

Pesky Garden Pests

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White Grubs





Red-Headed Flea Beetle
Systema frontalis

Red-headed flea beetle



Eastern
Tent
Caterpillar

Who's been chewing here?



They only
come out at
night.



Black Vine Weevil



The real culprit!

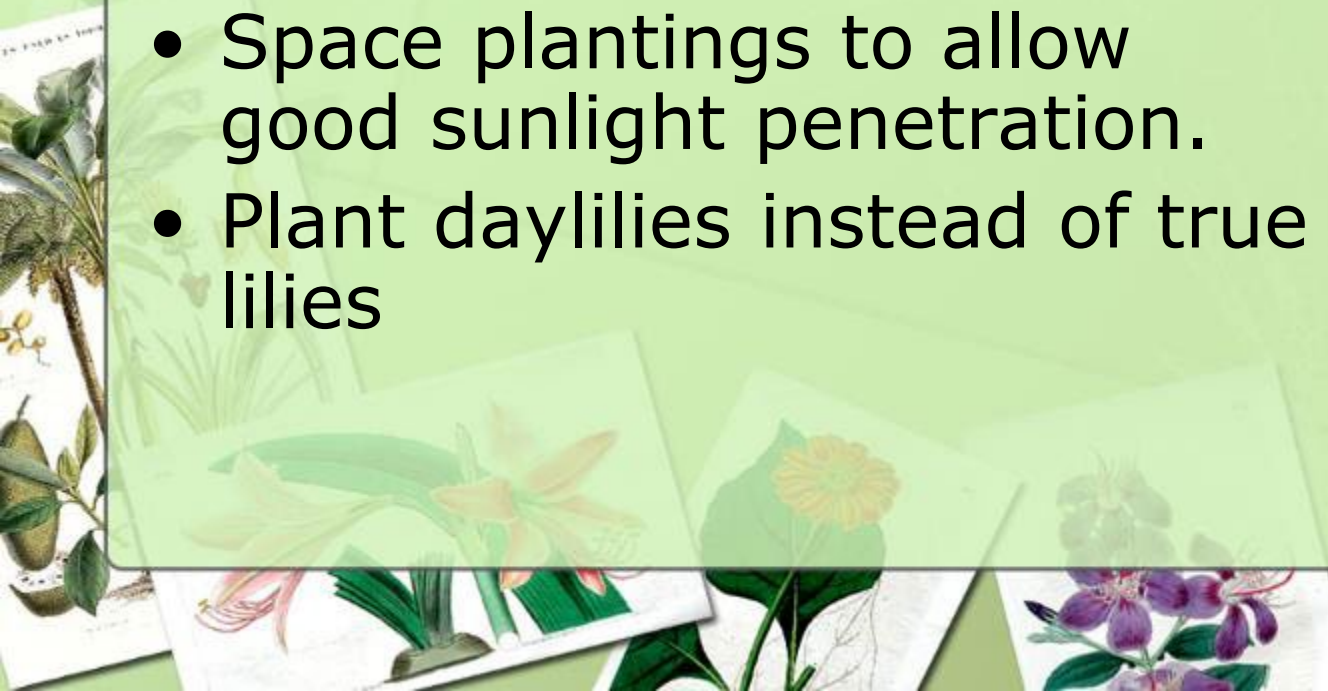


Black vine weevil larvae and adult near the stem of a small yew.



Lily Leaf Beetle

- Look for adults now as lilies sprout.
- Hand pick beetles and larvae. Squish eggs.
- Space plantings to allow good sunlight penetration.
- Plant daylilies instead of true lilies



Slugs and Snails



- Control weeds
- Keep grass mown low or consider gravel strip around gardens
- Traps (beer or commercial traps)
- Melon rinds, boards or flat rocks
- Copper foil ribbon around raised beds or pots.
- Hand pick
- Pesticide baits as last resort



Black knot of Prunus





- Impatiens downy mildew
- Our inspectors see it in greenhouses
- It has been up and down in the last few years
- Can overwinter in the soil
- Switch to New Guinea impatiens



#1 Killer of house plants

- OVER Watering
 - Plant wilts even though soil is wet
 - Leaf tips turn brown
 - Whole leaves turn brown and wilt
 - Leaf cells rupture (Edema)
 - Leaves turn yellow
 - Leaves start falling off



Winter Desiccation

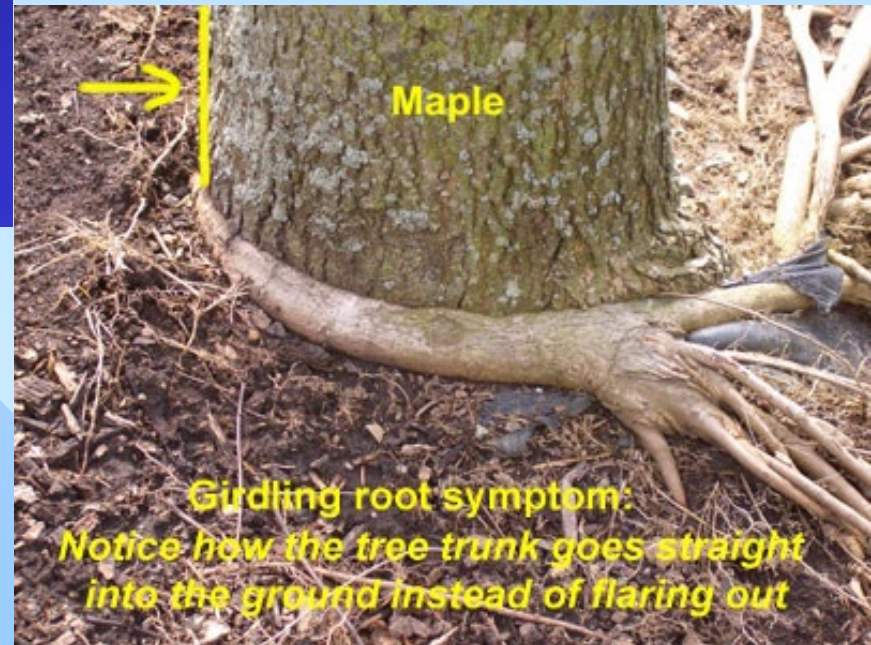


- Keep evergreens well watered at the end of the growing season
- Some can be protected with anti-desiccants like Wilt Pruf™

Girdling Roots

Proper Planting – starts with selection

Select high quality plant material



Invasive Pests - Deciduous

In Maine!

Winter Moth



Browntail Moth



In Maine!

Emerald Ash Borer



Asian Longhorned Beetle



NOT in
Maine... yet

Winter Moth

Geometrid moth; "inchworm"

Adults
emerge
late Fall



Tom Murray, BugGuide.net

Nov - Jan



Waltham Services

Eggs
overwinter



Gyorgy Csoka,
Hungary Forest
Research Institute,
Bugwood.org

Dec - Apr

Pupa looks
like soil



Maine Forest Service



Hannes Lemme, Bugwood.org

Jun - Nov



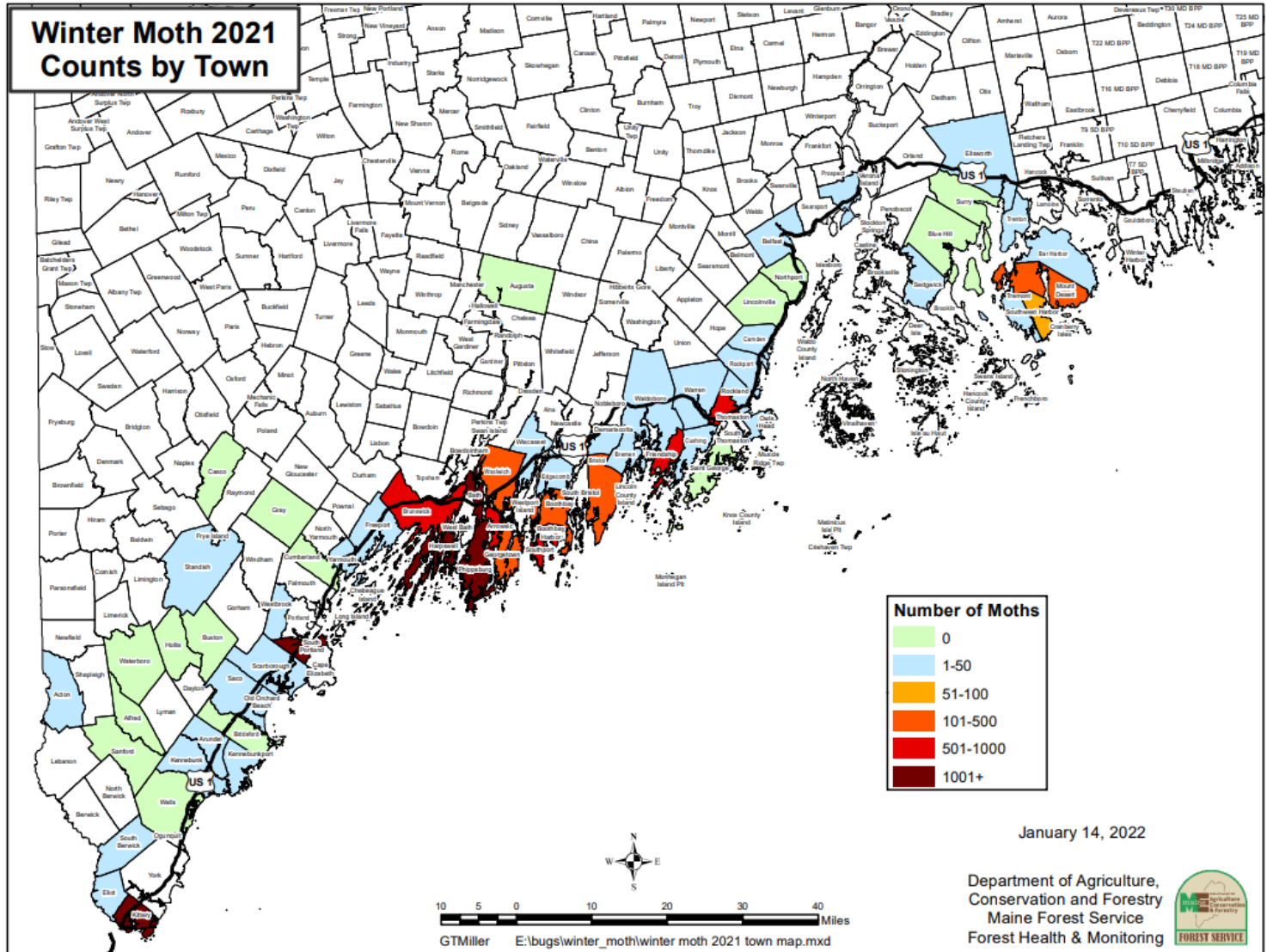
Cape Cod Times/Steve Heaslip

Apr - Jun

Caterpillars
chew leaves

Winter Moth in Maine

Winter Moth 2021 Counts by Town



January 14, 2022

Department of Agriculture,
Conservation and Forestry
Maine Forest Service
Forest Health & Monitoring



