

Understanding the Gypsy Moth – Q&A from the FOCA webinar

On July 30, 2020 FOCA hosted a webinar on the topic of the invasive Gypsy moth, and cottage country impacts. FOCA members can access the digital recording of the webinar and the slides, posted here: <https://foca.on.ca/invasive-species/> under “News”. Following the webinar, FOCA worked with the expert presenters Paul Zimmer (Zimmer Air Services Inc.) and Allison Craig (Bioforest) to compile the following Questions and Answers on main topics and recurring themes mentioned by event attendees.

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QUESTION 1: How much defoliation can a tree sustain, and still survive? My oaks on my cottage 2 acres are completely defoliated but more importantly I have 50 red and white pines. Many have no needles left and some have the top tree with needles only. Will the branches produce more needles?

ANSWER: That is the million-dollar question! Good healthy deciduous trees such as Oaks should be able to withstand a couple of years of defoliation and survive without problem. If there are other issues like a drought or poor soil conditions, or the tree is already under stress from something else that has affected the tree health, die back or mortality can occur. There are no set rules here due to the variabilities in tree health condition. Putting out a second set of leaves does reduce the trees' reserves and reduces growth, so to say there is no impact to the tree is not correct.

Conifers do not store their reserves in the roots, they store their reserves in the needles. It is possible to kill a white pine or other conifers in one year if the tree was completely stripped of its needles.

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QUESTION 2: My neighbour developed a skin rash after removing caterpillars from her trees. Is that common?

ANSWER: The hairs of the gypsy moth contain histamine which some people are allergic to. Not everyone will have a reaction if coming in contact with the caterpillar, but it is possible and is a known adverse effect.

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QUESTION 3: Because 2020 was a bad year for Gypsy moths, does it necessarily mean that next year will be bad, or could winter and spring weather conditions have a significant population effect on caterpillars?

ANSWER: Populations build and decline and eventually collapse. Doing egg mass counts in the fall will provide some indication of what you can expect for the following year. You can hire the services of an arborist or try to do it yourself using the egg mass survey plot posted on the FOCA website. Cold prolonged winters with temps. below -20 can also kill off some egg mass viability. Cool wet springs when the caterpillars are feeding helps produce the NPV virus and fungus. If you were seeing a lot of dead caterpillars hanging on the trunk in an upside down "V" or hanging with the head down is a sign of the natural controls. I don't believe we had a spring conducive to increasing these natural controls.

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QUESTION 4: Is it sufficient to scrape, crush, and allow egg masses to drop to the ground, or must the egg masses be drowned? I have been told that if they drop to the ground they will rot or be eaten. Is this correct? Is there a problem if we remove the egg masses as soon as we see them, or should we wait until late winter? Do I have to wear gloves when I do this?

ANSWER: Egg masses are still viable on the ground and snow cover will actually help them survive in sub-freezing conditions. The egg masses should be put in a bucket of soapy water to

kill them. You cannot rely on other predators to eat all the egg masses. You can remove the egg masses as soon as they are laid. Because a good portion of the egg masses are laid higher up in the trees it is difficult to see them when the tree is in full foliage. I do not know of anyone getting an allergic reaction to the egg masses, but I would recommend you still wear gloves during the process.

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QUESTION 5: Can individual trees be protected with an injection? I heard this was an option.

ANSWER: Yes, individual trees can be protected with TreeAzin®, a systemic insecticide that is injected directly into the base of trees. TreeAzin is a botanical injectable insecticide formulated with azadirachtin, an extract of neem tree seeds. TreeAzin treatments target first and second instar larvae and occur post-bloom, during or just after egg hatch to inhibit early instar larval development and limit the amount of damage to the tree. Similar to aerial spray programs, injections do not eradicate the population. TreeAzin controls gypsy moth populations and protects individual trees from sustaining significant damage during outbreaks. Tree injections are a suitable choice in environmentally sensitive areas because the product is injected directly into the tree without environmental exposure. Today, TreeAzin is used by Canadian municipalities including the City of Toronto and the City of Mississauga as part of their gypsy moth control programs. Injections must be performed by a licensed pesticide applicator.

A certified TreeAzin applicator can be found on BioForest's website at <https://serviceproviders.bioforest.ca/>, or contact a BioForest technical specialist (www.bioforest.ca; 1-888-236-7378) for more information.

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QUESTION 6: If I want to try creating physical barriers on my trees to prevent the caterpillars from climbing, such as a tape band around each trunk, what products should I use and where do I find them?

