

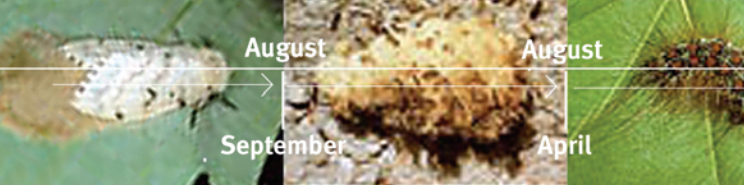


GYPSY MOTH

**DETAILED
MISSISSAUGA RESIDENT
2007 INFORMATION
PACKAGE**



MISSISSAUGA
Leading today for tomorrow

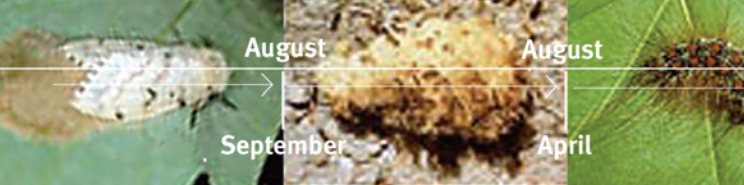




OVERVIEW

European Gypsy Moth (*Lymantria dispar*) has been present in Mississauga for more than 20 years. City staff has worked tirelessly alongside residents to keep population levels under control through monitoring and providing expert advice on Integrated Pest Management (IPM) controls such as scraping egg masses, installing burlap skirts and placing sticky bands around tree trunks, using pheromones to confuse male moths and leaving wooded habitat around trees, shrubs and garden plants to encourage predators. Additionally, staff has conducted extensive research and sought the advice from other levels of government both in Canada and the United States as well as abroad in an effort to learn more about the Gypsy Moth and effective control measures. Unfortunately, in specific areas of Mississauga, Gypsy Moth populations have reached significant levels such that they can no longer be effectively managed through manual IPM controls.

Last year, Mississauga conducted an extensive Gypsy Moth control program to combat the severe infestation in 11 areas across the city. Populations had reached outbreak levels and threatened thousands of trees on both public and private property. Mississauga's 2006 Gypsy Moth Control Program, which included an aerial spray, was successfully implemented and helped to reduce the Gypsy Moth population and preserve more than 80 per cent of the foliage in the impacted areas. The program was the first of its kind in an urban Greater Toronto Area (GTA) setting and received numerous accolades from individual residents and ratepayer associations. The program also received numerous awards from regulatory agencies such as Transport Canada and the Ministry of the Environment that now have



Mississauga's Gypsy Moth case as a model for other municipalities to follow.

Unfortunately Gypsy Moth populations have again reached outbreak levels in 10 new areas of Mississauga. If the City leaves the infestation untreated, there is the potential to lose thousands of trees, jeopardizing Mississauga's urban forest and a significant lifestyle disruption in certain neighbourhoods. Information through the Canadian Forestry Service and the United States Department of Agriculture (USDA) indicates that 13 egg masses per tree translates to approximately 30 to 40 per cent defoliation in residential woodlands. Investigations by staff and an independent consultant have shown trees in the impacted areas covered with hundreds of egg masses. A single egg mass can hold up to 1,000 caterpillars. Trees in the impacted areas would likely be completely defoliated and residents would be in contact with masses of caterpillars, affecting their ability to walk to their cars and use their backyards and their neighbourhoods. Children would be unable to play outdoors without coming into contact with the caterpillars whose shed skins, silken threads, hairs and droppings would blanket the area.

According to the Region of Peel – Public Health, extreme Gypsy Moth outbreaks have been associated with skin rashes and upper respiratory tract irritation in some people who have been exposed to airborne Gypsy Moth hairs, silken threads and/or shed skins. Children should be discouraged from playing with any Gypsy Moth caterpillars if they find them. The spiny hairs on the caterpillars have been known to cause welts or a patchy rash that can persist for four to five days.



