Reinders

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PRESIDENT'S MESSAGE

Now that we are in the last few weeks of the season and we can relax a little, it is time to look back and analyze 1980.

However the Wisconsin Golf Course Superintendents Association has two events coming up that everyone should be very interested in.

The Symposium is Back at the Pfister Hotel October 29 & 30. The topic will be "Sand Top Dressing" pro and con.

In the past the Wisconsin Superintendents have been very conspicuous by there absense. It sure seems if Superintendents are interested enough to travel from several states and Canada that it sure would be worth while for the local superintendents.

Our annual meeting will be held in November. This is the election meeting along with our regular business. It sure would be nice to have better participation. It is your organization, be proud of it, participate and it will become a much stronger association.

Woody Voigt

Gypsy Moth

By Clifford S. Chater
Shade Tree Laboratories

The gypsy moth Lymantria dispar, which is one of our more destructive forest insects, may also be one of our more serious shade tree pests. Since its accidental introduction from Europe into Massachusetts in 1869, outbreaks have occurred at intervals of a few to many years. Originally, outbreaks caused severe forest tree damage in Massachusetts but in recent years moderate forest tree weakening is the rule while shade trees suffer more stress and perhaps eventual death.

Severe infestation usually results in partial defoliation of conifers (evergreens) as well as deciduous trees. Complete defoliation of conifers may kill them in one season with the exception of pitch pine, which requires a longer period to be killed. One should do nothing for control if he or she is willing to tolerate defoliated trees, tree stress, possible tree death from the immediate defoliation, longer range injurious effects from secondary pests, a general mess of bits of chewed leaves, caterpillar excrement (pessets dropping from trees) caterpillars crawling on the trees and later on/or in the house and property for a few weeks annually over a period of three or four years. If these penalties are unacceptable then there is a wide choice of control materials available and many skilled professional-arborist applicator who may be consulted to provide relief and protect trees.

Typically, a population builds up for three or four years and, by then, the abundant caterpillars are so stressed by competition for food that, when weather conditions are suitable, they succumb to a virus disease. The disease so reduces their numbers that a troublesome build up is not seen again for a number of years. It is during these early years after a population collapse that the gypsy moth parasites, which are chiefly different species of wasps and flies, exert their greatest benefit. Eventually though, the parasites can no longer keep the increasing insect population in check and once again an expanded outbreak occurs. There seems to be no specific act that triggers an outbreak and the time interval between outbreaks remains unpredictable.

Properly planned control programs will reduce infestations and protect trees and provide relief to home owners during peak outbreaks of the pest. No attempt should be made to eradicate gypsy moth since this is not possible, at least with present knowledge.

Description: The male gypsy moth is dark brown with blackish bands across it's forewings. The female moth is nearly white and has wavy blackish bands across it's forewings. The mature caterpillar is hairy and about 1½-2½ inches long. The head has yellow markings, the body is slate colored, and on the back there is a double row of five pairs of blue spots followed by a double row of six pairs of red spots. The pupae is reddish brown with a sprinkling of reddish hairs.

Distribution: The gypsy moth has now become estab-

lished over all of New England and also parts of New York, Pennsylvania, New Jersey and Delaware. Current outbreaks (1979-1980) in Massachusetts are generally located along routes 128 and 495 in the east with some on Cape Cod and along the Connecticut River Valley in the west.

Life history and habits: The gypsy moth has one generation a year and spends the winter in the egg stage. The eggs hatch in early May about the time the shadbush (Amelanchier spp.) blooms. This occurs about May first in most of the state and about May 10 on Cape Cod. The newly hatched caterpillars sometimes lower themselves from tree branches on threads. At this time, they may be blown about by the wind. Some may be blown a few miles, but usually the distance is mostly a matter of a few hundred yards. Local and relatively long distance spread can ocuur in this way. Also egg masses, larvae (caterpillars) and pupae are often attached to objects such as vehicles and firewood, upon which they may then be moved long distances.

The caterpillars, hatched as above, feed until early July when they transform into pupae. Moths start to emerge from pupation about July 4th. The males are strong fliers but the females emerge, mate and lay their eggs near their place of pupation. The eggs are laid shortly after mating and may be deposited at any place or height in the tree or on numerous other nearby objects. Egg masses that are lower down, near or upon the ground, are more easily seen. This fact may lead some people to believe that they are absent in the upper part of the tree. The egg masses are covered with tan colored scales from the female's abdomen and each mass may contain 100-1000 eggs.

