared to egg mass counts in check plots taken later this fall should give us the final determination as to the ability of Bt to control gypsy moth.

Pheromones

The use of pheromones (sex attractants) in the control of insect pests has received wide publicity in recent months. The theory appears to be sound although practical application has not, as yet, been demonstrated.

Recently the gypsy moth sex lure has been synthesized and a sufficient quantity produced to conduct field trials. Massachusetts was chosen as one of the areas in which pilot tests would be held. Through cooperation of the Metropolital District Commission and with the sanction of the Department of Public Health the Bureau in conjunction with the Plant Protection Division of the U. S. D. A. treated two hendred acres of gypsy moth infested area on the Quabbin Reservoir.

The application was made by dispensing small particles of cork impregnated with Disparlure from an airplane when most of the gypsy moth were in the pupal stage just prior to emergence as moths.

At this writing the only fact known was the observation that male moth confusion reigned supreme. Whether this will have had any lasting effect on the resident population can only be determined by egg mass counts this fall.

Saddled Prominent

For the third year this insect defoliated vast acreages of Berkshire County with some activity noted in Hampden, Hampshire and Franklin Counties. The total acreage of visible defoliation recorded by an aerial survey was 105,000 acres. This was a slight increase over the total defoliation of last year.

Inasmuch as this has been an areawide problem Bureau personnel have cooperated and worked with U. S. Forest Service entomologists and entomologists from the Applied Forestry Research Institute of Syracuse University in an attempt to better understand the habits and behavior of this insect. The clue as to how to predict population numbers a year in advance still eludes us.

A clue as to the reason for the eventual collapse of a saddled prominent outbreak may have come to light this year. During the last two weeks of June millions of saddled prominent moths were observed flying. Upon investigation it was found that they were all male moths. There may be something that genetically triggers this phenomenon which reduces the population to an endemic state where it remains for a period of years.

Oak Leaf Skeletonizer

Activity of this insect was reported from all sections of the State where oak grows in abundance. Eastern Massachusetts was more heavily hit than other areas.

During the past year the question arose as to the amount of damage being inflicted on the oaks by this pest. Some trees were almost completely defoliated by July 1. These trees did not refoliate during the remainder of the year. Apparently the defoliation had little effect on the trees as most put out a set of leaves this year.

The spring of 1971 saw a continuation of the outbreak of this pest in some areas and a lessening of intensity in other areas. It would appear that this may be the last year for this particular outbreak except for a few localized exceptions.

Nantucket Pine Tip Moth

This pest which has killed thousands of pitch pines on Cape Cod appears to be still on a rampage although somewhat of less intensity than the past few years. Thanks to the efforts of the Waltham Field Station owners of particularly valuable trees are now able to control the pest.

Pine Looper

During last September reports began to filter into the Boston office of the browned condition of the pitch pines in the Eastham - Wellfleet area of the Cape. It was soon determined that the pine looper was again on the upsurge. The last major outbreak of this pest was in 1960 and 1961. The outbreak then collapsed due to a virus disease.

Mid June of this year saw much moth activity in Plymouth. It is expected that during late summer of 1971 evidence of this insect will be noticeable throughout the pitch pine areas of southeastern Massachusetts.

On the recommendation of this Bureau the Department of Public Works will spray with ground equipment approximately twelve miles of the Mid - Cape Highway in Wellfleet and Eastham for control of the pest on its right of way.

Dutch Elm Disease

Although it is an old story it is still with us and causing a considerable amount of elm mortality throughout the State. During the calender year 1970 there were 7,810 samples of elms suspected of having the disease cultered and confirmed as having the disease. This is a fifteen percent increase over the previous year. At the time of this writing it appears to be running ahead of last years figures.

Despite the apparent failure to control the disease it is being controlled through the combined efforts of the cities and towns and this Bureau. The efforts at sanitation and the supplemental spraying by communities are holding losses to a low percentage.

Bureau personnel, particularly the Tree Removal Crews, continue to assist deserving cities and towns in the work of removal and destruction of diseased elms.

Oak Leaf Roller

This is an insect which has caused severe mortality in stands of oak in Pennsylvania and New Jersey. Here in Massachusetts two relatively small areas have sustained outbreaks of this insect for the past two years. One of these is in the town of Mount Washington and the other in the town of Plymouth. No permanent damage has been noted as yet.

Hemlock Looper

A close relative of the pine looper, the hemlock looper, has built up to outbreak proportions in southeastern Massachusetts. It has been particularly destructive in stands of hemlock on the Fall River watershed.

This insect feeds in late summer and early fall on the needles of hemlock. The hemlock is a tree which rarely recovers from a complete defoliation. Observations last fall led to the recommendation that an immediate salvage cut be conducted on the area. This has been done.

Because of the concern voiced by those in charge of this watershed the Bureau was asked for control recommendations. Knowing that the insect had previously been controlled through the use of Malathion this was recommended. The proposal was submitted to the Department of Public Health for consideration inasmuch as it closely involved drinking water. It was given a go ahead by that Department. The application will be made in mid - August.

Excerpts from District Supervisor Reports

District #1

Eight towns on the Cape who had combined their financial resources to apply " Sevin " by aerial application cancelled their plans to spray, although the material was applied by ground method. The results were fair.