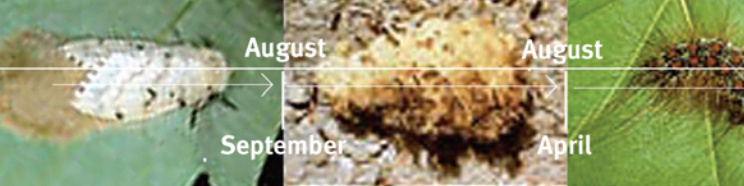
Spray Zones

The City of Mississauga will be spraying a total of 287 hectares (708 acres) which equals less than one per cent (1%) of Mississauga's total land mass. There are 10 new spray areas.

The spray zone areas have been determined using established and scientifically-designed methodologies. The City is only spraying areas where manual Integrated Pest Management (IPM) control options are no longer effective or possible. The City will continue to encourage the implementation of manual IPM controls such as scraping egg masses, using tree skirts and sticky bands and pheromone scents in areas where these measures will be effective in reducing Gypsy Moth population levels.



Female Gypsy Moths laying egg masses



The following steps were taken to determine the spray zone boundaries:

1. Egg mass surveys were conducted on City streets, woodlands and private property.
2. Specific egg mass information in regards to the size of the egg mass and location on the tree was collected from all areas.
3. The canopy cover, species, condition and size of the trees were recorded.
4. Areas with the highest defoliation predictions were identified using predictive models to determine high, moderate and low defoliation impacts.
5. The range of the zone depended on the following key parameters:
 - high density of egg masses
 - high defoliation impact
 - extent and distribution of preferred species
 - per cent canopy cover of the area

All zones and their boundaries were critically reviewed by City staff, the consultant and the aerial spray applicator.

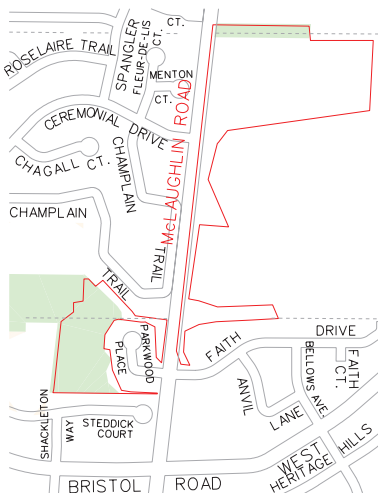


Egg mass on Shag Bark Hickory.

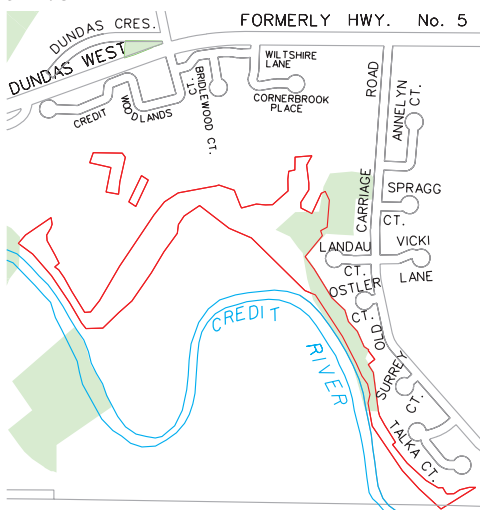


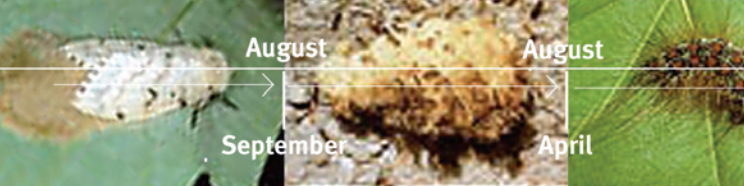
SPRAY ZONE MAPS [areas in red to be sprayed]

