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Browntail Moth (BTM) Frequently Asked Questions

Biology

When will the caterpillars be active?

- The caterpillars are active at two times of the year. In mid-April, they emerge from their winter webs and begin feeding and growing until they reach their maximum size in June.
- The second batch of caterpillars hatch from their eggs in August and are active until early October when they enter their winter webs to hibernate, emerging the following spring.
- Contact: Maine Forest Service: (207) 287-2431

When do the caterpillars have toxic hairs?

- Caterpillars in their third larval stage begin to develop the toxic hairs, larger caterpillars have more of the toxic hairs.
- Contact: Maine Forest Service: (207) 287-2431

What time of year should I clip overwintering webs?

- The Maine Forest Service recommends clipping webs between October and mid-April before caterpillars emerge from winter webs and begin feeding on new leaves.
- This task is more easily accomplished after the leaves have fallen from the trees as the webs are more visible.
- Contact: Maine Forest Service: (207) 287-2431

What trees do browntail moth caterpillars feed on?

- Browntail moth caterpillars feed on a wide range of broadleaved trees and shrubs.
- Preferred trees include oak, apple, crabapple, pear, birch, cherry as well as other hardwoods.
- Contact: Maine Forest Service: (207) 287-2431

When do browntail moth adults fly?

- Adults emerge in July and are flying through August. Peak activity around lights at night is between 10 pm and 12 am.
- Contact: Maine Forest Service: (207) 287-2431

Do the browntail moths also have toxic hairs like the caterpillar?

- There is a possibility of adult moths picking up the toxic hairs from the caterpillar stage as the moths emerge from their cocoons; however, the brown hairs on the abdomen are not the toxic hairs.
- The caterpillars, pupal cocoons, and shed skins have the toxic hairs that can cause a skin rash.
- The hairs on the adult moths are not toxic and do not cause a skin rash.
- Contact: Maine Forest Service: (207) 287-2431

What time of year am I most likely to get a rash from the browntail moth caterpillar?

- The greatest risk for exposure to the toxic caterpillar hairs is between April and July.

- Caterpillars, shed skins, and pupal cocoons all have toxic hairs that can cause a skin rash.
- The toxin is stable in the environment for 1-3 years and hairs can become airborne if disturbed, so one should take precautions year-round in heavily infested areas.
- Contact: Maine Forest Service: (207) 287-2431

Who should I contact for more information on browntail moth biology?

- Contact the Maine Forest Service forest entomologists at (207) 287-2431.

Management

Who can I report browntail moth infestations to?

- Report your detection to the Maine Forest Service if this is an area outside those where the browntail moth is widespread by going to <https://www.surveymonkey.com/r/btmreport> A risk map of infested areas detected through survey is available at: https://www.maine.gov/dacf/mfs/forest_health/invasive_threats/browntail_moth_info.htm#survey_mgmt
- Contact: Maine Forest Service: (207) 287-2431

How can I get rid of browntail moth adults?

- A wet/dry vacuum with a HEPA filter and filled with a few inches of soapy water.
- Keep outdoor lights off at night during the last week of June to the first week in August
- Contact: Maine Forest Service: (207) 287-2431

How can I get rid of egg masses?

- Egg masses are usually found on the bottom of the leaves of host trees (oak, apple, crabapple, pear, birch, cherry, and other hardwoods). Clip off affected leaves with gloved hands and soak the eggs in soapy water for two days then throw them away.
- Contact: Maine Forest Service: (207) 287-2431

How can I get rid of caterpillars?

- Learn to recognize and avoid skin contact with caterpillars. A key feature is two orange dots on the tail end.
- Pesticides can be used to control caterpillars. The Maine Forest Service recommends contracting with a licensed pesticide applicator to control browntail moth. Products must be labeled for the site of treatment.
- Pesticide treatments should be done before the end of May. Later treatments will not reduce human exposures to the toxic hairs.
- A list of contractors willing to do browntail work can be found here: https://www.maine.gov/dacf/mfs/forest_health/invasive_threats/browntail_moth_info.htm
- Contact: Maine Forest Service: (207) 287-2431

How can I get rid of caterpillars on the side of my house?

- Use a wet/dry vacuum with a HEPA filter filled with a few inches of soapy water.
- Contact: Maine Forest Service: (207) 287-2431

How can I get rid of caterpillar carcasses after pesticide treatment?

- On a damp morning, use a lawnmower with a bagger to bag clippings and remove from the site. You can also hire a lawn mowing company to do this work.
- Place a tarp or plastic under trees before treatment with pesticides. After treatment, remove the tarp/plastic from the site, dispose of caterpillar carcasses and rinse tarp/plastic off outside.
- Contact: Maine Forest Service: (207) 287-2431

How can I get rid of webs?

- Equipment that can be used includes a pair of hand snips, hand saw, and/or pole pruner, eye protection, clothing to cover skin and gloves.
- Removing webs only requires snipping out the nest itself rather than the entire limb.
- Collect nests and burn or soak in soapy water 3-5 days then throw them away.
- Clipping and destroying webs in the fall and winter can reduce populations.
- Pesticide applications can provide relief if webs are not within reach. The Maine Forest Service recommends hiring a licensed pesticide applicator for a pesticide application
- Licensed arborists can be hired to clip webs that are not within reach or are near hazards such as powerlines.
- A list of contractors willing to do browntail work can be found here:
https://www.maine.gov/dacf/mfs/forest_health/invasive_threats/browntail_moth_info.htm
- If you plan to hire a contractor, be aware that the demand for services is high. Try to line up services early.
- Contact: Maine Forest Service: (207) 287-2431

What is the best time of year to clip webs?