10 5 0 10 20 30 40 Miles

GTMiller E:\bugs\winter_moth\winter moth 2021 town map.mxd

Winter moth



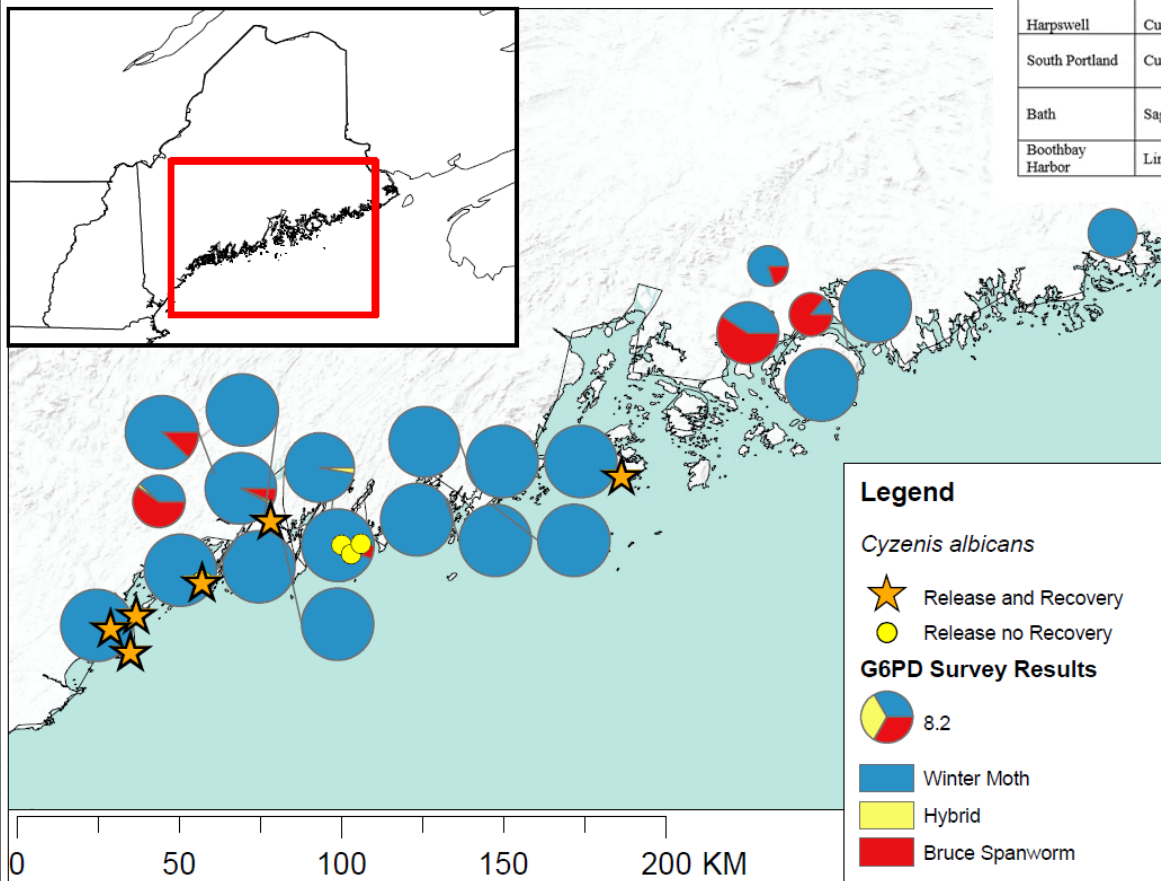
Cyzenis albicans



Biological control for winter moth

Table 3. Release and recovery of parasitic flies, *Cyzenis albicans*, in Maine

Town	County	Dates	Number of <i>Cyzenis albicans</i> Released	Comments
Harpwell	Cumberland	1-May-13	2000	Survival not good
Cape Elizabeth	Cumberland	1-May-13	2000	First recovery 2016
Kittery	York	16 & 23-May-14	1200	First recovery 2016
Harpwell	Cumberland	16 & 22-May-14	1200	
Vinalhaven	Knox	21-May-14	2000	First recovery in 2018
Portland	Cumberland	15-May-15	2000	First recovery in 2018
Cape Elizabeth	Cumberland	15-May-15	1000	In 2018 parasitism rates at 20%
Harpwell	Cumberland	15-Nov-16	2000	caged cocoons set out for release in spring 2017
South Portland	Cumberland	29-Nov-17	3000	caged cocoons set out for release in spring 2018
Bath	Sagadahoc	12-Sep-18	500	caged cocoons set out for release in spring 2019
Boothbay Harbor	Lincoln	21-Oct-19	500	caged cocoons set out for release in spring 2020



Browntail Moth

Euproctis chrysorrhoea

- Invasive insect from Europe
 - Order: Lepidoptera (moths)
 - Family: Lymantriidae
- Caterpillars have toxic hairs



Browntail Moth Risk Map

Browntail Moth Exposure Risk 2020

Disclaimer: Survey is not complete.

Ratings based on current knowledge of defoliation, winter web surveys and other observations of the lower peninsula. Future conditions are also based on surrounding conditions per survey. Conditions within each township are variable.

Normal: Be aware of the risk of browntail moth exposure. Moths have been found in light traps in all corners of the state. Areas not in host trees, especially apples and other fruit trees and oaks are more likely to have populations.

Alert: Towns in near locations with detections of browntail moth. Surveys has not been conducted or has not revealed established populations.

Trace: A small number of webs were found.

Low: Webs were frequently encountered in patches of trees where webs were found.

Moderate: Defoliation was moderate and/or continuous stretches of overwintering webs were found.

High: Defoliation was moderate and/or continuous stretches of high population of winter webs were found.

NOTE: occurrence of winter webs with moth should be considered in all areas, but of be especially high in areas with large low populations, or for defoliation in the normal or alert areas.

For More Information:

www.maine.gov/forestpests/btm



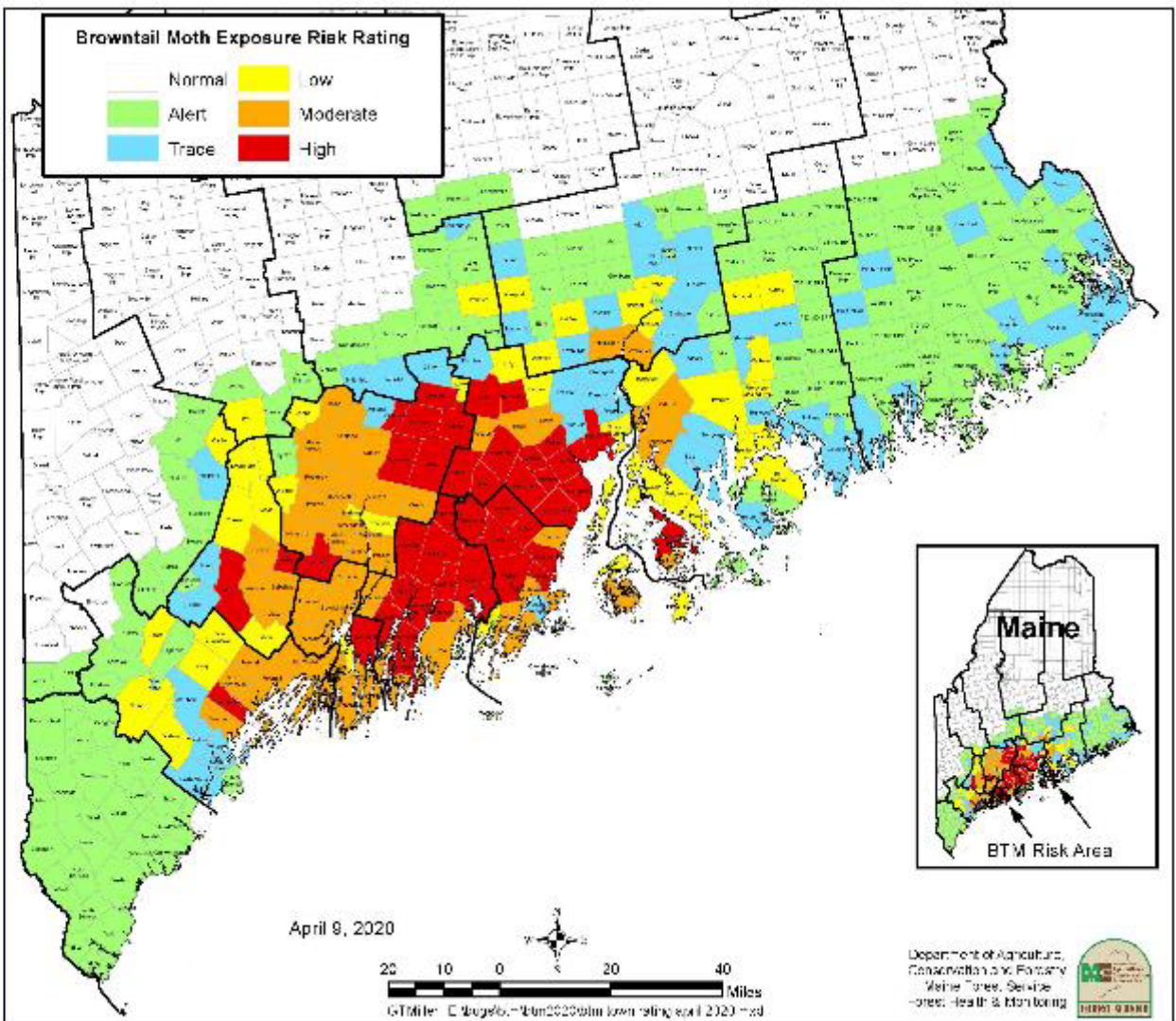
BTM Larva



BTM Webs Clipped

Browntail Moth Exposure Risk Rating

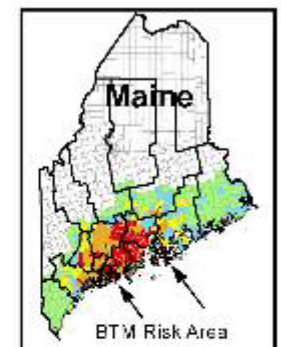
Normal	Low
Alert	Moderate
Trace	High



April 9, 2020



20 10 0 20 40
Miles
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Department of Agriculture,
Conservation & Forestry
Maine Forest Service
Forest Health Monitoring