Host plants: The gypsy moth may feed on a wide variety of trees and shrubs but oak, willow, linden, apple and larch are favored. Large hungry caterpillars will also eat pine, hemlock, spruce and, sometimes, maple. For the most part, ash, locust and sycamore are not fed upon.

Tree injury: While forest trees in general in Massachusetts will not be immediately killed by a typical outbreak, they will be weakened. Shade trees will be weakened and may be killed; especially, if they are already weakened by some other factors, including environmental complications. Healthy deciduous trees should be able to withstand partial defoliation for two or three successive years without being killed but they will be weakened, while conifers may be killed in one season. Once weakened, trees may then become susceptible to attack by borers and to fungi, especially the shoe string root rot fungus (Armillaria mellea). Death associated with this fungus may occur many years later, after infestation with gypsy moth. Thus death is not solely attributable to the gypsy moth. Many shade trees are even now suffering from previous outbreaks of gypsy moth of many years ago. It is suggested that shade trees, especially partly defoliated ones, be given adequate water, as needed, every year and fertilizer in alternate years to aid in maintaining or improving tree vigor.

Natural control or non-chemical treatment: Gypsy moth eggs are very resistant to cold and temperatures of at least minus 25°F. are required to kill them. The eggs are also very resistant to heat. Therefore, the eggs must be burned rather than scorched, to be sure they are dead from exposure to this treatment. Intensive efforts have been made to establish introduced parasites in this country and several species are presently busily at work. Predaceous beetles are also well established in the United States and likewise, a lethal polyhedral virus is usually prrsent. This virus causes the disease that brings about a population collapse. These agents eventually help to suppress an outbreak of gypsy moth.

Applied control: The gypsy moth is a very hardy pest. Dormant sprays of superior oil as commonly recommended for insect control (i.e. 2-3 gal/100gal water) will not kill the eggs. Creosote applied by brush is effective for egg kill, but care should be used not to let an

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excess soak into the tree bark since it will kill whatever living tree tissue it touches. Scraping eggs off the bark and allowing them to remain on the ground will not kill the eggs. Usually so few eggs can be killed by any manual method that in heavy infestations this egg killing will still not prevent tree-defoliation. There will always be many eggs that are missed and small caterpillars may also be blown in by the wind. Rubbing, wire brushing, hammering, scraping, often result in only limited egg control and burning with a propane torch often does more harm to the tree bark then the caterpillars would do. None of the manual methods are practical in tall trees.

Routinely, the larger caterpillars (4th instar) crawl down the tree trunk during the day and crawl back up again at night. This allows some of them to be captured if folded burlap is wrapped around the tree trunk for a trapping place. This may help, particularly in light infestations, but the benefit may be chiefly psychological. The caterpillars often wander about prior to pupation. It is at this time that they crawl onto and/or into homes, creating an extensive nuisance. It is too late then to do anything for control but battle them with a broom as a matter of good housekeeping.

If local control is desired, there are spray materials which can be applied when the caterpillars are small, about mid-May. The larger they become the harder they are to kill.

Some insecticides which are registered for gypsy moth control are:

Carbaryl (Sevin), a methyl carbamate type insecticide, is registered for use on many kinds of fruit, vegetable and ornamental plants. Carbaryl labeling carries a caution signal word and spray deposits are lethal to insects for about five days. It is useful against many kinds of insects, including caterpillars, lacebugs, periodical cicada, earwigs, some scale crawlers, some aphids and some leaf miners. It is particularly effective against Japanese beetle adults, elm leaf beetle, and birch leaf miner. It is very toxic to honeybees and application to blossoms, particularly white clover and linden, should be avoided. Carbaryl produces severe injury or death to Boston Ivy and Virginia creeper. Repeated applications thereon may also contribute to a buildup of mites and should be avoided.

Carbaryl is available as a liquid suspension or wettable powder. If used, beekeepers nearby should be forewarned so that hive openings may be screened appropriately for a few hours so as to alleviate the hazard of beehive contamination.