- Late October to mid-April.
- When the trees and shrubs are dormant.
- Contact: Maine Forest Service: (207) 287-2431

What protective measures should I take when clipping webs?

- Work with a partner, especially when working from a ladder or from a lift
- Wear protective eyewear.
- Wear gloves, long sleeves, and pants. Trees and shrubs may have toxic hairs from caterpillar activity.
- Individuals with known sensitivity to browntail moth hairs may want to leave web clipping to others.
- Do not clip webs that are outside your skill set (i.e. too high or near hazards such as powerlines), hire a professional.
- A list of contractors willing to do browntail work can be found here:
https://www.maine.gov/dacf/mfs/forest_health/invasive_threats/browntail_moth_info.htm
- Contact: Maine Forest Service: (207) 287-2431

How do I manage browntail moth webs in tall trees?

- Some libraries have sets of pole pruners for loan. You may also be able to rent pole pruners.
- With care, a stable ladder, such as an orchard ladder or a lift can help in access to higher webs
- Some trees are too big to practically manage through web clipping, even by professional arborists. Properly applied insecticides can work for population reduction in these trees.

- The Maine Forest Service maintains a list of licensed arborists providing pruning services that can be found at https://www.maine.gov/dacf/mfs/forest_health/invasive_threats/browntail_moth_info.htm.
- Contact: Maine Forest Service: (207) 287-2431

How do I find a licensed arborist to remove browntail moth webs?

- The Maine Forest Service maintains a list of licensed Arborists willing to clip nests https://www.maine.gov/dacf/mfs/forest_health/invasive_threats/browntail_moth_info.htm. If you already have a relationship with a licensed arborist reach out to them in September to line them up for winter web removal.
- An Arborist for hire must be state licensed and insured.
- For more information on hiring an arborist see: <https://www.maine.gov/dacf/php/arborist/index.shtml>
- Contact: Maine Arborist Program (207) 287-3891

How do I determine if I have a high browntail moth population and what should I do?

- Conduct a population assessment to determine how many webs are in the trees on your property. This should happen as early as possible in the dormant season beginning in October; however, it is often difficult to spot webs in oaks until December. A guide to surveying for webs is available online here https://www.maine.gov/dacf/mfs/forest_health/documents/browntail_moth_citizen_science_survey.pdf
- Contractors (licensed pesticide applicators or arborists) should be lined up as soon as a decision is made to contract for help.
- Web clipping should happen during the dormant season, generally October through Mid-April
- Caterpillar treatments should happen in early spring, generally before the end of May.
- The best time to manage browntail moth is when its populations are low.
- Contact: Maine Forest Service: (207) 287-2431

I can't afford to treat my trees, what can I do?

- Clip and destroy any webs that are within reach during the dormant season (October through Mid-April)
- Talk to your neighbors, they may be willing/able to help if they are already treating their trees. However, unless they are licensed pesticide applicators, they cannot treat trees on your property with pesticides.
- Tree removal is an option to manage browntail moth, but the benefits of mature trees should be weighed against removal; removals can be followed by the planting of non-host trees.
- Follow precautions to reduce exposure to browntail moth hairs.
- Contact: Maine Forest Service: (207) 287-2431

My neighbor won't treat their trees. Should I even consider treating mine?

- Yes, however, consider the following:
 - Treating browntail moth in your yard will not impact the overall population. It can provide some relief in the treated areas for normal outdoor activities
 - Adult browntail moths are strong flyers and may find your treated trees from long distances, not just nearby untreated properties
 - Understand that there are many reasons people may choose not to treat browntail moth with pesticides. Having a conversation may help come up with an approach that works for the whole neighborhood.
 - Contact: Maine Forest Service: (207) 287-2431

Is tree removal recommended to help manage BTM?

- If there are trees that can serve as a host for browntail on your property removal and planting a non-host tree such as a red or sugar maple is a viable option.
- Tree removal can be successful year-round but is best performed from August to April.

- Benefits of mature trees should be weighed against removal.
- Contact: Maine Forest Service: (207) 287-2431

Does killing browntail moth adults (moths) help with management?

- Moths found on buildings and in light traps are primarily males. Killing males is unlikely to reduce the next generation of browntail moth.
- Using a bug-zapper or other device to kill insects attracted to lights is not recommended. It will kill insects that might help control browntail moth and other pests as well as browntail moths. It will also attract more browntail moths to the area. Females attracted to an area by lights tend to hang out in host tree foliage and are not captured in high numbers with these methods.
- Contact: Maine Forest Service: (207) 287-2431

How do I find a licensed pesticide applicator?

- The Maine Forest Service maintains a list of licensed pesticide applicators willing to treat trees: https://www.maine.gov/dacf/mfs/forest_health/invasive_threats/browntail_moth_info.htm, you can also find a list of all for hire companies on the board of pesticides control website, applicators for
- A pesticide applicator must be properly licensed and insured to treat your property.
- Contacting a licensed pesticide applicator should be done as soon as you think you'll need one as there are a limited number of licensed applicators willing to treat for browntail moth
- Contact: Board of Pesticide Control: (207) 287-2731

Who do I contact for more information on browntail moth management?