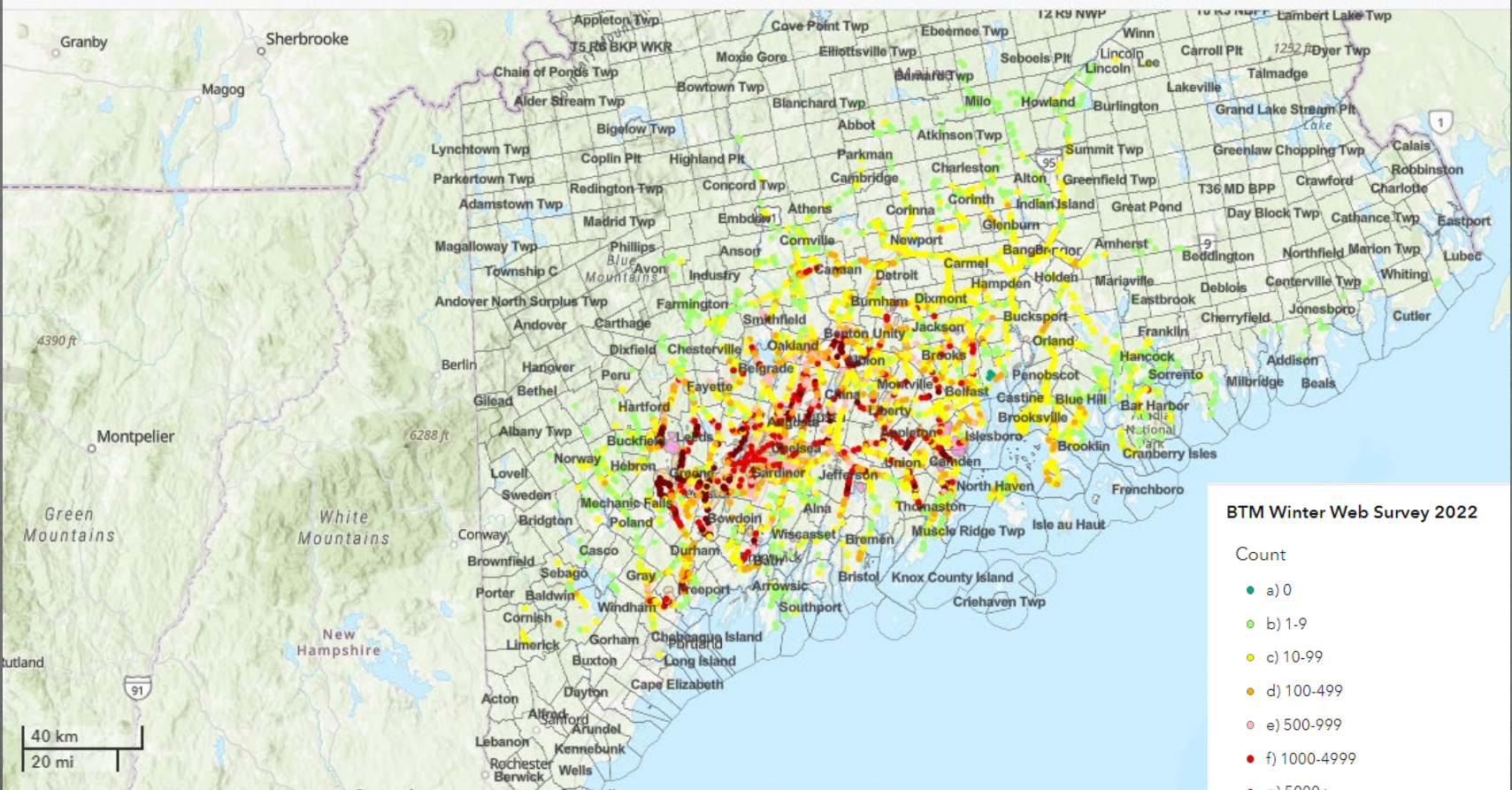


New BTM Dashboard

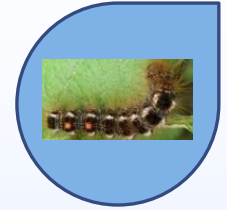
- <https://www.arcgis.com/apps/dashboards/8f2931a691374ac9853636e71cbb1f40>



Browntail Moth (BTM) Dashboard



Browntail moth management



IPM Actions

- ▶ Keep outside lights off
- ▶ Remove host trees near houses
- ▶ Trim out webs & destroy nests
 - ▶ https://www.maine.gov/dacf/mfs/forest_health/documents/arborists_prune_btm_webs.pdf
- ▶ Wet-dry vacuum containing soapy water and fitted with a HEPA filter
- ▶ Pesticide application timing -only a few weeks in spring
- ▶ Late August application may also work

- oak, apple, crabapple, pear, birch, cherry



Pupils of Farm School, Thompson's Island, destroying winter webs of brown-tail moth, Dec., 1902.
From photo kindly loaned by Chas. Bradley, Supt.

https://www.maine.gov/dacf/mfs/forest_health/invasive_threats/browntail_moth_info.htm



Emerald ash borer



Emerald Ash
Borer
Quarantine
Southern
Maine

New Emergency Order Adds to Quarantine

EAB found in 12 new towns
2021 - 2022:

Androscoggin County
Lewiston (V) 2022

Cumberland County:
Bridgton (v)

Falmouth (gtt)

Gray (v) 2022

Saco (v)

South Portland (v)

Westbrook (v)

Kennebec County

Oakland (V) 2022

Oxford County:

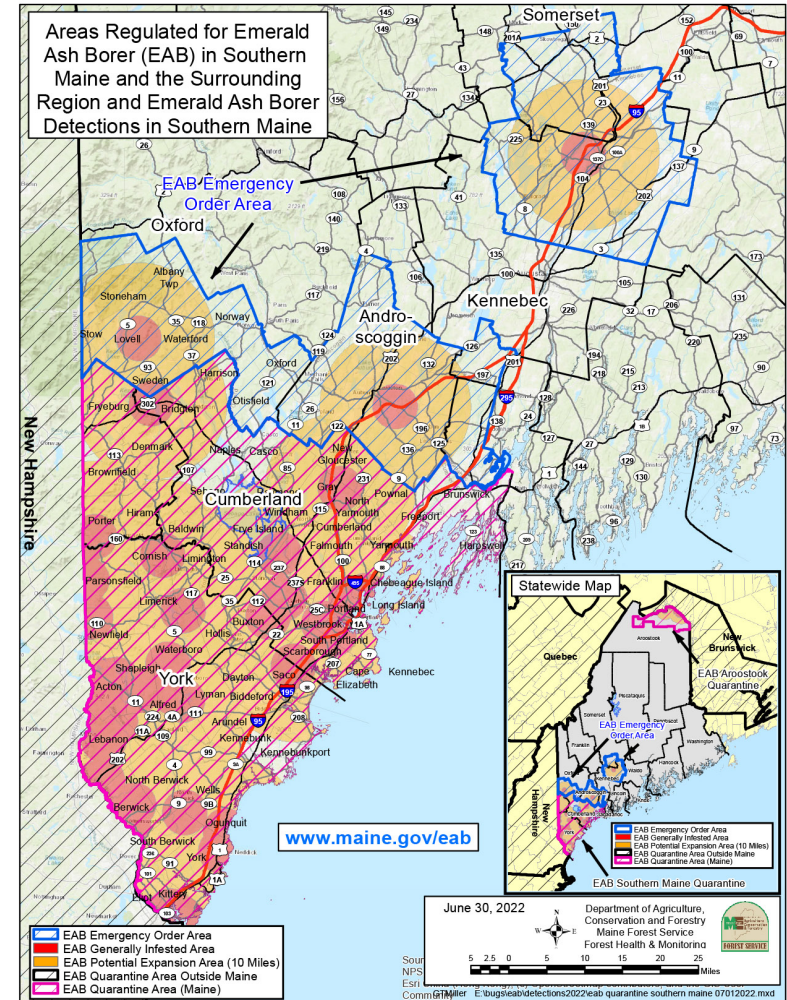
Lovell (gft)

Porter (v)

York County:

Buxton (gft)

Cornish (v)



Emerald ash borer

Emerald Ash
Borer
Quarantine
Northern
Maine



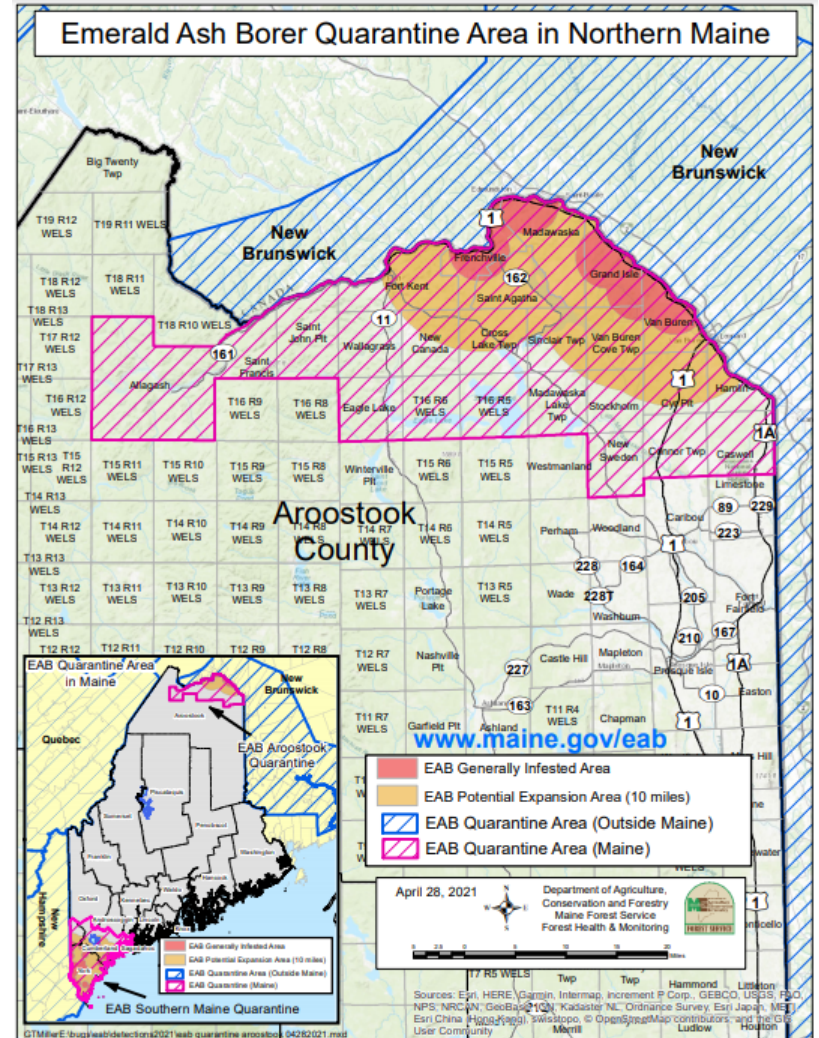
Six Towns Added to the Quarantine

New towns include:

Expansion south - Caswell, Connor Twp, New Sweden

Expansion East – St. John Plt, St. Francis, Allagash

EAB found in one new town: Van Buren



Emerald ash borer



Emerald Ash Borer Life Cycle: Evidence in trees

Recognizing EAB

Up close

Bark splitting



Michigan Dept. of Agriculture, Bugwood.org

S-shaped galleries under bark



John Obermeyer, Purdue

EAB

NOT EAB



Pennsylvania Dept. of Conservation and Natural Resources



D-shaped exit holes

Recognizing EAB

From afar

Woodpecker activity!!!