STAGHORN WOODS – east and west of McLaughlin Road north of Bristol Road

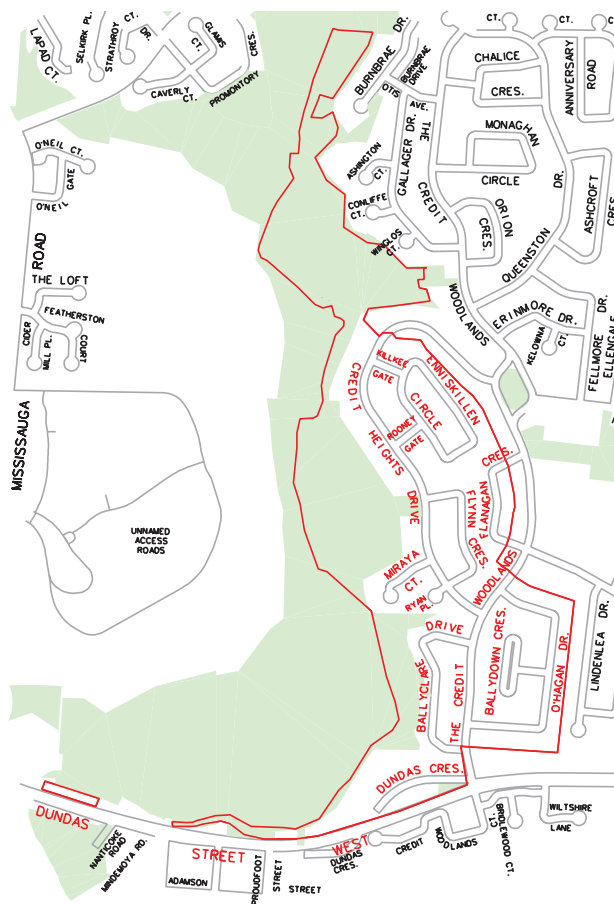


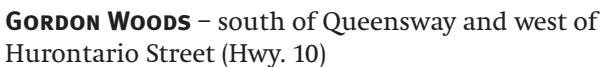
CARRIAGE WAY/CREDIT VALLEY GOLF – west of Old Carriage Road between Dundas and the Credit River

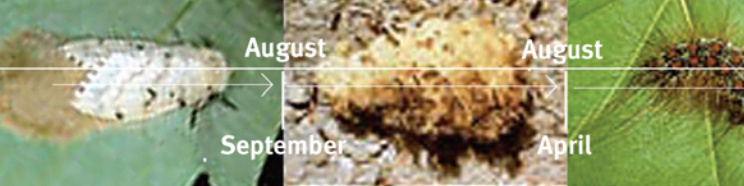




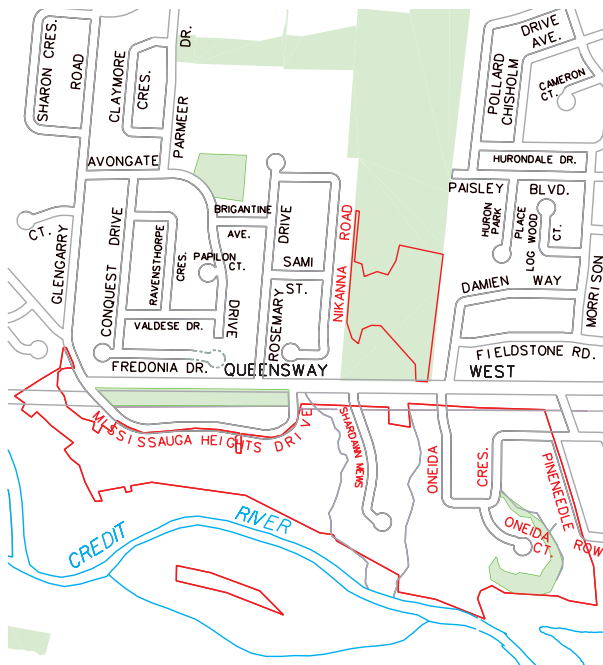
ERINDALE PARK / CREDIT HEIGHTS – west of the Credit River between Dundas Street and Burnhamthorpe Road