- The Maine Forest Service or Board of Pesticide control can answer questions related to BTM management.
- Maine Forest Service: (207) 287-2431
- Board of Pesticide Control: (207) 287-2731

Pesticide Options

General

How safe are pesticides?

- Pesticide safety is always about risk not hazard. All pesticides are known to have hazard (the ability to cause harm) but whether or not they cause injury is based on exposure (how much an organism receives). Risk (or how likely harm is to occur) is equal to hazard times exposure (Risk = hazard x exposure).
- As part of the risk assessment pesticides undergo for EPA registration, potential to harm organisms both terrestrial and aquatic is assessed.
- Pesticides allowed for use in certain areas have been assessed for how long the pesticide persists and how hazardous it is to organisms (fish, birds, honeybees and plants are tested).
- Not all pesticides are allowed to be used in all situations.
- Reading and following the directions on the pesticide label is an important part of making sure we prevent ecological or human health injuries.

How can I tell if a product is registered in Maine?

- Not all products that are registered by the EPA are registered in Maine. All products that are registered in Maine can be found at http://npirspublic.ceris.purdue.edu/state/state_menu.aspx?state=ME
- Contact: Board of Pesticides Control (207) 287-2731, thinkfirstspraylast.org

What is the timing for spraying for browntail moth caterpillars?

- The pesticide applicator or product manufacturer should be good sources of this information. Every EPA registered pesticide label has a section with a 1-800 number specifically for people to contact them for more information about the product.
- Refer to the pesticide label, some labels restrict applications to certain life stages.
- Maine Forest Service: (207) 287-2431
https://www.maine.gov/dacf/mfs/forest_health/invasive_threats/browntail_moth_info.htm
- Cooperative Extension: 1-800-287-0279 or (207) 581-3880, <https://extension.umaine.edu/diagnostic-lab/>
- Reach out to the National Pesticide Information Center (NPIC) 1-800-858-7378 or npic@ace.orst.edu

What method of pesticide application is best?

- The best method of browntail moth management depends on the situation.
- An integrated management approach is ideal.
- Where it is possible and practical, removing and destroying the nests is the preferred control method.
- Should you decide to use pesticides, foliar applications, tree and soil injections can be made using the products allowed by policy. It is recommended that you employ a licensed commercial applicator, or consult the BPC, MFS or UMaine Cooperative Extension:
 - Board of Pesticides Control (207) 287-2731, thinkfirstspraylast.org
 - Maine Forest Service: (207) 287-2431
https://www.maine.gov/dacf/mfs/forest_health/invasive_threats/browntail_moth_info.htm
 - Cooperative Extension: 1-800-287-0279 or (207) 581-3880,
<https://extension.umaine.edu/diagnostic-lab/>

Can I treat all of my host trees near an existing infestation on my property to prevent future infestations?

- Treating all of your susceptible oaks, apples, birches, cherries, and other potential browntail moth hosts is not considered to be a good approach. Depending on the product used and time of year this approach could be more costly, affect a greater number of non-target organisms, and could cause environmental pollution.
- The best practice is to use Integrated Pest Management (IPM) to effectively monitor, treat, and prevent browntail moth by scouting winter webs, clipping winter webs within reach, keeping outdoor lights off during moth flight (June – July), and precise application of pesticides when necessary.
- Don't forget that pesticide use should be a last resort when trying to get rid of any pest. For more information about integrated pest management techniques, visit the IPM council page https://www.maine.gov/dacf/php/integrated_pest_management/ipm_council.shtml.

I just treated my yard for browntail moth and now my neighbors are asking if I can treat theirs too, I can with their permission, right?

- Unless you are a licensed pesticide applicator, you can only apply pesticides to your own property – regardless of permission. Although this might seem like a nice gesture, it can lead to issues regarding permission, pollution, or even poisonings.
- The BPC recommends that homeowners hire licensed pesticide applicators.
- Visit the [BPC licensing website for more information](#) about requirements to obtain a license. Thinkfirstspraylast.org.

How do these pesticides work? (What is the mode of action of the pesticides used for browntail moth?)

- This depends on the product that is being applied. Pesticides used for browntail moth work by variable methods. Some products kill on contact, while others must be ingested by the caterpillar. Products that must be ingested may require time (even weeks) to provide control.
- Contact: Board of Pesticides Control (207) 287-2731, thinkfirstspraylast.org

What is the best pesticide to use for browntail moth?

- While a pesticide product may have been tested for efficacy on similar species, due to the localized nature of browntail moth impact in Maine, there has been limited efficacy testing for browntail moth.
- If the site or pest is listed on the label, then the product has been tested by the EPA for efficacy/safety on that site or against that pest.
 - Cooperative Extension: 1-800-287-0279 or (207) 581-3880,
<https://extension.umaine.edu/diagnostic-lab/>
 - Maine Forest Service: (207) 287-2431,
https://www.maine.gov/dacf/mfs/forest_health/invasive_threats/browntail_moth_info.htm

Who do I contact for more information on pesticide choice?