04/24/2012

USDA APHIS PPQ, Bugwood.org



USDA APHIS PPQ, Bugwood.org

Crown dieback



J. Ellis, Purdue University

Epicormic shoots

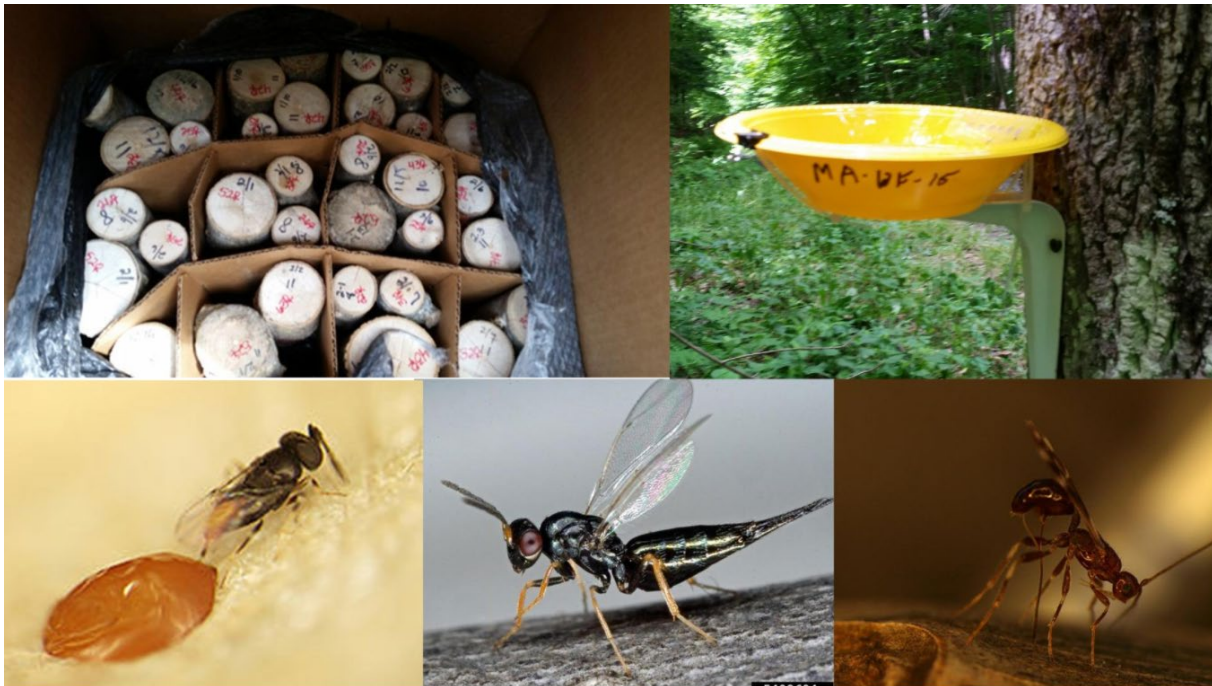


Some Considerations

- Dead/dying ash infested with EAB can pose significant hazards to people/ infrastructure
- MFS does not recommend eliminating ash;
 - High risk ash should be removed before it shows severe dieback
 - Resistance in some white ash seen so don't recommend cutting all forest ash
 - Need male and female trees near each other to provide seed sources

Biocontrol

Species	Type of parasitoid
<i>Tetrastichus planipennis</i>	Larval endoparasitoid
<i>Spathius galinae</i>	Larval ectoparasitoid
<i>Oobius agrili</i>	Egg parasitoid



Don't Move Firewood!

Signs at border crossings & visitor centers





BEECH LEAF DISEASE

- First reported in OH, 2012
- American, European, and Oriental beech are susceptible



- Perhaps caused by a foliar nematode, *litlenchus crenatae*

BLD SYMPTOMS

- Early symptoms - dark bands between lateral veins of leaves
 - Evident when leaves emerge (spring)
- Later stages – leaves become thickened, shriveled and curled
- Reduced bud and leaf production
- Mortality
 - 2-5 years – saplings
 - ~6 years – mature trees



May be 2 years in
Maine for both



BLD LOOK-ALIKES



Anthracnose



Eriophyid mites



Aphid leaf rolling

<https://vtinvasives.org/invasive/beechn-leaf-disease>

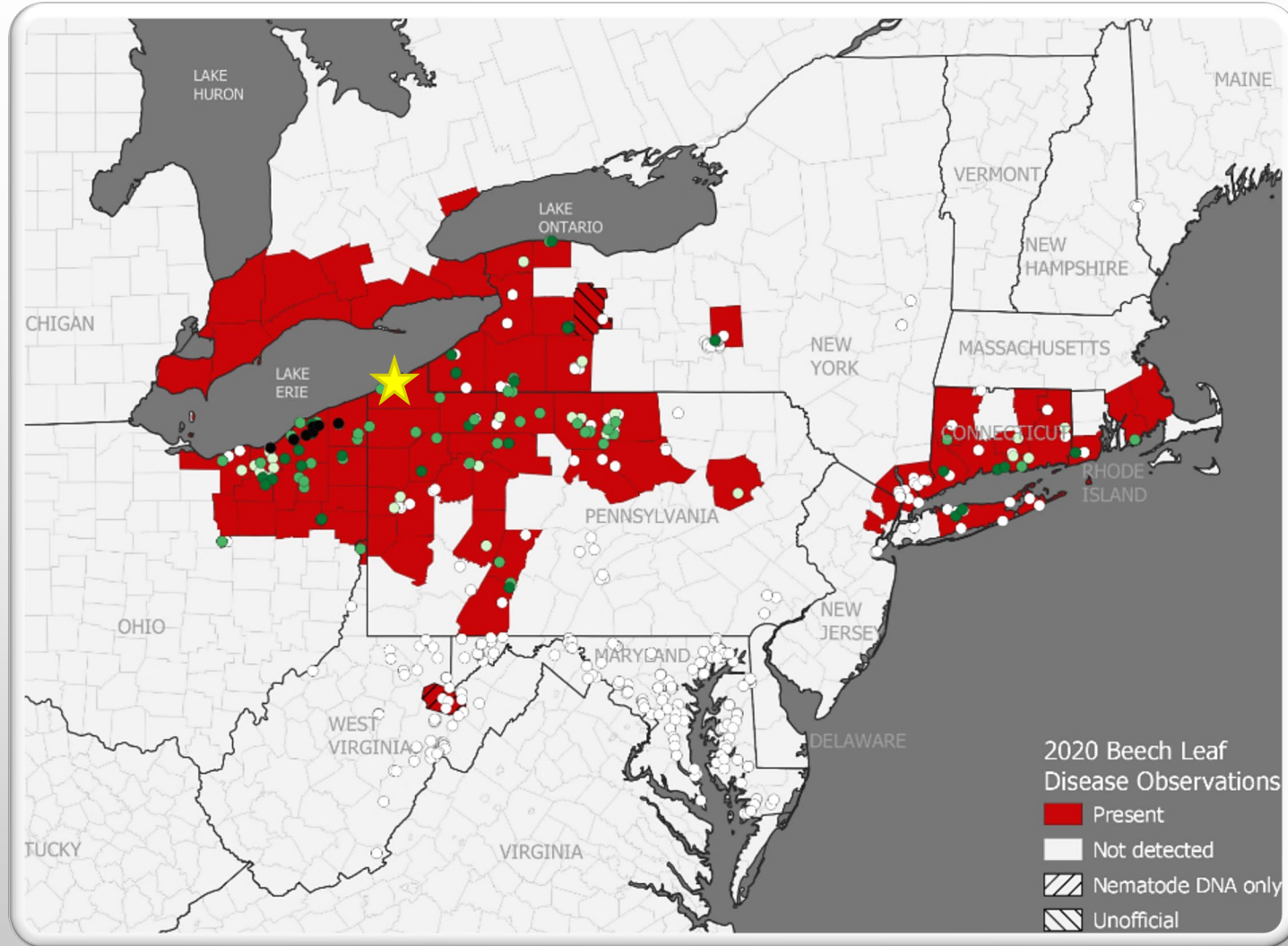
BEECH LEAF DISEASE

First discovered in 2012 (Ohio)

Currently known in:
Canada (Ontario),
USA:

- Connecticut
- Massachusetts
- New York
- Ohio
- Pennsylvania
- Rhode Island

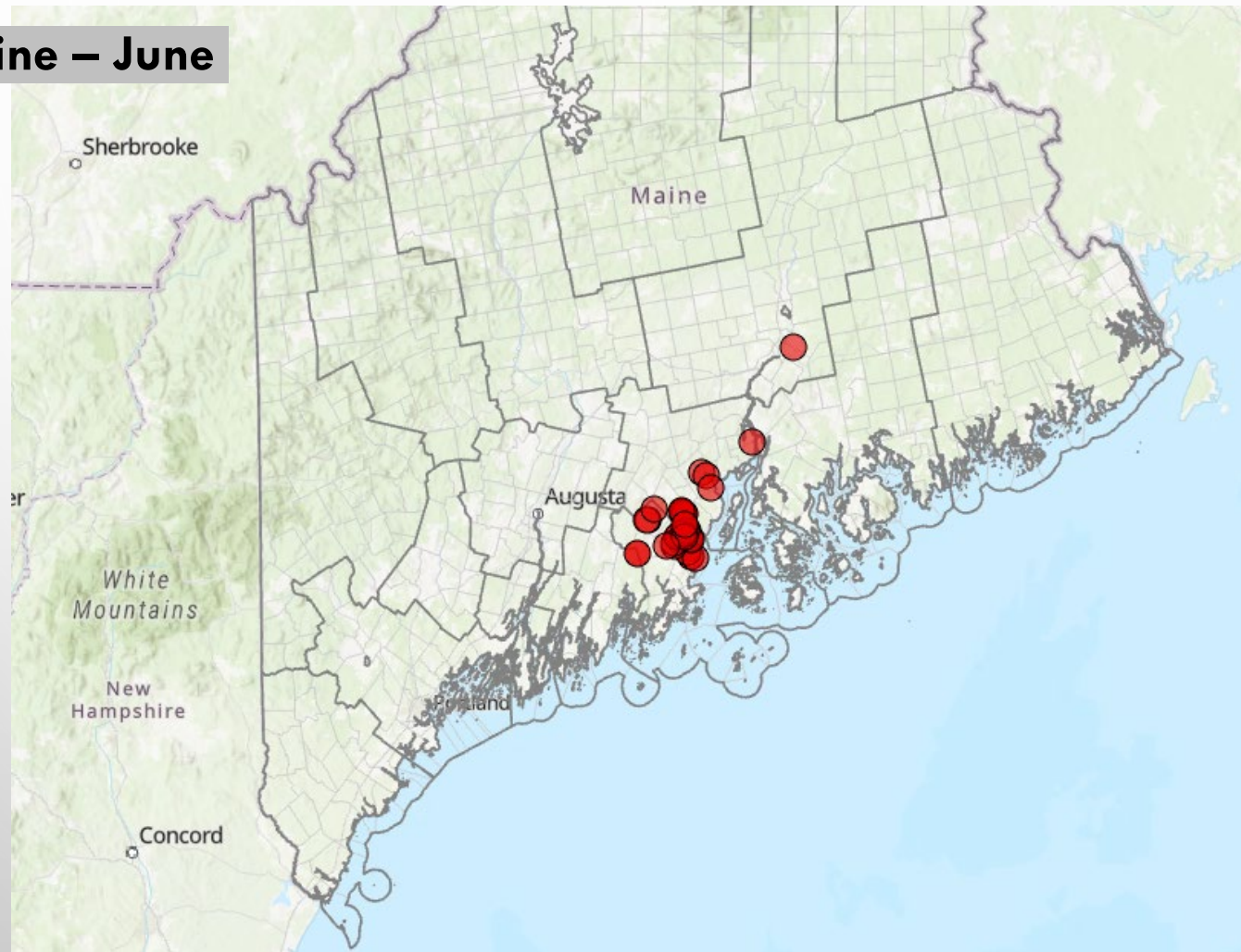
And now Maine...