QUEENSWAY/HURON PARK – north of Credit River and west of Mavis Road

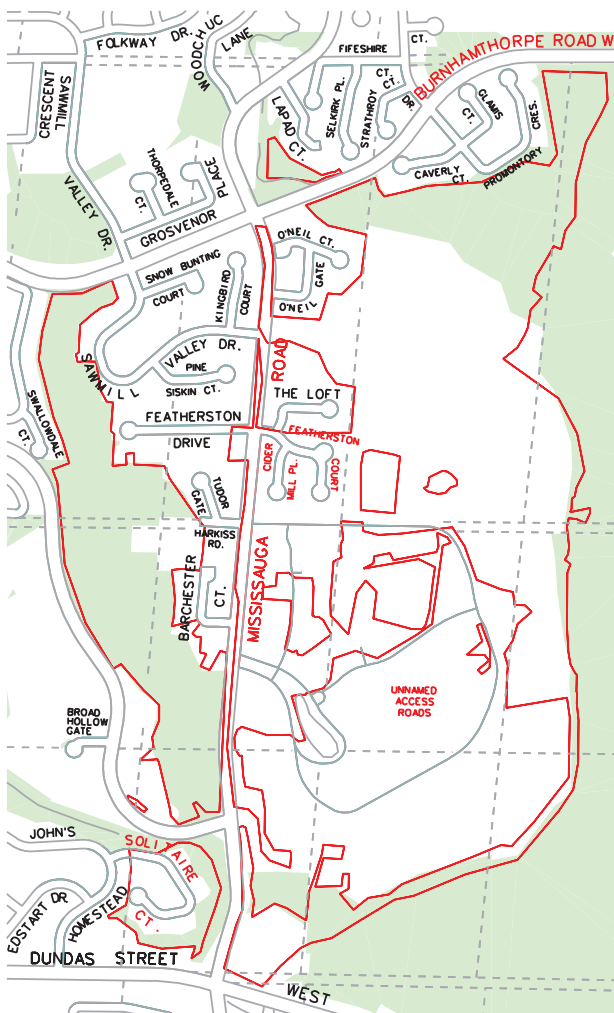


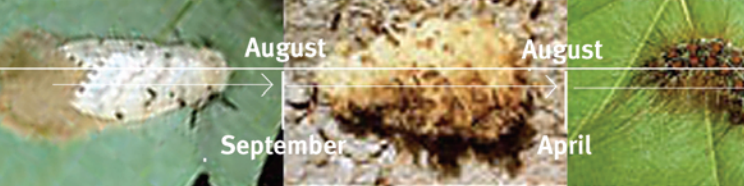
PARK 388 – north of Hwy. 401 and west of Second Line





**UNIVERSITY OF TORONTO AT MISSISSAUGA (UTM)/
SAWMILL VALLEY TRAIL** – north of Dundas Street
and south of Burnhamthorpe Road between the
Collegeway and the Credit River





WINDRUSH WOODS – end of MillCreek Road north of Derry Road

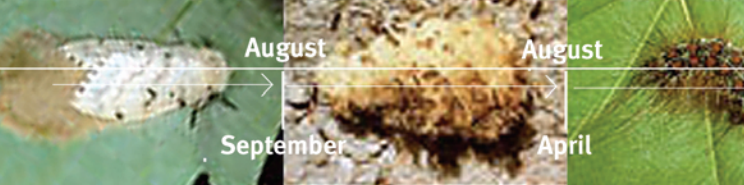


Gypsy Moth caterpillar frass (droppings) in swimming pool



MEADOWVALE CONSERVATION AREA – north of Old Derry Road and west of Second Line





Gypsy Moth egg masses and pupal cases.

Btk – *Bacillus thuringiensis* subspecies *kurstaki*

What is it?

Bacillus thuringiensis subspecies *kurstaki*, commonly referred to as Btk, is a rod-shaped bacterium that occurs naturally on dead or decaying matter in the soil.

How does it work?

It is soil bacteria that occurs naturally worldwide and is cultured specifically for pesticide use using high quality controls. Btk is only toxic to specific lepidopteran insects in the caterpillar stage of their life cycles. When Btk is ingested by the susceptible caterpillar, the highly alkaline environment of the caterpillar's gut triggers the Btk bacterium to release a crystalline protein called an 'endotoxin' that is toxic to the insect's digestive system. The caterpillar must ingest the Btk bacterium in order for it to be effective.