ANSWER: Start with your local nursery or garden supply centre for some of the products used. There are commercial products sold such as sticky tapes. You can also do an internet search. E-Bay and Amazon had products listed for gypsy moth caterpillar use. Avoid using things like Vaseline or oils as they will be ineffective, nor are they great for the environment.

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QUESTION 7: Some areas are looking at aerial spraying. Are there any significant concerns with aerial spraying with either Gypchek or Btk? Local scientists are sharing articles that indicate that Btk will impact all members of the Lepidoptera and consequently result in a 2-year limitation of birds. Spraying with Gypchek is considered to be more specific to the gypsy moths. Where would we be able to access this chemical for personal or aerial spraying?

ANSWER: Gypchek is a USA registered product. The equivalent is Disparvirus in Canada however there is none available for use. It is more specific to the Gypsy Moth as opposed to Lepidopteran caterpillars. The label states that it is for use by or under the direct supervision of the Canadian Forest Service in government sponsored gypsy moth management programs. You or I could not purchase and use this product even if it was commercially available due to

the use restriction. If we could purchase Disparvirus and IF we could use Disparvirus, the price would probably exceed the cost of btk by 500% on a per acre basis.

BTK will affect other Lepidoptera but only if they are in the caterpillar stage feeding in the wooded areas during the same time. That potential is relatively low because of what they eat and where their food source is located. Additionally, the areas we would be applying btk to is quite small in the overall landscape and will have very short residual activity. For more information on Foray 48B, see: <https://www.valentbiosciences.com/foresthealth/>.

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QUESTION 8: If we're being told constantly to avoid using pesticides or toxic products at the cottage, shouldn't we also avoid aerial spraying?

ANSWER: Aerial application is simply a delivery method for Foray 48B which although is registered as a Pesticide by the PMRA it is an extremely safe biological product. It is not toxic. It is in fact Certified Organic in Canada. Health Canada approved it for this use only after exhaustive scientific studies during the registration process and subsequently through a rigorous re-evaluation process which is ongoing. I would not recommend spraying broad spectrum chemical pesticides that would have a detrimental effect on the environment, insects, wildlife, aquatic organisms, and humans. Everything we do has an environmental impact, be it city dwellers driving to the cottage, or doing nothing during a severe outbreak.

The MNRF sprayed this product on 100,000 hectares of forests in NW Ontario in 2019, and was planning to spray 80,000 hectares in 2020 until Covid cancelled the program; so, there are times when aerially spraying a safe, PMRA approved pesticide may in fact be environmentally beneficial.

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QUESTION 9: Can the spraying have a negative impact on humans? What if I am (or my kids or my pet are) outside while spraying is happening?

ANSWER: This product Foray 48B has been sprayed all over the world in municipal settings including Victoria, Vancouver, Winnipeg, and in Ontario, Toronto, Mississauga, Hamilton to mention a few. Extensive health studies have been carried out on the population in some of these areas and no detrimental health effects were contributed to the use and aerial application of btk. The public is unlikely to experience any symptoms and no special precautions are necessary. Btk aerial spraying is also not expected to have adverse effects on vulnerable populations including children with asthma, people with weakened immune systems, pregnant women or the elderly. However, infrequently there may be some residents who are more sensitive and may experience skin, eye or respiratory irritation.

Regardless of safety we request you stay indoors during the application as there will be an odour for a brief period which you may not like. But again, it is not harmful. As you can imagine it is difficult to lock down the population in a city like Toronto during the applications. During multiple programs over the last 14 years we [Zimmer Air Services Inc.] have on occasion sprayed residential areas and noted people out on the street. I am not aware of any negative health outcomes or complaints related to their health if they were able to smell the btk, or droplets were able to penetrate the canopy and land on them.

There are some relevant health studies available for viewing. British Columbia has carried out many of these programs using Foray 48B and consequently has gathered a lot of data relating to human health: <https://www.healthlinkbc.ca/healthlinkbc-files/gypsy-moth-spraying>.

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QUESTION 10: Does Btk negatively affect insects, birds, fish, butterflies or bees? Are the larvae of gypsy moths readily distinguishable from those of any beneficial insects, or do we risk killing beneficials through misidentification?

ANSWER: The btk has no effect on other insects, bees, birds, fish, or aquatic organisms. As indicated previously (see Question 7), it targets Lepidopteran caterpillars and will only affect those that are in the caterpillar stage during the application in the forest. As most are not in the caterpillar stage at the same time and feed on other types of plants, the potential to harm off-target caterpillars is minimal.