- Board of Pesticides Control (207) 287-2731 thinkfirstspraylast.org can provide information on the active ingredients and their potential impacts.
- Maine Forest Service and Cooperative Extension can provide more information on specific products
 - Cooperative Extension: 1-800-287-0279 or (207) 581-3880,
<https://extension.umaine.edu/diagnostic-lab/>
 - Maine Forest Service: (207) 287-2431
https://www.maine.gov/dacf/mfs/forest_health/invasive_threats/browntail_moth_info.htm

Control of Browntail Moth near Marine Waters

Should I use pesticides near marine waters?

- First and most important the Board of Pesticides Control strongly urges homeowners to hire a licensed commercial pesticide applicator to help them with controlling the browntail moth. Applications near water are likely to drift into the water, which is dangerous to the environment, and a violation of the law.
- The least toxic control method is to prune browntail moth nests during the months of October to April.
- If a pesticide product is going to be used, the distance from the high-water mark will determine which products can be used.
- In the context of browntail management, marine waters are defined as within 250 feet of the mean high tide mark adjacent to coastal waters and extending upriver or upstream to the first bridge”
- Contact: Board of Pesticides Control (207) 287-2731, thinkfirstspraylast.org

What pesticides and application methods can I use 0 to 25 feet from the high-water mark of marine waters?

- The Board of Pesticides Control recommends hiring a licensed commercial applicator to treat for the browntail moth. Licensed commercial applicators have been trained on which pesticide products, application methods, and timing for treatments are appropriate for use on the browntail moth.

- There are different rules/regulations for licensed commercial applicators and homeowners. The rules/regulations can be found at <https://www.maine.gov/dacf/php/pesticides/laws.shtml>, specifically in Chapter 29, **Standards for Water Quality Protection**.
- Contact: Board of Pesticides Control (207) 287-2731, thinkfirstspraylast.org

What pesticides and application methods can I use 25 to 50 feet for marine waters? The distance is always measured from the high-water mark:

- There are different rules/regulations for licensed commercial applicators and homeowners.
- Homeowners can use approved biological products that have active ingredients of BtK, BtA, *Beveria bassiana*, GS-omega/kappa-Htx-Hv1a, *Isaria fumosorosea*, kaolin clay, Spinosad. These products can be applied with powered equipment. The information listed on the pesticide label must be followed, **IT IS THE LAW**.
- Licensed commercial applicators using non-powered equipment can apply products allowed in the policies found at <https://www.maine.gov/dacf/php/pesticides/laws.shtml>
- Soil and tree injections are approved for appropriate pesticides.
- Contact: Board of Pesticides Control (207) 287-2731, thinkfirstspraylast.org

What pesticides and application methods can I use 50 to 250 feet from the high-water mark of marine waters?

- Products allowed by the Board of Pesticides Control's policies currently can have active ingredients of Acephate, Chlorantraniliprole, Cyantraniliprole, Indoxacarb, Piperonyl Butoxide, Tebufenozide, and Spinosad.
- Applications of products approved for use for 50 to 250 feet of marine waters high water mark can be made using hydraulic handheld and air-assisted equipment.
- Applications must be directed away from the water
- Applications must be made when the wind is greater than 2 MPH and less than 15 MPH (label may have further restrictions). The BPC recommends not spraying pesticide products if the wind is greater than 10 mph.
- Contact: Board of Pesticides Control (207) 287-2731, thinkfirstspraylast.org

What pesticides and application methods can I use past 250 feet from the high-water mark of marine waters?

- Applications of any pesticide registered in Maine for use on trees or ornamental plants following Board of Pesticide Control regulations and the pesticide label restrictions. If the trees or plants are fruit bearing the pesticide must also be specifically labeled for use on those fruits.
- The pesticide label is the law; applications must be made in accordance with label instructions.
- The site must always be listed on the label (in this case, ornamental trees or fruit trees) Tree and soil injections can be applied from the high-water mark to 250 feet or more.
- The products used must be approved for use on trees or ornamental plants. This information can be found on the pesticide label. If you have questions or for more information, please contact the Board of Pesticide Control by **visiting their web site: thinkfirstspraylast.org or by calling (207) 287-2731**

Pesticides and Food/Pesticides and Non-Target Organisms

How safe are pesticides?

- Pesticide safety is always about risk not hazard. All pesticides are known to have hazard (the ability to cause harm) but whether or not they cause injury is based on exposure (how much an organism receives). Risk (or how likely harm is to occur) is equal to hazard times exposure (Risk = hazard x exposure).
- As part of the risk assessment pesticides undergo for EPA registration, potential to harm organisms both terrestrial and aquatic is assessed.
- Pesticides allowed for use in certain areas have been assessed for how long the pesticide persists and how hazardous it is to organisms (fish, birds, honeybees and plants are tested).
- Not all pesticides are allowed to be used in all situations.
- Reading and following the directions on the pesticide label is an important part of making sure we prevent ecological or human health injuries.

I have trees that are within 50 feet of my well that I plan on treating. I am concerned about chemicals leaching down into my water source. What do I need to consider when treating near my well? Do the leaves that fall from treated trees pose a risk to my well?