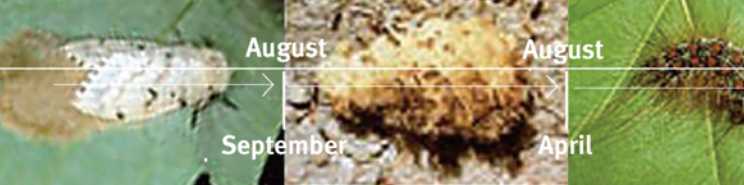
Btk does not affect adult moths and butterflies. This includes the Monarch Butterfly as it is not in the caterpillar stage at this time of year. Btk does not affect other insects, honeybees, fish, birds or mammals. There is also no impact on animals that may eat a Gypsy Moth caterpillar that has ingested Btk. Once applied, the Btk biodegrades quickly into the environment through exposure to sunlight and micro-organisms. There are no groundwater contamination concerns, as Btk does not percolate through the soil beyond 25 cm.

Is it safe?

The safety and health of residents and the preservation of the environment are top priorities for the City of Mississauga.

In 2006, when Mississauga was first faced with this issue, City Council moved cautiously and extensively evaluated every available control option. Mississauga did its homework and due to the severity of the outbreak, Council endorsed the recommendation to conduct an aerial spray using Btk, a naturally occurring bacterium that is approved for use on organically grown produce and one which most of us have already had contact with. Based on the success of the 2006 program and the Gypsy Moth population outbreak facing 10 new areas across the city, Mississauga City Council has endorsed an aerial spray using Btk as part of the 2007 control program.

Btk has been extensively studied by the United States Environmental Protection Agency (EPA), Health Canada Pesticide Management Regulatory Agency (PMRA), and the United Nations Environmental Programme in conjunction with the World Health Organization (WHO). These agencies conclude that Btk poses minimal risk to human health when used as directed. Research and studies of Btk show low potential for adverse public health impacts – including impacts on



children, pregnant women and the elderly. In addition, the aerial spray program is not expected to have adverse effects on children with asthma or people with weakened immune systems. The weight of evidence from studies demonstrates that Btk is not infective or pathogenic.

The City believes that a co-ordinated spray program is preferable to an individualized approach in which toxic chemical pesticides may be used.

Residents with specific medical health concerns may call the Region of Peel - Public Health at 905-799-7700.



Full grown Gypsy Moth caterpillars



Spray Days – What you need to know

NOTIFICATION

The following will be used to notify residents of the aerial spray program details:

Website – www.mississauga.ca/pestmanagement

Hotline Message – 905-615-3200, ext. 7878

Newspaper Advertisements – The Mississauga News, The Toronto Star

Portable Road Signs

E-mail Notification to resident association representatives

Rogers Cable 10 – public service announcements and community notices

Media Advisories

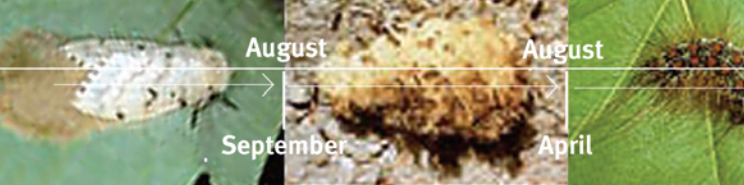
DATES

At this time the City is planning to conduct two aerial applications (includes all 10 spray zones). The first aerial application of Btk will begin mid-May, with the second application following the next week. The need for the third application will be determined after the second application. Residents will be notified in advance if a third application is going to be conducted.

Spray days are weather dependent and actual dates will be selected 48 hours in advance. Residents can find up-to-date information regarding spray dates on the Gypsy Moth website or by calling the hotline.

CANCELLATIONS

If a spray is going to be cancelled, it will be done 12 to 24 hours in advance. A notice will be posted on the Gypsy Moth website and the hotline message will be updated. In addition, notification will be provided to resident association representatives.



Based on current weather pattern predictions, it seems we will be able to conduct two full aerial spray applications. If we are unable to conduct a full spray due to weather constraints, areas with the highest concentrations of Gypsy Moth caterpillars will be selected. The other areas will have Integrated Pest Management (IPM) controls implemented.