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QUESTION 11: If egg hatching occurs at different times in the spring even among properties in close proximity, and the spray only lasts a few days on the leaves to be eaten by the caterpillars, how is the date for spraying set in any given area?

ANSWER: The date for spraying is typically determined through a combination of temperature-driven simulation models and maps (BioSIM), as well as in-field assessments to monitor egg hatch and host emergence which helps to refine the spray date. For maximum efficacy, leaves should be expanded a minimum of 30% and eggs should be 90-100% hatched. Two sprays are performed, between 7 to 10 days apart, in order to accommodate for variations in egg hatch.

BioSIM maps are produced annually by BioForest and are available on BioForest's website (www.bioforest.ca, under "Resources") and BioForest staff conduct in-field assessments for numerous municipal aerial spray programs across Ontario. Contact BioForest's Urban Forest Health Services team (1-888-236-7378) for more information.

ADDITIONAL THOUGHTS: The BioSIM model is quite accurate for the area. Yes there will be some small variations in hatch because of the location of the egg mass. That variation will only last a few days, not weeks so when we begin to apply at 90% hatch with sufficient leaf out, our 2nd application should catch the rest of the hatch-out. Keep in mind btk is used to prevent defoliation. It is not a scorched earth approach so there will still be some caterpillars around.

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QUESTION 12: Does the Ministry of Natural Resources and Forestry have a current spraying program for Gypsy moths? What Ontario Municipalities are doing/have done spraying in recent years?

ANSWER: The MNRF and Province stopped funding programs on private land for the gypsy moth in the late 80's although they may have carried out some gypsy moth applications on Crown Land into the 90's. I am not aware of any Gypsy Moth spray programs initiated recently although they do have it as a control measure if they so choose to use it. As indicated earlier the MNRF had a btk spray program in 2019 and sprayed 100,000 hectares for the Jack Pine Budworm. In 2020 there was no program because of Covid but they are planning on carrying

out programs in 2021 and 2022. In addition to Ontario British Columbia, Quebec, New Brunswick, and Newfoundland carried out government programs in 2020. In BC the MNR carries out spraying programs routinely for the Asian Gypsy Moth.

In 2020 Sarnia, Toronto, and a small municipality in Niagara called Pelham carried out programs. Over the last 5 years we have carried out programs for Oakville, Mississauga, Toronto, Hamilton, Burlington, etc., Surrey and Delta in B.C.

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QUESTION 13: If my municipality is spraying Btk, can I “opt out” of the process? I don’t want my property to be sprayed.

ANSWER: Your municipality has the power to enact by-laws for the greater good of the municipality and its residents therefore you cannot opt out. Each municipality in the preceding question enacted such bylaws during the gypsy moth spray program. The urban tree canopy provides health, social, environmental, and ecological benefits to communities. If a municipality has chosen to carry out a spray program they will have surveyed the area and will only spray those areas that will be moderately or severely defoliated. They will not blanket spray the area.

I know of no municipality proposing to carry out a municipal run program in cottage country, at this time.

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QUESTION 14: Can our cottage association hire an aerial sprayer to treat our area?

ANSWER: Cottage Association do not have the legal authority to bind its members relating to their own personnel property. Zimmer Air Services Inc. requires every member in the Association to sign a contract or a waiver. We require this because a number of years ago although we had a contract with the Association and were advised that the members supported the program, not all property owners did. A complaint was made by the property owners to the MECP and ZASI were found in violation of the Pesticide Act having sprayed someone’s property without their consent. What other aerial application providers do may vary from what we do.

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QUESTION 15: We have a group of property owners in our area who want to spray to protect our trees. What do we do next?

ANSWER: Probably the first thing to do is some level of egg mass survey to ensure you will have a Gypsy Moth caterpillar problem next year. (see more, under the next questions) That done, you can use the guide the MNRF have provided which is on the FOCA website however the guide is geared towards woodlot owners not cottagers. It is quite out of date and many of the service providers on the list are no longer in business, no longer spray, or are out of Province and those remaining may not adhere to all aspects of the MNRF guide.

Your best bet is to contact an aerial applicator for information on how they propose to manage a spray program and to obtain pricing. Every company will have a different procedure and timelines for entering into a contract. Providing the pest, area size, location, and number of participants will help the provider determine the cost and legal requirements that must be met if

a program is to proceed. There are different legal requirements carrying out a spray program from a group of woodlot owners as compared to a group of cottagers.