- Applications near wells and surface water must be made thoughtfully.
- One of the first considerations in this scenario is to use tree injection rather than foliar spray or soil drench, as tree injection is a good first step in reducing off site movement. When the product is injected it is taken upwards because the tree is pulling water out of the ground to support the growing leaves. The product will spread out into all the tree parts. It is unlikely that the tree would send the pesticide down into the ground out through its roots.
- When thinking about what happens to the leaves, the answer to this question varies based on what pesticide is used. Consider selecting a pesticide that does not readily leach. Some pesticides are more likely to bind to soil and organic matter and are unlikely to flow off target with rainwater.
- Also consider choosing a pesticide with a short residence time in the environment, this varies widely between different pesticides. The leaves can contain pesticide residues but how much will depend on how long the pesticide lasts and if the pesticide stays dissolved in water.
- Reach out to the National Pesticide Information Center (NPIC) 1-800-858-7378 or npic@ace.orst.edu or the pesticides toxicologist at the BPC for more information about your pesticide's active ingredients.
 - Board of Pesticides Control (207) 287-2731, thinkfirstspraylast.org

If a homeowner is treating fruit trees from which they plan to consume fruit, how can they tell what pesticides are appropriate?

- All information regarding pesticide use will be present on the pesticide label.
- If the label states that the product is appropriate for fruit tree use, then it is appropriate to use in those places.
- The EPA determines if pesticides can be used on food crops.

If birds eat dying caterpillars will they be injured?

- Browntail moth have relatively few bird and mammalian predators due to the nature of their toxic hairs.
- Depending on the product and its toxicity, birds may or may not be affected if consuming treated insects.

If honeybees eat pollen/nectar from my oaks treated with a systemic pesticide will they die?

- Oak trees do not have nectar, but they can still provide sweet attractants to bees and other pollinators, most often through insect associates. In many cases, that insect activity will be impacted by treatments applied for browntail moth.

- Typically, at the time of the year in spring when browntail moth treatments are made other floral resources, like dandelions, are available and preferred by honeybees for foraging meaning oak pollen is not an important resource.
- This question also depends on factors of the pesticide's unique chemistry. Some pesticides are not likely to be found in the pollen, all of this depends on the pesticide.
- The longevity of the pesticide in the tree is also a factor. If the pollen is produced even just a couple of weeks after the tree is treated, the pesticide may have completely degraded by that point. If the pesticide is very persistent and present in the pollen, honeybees may be exposed. If it is an insecticide with a broad target range it would be possible for the pesticide to kill the honeybees.
- If the pesticide has the Bee Label, there is a higher risk to pollinators.



- When considering use of a pesticide reach out to the National Pesticide Information Center (NPIC) 1-800-858-7378 or npic@ace.orst.edu or the pesticides toxicologist at the BPC for more information.

If honeybees eat honeydew from aphids or other insects feeding on treated trees will the honeybees die? It is unlikely that aphids would survive feeding on treated trees. Most of the insecticides used in browntail moth treatments are likely to also affect most of the other insects feeding on the treated tree if they are feeding when the product is still persistent in/on the trees.

What pesticides can I use on fruit trees that are lower risk for pollinators or human consumption?

- If the label has fruit trees listed under site section it can be applied. The EPA determines whether or not a pesticide is allowed on food crops; if there is too much risk, the label will not list for fruit trees.

- If the pesticide has the Bee Label, there is a higher risk to pollinators.



PROTECTION OF POLLINATORS



APPLICATION RESTRICTIONS EXIST FOR THIS PRODUCT BECAUSE OF RISK TO BEES AND OTHER INSECT POLLINATORS. FOLLOW APPLICATION RESTRICTIONS FOUND IN THE DIRECTIONS FOR USE TO PROTECT POLLINATORS.

Look for the bee hazard icon  in the Directions for Use for each application site for specific use restrictions and instructions to protect bees and other insect pollinators.

This product can kill bees and other insect pollinators.
Bees and other insect pollinators will forage on plants when they flower, shed pollen, or

- The applicator must read and follow the label, it is the law.
- Careful attention to the environmental warnings found on the label must be followed.
- For additional information, contact the Board of Pesticides Control at (207) 287-2731 or thinkfirstspraylast.org

What are the impacts on birds, lobsters, bees, pets, and people?

- The label will have information on impacts to non-target organisms and the environment. The Board of Pesticides control can provide assistance in understanding the label.
- The pesticide products applied must follow the pesticide label to minimize risk. The BPC strongly urges homeowners to use a licensed commercial pesticide applicator.
- Contact: Board of Pesticides Control (207) 287-2731, thinkfirstspraylast.org

Pesticide Injections

I am planning on injecting infested trees myself, which trees should I inject?

- The Department of Agriculture Conservation and Forestry recommends working with an experienced and reputable licensed pesticide applicator for management of this pest but recognizes that this is not always possible.
- To decide which trees to inject, scope out where the webs are in your yard by searching during the winter when the leaves are off the trees, the webs will shine brightly in the sunlight. Some webs may look like single leaves, but examination with binoculars under good lighting conditions should reveal bright white silk holding the leaf to the twig. This survey effort will give you a good idea of where to focus treatment.
- Prioritize treatment of trees that are in high traffic areas such as overhanging a house or deck or other areas where avoidance will not be possible.
- Use web-clipping instead of injection to treat trees whose branches are within reach.
- Trees that are in poor health may not respond well to injections.
- In all cases, read, understand and follow label directions.