TIMES

The aerial applications will take place between 5 and 7:30 a.m. The aircraft will be grounded by 7:30 a.m.

LOCATIONS

There are 10 zones included in the Btk aerial spray control plan. Exact spray boundaries for each area are outlined on pages 6 to 12.

It will take two days to spray all 10 impacted zones once and two applications are planned. The spraying will begin with the zones in the north part of the City and work south.

PREPARATION AND FOLLOW UP

It is not expected that residents will see a lot of Btk residue on items such as siding, children's play equipment, etc. It is recommended however, that where possible residents bring in children's play toys (e.g. bicycles, wagons, play houses, small slides, balls, bats, hockey nets, etc.) cover sand boxes and other larger play equipment, park cars inside the garage and either cover or bring in patio furniture and barbecues. These are simply precautionary measures. For a short time following a spray, residents may notice an organic smell in the air as a result of the bacteria.

Following a spray, increased attention to good personal and food hygiene is recommended (e.g. hand washing after outdoor activities, especially gardening and yard work; washing all fruit and vegetables before cooking and eating). Btk is



formulated to stick to foliage when it dries. To remove dried Btk from any surface, wet the surface with water and then sponge or wipe with a soft cloth. For some items, such as car windshields, soap or a cleaning product may be needed. As for backyard swimming pools, normal maintenance procedures are all that's required.

AIRCRAFT

A twin engine helicopter with a spray system utilizing rotary atomizers will be used to conduct Mississauga's aerial spray program. The helicopter will be flying approximately 50

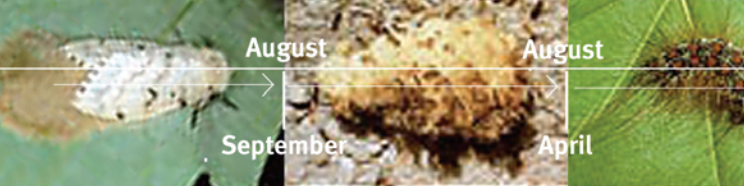


to 100 feet above the tree tops and will be using a Global Positioning System (GPS). Spray boundaries will be entered into the system, which means the actual flight path will match the actual spray boundaries on the ground. In addition, the aircraft navigation system is tied into the GPS, so only areas designated for spray will be sprayed. Every hectare of every spray zone will receive an equal amount of Btk. Residents will be able to see and hear the aircraft as it conducts the spray. Residents will likely be unable to see the spray as the mist will be too fine and concentrated on the top of the tree canopies.

ROAD CLOSURES

The City of Mississauga received approval from Transport Canada to conduct the aerial spray control program, and is complying with the requirements of the Ministry of Transportation, the Ministry of the Environment, Peel Regional Police, Ontario Provincial Police (OPP) and the Royal Canadian Mounted Police (RCMP).

The requirements deal specifically with minimizing the risks and potential damage to



property and residents as a result of the low flying helicopter. To satisfy the requirements, local road closures will occur during spray days.

The road closure areas will correspond to the zones being sprayed – not all areas will experience road closures on every spray day. Road closures will last approximately 10 to 20 minutes and will take place between 5 and 7:30 a.m. (The helicopter will be grounded by 7:30 a.m.) The road closures will correspond to the aerial spray application days expected to take place between May 16 and June 8. It is important to remember that spray days are dependent on weather and some dates may have to be cancelled and rescheduled. Up-to-date information will be available on the Gypsy Moth website and hotline message.



Gypsy Moth hatch out on Oak tree.

Photo: ncrca-Atlantic

Notification signs will be posted along local roads a week in advance to announce the potential upcoming road closures. Road closure notifications will also be published in The Mississauga News, posted on the Gypsy Moth website and details provided on the hotline message.