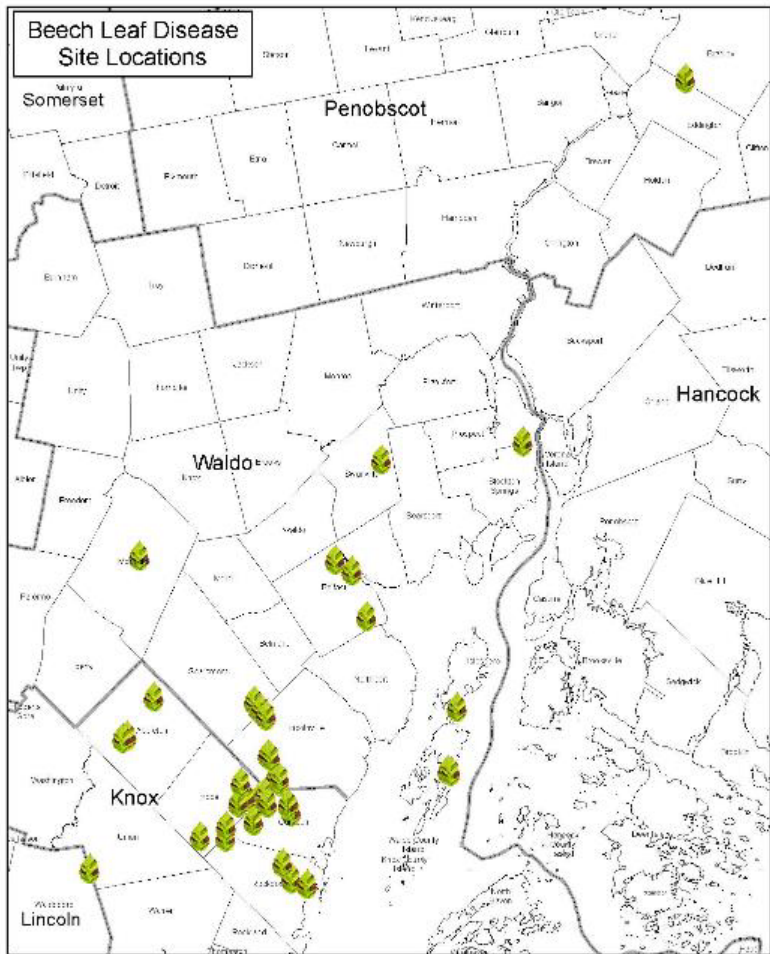


First reported in Maine – June

2021

- Waldo Co.
- Knox Co.





October 26, 2021



Scale bar: 0 1 2 3 4 5 Miles

Department of Agriculture
Conservation and Forestry
Maine Forest Service
Forest Health and Monitoring



**B
L
D**





Midcoast Maine – symptoms observed in early June

What is SLF

A “true bug”; Fulgoridae = **planthopper**

- 1 generation/year
- Adults are large – 1” long
- Nymphs have 4 stages
- Eggs overwinter under a protective coating



Egg mass

SEEN: October-June



1st instar nymph

May-July



4th instar nymph

July-September



Adult

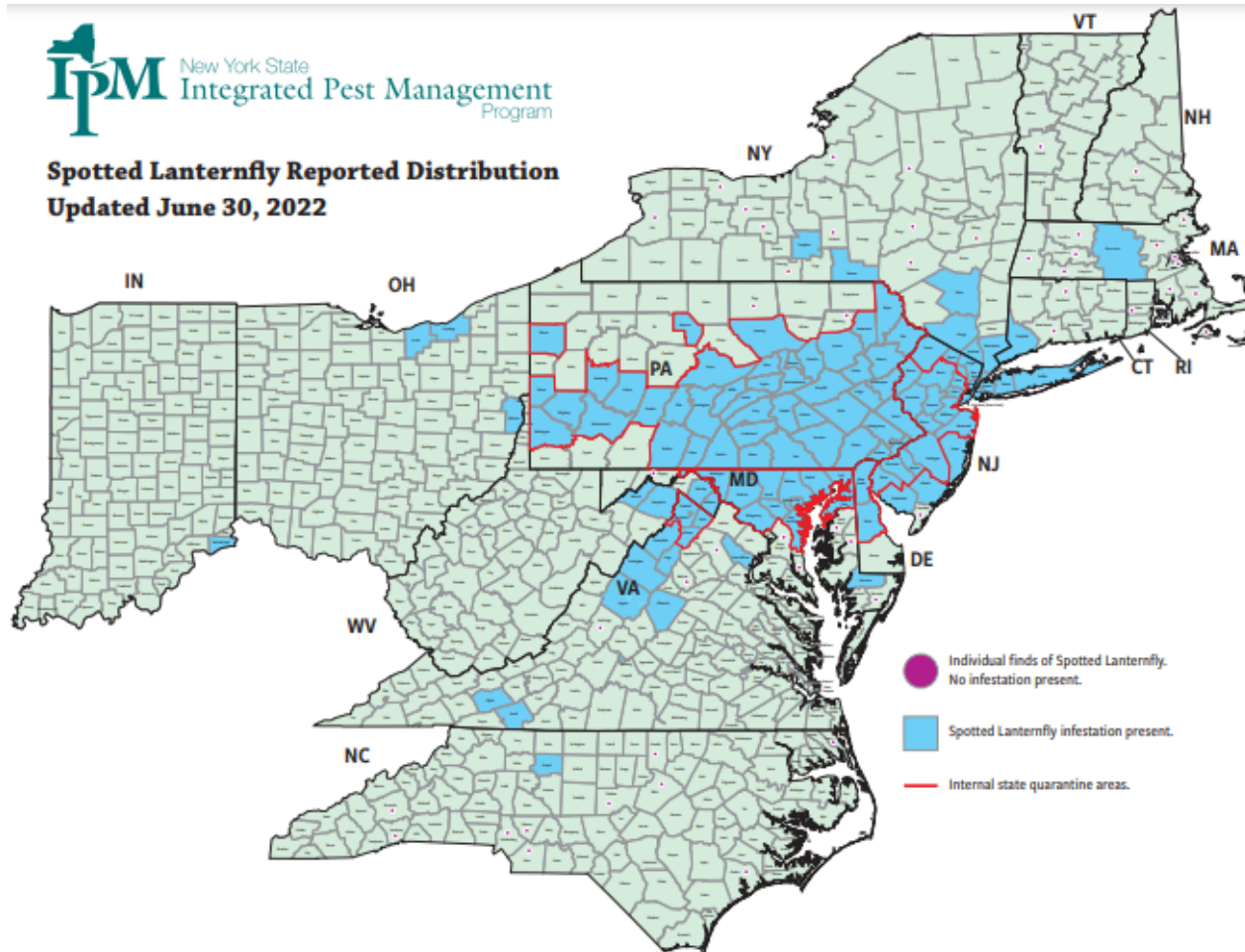
August-November

SLF detections in Maine

- ▶ Egg masses were found on red maple trees planted in:
 - ▶ Freeport and Yarmouth - spring planting
 - ▶ Boothbay and Northeast Harbor - fall planting
- ▶ All the suspect trees were inspected & DACF asked the homeowners and landscape companies to keep an eye on the areas where egg masses were found
- ▶ Look for rectangular yellowish-brown egg masses covered with a gray waxy coating and they are found on almost any surface
- ▶ If any life stages of SLF are found take a photo and/or collect a specimen
- ▶ Report any potential sightings to bugwatch@maine.gov



Spotted Lanternfly Reported Distribution
Updated June 30, 2022



Tree of Heaven (*Ailanthus altissima*)

Feeding on TOH improves female maturity



What's Being Done

- Quarantines- PA, NJ, DE, MA, MD, VA, WV
- NY Truck Stop:
 - Trucks leaving NJ/PA are stopped at the NY border and inspected;
 - Drones are used to check tops of trucks.
- Voluntary Self-Inspection/Checklist/Scrape cards



What do you need to do?



All we ask, is that you look before you leave a quarantined area. Inspect your car or other things that have sat outside. Look for the spotted lanternfly (or their egg masses) to avoid transporting them.



