Wisconsin's Insect Trends and Pests to Watch for in 2024

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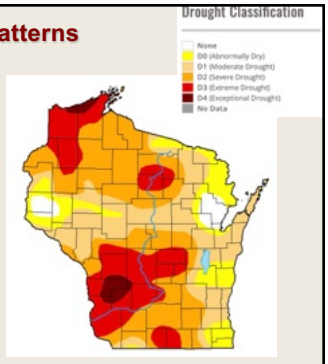
Wisconsin's Weather Patterns

- Many part of Wisconsin experienced dry conditions 2021, 2022, and 2023
- Dry conditions can directly favor or hinder certain arthropods
  - Spongy moth, spider mites, etc.
- Weather patterns can indirectly influence insects via impacts on landscape plants



September 5th, 2023. Map Source: US Drought Monitor

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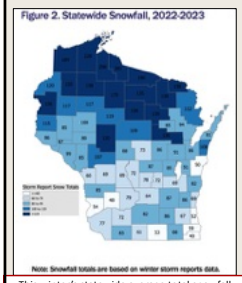
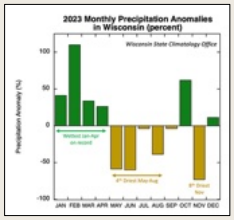
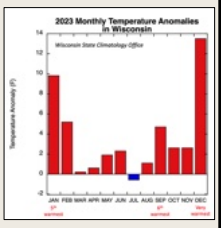
Wisconsin's Recent Weather Patterns



This winter's statewide average total snowfall was 100.6 inches, over 36 inches above last year.

Source: WI-DOT Report "Winter Maintenance at a Glance"





Source: WI State Climatology Office

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Spongy Moth (*Lymantria dispar*)

- Formerly known as the *Gypsy Moth*
- Invasive; native to Europe and northern Asia
  - Introduced in Massachusetts: 1860's
  - Range expanding west/south; outbreaks @ leading edge
- Feeds on a wide range of trees and shrubs

Spongy moth caterpillar

Adult (female) spongy moth w/egg mass

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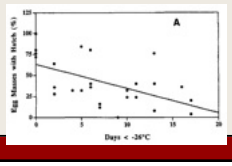
Spongy Moth Trends: 2020 – 2023+

- Populations have been on the rise for several years in Wisconsin
  - Dry spring weather plays an important role
- DATCP Trapping Surveys: record catch of adult moths in traps
- DNR monitoring: new record for acreage defoliated in the state (374,620 acres)
- Other factors such as heavy snow cover and mild winter temperatures can also increase survival of eggs

USFS: winter egg mortality 48-72 hours at -20˚F (-28˚C)



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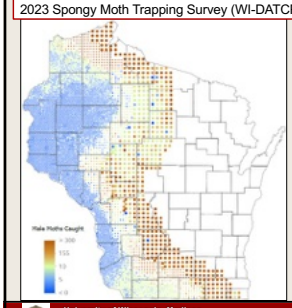
Spongy Moth Trends in Wisconsin

2023 Spongy Moth Trapping Survey (WI-DATCP)



2023 Spongy Moth Trap Counts

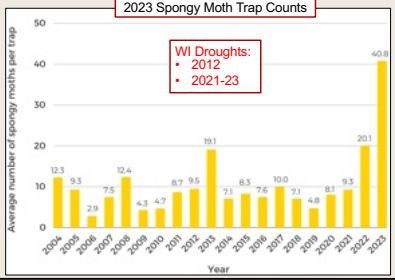


Chart & Map Source: WI-DATCP

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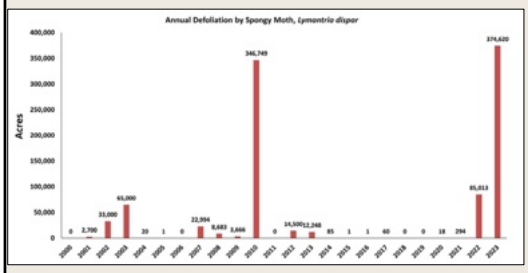
Spongy Moth Trends in Wisconsin



Areas of Defoliation in 2023
Credit: Mike Hillstrom, DNR

University of Wisconsin–Madison
Insect Diagnostic Lab

Credit: WI-DNR

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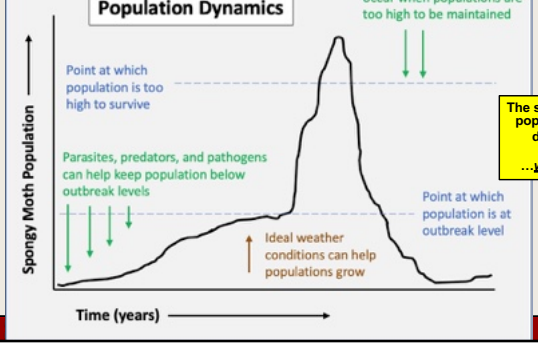
Spongy Moth Population Dynamics



The spongy moth population will decline…

…*when*???…

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Spongy Moth Caterpillars

- Larvae (caterpillars) are the damaging life stage
  - Use chewing mouthparts to feed on foliage
- Pass through 5-6 larval sub-stages (instars)
  - Small caterpillars (1st & 2nd instar):
    - Dark w/pale spots; "shaggy" w/raised bumps
    - Active day & night
    - Can disperse via ballooning
  - Large caterpillars (3rd + instar)
    - Up to ~2" long
    - Grayish w/raised blue and red nodules
    - Active at night
    - Most feeding damage caused by last two instars!