To minimize the potential risks associated with the low flying helicopter, and to ensure the City is complying with all the transportation agencies safety requirements, residents are strongly urged to stay indoors for the duration of the spray as well as 30 minutes after, and not travel in or out of the spray zone area during the treatment. Residents are asked to plan ahead in regards to daily activities such as walking dogs, walking to the bus stop or schools and modify their schedules to do these activities either earlier or later in the day. While this might mean a change of routine for some, we ask for your co-operation as we want to ensure we are complying with all regulatory agencies to make the spray control program as safe as possible.

All 9-1-1 emergency services (police, fire, ambulance) will be able to access all spray zone areas at all times – even during treatment times. They will have full unrestricted access to all properties for the duration of the aerial spray control program.

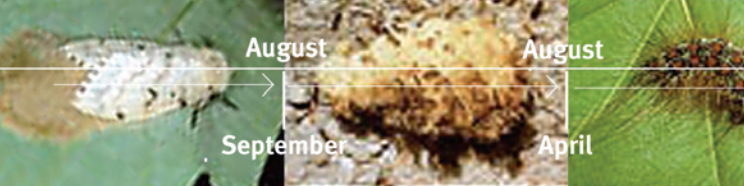
If it is simply not possible that you remain in your home during the spray, specific exit routes have been developed out of each spray zone area.

For a complete listing of these maps and directions or for additional information regarding road closures, please visit the Gypsy Moth website or call **905-615-3200, ext. 5794**.

BTK FORMULATION, LABEL AND CONCENTRATION

FORMULATION

The formulation of Btk the City will be using, Foray 48B, is comprised of 3 per cent (3%) actual bacteria, 75 per cent (75%) water and 22 per cent (22%) food grade inerts. The term ‘food grade inerts’



refers to a special blend of additives that give the formulation protection against ultraviolet light and help make it stick to foliage; they do not pose any health risks.

Btk remains effective for approximately three to seven days. This is why two applications are necessary. It breaks down quickly when exposed to sunlight and micro-organisms. Generally speaking, Btk loses 50 per cent of its insecticidal strength in one to three days after spraying.

LABEL

The label for the biological insecticide Btk the City of Mississauga will be using for the aerial spray control program is Foray 48B. The label is registered by Valent BioSciences Corporation and Valent BioSciences Canada Ltd. under the Pest Control Products Act (PCPA) under Health Canada's Pest Management Regulatory Agency (PMRA). The PCPA registration number is 24977.

The label provides information on:

- Directions for use
- Ground application
- Aerial application
- Uses
- Dose rates
- Target insects
- Resistance management
- Precautions
- First aid
- Toxicological information
- Storage
- Disposal
- Notices to buyer and user

A copy of the label is posted on the City's Gypsy Moth website and is also available in hard copy by calling **905-615-3200, ext. 7878**.

CONCENTRATION

A small amount of liquid covers a large area: 4 litres per 1 hectare (2.5 acres). Comprehensive spray drift modelling has been done to ensure accurate and effective application.



COST

Currently, the total cost for the Gypsy Moth aerial spray program is estimated at \$317,000. Property owners living within a spray zone will receive an itemized bill following the spray. Currently, the projected cost per property is \$200 and recovers only those costs estimated for spraying over residential areas.

The remainder of the costs will be shared between the City and other public entities. A bill will be issued to all affected property owners following the spray and it will be based on the final actual program costs. The bills become due and are payable when received. A reminder notice will be issued after 30 days for all unpaid accounts.

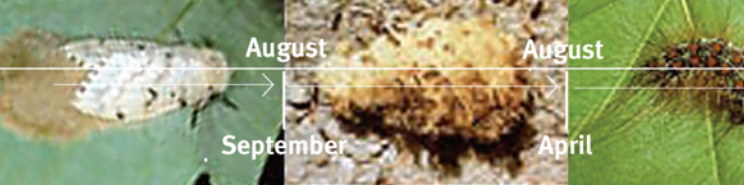
All residents located within a spray zone will receive a bill. Residents in these areas are receiving a direct benefit from the spray and are seeing significant cost savings, as the cost to hire a private spray contractor or remove a single mature tree is more than \$1,200.

All Mississauga residents contribute to the enhancement and sustainability of Mississauga's trees, woodlands and natural areas through their taxes.