Report

Tree of Heaven



Spotted Lanternfly



Bugwatch@maine.gov

Stay Updated
Join Maine Bug Watch

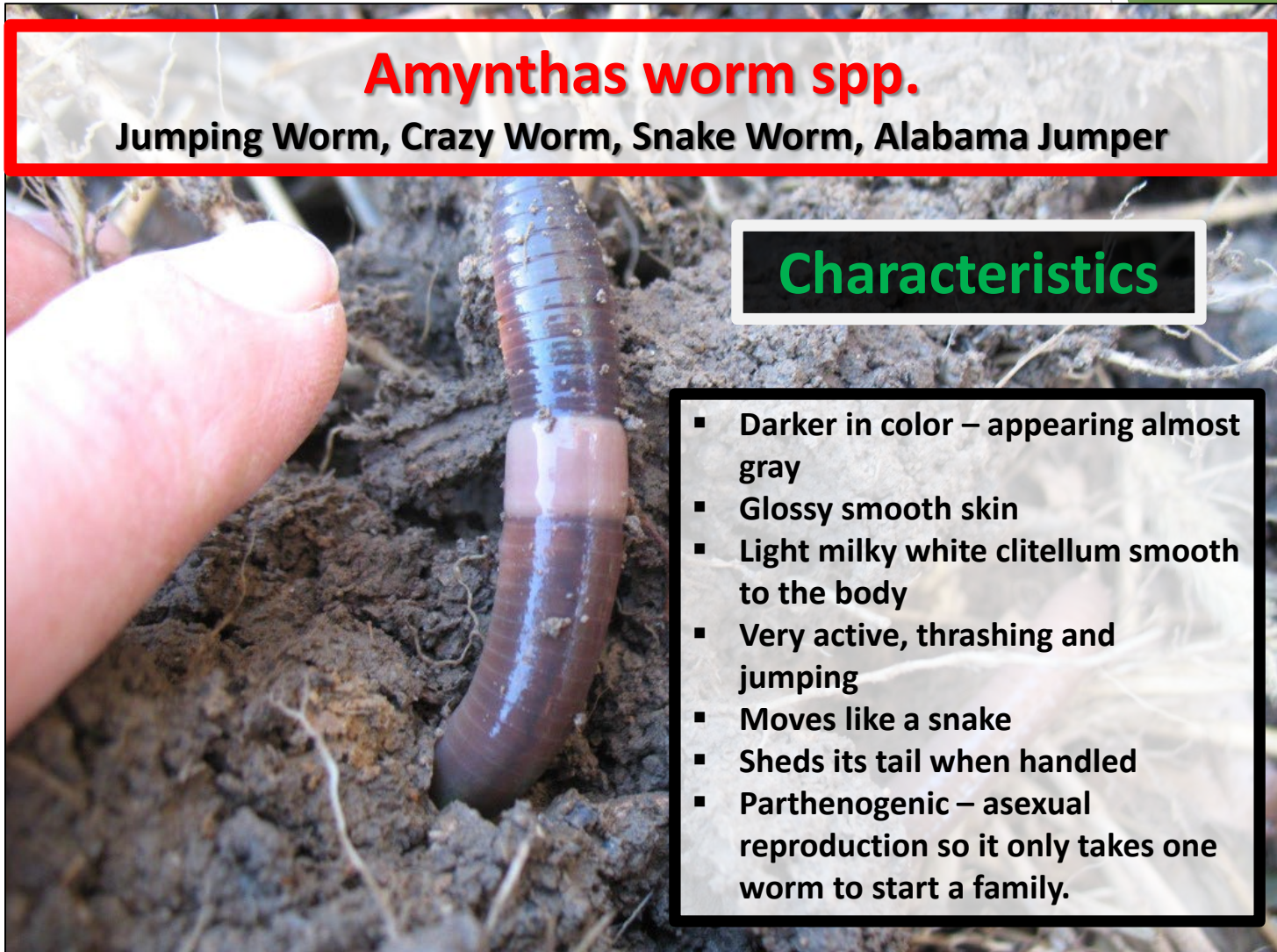


Amyntas worm spp.

Jumping Worm, Crazy Worm, Snake Worm, Alabama Jumper

Characteristics

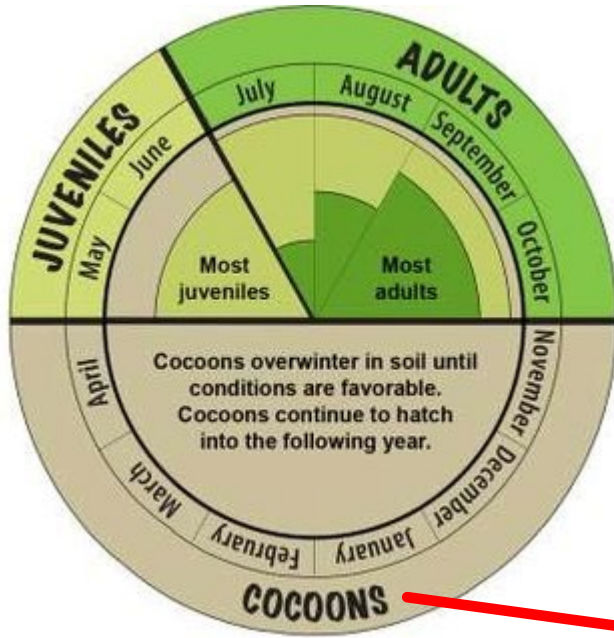
- Darker in color – appearing almost gray
- Glossy smooth skin
- Light milky white clitellum smooth to the body
- Very active, thrashing and jumping
- Moves like a snake
- Sheds its tail when handled
- Parthenogenic – asexual reproduction so it only takes one worm to start a family.





Amyntas tokioensis

Amyntas agrestis



Life Cycle



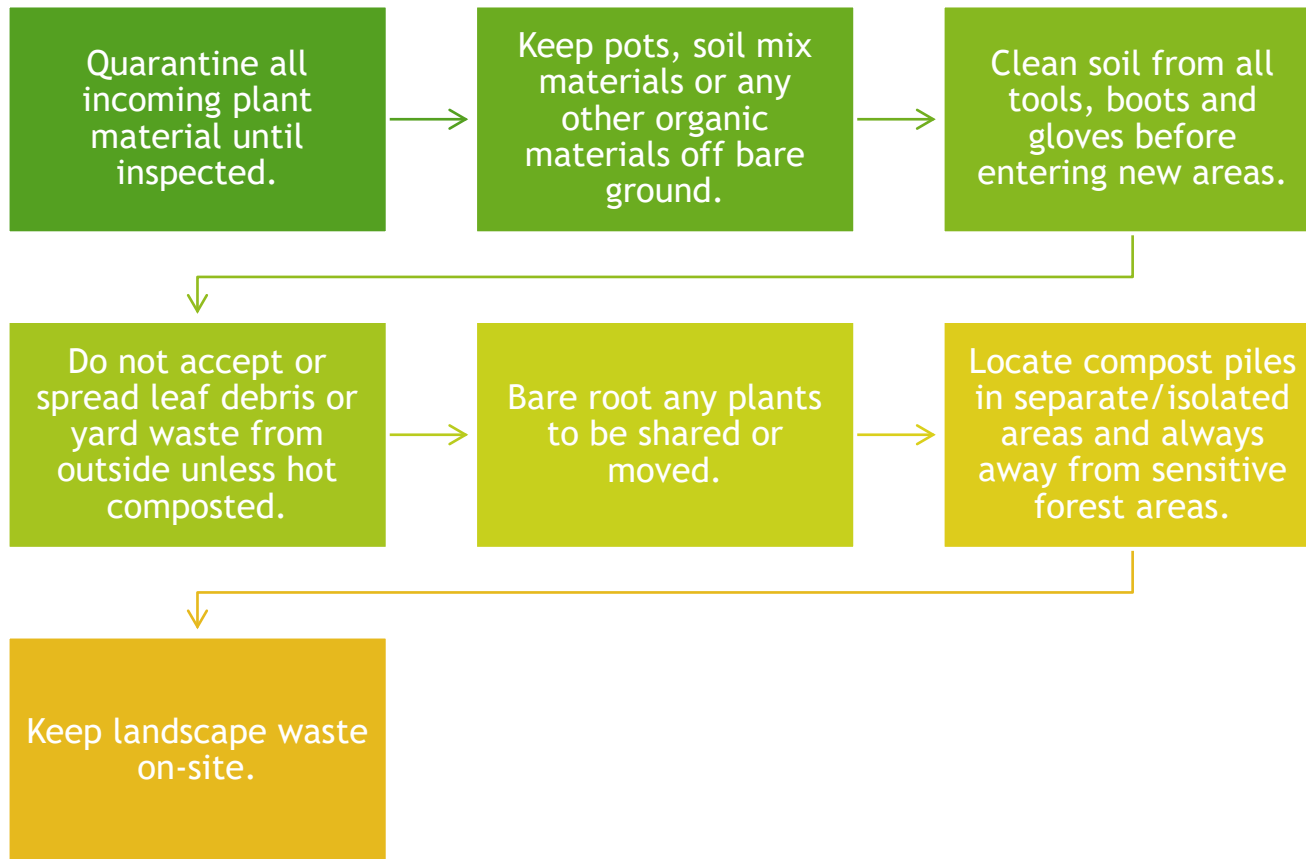
HOW ARE THEY SPREADING?



Earthworms in the genus *Amyntas* soil amendments many which may be used in landscaping and horticulture.



BMPs to slow the spread of *Amynthas* worms



Asian Longhorned Beetle (ALB)

Anoplophora glabripennis



City of Bowling Green, OH



MA Dept. of Agricultural Resources



USDA Forest Service

From: Asia

How it Got Here: SWPM

NOT FOUND IN MAINE

ALB vs. Native Longhorned Beetle

Asian longhorned beetle



Christine Peterson, AP

Hardwoods

White spotted sawyer



N. Slainesville, BugGuide.net

Conifers

ELYTRA

Shiny black

ELYTRA

Dull black

ANENNAE

Stark B/W
contrasting
bands

ANTENNAE

Dim B/W
contrasting
bands

SPOTS

Distinct
white

SPOTS

indistinct off-
white or none

LEGS

Blue tinge

LEGS

no tinge

Oviposition Sites (egg niches)

