# Brown Tail Moth

Yarmouth's Options for Action February 7, 2018











## GIPSY AND BROWN-TAIL MOTH QUARANTINE

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#### IMPORTANT NOTICE

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## **REGIONAL PUBLIC INFORMATION SESSIONS** BROWNTAIL MOTH CATERPILLARS

WEDNESDAY, OCT 17, 2018 6:00—7:15 P.M. FALMOUTH ELEMENTARY SCHOOL CAFETERIA 58 WOODVILLE RD, FALMOUTH Monday, Oct 29, 2018 6:00— 7:15 PM Freeport Town Hall Council Chambers 30 Main St, Freeport

## THESE SESSIONS ARE OPEN TO ALL RESIDENTS OF COMMUNITIES AFFECTED BY THE BROWNTAIL MOTH CATERPILLAR

## **Presenters:**

**Allison Kanoti,** Acting State Entomologist, Maine Forest Service, Forest Health and Monitoring, DACF **Mike Hughes,** President of Maine Arborists Association, ASCA Registered Consulting

Arborist, ISA Board-Certified Master Arborist, Licensed Applicator since 1988 (Freeport Session)

Marty Folsom, Senior Consulting Arborist, CTSP, MCL Lucas Tree Experts (Falmouth Session)

**Rebecca Miller,** Maine Health Educator, MPH, BSN (Falmouth Session) **Kristine Jenkins,** Cumberland District Public Health Liaison, Maine CDC (Freeport Session)

# Action Options:

- Aerial spray
- Roadside spray: Misting or hydraulic
- Individual Tree/lot treatments- Hydraulic spray, trunk injection, root absorption, trunk application- individual trees- prices vary, call early to schedule
- Clipping- winter/early spring manual clipping.
- Contact Avoidance /Covering
- Emerging research- UMaine
  - Funding support request

# **RELATIVE RISKS**

"[...when used as labelled]...Any one of the pesticides should represent a good low risk situation for all parties. ...the selection process should emphasize which pesticide will work best for Yarmouth's situation and work best at dealing with BTM..."

> Pamela J. Bryer, Ph.D. Toxicologist Board of Pesticides Control Department Agriculture, Conservation, & Forestry

# Major Pesticide choices

- Spinosad (CONSERV): Mist or hydraulic spray roadside- or tree specific
- **Bifenthrin (BISECT L):** Mist or hydraulic spray roadside or tree specific
- Bt (Variety of subsets and product names): aerial application (plane), broad area application
- Acephate: Spring root/soil injection
- Emamectin Benzoate (TREE AGE) FALL Option- trunk injection (tree specific)
- Permethrin (ASTRO): Mist or hydraulic spray (suspended in water).
- Non-Pesticide choices:
- Clipping,
- Awareness, Avoidance of exposure to caterpillar "hairs",
- Research hopes: Silk web decomposition, natural cycles (fungi and weather related?), pheromone interruption, other pesticides, other

# Searching for better approaches:

- Dr. Eleanor Groden- UMaine Entomologist
- Pheromone interference studies in NY
- Fungal infection/death (collapse in 1916) Cool wet spring conditions (natural cycle)
- Silk nest deterioration- spray applications (detergent)
  - Environmental impacts: effects on non-target species
  - Nests fail to protect overwintering caterpillars- die of exposure
  - Study proposal at \$297,000 over 3 years: looking for funding sources
    - Invitation of Towns to solicit local cash sources
    - Lobby to UMaine system, CES, MFS, Legislature for funding

## Title 22: HEALTH AND WELFARE

## Chapter 257-A: CONTROL OF BROWNTAIL MOTHS

## §1444. CONTROL OF BROWNTAIL MOTHS

**1**. **Declaration of public health nuisance.** The Director of the Bureau of Health may declare that an infestation of browntail moths is a public health nuisance. The declaration may be made on the director's own initiative or on petition to the director by municipal officers in a municipality affected by the infestation.

[ 1997, c. 215, §1 (NEW) .]

2. Aerial spraving. When the infestation causing a public health nuisance may be controlled by the aerial spraying of pesticides, the municipal officers in the affected municipality may conduct aerial spraying subject to rules adopted by the Board of Pesticides Control pursuant to Title 7, section 610 and Title 22, section 1471-M, except that:

A. The municipality is responsible for compliance with the notification and consent regulations; [2015, c. 58, §1 (AMD).]

B. Landowners who are sent written notification by mail, sent to the landowner's last known address as contained in the municipal assessing records and who fail to respond to the notice within 30 days are deemed to have consented to aerial spraying; [1997, c. 215, §1 (NEW).]