When is the optimal time for tree injections?

- The optimal timing for control of the caterpillars is when they are small.
- Injections that leave larger dead caterpillars with the associated hairs in your yard, either due to timing of injection or rate of product movement to leaves, are not ideal. In most years, controlling caterpillars before late-May is recommended.
- Timing of injection may depend upon product used, tree species, mode of pollination, seasonal development, and injection system. The Department of Agriculture Conservation and Forestry recommends working with an experienced and reputable licensed pesticide applicator for management of this pest.
- In any case, the label directions and other pesticide regulations must be followed. In addition, understanding of details regarding rate of translocation of the product to areas where the caterpillars are feeding and duration of product in leaf tissues and other parts is needed for optimal management.
- If a homeowner is intending to conduct treatments on their own they should be sure to understand and follow the label and know that information beyond what is on the label may be needed to understand what product best fits their needs.
- The product manufacturer, University of Maine Cooperative Extension Pest Management Office and Maine Forest Service Forest Health and Monitoring Division can provide additional guidance.

How quickly do injections start working?

- This aspect of injections depends on many factors including but not limited to timing of application, health of tree, product used, tree species, and method of application
- As an example, experienced licensed pesticide applicators report that products with emamectin benzoate appear to take a couple weeks to reach feeding caterpillars in the August treatment window and longer in the early spring. Some have seen two seasons of control with impeccably timed

spring treatment with this active ingredient. Acephate and Dicrotophos based products reach feeding caterpillars very quickly. Applicators report caterpillars falling from the trees while cleaning up after using Acephate based products (i.e. within 15-20 mins)._

How long do injections last?

- **How long will they protect from browntail?** Some of the treatments only actively kill browntail moth caterpillars for a few days after application while others maintain their efficacy for two generations (those that mature in the spring, and those that begin feeding in August).
 - The pesticide applicator or product manufacturer should be good sources of this information. Every EPA registered pesticide label has a section with a 1-800 number specifically for people to contact them for more information about the product.
- **How long do residues linger in the environment?** Some of the active ingredients are likely to be completely removed from the environment on the order of two or three weeks while others could be detectable in the environment for five or so years. All of this information is available for every pesticide registered for use.
- The National Pesticide Information Center (NPIC) is a good source for information on pesticides, they are available at 1-800-858-7378 or npic@ace.orst.edu you can also reach out to the pesticides toxicologist at the BPC for more information.

For products available as injections, which active ingredients are effective against browntail moth?

- Active ingredients of products reported in use by applicators include: Acephate, Dicrotophos, Emamectin Benzoate, Abamectin and Azadirachtin.
- There are not many formal trials of pesticides for browntail moth, so we do not have access to a lot of data on efficacy. For those that there are trials, the results are sometimes mixed, or the studies small.
 - Trials with Acephate injections were run by MFS in 1995 (10 trees,) and 1996 (12 trees). The results were variable, with poor control in moderate to high populations. Despite these mixed results, similar products continue to be used to this date, with reports of adequate control by licensed commercial pesticide applicators as well as homeowners.
 - In addition to the MFS trials Dr. Eleanor Groden at UMaine did some efficacy trials on six registered biorational insecticide products. Azasol was the only injectable in the group. In this limited field trial, Azasol was not found to be effective. More information on this can be found on [page 12 of the research summary](#).

Is there be an approved site(s) for disposal of injection cartridges?

- All product labels should have proper care, handling, rinsing, and disposal instructions specific to each product. If the instructions on the label are not clear on where or how to dispose of injection cartridges, consult the BPC by visiting their website or calling at 207-287-2731.
- Please establish pesticide container/cartridge disposal plan prior to purchasing any pesticide product.

What is recommended to remove fallen caterpillars from the ground after injections?

- Mowing with a bagger attached on a damp morning or hiring a lawn company to bag the grass clippings are effective.
- Be sure to take measures to avoid exposure to the caterpillars' toxic hairs when performing cleaning up.

How much of the insecticide for tree injections is making it beyond the target insect pest?

- Tree injectable products can remain active in the trees anywhere between 2 weeks to 2 years post treatment. The length of this period will play a part in off target impacts.
- Reading and researching the active ingredients and product labels will help you determine how long the systemic will remain active.

- Reach out to the National Pesticide Information Center (NPIC) 1-800-858-7378 or npic@ace.orst.edu or the pesticides toxicologist at the BPC for more information about your pesticide's active ingredients.

Are injections dangerous to aquatic organisms?