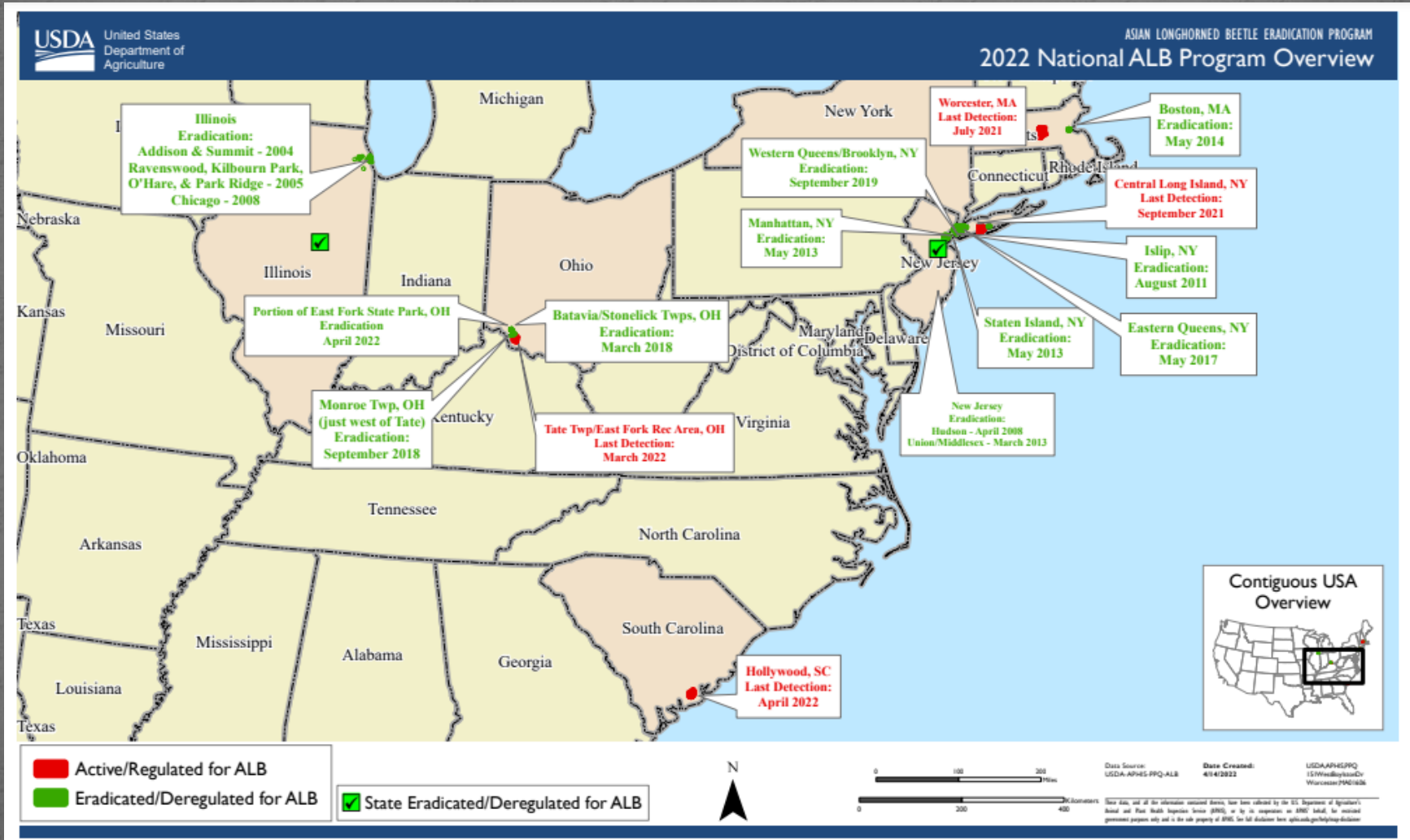


Jenn Forman Orth, Mass. Department of Agricultural Resources



Jenn Forman Orth, Mass. Department of Agricultural Resources

ALB – rare cases of eradication



Hemlock Woolly Adelgid

Look at undersides of HEMLOCK twigs



- Discrete white cottony balls at BASE of needles
- found in newer growth
- most visible November thru July



Healthy hemlock
(no HWA)



HWA infested
hemlock

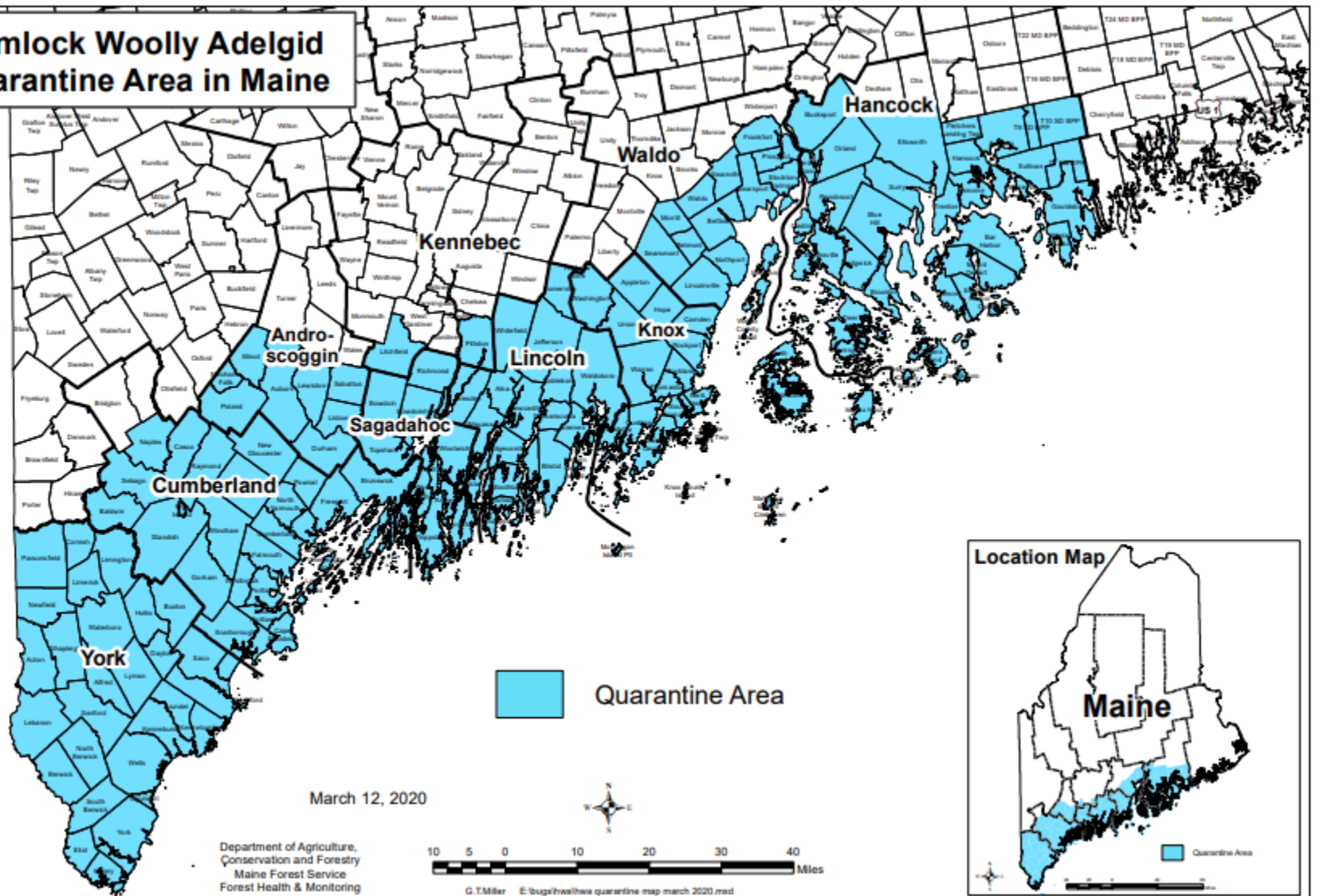


**Westbrook ME
(Uninfested)
April 2008**

**Wolfe Neck Woods
State Park
March 2012**

HWA Quarantine Map

Hemlock Woolly Adelgid Quarantine Area in Maine



1 – 2 punch for hemlocks

Hemlock Woolly Adelgid



Hemlock tree infested with
Hemlock Woolly Adelgid



Look for white cottony masses
on the undersides of branches

Elongate Hemlock Scale



Hemlock tree infested with
Elongate Hemlock Scale



Hemlock tree infested with Elongate
Hemlock Scale and Hemlock Woolly Adelgid

Use IPM!

Integrated Pest Management

- Good horticultural practices
 - select right plants for right places
 - choose pest-resistant, disease-resistant cultivars
 - consider native plants
 - provide optimal soil, water, sunlight



Use IPM!

Integrated Pest Management

- Discourage pests:
 - row covers or netting
 - traps or trap crops,
 - repellents,
 - crop rotation,
 - plant spacing



Use IPM!

Integrated Pest Management

- Encourage natural enemies
 - Spare the sprays
 - Diverse plantings, including season-long offering of plants with flat, open flowers.



What are pesticides?



- ❖ Bleaches, *Lysol*, pine oil
- ❖ Weed & Feed, *Roundup*
- ❖ Rat & mouse baits
- ❖ Plant disease controls

No endorsement intended or implied

What are Pesticides?

- ❖ Sevin, Pyrethroids, *Raid*



- ❖ “Organics” like pyrethrum



- ❖ Biological Controls



- ❖ Wood preservatives



No endorsement intended or implied

These are Pesticides?

- ❖ Plant incorporated protectants
 - ❖ Have the *Bt.* Crystalline protein engineered into them



No endorsement intended or implied

EPA exempt pesticides



- ❖ Some pesticides have been deregulated by EPA

- Exempt from Federal registration
- Must be registered by State of Maine
- Exempt from toxicity testing
- NOT risk free

Ingredients in some of these products:

- Rosemary oil
- Peppermint oil
- Thyme oil
- Clove oil
- Wintergreen oil
- Cinnamon oil

No endorsement intended or implied

What are the risks?

- ❖ **Peppermint oil –**
 - ❖ highly toxic,
 - ❖ use in infants or children is not recommended, when inhaled, due to the potential toxicity of the product
 - ❖ doses of menthol over 1 g/Kg body weight may be deadly
 - ❖ causes dermatitis,
- ❖ **Cinnamon oil –**
 - ❖ powerful irritant and
 - ❖ even worse sensitizer
 - ❖ cinnamon contains coumarin, the parent compound of warfarin, a medication used to keep blood from clotting

<http://www.naha.org/>

<https://nccih.nih.gov/health/cinnamon>



Now there is an organic insecticide that is safe to use around children and pets and won't harm the environment. EcoSMART[®] Flying Insect Killer is made from a patented blend of organic plant oils. It kills bugs fast without any synthetic toxins or harmful residues. It's safe. It's effective. It's smart. Naturally.

To learn more about the EcoSMART[®] and its entire line of organic pesticide products, please visit our website at www.ecosmart.com. **FRESH NATURAL SCENT SIGNALS IT'S WORKING.**

DIRECTIONS FOR USE:
INSTRUCCIONES DE USO:

SHAKE WELL BEFORE USING. READ ENTIRE LABEL AND USE ACCORDINGLY. AGÍTESE BIEN ANTES DE USAR. LEA COMPLETAMENTE LA ETIQUETA Y USE EL PRODUCTO EN CONFORMIDAD.

LA TRADUCCIÓN COMPLETA EN ESPAÑOL DE ESTA ETIQUETA PUEDE SER ENCONTRADA EN WWW.ECOSMART.COM

FLYING INSECT TREATMENT: Kills flies, gnats, mosquitoes, moths and other flying insect pests on contact. Hold container upright and aim nozzle away from yourself. Press button firmly to spray. Direct spray at flying insects, contacting as many insects as possible. Spray in short 2-3 second bursts. Also can be used to spray window screens to repel flying insects from the area. For larger stinging flying insects like wasps and yellow jackets use EcoSMART's Wasp & Hornet Killer aerosol.

NOTE: This product contains plant oils which are inherently fragrant. For people who are fragrance sensitive, test a small application before using over a larger area. When used indoors, wipe away excess product. As with most household products, this product will stain any surface that water alone will stain. Be careful when spraying around plants as some plants with tender tissue and/or tender new growth may be sensitive to botanical oils.

PRECAUTIONARY STATEMENTS: Caution – We recommend good safety practices when using any pesticide, such as avoiding contact with eyes and skin and keeping out of the reach of children and pets. If product gets in eyes, flush with water for at least 15 minutes. If on skin, wash with soap and water. If irritation persists, contact a physician.

PHYSICAL HAZARDS: Contents under pressure. Keep away from heat, sparks and open flames. Do not puncture or incinerate container. Exposure to temperatures above 130° Fahrenheit may cause container to burst.

STORAGE & DISPOSAL: Store in a cool, dry area away from heat or open flame. When container is empty, recycle if available. Do not puncture or incinerate.

LIMITATION OF LIABILITY: To the extent consistent with applicable law, EcoSMART makes no warranties of merchantability or fitness for a particular purpose, nor any other express or implied warranty except as stated above. Buyer assumes all responsibility for safety and use not in accordance with label, directions and precautionary statements.