Integrated Pest Management

Integrated Pest Management (IPM) is a decision-making process that utilizes a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools in a way that minimizes economic, health, and environmental risks.

The IPM approach uses knowledge of pest, plant and environmental conditions to select the best combination of management strategies. IPM recognizes the extraordinary adaptability of insects



and does not attempt to eradicate a particular pest entirely, but rather is aimed at keeping pest populations below the threshold level at which they can cause significant economic loss.

The City of Mississauga is recognized as a leader in Plant Health Care (PHC) and Integrated Pest Management (IPM) practices. The City believes that the best way to manage pests is through IPM controls, which place the emphasis on prevention and examines all available information and considers all options before deciding how to manage a pest problem.

DOING YOUR PART

Scraping and Destroying Egg Masses

The City of Mississauga is urging all residents, regardless of whether their home is located within a spray zone or not, to carefully inspect all areas of their property. Please inspect trees, patio furniture, wood piles, fences, children's play equipment and outdoor toys such as bicycles and wagons, eaves, siding, etc. and remove and destroy all reachable egg masses.

Egg Mass Scraping Tip: If you spray the egg mass with soapy water before scraping it into a container, it won't blow away in the wind. Egg masses should be soaked in soapy water for two to three days.

Scraping egg masses is a very important step in helping to reduce the number of Gypsy Moth caterpillars that hatch - removing one egg mass means 1,000 less caterpillars (approximately), so every little bit helps. It is also an important step to ensure that egg masses are not transported to other areas of Mississauga, the province or beyond.

The City's Gypsy Moth control program will not eradicate the Gypsy Moth population; it will bring the numbers down from crisis levels to more manageable levels. There will still be significant



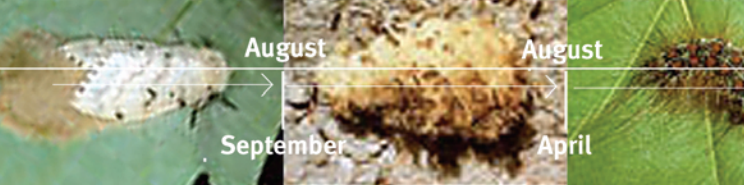
numbers of Gypsy Moth caterpillars in Mississauga, so the City needs the help of all residents, regardless of whether their property was sprayed or not, to implement the following IPM controls in residential areas:

- **Scraping off and destroying egg masses - now until the caterpillars hatch and then again in the fall when new egg masses are laid.**
- Picking caterpillars off foliage and soaking them in soapy water – May to July.
- Placing sticky bands on tree trunks – May to July.
- Installing burlap skirts around tree trunks and then collecting and destroying the caterpillars – May to July.
- Collecting and destroying Pupae – July to August.
- Using pheromone traps to capture and confuse male moths – July to August.
- Leaving wooded habitat around trees, shrubs and garden plants to encourage predators – throughout spring, summer and fall.

Success

There will be onsite measurement of the deposit of the Btk following each aerial spray to evaluate the coverage and accuracy of the spray. Success will also be measured by tree mortality figures, tree health in July (if the trees are green and covered with leaves versus completely defoliated) and extensive egg mass counts in the fall.

Even with the aerial spray control program, we expect to still have some loss of trees. The City is committed to re-planting trees on City property and keeping our parks green. Residents are



encouraged to implement healthy tree practices and to consult with qualified arboricultural companies to develop healthy tree management plans for their trees. A full list of healthy tree practices is available on the Gypsy Moth website at www.mississauga.ca/pestmanagement or by calling **905-615-3200, ext. 4100**.





August

August

FEMALE LAYS EGGS

EGG MASSES

CAT

September

April

FOR MORE INFORMATION

If you have any questions about Mississauga's planned aerial spray control program or would like more information, visit the Gypsy Moth website at **www.mississauga.ca/pestmanagement**
e-mail: **gypsy.moth@mississauga.ca**
or call the message hotline number at **905-615-3200, ext. 7878**

**For specific health concerns
call Peel Public Health at 905-799-7700.**

Cover photo: Gypsy Moth pupal cases on Cherry tree.



Produced by Communications Division

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