## Pesticide selection considerations

- Cost
- Efficacy
- Human Health risks and exposure means
- Risks to other (non-target) insects such as bees
- Risks to fish, aquatic invertebrates, crustaceans, birds, mammals
- Bioaccumulation tendencies
- Half life (breakdown in environment)
- Contamination of groundwater (and surface waters)
- Legal and practical parameters/methods of dispersal
- Application method: Aerial, mist, spray, root drench, trunk injection

# Town and School traffic areas:

- <u>Clipping of reachable webs 2018</u>
- 2018: Community House, Community Garden, School Areas
- Winter 2019 Add North Road Playground/Little League area
- •
- Acephate soil injections (spring)
- 2018 Locations included:
  - YHS Tennis Courts
  - North Road Playground
  - East Main Street/Route 1 intersection
  - Library
- 2019 locations will be the same, plus:
  - Yarm. Elementary School
  - Harrison Middle School
  - Maybe SOCI, depending on the application and timing

- Budget to clip winter 2019/2020?
- Budget for trunk injection Fall 2019?
- Budget for root/soil injections Spring 2020?
- Raking and leaf litter removal- spring/summer 2019?
- Scheduling and access restrictions- spring summer 2019?
- Budget canopy over selected streets- Spring 2020?
- Supplemental Funding for Roadside or Aerial spray 2019?
- Funding in FY 20 for Research Contribution?

# Additional Slides For On Line Review

END

	Please note: this table is a comparison of the pesticides presented for review (and proposed method of application); a pesticide that is most toxic here only means it is more toxic than the other chemicals listed here <sup>§</sup> .								
	Relative Rank	Acutely Toxic to people?	Persists in ecosystem?	Toxic to birds?	Toxic to fish?	Likely to leach into water?	Toxic to bees?	Are bees likely to be exposed?	EPA Carcinogenicity Rating
Least like	1	Bt	Bt	Bt	Bt	All unlikely to leach into groundwater.	Bt	<i>Bt</i> : Not likely if no bees present: product rapidly decomposes	Bt : Unlikely to be carcinogenic.
	2	Conserve	Conserve	Astro	Conserve		Astro	Conserve: Not likely if no bees present: product rapidly decomposes	Conserve: Not likely to be a carcinogen
	3	Astro	Astro	Bisect L	Astro		Bisect L	Astro: Not likely if no bees present but bee habitat must be avoided	Bisect L: Possible human carcinogen
Most likely	4	Bisect L	Bisect L	Conserve	Bisect L		Conserve	Bisect L: Not likely if no bees present but bee habitat must be avoided	Astro: Likely to be carcinogenic to humans
Most likely	3 4	Astro Bisect L	Astro Bisect L	Bisect L Conserve	Astro Bisect L		Bisect L Conserve	habitat must be avoided Bisect L: Not likely if no bees present but bee habitat must be avoided	Bisect L: Possible human ca Astro: Likely to be carcinog

<sup>§</sup> You are more likely to be crushed by your refrigerator than your stove in a relative sense, and that is what this table shows -relative risks and benefits. Current use pesticides offer minimal risk when the EPA required label directions are followed.

Note: I've used the brand names you gave me in this table but made determinations based on the active ingredients. Data used to generate these relationships are in the Data Input Page (on Page 2). This is not an endorsement of any brand, ingredient, or approach.

- Guesstimate \$1800/mile mist sprayer early May-
  - Whitney Tree currently has only mist applicator in Maine- SCHEDULE NOT AVAILABLE FOR YARMOUTH. Hughes Tree considering purchase.
  - How many miles of road (tree canopy)- 15 miles (guess) @ \$1800 = \$27,000
  - Hydraulic spray option---roughly twice the cost- about 40 gallons of solution per tree---2-3% sticks the rest comes to ground.
  - Efficacy modest to good on target tree- Negligible impact infestation control.
- Contact attacks in insects- death in 1-2 days
- Unlikely to leach into ground water-
- Soluble in water- higher risk of movement to streams, river
- Toxic to bees (if present) short half life, target tree tops early season
- Toxic to bird
- Not likely human carcinogen-

# Bifenthrin (Bisect L): Late April to Mid May- no wind or rain.

- No quoted price- assume similar to CONSERV- \$27,000 if Mist sprayed. Guess \$54,000 for hydraulic spray at night. (Hourly rate around \$350/hour:
- Efficacy modest to target tree- negligible impact on infestation.
- Contact attacks insect nervous system- fairly quick death
- Unlikely to leach into groundwater- binds to organics that can be carried to surface waters (streams, rivers, bay, ponds)
- More toxic to bees than Spinosad.
- More toxic to fish, may bioaccumulate
- Possible human carcinogen

# Bacillus thuringiensis (Bt): Late April- Mid May (no wind/rain)

- Aerial spray (crop duster): Estimate \$50/acre x 3000 acres = \$150,000
- Efficacy modest/high (especially with two applications-\$300,000)
- Breaks down larvae gut- death by starvation or infection: can take several days to weeks
- Least toxic to humans, fish, bees, birds
- Unlikely to be human carcinogen
- Binds to soils, breaks down in sunlight and acid soils
- Not likely to leach to groundwater.
- All require 250ft setback to waters- drift, GPS controls, high speed

Permethrin (ASTRO): Early May (no wind/rain): Pyrethroids class of chemicals

- Mist or hydraulic spray- roadside or target trees
- Broad spectrum- kills a lot of non-target insect species
- Both stomach poison and contact kill of insects
- Some toxicity to cats
- High toxicity to fish, bees; low toxicity to birds
- Not well soluble in water- adheres to organics. Can remain up to 1 yr

# Acephate: Spring root/soil injection or drench

- Acephate also has health and environmental risks- but these are greatly minimized by the method of application. Spring injection to the soils for root take-up. Chemicals are taken up into the leaves and ingested by the feeding caterpillars. (Spring)
- This is a more expensive and time-consuming process but appears to have greater efficacy for the targeted tree if time and weather conditions cooperate.
- Boring into the trees does present some risk to the trees- oaks tend to be quick healers.
- Like all other treatments- does not control the infestation, but does protect the treated tree.