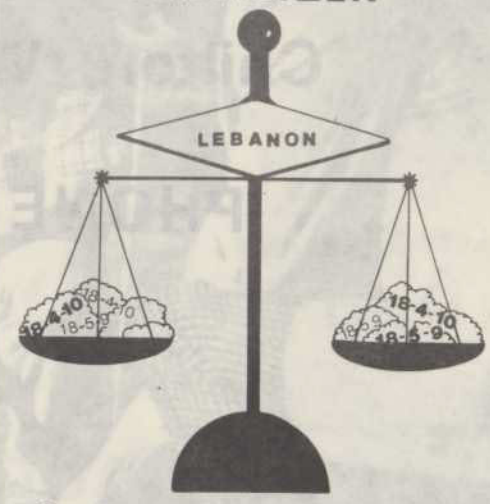
Acephate (Orthene), an organic phosphate-type insec-

ticide, is registered for use and is effective against a very wide range of insects on vegetables, ornamentals and flowers. It has low volatility which extends the time it remains lethal to insects. This period is ten to fifteen days. Its labeling carries the signal word of caution. It is available as a 75 percent crystaline powder.

Imidan a phosphate-type insecticide, is registered for use on many vegetables, fruits and ornamentals, and is active against a wide range of insects. Labeling carries the signal word warning, which indicates that it is of a lower order of toxicity to man and warm blooded animals than many phosphate insecticides. It breaks down quite rapidly in the soil. It is available as 12.5 percent, 50 percent and 70 percent wettable powders. If used, beekeepers nearby should be forewarned so that hive openings may be screened appropriately for a few hours to alleviate the hazard of beehive contamination.

Dylox (trichlorfon), a phosphorus-type insecticide, is registered for use on many vegetables, field crops, seed crops and ornamentals. It has a low order of toxicity to beneficial insects including honeybees and is very soluble in water. Its labeling carries a signal word of warning and it breaks down rapidly in the soil.

Bacillus thuringiensis (BT) is a microbial insecticide that is non-toxic and non-pathogenic to man and warm blooded animals, fish and honeybees, but it is capable of inducing fatal disease in certain insects, mostly caterpillars. On the basis of evidence to date, this bacillus is harmless to parasitic and predatory insects and other forms of life. It is useful against such insects as gypsy moth, cankerworm, fall webworm, elm



spanworm, and linden looper. Also, it gives some control of tent caterpillar. Occasionally, it gives erratic performance. Two applications are required. It must be applied near or during the second instar stage of the gypsy moth caterpillar development which is usually about May 20, in most of Massachusetts. A second application is required about June 1.

Malathion and Methoxychlor are also in use, but these materials are not considered especially effective either separately or mixed for control of gypsy moth.

Chemicals may also be applied systemically by injecting them into tree trunks, but these chemicals may be dangerous to handle and their use is limited to certified applicators. Bidrin is the material commonly available in capsule form for trunk injection, but in this method many wounds must be made in tree trunks. The wounds are often small but they are still many times larger in size than is required for entry by organisms which cause decay. Untreated, a relatively healthy tree may recover from defoliation but, if wounded and infected, it may harbor decay for the rest of its life.

Disparlure is registered and used for trapping. Impregnated plastic strips are used for confusing the mating process, but are significantly effective for this purpose only in very light infestations (a few egg masses per acre).

Diflubenzuron (Dimilin) is an insect growth regulator which interferes with the formation of chitin - the insects outer covering. This is a very effective control material, but it is registered only for forest use away from human habitation.

Gypcheck, a formulation of virus, is toxic only to the gypsy moth. It is registered for use only under the direct supervision of the U.S. Forest Service. It is produced only by the federal government and is not commercially available. If this material becomes available for wide-scale use we will have the ability to choose an earlier year for treatment in the population cycle. Thereby, the virus disease should be effective as a control measure, sooner than the date associated with the natural build-up of the toxic virus.

THE FIFTEENTH ANNUAL

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Sand and sand mixtures have been researched for about 30 years under the aegis of the USGA Green Section and their efforts are bearing fruit from both agronomonic and playability aspects. We feel sure that you will benefit from this year's distinguished speakers. The cons will be presented along with the pros of construction and topdressing.

If you are contemplating construction or pure sand topdressing., Milwaukee is the place to learn about the subject. If you are already involved, you will be interested in these updates.