EcoSMART represents that this product is a Minimum-Risk pest control product, and qualifies for exemption from EPA registration under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).

GUARANTEE: If for any reason you are not satisfied with this product, mail us proof of purchase to obtain a full refund of your purchase price.

Active Ingredients:
Peppermint Oil 2.00%
Cinnamon Oil 1.00%
Sesame Oil 1.00%
Other Ingredients* 96.00%
Total 100.00%



*Water, Wintergreen Oil, 2-Propanol, Canola Oil, Lecithins, Nitrogen

No endorsement intended or implied

Caveat emptor!

For Release: 09/10/2012

FTC Takes Action Against Companies Marketing Allegedly Unproven Natural Bed Bug and Head Lice Treatments

Cedar, Cinnamon, Lemon Grass, Peppermint, and Clove Oil? There's No Proof They Will Eradicate Bed Bugs, Agency Says

The Federal Trade Commission filed deceptive advertising charges against two marketers of remedies for bed bug infestations, who allegedly failed to back up overhyped claims that they could prevent and eliminate infestations using natural ingredients, such as cinnamon and cedar oil. One marketer also allegedly made misleading claims that its products were effective against head lice.

In one of the two cases, [RMB Group, LLC](#) and its principals have agreed to settle the charges relating to their "Rest Easy" bed bug products. In the case against Cedarcide Industries, Inc. and others, challenging their marketing of "Best Yet!" bed bug and head lice treatments, the defendants have not settled, and the FTC is beginning litigation against them.





What about home remedies

- ❖ Home chemistry is not recommended by the BPC
- ❖ Many of the materials used seem “safe” because we eat them or use them on our skin
- ❖ Exposure routes may be different
- ❖ What we eat may not be safe to breathe

Example



6. Eucalyptus oil

A great natural pesticide for flies, bees and wasps. Simply sprinkle a few drops of eucalyptus oil where the insects are found. They will all be gone before you know it

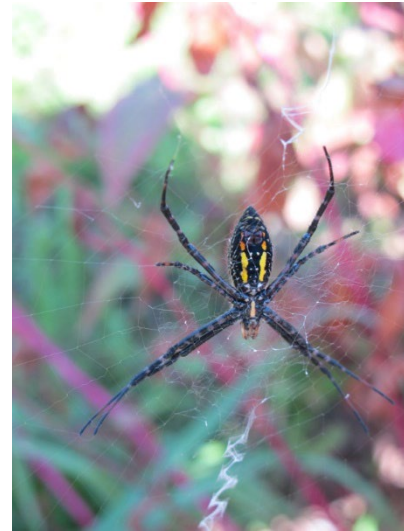
From Medline Plus – NLM NIH

<http://www.nlm.nih.gov/medlineplus/druginfo/natural/700.html>

- ❖ Eucalyptus oil is **POSSIBLY UNSAFE** when applied directly to the skin without first being diluted. Eucalyptus oil is **LIKELY UNSAFE** when it is taken by mouth without first being diluted. Taking 3.5 mL of undiluted oil can be fatal. Signs of eucalyptus poisoning might include stomach pain and burning, dizziness, muscle weakness, small eye pupils, feelings of suffocation, and some others. Eucalyptus oil can also cause nausea, vomiting, and diarrhea.

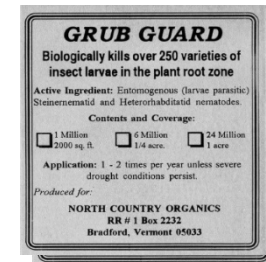
Children: Eucalyptus oil is **LIKELY UNSAFE** for children. It should not be taken by mouth or applied to the skin. Not much is known about the safety of using eucalyptus leaves in children. It's best to avoid use in amounts larger than food amounts.

Surgery: Since eucalyptus might affect blood sugar levels, there is concern that it might make blood sugar control difficult during and after surgery. Stop using eucalyptus at least 2 weeks before a scheduled surgery.

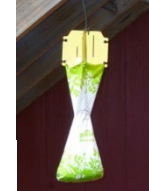


What products are NOT pesticides?

- ❖ Insect parasitic nematodes



- ❖ Rodent or insect traps



- ❖ Beneficial insects or mites



No endorsement intended or implied

What does registration mean?

- ❖ Not a safety guarantee
- ❖ Reasonable certainty of no harm, **but NOT risk free**
- ❖ Must read and follow the label to manage the risk



Use IPM!

Integrated Pest Management

- Know your enemy:
 - identify pests
 - know the good bugs

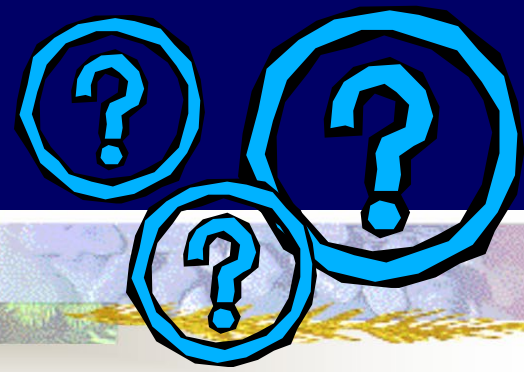


Proceed with caution to protect beneficial insects



- Dragonflies
- Spiders
- Small parasitic wasps
- Predatory mites
- Syrphid flies
- Ground beetles





3 Questions to Always Ask:

1. Is the pest really a problem? Or is it just annoying? (*Action Threshold*)
2. What exactly do I have here? Proper identification of the pest and life cycle stage.
3. Can the environmental factors of why the pest is there be altered to make it a less desirable place for the pest to be?



May/June Beetle



Green June Beetle



Masked Chafer



Japanese Beetle



European Chafer



Oriental Beetle



Asiatic Garden Beetle



Black Turfgrass Ataenius Aphodius

White Grub Rastral Patterns

May/June Beetle



A rastral pattern is an arrangement of short, stout hairs located above the anal slit at the tip of the abdomen, when the grub is positioned as shown here.



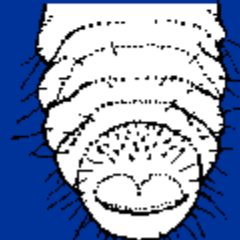
Masked Chafer



Japanese Beetle



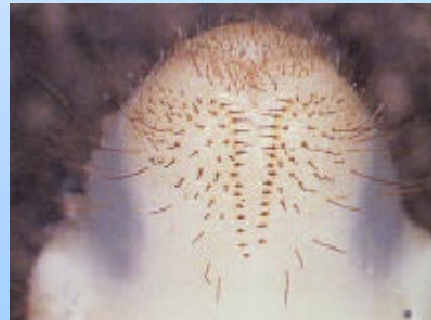
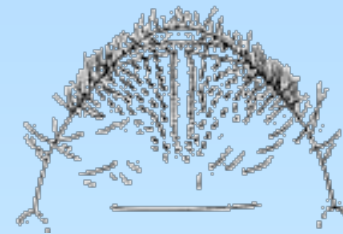
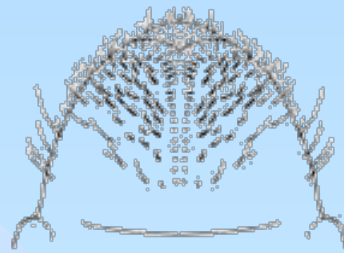
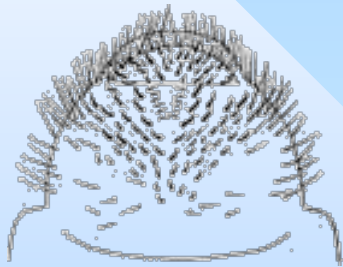
Black Turfgrass Ataenius



White Grubs:
Must Identify in
Order to Control!

Pest Identification is crucial

White grub rastral patterns



Japanese beetle

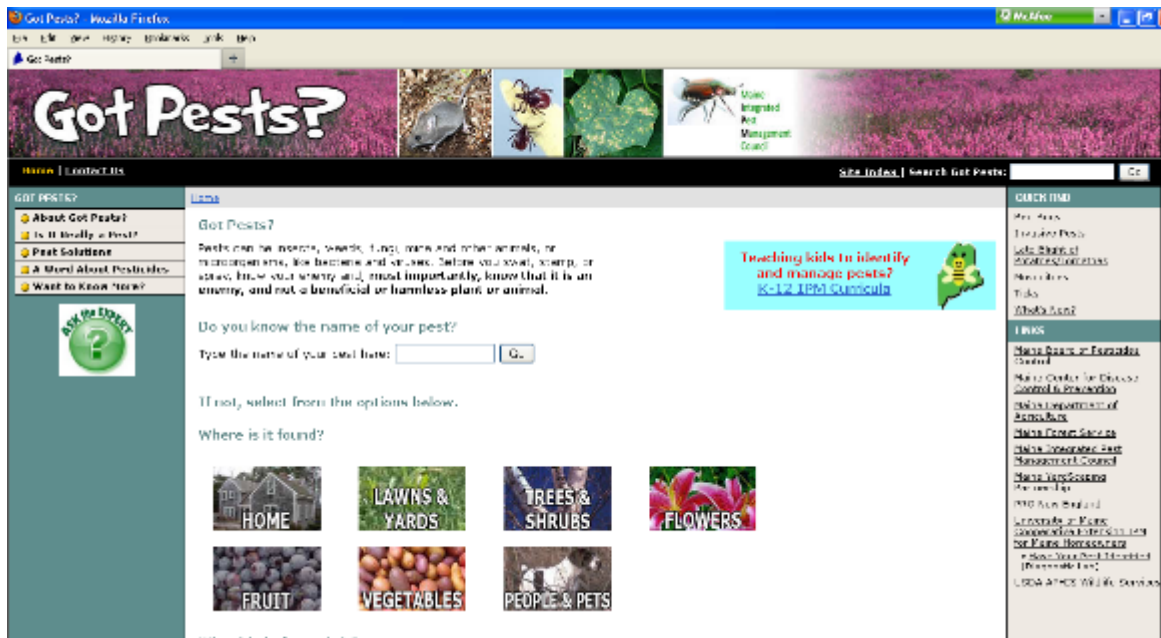
European chafer

May/June beetle

Rose chafer

Identifying Pests and Beneficials

- Gotpests.org



Bugs? Plant Diseases?
Weeds? Critters?
In Your Garden?
Yard? Home?

www.GotPests.org

Maine Integrated Pest
Management Council

Resources

- ▶ **Maine Department of Agriculture, Conservation and Forestry Plant Health Division**
 - ▶ **Apiary • Arborist • Ginseng • Horticulture • Hemp • IPM - Programs**
207-287-3891
 - ▶ <https://www.maine.gov/dacf/php/index.shtml>
 - ▶ **Cooperative Extension: Insect Pests, Ticks, and Plant Diseases**
 - ▶ 207.581.3880 or 800.287.0279 (in Maine)
 - ▶ extension.diagnosticlab@maine.edu