- Yes, most of these pesticides could kill many aquatic organisms but it is unlikely to ever reach them.
- Tree injection is a good first step in reducing off site movement and would definitely reduce the potential for harm to aquatic organisms.
 - When the product is injected it is taken upwards because the tree is pulling water out of the ground to support the growing leaves.
 - The product will spread out into all the tree parts. It is unlikely that the tree would send the pesticide down into the ground out through its roots.
- Most of the pesticides used for browntail moth are going to be toxic to other insects -aquatic ones included. Also, fish are typically more sensitive to pesticides because of how they continuously pump water across their gills to breathe.
- However, after the product is used the pesticide is diluted and simultaneously it is breaking down during its time in the tree, soil or water. It would be difficult to produce high enough levels of the pesticide in a nearby pond to cause harm. Yes, most of these pesticides could kill many aquatic organisms but it is unlikely to ever reach them.
- Pesticide safety is always about risk not hazard. All pesticides are known to have hazard (the ability to cause harm) but whether or not they cause injury is based on exposure (how much an organism receives). Risk (or how likely harm is to occur) is equal to hazard times exposure (Risk = hazard x exposure). As part of the risk assessment pesticides undergo for EPA registration, potential to harm aquatic organisms is assessed. Pesticides allowed for use in areas with lakes and streams have been assessed for how long the pesticide persists, how likely it is to stay dissolved in water, and how hazardous it is to aquatic organisms (typically pesticides are tested against two different fish species, a couple of aquatic invertebrate species, and several plant species).
- Not all pesticides are allowed to be used in all situations, reading and following the directions on the pesticide label is an important part of making sure we prevent ecological or human health injuries.

Are injections toxic to bees and other pollinators?

- Insecticides injected to control browntail moth are generally broad-spectrum. They could be toxic to pollinators if pollinators are exposed. Some pesticides are not likely to be found in plant nectar, while others are not likely to be found in plant pollen. Pollen of some trees and shrubs are less likely to be encountered by pollinators. Always read the label and follow the instructions on the label and look out for the pollinator toxicity symbol to reduce exposure of pollinators.



If our oak trees are injected with a pesticide like Vivid II (Abamectin) would the acorns be toxic if consumed by rodents or dogs?

Note: Acorns alone contain naturally occurring chemicals, tannins, that are hazardous for dogs. Eating acorns can lead to vomiting, diarrhea, and other gastrointestinal effects.

There are three main aspects to this question: 1) has to do with the 'persistence' of the insecticide, 2) depends on where in the environment the chemical is likely to go, or its 'partitioning', and 3) is about volume.

1) Persistence –In terms of how long the product sticks around, abamectin has what is known as a soil half-life of 25 days. If we calculate that out until the insecticide is completely removed from the environment (97% gone) we would expect some amount of abamectin to be present in the soil for 125

days or about 4 months. The timing of the injection and acorn development is an important part of this question. Also, we would expect the chemical to keep breaking down in the acorns as time persists. If acorns are eaten 4 months or longer following the application, we would not expect an exposure to occur. For this chemical, we also have information on how long it persists in plant tissues, but to be cautious 4 months is a good metric to use. Every pesticide is different in how long it persists, but this information can be easily found. Reach out to the National Pesticide Information Center (NPIC) 1-800-858-7378 or npic@ace.orst.edu or the pesticides toxicologist at the BPC for that information.

2) Partitioning –Abamectin does not dissolve well in water but it does dissolve into lipids and fats. After injection, abamectin moves around within the tree until it finds the parts of the tree that are best suited to these chemical properties (think of mixing oil and water, they will mix for a while but then they eventually separate). Acorns have a higher fat content than most places in the tree, so it would be expected to find abamectin in acorns following injection –depending on the timing. Not every insecticide works this way, and many are highly soluble in water, while others have a much shorter time before they breakdown. This information can be easily found for other products, reach out to the National Pesticide Information Center (NPIC) 1-800-858-7378 or npic@ace.orst.edu or the pesticides toxicologist at the BPC for that information.

3) Volume -The amount of the chemical that needs to be present in a tree to kill a feeding insect is a small amount because the target insects themselves are small. The injected chemical will get dispersed into the whole tree which further dilutes the chemical. If some of that chemical makes it into an acorn, it is unlikely that there could ever be enough to cause effects in pets. In our country, there is the continuing problem of children and pets finding pesticide products that people have brought into their homes but not stored in a secured or out of reach location, and many of them do get harmed from ingesting pesticides straight from the packaging. Always read the pesticide label regarding storage and store chemicals where children and pets cannot reach them.

Human Health Concerns

What are the symptoms of browntail moth toxin exposure?

- A skin rash on any part of your body that was exposed. The rash tends to be red, bumpy, and itchy. It can cause discomfort for hours to weeks.
- Respiratory issues such as breathing difficulty can occur if the browntail moth hairs are inhaled.
- If you are having trouble breathing, swallowing, or swelling of your mouth, tongue, or throat, call 9-1-1.

How do I treat the rash?

- Mild rashes can be treated at home with:
 - A cool bath with baking soda or Aveeno Oatmeal Bath
 - Hydrocortisone cream, such as Cortaid, sparingly to the itchiest areas
 - Calamine or caladryl lotion
- If home remedies are not working, see your healthcare provider. There are medications that your healthcare provider might recommend.
- Be careful not to apply any creams or lotions to places where young children may rub them into their eyes or mouth.

How do I treat respiratory symptoms?

- You can take allergy medications for mild respiratory symptoms (e.g. runny nose, sneezing).
- If you have asthma, an inhaler may reduce symptoms.

- Call your healthcare provider if your symptoms continue.
- If you have difficulty breathing, swelling of the mouth, tongue or throat, call 9-1-1.

Is the rash contagious?

- You cannot “catch” the rash from another person like you can a cold. The hairs need to come in contact with your skin, mouth, throat, or respiratory tract for symptoms to appear.

Is it safe to eat food grown in infested areas?