Early instar spongy moth caterpillar

Late instar spongy moth caterpillar

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Leaf Consumption by Caterpillars

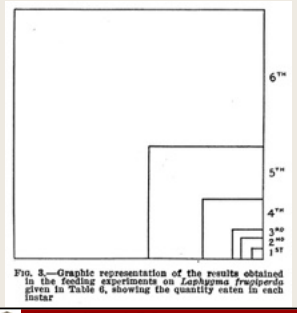

FIG. 3.—Graphic representation of the results obtained in the feeding experiments on *Lophyma frupiperda* given in Table 6, showing the quantity eaten in each instar

- Later instars consume much more leaf area than younger larvae
- For spongy moth, 80-90% of feeding damage is caused by final two instars!
- This can give the impression of a sudden or overnight appearance of caterpillars

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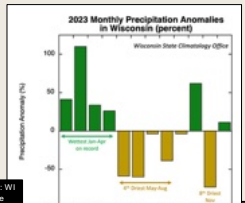
An ace in the hole?...*Entomophaga maimaiga*

- Fungus from native range of spongy moths
- Purposefully introduced in 1910-11 & 1985-86; *infected caterpillars found in 1989*
- Can kill caterpillars in a matter of days; additional spores produced
- Weather plays a key role…*moisture/humidity is critical!*



Source: WI State Climatology Office

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Spongy Moths – *Thoughts on Management*

- We have a lot of options in the IPM toolbox
- *How much tolerance do we have for this pest?*
  - Considerations: weather patterns, repeated defoliation, secondary pests
- *How proactive / aggressive do we need to be?*

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Two Lined Chestnut Borer (*Agrilus bilineatus*)

- Native metallic wood boring beetle (Buprestidae)
- Associated with stressed/compromised oaks: *"secondary" borer*
- *If warranted, treatments similar to EAB*

TLCB Symptoms:
Discolored foliage (left) & thinning canopy (right)

Larvae & Galleries

Adults

Photo credit for oak canopies: WI-DNR

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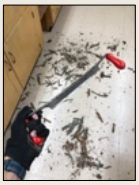
Two Lined Chestnut Borer (*Agrilus bilineatus*)

- To confirm presence of two lined chestnut borer:
  - D-shaped exit holes
  - Peel bark to check for galleries & larvae

Year	Number of 2LCB Cases at UW-IDL
2019	10
2020	11
2021	16
2022	26
2023	48



Tips for sending in oak samples to UW Diagnostic Lab:
- Check UW Plant Disease Diagnostics Clinic website Re: oak wilt testing
- Send sufficient material; cut up to fit in a box, etc.
- Small diameter is good! (~ ½ - 1" works well to check for 2LCB)

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Bronze Birch Borer (Agrilus anxius)

- Native metallic wood boring beetle (Buprestidae)
- Associated with stressed/compromised oaks: *"secondary" borer*
- *If warranted, treatments similar to EAB*

Adults

Larva

D-Shaped Exit hole

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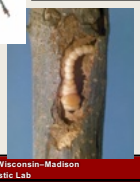
Other "Secondary" Borers

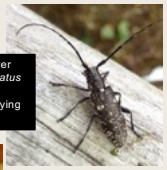
Flatheaded Appletree Borer
Chrysobothris femorata

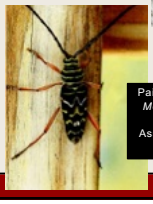
Associated w/stressed hardwoods (many species)



Whitespotted sawyer
Monochamus scutellatus

Associated dead & dying conifers





Painted Hickory Borer
Megacyllene caryae

Associated w/dying & dead hickories

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"Secondary" Bark Beetles

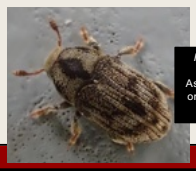
Pityogenes hopkinsi

Associated w/smooth barked portions of dead/dying white pines

Many bark beetles show up to trees that are severely stressed or actively dying

Pseudopityophthorus minutissimus

Associated w/really stressed oaks & cut branches/wood



Hylesinus aculeatus

Associated w/dead, cut or seriously-weakened ash trees

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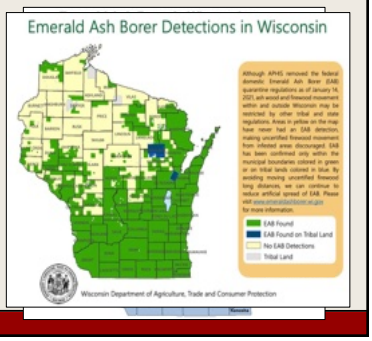
Emerald Ash Borer