Isolated infestations of the brown tail moth were noted in Dennis, Barnstable and Truro (National Seashore Park). Clipping of winter nests and natural shifting of sand keeps this insect under control.

Some evidence of wood ticks in most towns in the District. Control measures are carried out for this insect annually in all towns by the local superintendents.

District #2

Small amount of spiney elm caterpillar found in the District.

There was a great deal more of the eastern tent caterpillar this year and there was much more of the forest tent caterpillar.

Gypsy moth is increasing in areas infested and it appears that in 1972 we will have more of it.

District #3

Several towns have a wood tick problem. The oak leaf skeletonizer has caused a great concern to most towns in District #3.

A fall webworm infestation was heavy in the Newbury and Newburyport area.

District #4

Several attempts to control the pine leaf aphid at Pearl Hill left much to be desired. During the winter of 1970 and 1971 all the spruce in the area were removed in an attempt to break the life cycle by the removal of the alternate host.

Oak leaf skeletonizer caused the greatest concern - especially in eastern Middlesex County.

May and June of 1971 showed an increase in gypsy moth larvae in Western Middlesex County.

Dutch elm disease still seems to be taking second place to the dying maples and pines along the roadsides.

Twelve days were spent picking up and delivering pesticides to be stored in the bunkers in Cohasset.

District #5

Gypsy moth populations are beginning to build up in certain areas of Douglas, Sutton and Oxford.

The fall webworm was extremely heavy in October all throughout Sutton, Millbury and Oxford.

White pine weevils are presently doing extensive damage to a Norway spruce planting around the reservoir property in Leicester.

Maple decline is taking more and more roadside trees annually.

The Dutch elm disease problem saw a definite increase in the numbers of afflicted trees throughout Southern Worcester County.

District #6

We assisted in tree removal in the forest and parks recreation areas in Districts 5, 6 and 7. A total of 165 trees were removed in State parks and other departments.

Light defoliation from the elm leaf beetle was noted in some towns in Northern Worcester County.

Worked with the U. S. Forest Service and the University of Massachusetts on an experimental spray project spraying test plots with Bacillus thuringiensis for control of the gypsy moth.

District #7

The saddled prominent was on the rampage again in this District. A total of 3,752 acres were defoliated in Hampden County and a total of 7,290 acres were defoliated in Hampshire County.

There was quite an increase in gypsy moth activity this year. An extensive area around Peaked Mt. in the towns of Monson and Hampden were severely infested with gypsy moth. It is suspected that most of these caterpillars were blown in from Connecticut due to the lack of sufficient egg masses in the area.

District #8

Dutch elm disease continues to be the number one problem in Berkshire County. Thousands of trees have died in the last year. No inroads can be made on this problem until cities and towns get totally involved on private property.

The beech scale and nectria canker complex continues to take its toll on American beech trees. Defoliation by the saddled prominent caterpillar has hastened the onslaught.

The green striped mapleworm this year is reported all over the County.

There is a good population of maple trumpet skeletonizer in the northern half of the County.

Small, localized outbreaks of gypsy moths in two public and three private camp grounds in Southern Berkshire County.

Last year saw 1300 acres of defoliation in Mount Washington from oak leaf rollers. The area shows some crown deteriforation and old mortality from a previous outbreak.

There were a few cases of elm spanworm in the Great Barrington, Alford and Egremont area.

Aquatic Weed Control

The Department is continuing in its effort to bring the aquatic weeds and algae under control in the various bodies of water for which it is responsible.

Areas treated last year were Lake Cochituate for control of algae, Watson Pond in Taunton was treated for weeds and algae, the swimming area at Hopkinton State Park was treated for weeds and algae, Stearns Pond in North Andover was treated for weeds, Dean Pond in Monson was treated for weeds, Big Bear Hole in Taunton was treated for weeds and algae and Middle Pond in Taunton was treated for algae.

All treatments were successful bringing the Department closer to the time when all of the bodies of water will be on a maintenance basis and not a crisis basis.

Pesticide Storage

Pesticides are still being received from time to time for storage in the bunkers at Wampatuck State Park. At the present time there are approximately 133 tons of various formulations, both liquid and powder, stored in three of the bunkers.

Deterioration of the pesticide containers will give cause for some concern in the near future. All precautions are being taken to prevent leakage, etc but the age of some of the containers may cause problems.

Those personnel who must enter the bunkers for one reason or another have been supplied with the best respirators available.

Hazardous Trees

It came to the attention of the Bureau last year that there was the possibility that on our various parks and recreation areas might be dead or unhealthy trees. These trees could pose a hazard to those camping or picnicking under them due to falling limbs and branches.

Last fall each recreation area across the State was surveyed by Bureau personnel in the company of Recreation personnel to determine the location of any of these hazardous trees. A number of these were found and the hazards removed by either park persennel or the Bureau tree removal crews.

Summary

As far as Bureau activity is concerned the past year has been one of rising insect populations and rising concern for the environement. Such things as saddled prominent, gypsy moth, pine looper, oak leaf skeletonizer and Nantucket pine tip moth have chewed their way through thousands of acres of trees. At the same time some of the better tools from the viewpoint of the applicator have been questioned as possibly toxic to other living forms.

On the one hand we find the environment being altered by tree insects and disease and on the other hand people stating that to control these pests is to help destroy the environment. Someday the question will be resolved. Until that time the judgement of those charged with protecting all of these interests must prevail and that judgement must be good.