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QUESTION 16: What should I do if I want egg mass surveys conducted on my property or within my cottage association area?

ANSWER: FOCA has posted fact sheets on how to conduct egg mass surveys on your property at <https://foca.on.ca/invasive-species/>. The surveys are straightforward enough, but can be time-consuming and may be physically demanding, depending on the terrain of your property. If you are interested in having BioForest conduct egg mass surveys on your property, or if numerous properties within a cottage association are interested, contact BioForest's Urban Forest Health Services team (1-888-236-7378) for more information.

QUESTION 17: How much "buffer" does a sprayer leave, if a neighbour property "opts out" of the process?

ANSWER: There are two scenarios here, and I am speaking on behalf of Zimmer Air Services Inc. (ZASI) only, not other aerial application service providers. Although it may be suggested that no buffer is required, ZASI will only do this if a property owner opted out but does not object to the spraying or the use of btk. If the property owner is an "objector" then we must adhere to their legal rights and not spray on their property. We will look at every location on its own merits and will determine an appropriate buffer. Typically, for discussion purposes, we use 20 metres as a guide.

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QUESTION 18: How small (narrow) of a property is viable for spraying?

ANSWER: The minimum swath Zimmer Air Services Inc's A/C covers is 30 meters (100 feet). Spraying a single property will possibly be not that effective, depending upon the level of infestation of the Gypsy Moth. Note that an aerial applicator may charge more, or decline spraying small stand-alone properties. It is always best to get your neighbors involved as they will probably have the same problem as you do. Doing so will attract greater interest from an aerial applicator and be more effective for all involved.

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QUESTION 19: What is the "cut-off" date to get programs in place for next Spring for btk spraying?

ANSWER: Different companies "cut off dates" will vary. Zimmer Air Services Inc. (ZASI) uses March 31st as our cut off date, as our btk order date is established for April 1. As the btk is a living bacterium and is manufactured in the USA, the manufacturer does not produce a lot of excess product as they cannot sell it as new product the following year. To ensure customers' needs can be met, early order and shipping is necessary to meet customer contracted program requirements. Even prior to the April 1st date, we are providing ballpark projections to the manufacturer of how much product we might require. After April 1st, we may take late bookings however that will depend on the btk, availability, our ability to organize a late signed contract,

and to get product here in a timely manner. Additional charges will apply so ZASI has a late booking fee. If you are waiting until you see the caterpillars feeding you will probably be too late to get a contractor in to carry out a program.

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QUESTION 20: How do we find out approximately how much it might cost to spray our area (e.g., cost per hectare)? We may need to do some fundraising, ahead of time.

ANSWER: Once you know how large an area and number of participants in the program, the aerial applicator should be able to provide pricing. They may factor in positioning charges, or mobilization fees depending on that information. Pricing will change depending upon what the applicator uses, as there is a range of rates listed on the Label for the pest being controlled. The lowest price should not be the only determining factor. You may also want to check the aerial applicators' references. Some specialized equipment is necessary to do the application correctly, and many aerial applicators do not have this equipment or experience on these types of programs, which could reduce program effectiveness. Zimmer Air Services Inc. has a base price in accordance with their contracts. Decisions to spray or not to spray should be based on that price. Should economies of scale kick in with widespread participation in the program, some discounting may apply. We feel our pricing schedule is already a good value so large discounts are not possible. Once the mapping has been completed, payment will be requested for April 15th and any discounts if applicable will be provided at that time.

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QUESTION 21: If I have my cottage lot sprayed (0.5 acres), but the forest across the access road from my lot isn't sprayed, what is the likelihood Gypsy Moth caterpillars from the forest will cross the road and begin eating the leaves of my trees? i.e. how far will they travel to get to more trees?

ANSWER: There is the potential that migration from an untreated area will occur, but only if the untreated areas food supply is depleted. Spraying your property should still provide a reasonable level of protection to your foliage. Dr. Scarr has said they may travel up to 200 metres, however a strong wind when the caterpillars are hanging on their strings can also cause a blown-in population from further away.

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QUESTION 22: Where should I go to learn more about the Gypsy moth and control measures?

ANSWER: There is substantial information on the internet related to Gypsy Moth. I would recommend you focus your search on reputable sources like government sites and factsheets presented by known universities. You may want to use the Zimmer Air Services Inc. website as they have placed a lot of information on the site relating to the gypsy moth from past programs and unbiased reputable sources: visit www.zimmerair.com and under "Services" go to "Aerial Application/Forest Pest".