Billings Township
Mosquito Management
Community Outreach Program 2024

The Billings Township Mosquito Management program has been in place since 2005. APM Mosquito Control (APM) performs the mosquito control program for Billings Township. The program consists of all phases of an Integrated Pest Management strategy against mosquitoes in the township.

1. Adult mosquito monitoring/Disease Testing.
2. Breeding site inspections and larviciding.
3. ULV Adulticide applications.
4. Special events/Nuisance Adulticide applications.
5. Aerial larvicide to approximately 600 acres of predetermined woodlots for control of the spring mosquito.

Detailed information about the program is available at the township offices. In an effort to notify residents within the township for community Larviciding and ULV adulticide applications APM and Billings Township utilize the following methods:

1. Initially the township mailed a brochure about the mosquito control program to every resident. The Brochure explains how the whole program works and gives any resident the opportunity to not participate. See Brochure included with this correspondence.

2. The township posts information about mosquito program on the door of the township offices, as well as the township website. Copies of the brochure are available at the township office.

3. Public notice in newspaper. A notice appears in the local paper explaining Spring aerial larviciding and seasonal adulticiding. Also allows anyone interested in further information to contact APM or township.

4. A Call/Shut-off notification list is maintained as part of the township program. Before ULV adulticide applications take place,

APM will call any residents that request to remind them and inform them that a community mosquito control application will be happening that evening, weather permitting. Residents may also request that the ULV adulticide be shut off in front of and or upwind of their area. These areas are staked and noted on ULV adulticide operational maps.

5. Mosquito control is often a topic of discussion at township meetings and residents are always encouraged at meetings to find out more about their local mosquito control program. APM holds open house events for residents at the request of the township. These events introduce the personnel assigned to service the area; provides an overview and demonstration of equipment used and information on materials used to provide mosquito control.

6. Information (sample labels & SDS) on insecticides used in program are available upon request by calling APM at (877) 276-4714 and are available at the Billings Township offices as well as the APM website at *www.advancedmosquito.com*

The contact person that can respond to public questions is Ben Seago at APM Mosquito Control.

Billings Township
1050 Estey Rd
Beaverton, MI 48612
989-435-8480

APM MOSQUITO CONTROL
21240 34 Mile Rd
Armada MI 48005
Local: 989-426-2420
Toll Free (877) 276-4714

www.advancedmosquito.com

Billings Township

2024 Mosquito Control Program

Billings Township has contracted APM Mosquito Control (APM) to provide mosquito abatement services for the 2024 season. APM specializes in municipal mosquito management programs and currently provides service to over 30 cities, townships, and villages throughout central and SE Michigan. APM has over 30 years of experience in integrated mosquito management. The local office is located at 285 E Howard Rd, Beaverton MI (989) 426-2420.

This information is being provided to the community as insight to APM's approach for an effective integrated mosquito control program for Billings Township property owners and residents. This information also explains how we as property owners and residents can assist in this plan.

INTEGRATED MOSQUITO MANAGEMENT

This is a process, consisting of the balanced use of environmentally compatible and economically feasible products, to reduce mosquito populations to a tolerable level. APM develops and implements comprehensive integrated mosquito control programs. The basis of every APM control program is biological larval control. All potential mosquito larval habitats are surveyed, cataloged and mapped. Routine larval surveys are then scheduled to determine where larvae are developing and what actions need to be taken to control them. Adult mosquito populations are also sampled using a network of light traps. These surveillance activities allow APM to plan and implement larval and adult mosquito control applications in a manner consistent with Integrated Mosquito Management (IMM) protocols.

The primary objective of IMM is to prevent the development of mosquito larvae by using biological methods, thus minimizing the need to "fog" for adult mosquitoes. The use of ULV (ultra-low volume) fogging gives good but only temporary results under acceptable weather conditions and is not generally cost effective as a sole means of control. Biological larval control methods take advantage of natural enemies to reduce mosquito populations. Natural enemies fall into 3 categories: those that prey on mosquitoes; parasitize them; or act against their hormonal system. APM uses biological control in all three areas.