# Emamectin Benzoate (TREE AGE)

- FALL injection into to trunk of the tree- taken up into the leaves.
- Ingested by larvae before they spin the winter webs.
- Boring into tree presents some opportunist risk to tree (bugs/ disease) but oaks are fairly good self healers.
- Pesticide very targeted with little environmental risk exposure.
- May have a longer effect (2 years).

# Chemical control of larvae

Method	PROS	CONS		
Chemical Spray	Cheaper then injections or Bt	Non-target effects		
	Most applicators with equipment	Cannot use on flowering trees (ie apple)		
	Homeowners see results	Many cannot be use near coastal waters		
	Can be done in May or August/ September			
	Reliable if applied early enough			
Bt Spray	Affects only Leps that eat it	Need significant leaf area to hold pesticide		
	Does not affect lobster	Larvae must ingest		
	Short-lived (also a con)	Probably needs two applications		
Inject	Can be used near water	Non-target effects from persistence		
	Can be used with pollinators in area	Expensive		
	April or August application	Should NOT be done in June/July		
Prune	Can be done by landowner	Webs often too high		
	No non-target effects	Often too many		
	First choice if possible			

## Section 5. Restrictions on Pesticide Applications to Control Browntail Moths Near Marine Waters

Pesticide applications for control of browntail moths within 250 feet of the mean high tide mark adjacent to coastal waters and extending upriver or upstream to the first bridge are subject to the requirements of this section:

## A. Exemptions

The prohibitions and restrictions in Section 5 do not apply to biological pesticides, to the injection of pesticides directly into the soil or shade and ornamental trees or to the application of pesticides by licensed commercial pesticide applicators using non-powered equipment.

## B. Prohibitions and Restrictions

- A person may not apply a pesticide to control browntail moths on shade or ornamental trees within 50 feet of the mean high water mark.
- II. A person may not apply a pesticide to control browntail moths on shade or ornamental trees in coastal areas located between 50 and 250 feet from the mean high water mark except in accordance with this subsection.
  - Only products with active ingredients specifically approved by the Board for this purpose may be applied.
  - Applications may be performed only with a hydraulic hand-held spray gun or air-assisted sprayers.
  - c. Applications may be performed only in a <u>manner in which</u> the applicator directs the spray away from marine waters.
  - Applications may not be made when the wind is blowing toward marine waters.
  - e. Applications may be performed only when the wind is equal to or greater than 2 miles per hour and blowing away from marine waters.

BPC Chapter 29 Rules Sec 5

# Products Allowed in 50-250' of Marine Waters/ Definition of Biological Pesticide

## BACKGROUND

On January 25, 2008, the Board adopted Section 5 of Chapter 29 which regulates the use of insecticides used to control browntail moth within 250 feet of marine waters. Section 5 limits insecticide active ingredients to those approved by the Board. Since that time, a number of newer chemistries have been registered for use and far more data is available on the efficacy of many products. On November 4, 2016 and December 16, 2016 the Board discussed the browntail moth populations and the available products. On January 11, 2017, the Board approved the following active ingredients for control of browntail moth in coastal areas located between 50 and 250 feet from the mean high water mark in accordance with CMR 01-026 Chapter 29: Standards for Water Quality Protection.

Acetamiprid Bifenthrin Clothianidin Deltamethrin Diflubenzuron Dinotefuran Fluvalinate Imidacloprid Spinosad

## POLICY

For the purposes of Chapter 29, Section 5, the term "biological pesticide" includes any microbial pesticide that contains the microorganism and byproducts normally associated with the organism, as approved by the Board.

As of March 31, 2017 the Board has approved: Spinosad Bacillus thuringiensis variety kurstaki Azadirachtin

# **Biorational Pesticides**

<u>Spinosad</u>: Derived from a bacterium that is subjected to a specific fermentation process to develop the active ingredient for spinosad. Affects the insect nervous system and can be effective as a contact spray as well as by ingestion.

Bacillus thuringiensis kurstaki (B.T.K): Product contains a bacterium that is specific to butterfly and moth larvae. It must be ingested to be effective, best w/ early instars

<u>Azadirachtin</u>: considered nontoxic to mammals and is not expected to have any adverse effects on nontarget organisms or on the environment. Obtained from the seed kernels of the neem tree. Antifeedant and growth disruptor, synergistic w/ beauveria