- If you suspect that a fruit or vegetable is contaminated with browntail moth caterpillar hairs, you should not eat the fruit or vegetable unless it can be peeled and/or cleaned to completely remove the hairs.
- Leafy vegetables may be more difficult to clean and may have a greater chance of retaining the caterpillar hairs, even after the washing process.
- Ingestion of the hairs is a concern because of possible allergic reactions in the mouth, throat, and esophagus, as well as the possibility of breathing in the hairs, which could cause respiratory issues.

Can I build up a tolerance to the browntail moth caterpillar hair toxin?

- There is not enough research available on browntail moth caterpillar hair toxin to know if individuals can build up a tolerance to the toxin.

Will the reaction to the hairs get worse each time I am exposed?

- There is not enough research on browntail available on browntail moth caterpillar hair toxin to know if the reactions will increase in severity each time an individual is exposed.

Who can I contact for more information on browntail moth health concerns?

- You can contact the Maine Center for Disease Control and Prevention (Maine CDC) for more information at 1-800-821-5821.

Animal Health Concerns

Will browntail moth affect my dog, cat or livestock?

- Animals are less susceptible to browntail moth rashes/dermatitis than humans because the irritating hairs cannot penetrate the haircoat. However, non-haired areas of the body can be affected (abdomen, muzzle, shaved udders) – some animals are less hirsute (hairy) than others in these areas.

What can I do if I think my pet is bringing browntail moth hairs inside?

- To limit rash on animal and humans coming in contact with the animals that may have encountered browntail hairs:
 - Protect hands with gloves
 - Wipe the haired and non-haired areas of the animal with a damp towel,
 - Then wash and dry (with heat) the towel.

What can I do to mitigate the risk of browntail moth hairs to my animals?

- If there is known browntail moth activity in an area, avoid animal contact with that area for exploring, grazing, etc., when possible.

Reducing Toxic Hair Exposure

When is the greatest risk of getting the rash?

- The greatest risk for exposure to the toxic hairs is between April and July.
- Caterpillars, shed skins, and cocoons all have toxic hairs.
- The toxin is stable in the environment for one to three years and hairs can become airborne at any time.
- It is important to take precautions year-round in heavily infested areas.

How do I avoid exposure to the browntail moth toxic hairs?

- When working in heavily infested areas, wear proper protective equipment to reduce exposure including:
 - Long sleeves
 - Long pants
 - Goggles
 - Dust mask/respirator
 - Hat
 - Disposable coveralls
- Avoid heavily infested areas between April and August, don't use leaf blowers or lawnmowers on dry days in these areas
- Using pre-contact poison ivy wipes can help minimize hairs sticking into exposed skin
- Do yardwork on wet days, which decreases the likelihood that the hairs will become airborne.
- Make sure to use a HEPA filter on a wet/dry vacuum to decrease the likelihood that the hairs will become airborne.
- Do not dry laundry outside in infested areas.

I covered up and I still got a rash. What else can I do?

- Take a cool shower after working in an infested area. This will help wash away any hairs on your body.
- Consider using disposable coveralls for outside work. Take care in removing protective clothing.

Who can I contact for more information on reducing exposures to browntail moth toxic hairs?

- You can contact the Maine Center for Disease Control and Prevention (Maine CDC) for more information at 1-800-821-5821.

Public policy

Why won't the state eradicate browntail moth?

- Browntail moth is not a pest that can be eradicated. It has been in the United States for more than 100 years. Populations at low levels can escape notice. Browntail moth travels readily on vehicles, plants and other carriers and the adult moths are good flyers.
- Contact: Maine Forest Service: (207) 287-2431

What is the state doing?

- The state agencies are committed to coordinating within state government and with others outside to respond to this issue. However, the responsibility for making decisions and raising necessary resources for pest control projects is most appropriately handled at the local or individual level.
- The Maine CDC works to provide information to health care providers and the public about the health risks from browntail moth.
- The Maine Forest Service works with cooperators to develop tools for management and provide the technical support necessary to respond to towns, businesses and private individuals to manage this and other pest situations.
- The Board of Pesticides Control is committed to providing the information needed to support the proper use of pesticides.

Is the state doing anything to help landowners/towns who have browntail moth?

- Currently, the state is:
 - supporting and conducting research,
 - tracking infestations,
 - supporting public nuisance declarations and
 - providing education to individuals, municipalities, businesses and others on response options.
- Contact: Maine Forest Service: (207) 287-2431

What does a public health nuisance declaration do?

- A public health nuisance declaration allows a municipality to take actions to address an issue of public health concern affecting the community.
- Where browntail moths are concerned, a declaration can allow the municipality to use public municipal funds on private lands to control for browntail moth populations.
 - More specifically, a municipality may conduct aerial spray operations to target browntail moth infestations pursuant to Maine Statute Title 22, §1444. Other options may be available to control browntail moth populations and should be discussed with Maine Forest Service.
- A declaration can provide a municipality with more options for browntail moth treatment that may not have otherwise been available absent the declaration.
- A declaration does not provide access to additional state funds or services. To petition for a browntail moth public health nuisance declaration, please follow the steps outlined here:
www.maine.gov/dhhs/browntailmoth.

Who do I contact for more information about policy questions?

You can contact the DACF, dacf@maine.gov, or state, federal and local elected officials.