Bti (*Bacillus thuringiensis var. israeliensis*) is a naturally occurring spore and crystal forming soil bacteria. Bti's active ingredient has been shown to be toxic only to mosquitoes, black flies and closely related species, with no toxic effects on other aquatic organisms. A Bti application in late April to lowland/woodland areas (using aircraft) will be the initial step of the Sims township integrated mosquito control program. Mosquito control activities are limited to specific political boundaries, but unfortunately adult mosquitoes don't obey lines on a map. Thus, any program that hopes to have effective control must contend with local larval development and invading migratory adults.

Nature has provided no successful alternative to chemical insecticides for controlling adult mosquitoes. The controlled application of ULV insecticides using modern technology and equipment can effectively reduce adult mosquitoes utilizing extremely small amounts of insecticide. Kontrol 4+4 or Perm X UL 4-4 is applied via truck and or off-road vehicle-mounted equipment. PermX UL 4-4 and Kontrol 4+4 are permethrin-based insecticides, which offer excellent effectiveness against adult mosquitoes, low mammalian toxicity, low odor, and rapid biodegradability.

THE MOSQUITO STORY

Mosquitoes (Order Diptera, Family Culicidae) are some of the most adaptable and successful insects on earth and are found in some extraordinary places. Virtually any natural or man-made collection of water can support mosquito production.

Mosquitoes can be distinguished easily from other flies by the fact that they have both a long, piercing proboscis and scales on the veins of their wings. About 55 species are found in Michigan. Only a few of these are important as carriers of disease, but many others are significant nuisances. The two most common mosquito species found in Michigan are *Aedes vexans* and *Culex pipiens*. *Aedes vexans* is known as the floodwater mosquito because it lays its eggs on dry ground in flood prone areas. *Culex pipiens* is an important disease vector, known to spread St. Louis Encephalitis, West Nile Virus, and other encephalitis diseases.

THE MOSQUITO LIFE CYCLE

All mosquito species have two things in common: they must have water for their early stages; and they all undergo the same four-stage life cycle — egg, larva, pupa and adult.

Mosquito eggs are laid individually or in clusters and are deposited either on the water surface or in flood prone areas. Most species of mosquitoes over winter in the egg stage. If eggs are laid out of water, embryos may lay dormant for several years. Once the egg hatches, the larval stage begins. The larvae of most mosquito species hang suspended at the water surface using an air tube to breathe. The larvae feed on aquatic organisms near the surface. As a defense mechanism, the larvae can dive deeper into the water by swimming in a characteristic "S" motion. Larvae grow quickly and outgrow their exterior covering. Larvae molt four times. Larval stages last between 5 and 14 days depending on temperature and food availability.

No feeding occurs in the pupal stage that lasts from 1 ½ to 4 days, after which the pupal skin splits along the back allowing the newly formed adult to slowly emerge and rest on the water surface.

Male mosquitoes will emerge first and linger near the breeding site waiting for the females. Mating occurs quickly after emergence due to high mortality. As much as 30% of the adult population can die per day. The female compensates for this by laying large numbers of eggs, usually about 300. Males live about 7 days and feed on plant nectar. Females live about 6 weeks and must take a blood meal to nourish her eggs. She uses carbon dioxide, exhaled chemicals, and temperature patterns to locate her victims.

The average female flight range is between 1 and 10 miles, but some species have been shown to travel up to 40 miles. After each blood meal the female will oviposit her eggs, completing the life cycle. Several oviposits per female are possible.

MOSQUITOES AND PUBLIC HEALTH

Mosquitoes can spread disease only when they bite. During feeding, the female pierces her victim's skin with her proboscis, injects her saliva, which contains an anti-coagulant and then sucks the victims' blood in. If the victim's blood contains disease-causing organisms, the mosquito ingests them too. These organisms are then maintained within the mosquito and eventually may be injected into another victim. In this way a mosquito can spread disease from animal to animal, animal to man, or even person-to-person. In the U. S. there are about six mosquito-borne viruses that are capable of causing acute infections of the central nervous system. Most often this type of infection causes brain and central nervous system inflammation or encephalitis. The most common types found in our area is West Nile Virus (WNV), St. Louis Encephalitis (SLE) and Eastern Equine Encephalitis (EEE). The only common parasite transmitted by mosquitoes is Dog Heart worm. Transmission of Dog Heart worm occurs only through the bite of an infected mosquito and involves a complicated transmission cycle. Mosquitoes and other insects do not transmit HIV or cause AIDS.

Controlling Mosquitoes

Standing water means mosquitoes. Any standing, stagnant water that remains for 7 to 10 days after a rain can, and usually will, produce mosquitoes.

Empty all water holding containers in your yard on a regular basis, at least once a week. Tires, children's wading pools, rain barrels, buckets, plant pots, birdbaths, and stored boats are common examples of mosquito breeding sites around the yard.

Leaves and other debris should be removed from eaves troughs and down spouts.

Ditches and retention basins must be kept free of vegetation and debris to promote rapid drainage.

Pond edges should be kept clean of cattails and other aquatic vegetation. This is where mosquito larvae develop and mature.

To reduce the number of adult mosquitoes in your yard, keep your yard mowed as short as is practical. Keep ornamental shrubs and bushes trimmed and pruned to allow airflow and light to penetrate. This is where adult mosquitoes like to rest during the day.

Good housekeeping is encouraged. Screens on windows and doors should be well maintained to prevent mosquitoes from entering homes, structures as mosquitoes seek out cooler and shaded areas for resting.

HOW THE PROGRAM WILL WORK

Initial spring larvicide application of Vectobac G (bti) to Lowland/woodland wet areas from an aircraft to approximately 600 acres of targeted flooded woodlots during mid-April to mid-May. The aerial applicator will be Mr. Ron Evans of Evans Aviation Company, Imlay City, MI. Ground larviciding by APM personnel will begin in early April.

The mapping and surveying of mosquito breeding sites in Billings Township, along with the development of historical data. The larviciding of these sites when found breeding with Vectobac G (bti) or Vectolex FG (Bs). This will be an ongoing process.

The placement of NJLT and CDC dry ice baited traps for adult mosquito monitoring and disease testing

Residents are encouraged to call the toll-free number to APM when noticing excessive adult mosquito populations and or have standing water in their immediate area.

A weekly nighttime ULV application to targeted areas from a truck mounted sprayer. This will be provided whenever onsite inspections, NJLT counts, or local reports reveal an increase in adult population.

The aerial treatment will take place in a period from mid-April to early May. Weekly ground treatment via truck, ORVs, backpack and ditch treatment equipment and will take place from mid-April until October 1 as mosquito populations warrant.

Description of Materials being used for mosquito abatement

Perm X UL 4-4 (4% permethrin, 4% technical piperonyl butoxide)

Kontrol 4+4 (4.6% permethrin, 4.6% technical piperonyl butoxide)

Duet ULV (Prallethrin 1%, Sumithrin 5%, Piperonyl Butoxide 5%)

Vectobac G (.2%bacillus thuringiensis israelensis)

Vectolex FG (7.5 % bacillus sphaericus)

Demand CS (9.7 % Lambda-cyhalothrin)

PUBLIC NOTICES

Public notice announcing the mosquito control program will be published in The Gladwin County Record, and also be posted at the Township Hall.

We request that all property owners who are renting or leasing their properties notify their tenants either by passing this information to them or advising them that this information is available at the Billings Township Hall.

Those who believe that their mosquito population is excessive are to Contact APM via their local number 989-426-2420 or the toll-free number for an onsite inspection and additional treatment if the need is necessary and weather conditions permit. **APM's contact information; local: 989-426-2420, toll free 1-877-276-4714.**

Notice: **Property owners and residents who do not wish to be treated by this method of mosquito control are to fill out the letter of objection (included with this information) and submit it to APM Mosquito Control 285 E Howard Rd, Beaverton, MI 48612. These properties will be identified as non-treatment areas.**

The Mosquito control contractor is: APM Mosquito Control, 21240 34 Mile Rd., Armada Michigan 48005. Their toll-free number is **1-877 276-4714**

APMs' local office is located at:

285 E. Howard Rd Beaverton MI 48612, 989-426-2420

This is a letter of objection. The property owners or residents of Billings Township who prefer that their properties **NOT** be treated for Mosquito control are to Notify Billings Township as soon as possible using this form with the required information filled out. These notices will be forwarded to APM Mosquito Control so they can create a buffer zone and exclude your property from being treated.

We, the following, **DO NOT** want our property treated for mosquito control.

Name_____

Property Description_____

Property address_____

Phone Number_____