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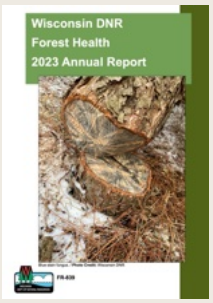
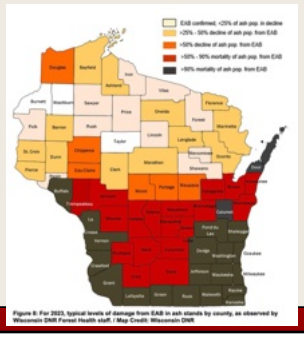
EAB Damage Map





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Periodical Cicadas

- Brood XIII 17-year periodical cicadas will emerge this year
  - Last emerged in 2007

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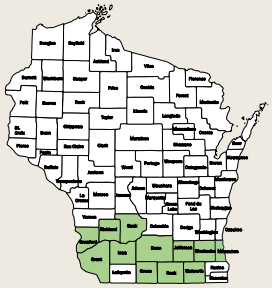
Where will we see periodical cicadas? *When?*



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Potential impacts to nursery & landscape plants:

- Females use ovipositor to cut slits into twigs/branches
  - Large trees: damage mainly cosmetic; "flagging"
  - Small trees: damage can be more problematic—*consider mesh netting*

Photo credits: CicadaMania website

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Key Things Arborists Should Know About 17-Year Cicadas:

1. Distribution is restricted to very specific spots in southern WI
   - *Most of Wisconsin will not see these*
2. Site history is a key factor!
   - *Were they present at a site in 2007? If not, you won't see them in 2024 either…*
3. Periodical cicadas are generally harmless and don't need to be managed
   - Small trees or shrubs would be the exception

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Japanese beetles

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Asiatic Garden Beetle

- First confirmed in 2021 (Dane Co.)
- Adults feed on landscape plants
  - Most active when temps > 70˚F at night
  - Readily fly to lights
- Larvae can be associated w/poorly maintained lawns

Asiatic garden beetle adult

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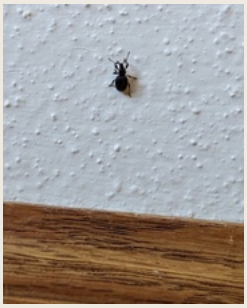
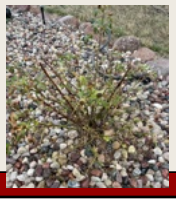
Broad-Nosed Weevils (Curculionidae: Entiminae)





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Commonest Broad-Nosed Weevils

Strawberry Root Weevil

Black Vine Weevil (Taxus Weevil)

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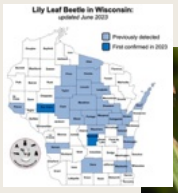
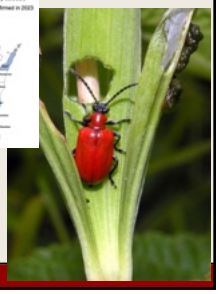
Invasive Leaf Beetles

Viburnum leaf beetle



Lily leaf beetle



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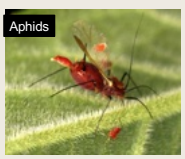
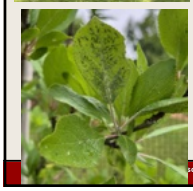
Sucking Insect Pests



Aphids



Thrips

Triozids (Serviceberry)

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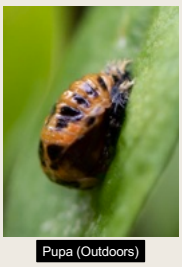
Multicolored Asian Lady Beetles

Adults (Indoors)



Pupa (Outdoors)

Larva (Outdoors)

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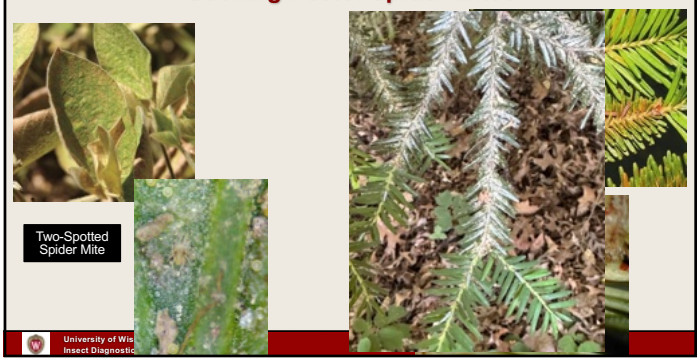
Sucking Pests: Spider Mites



Two-Spotted Spider Mite

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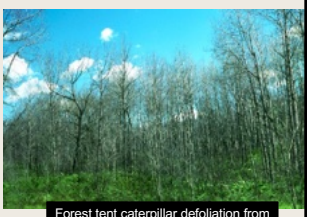
Forest Tent Caterpillar



Forest tent caterpillar defoliation from our last WI outbreak ~ 1999-2002

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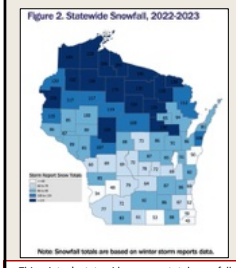
Weather Patterns & Mosquito Activity



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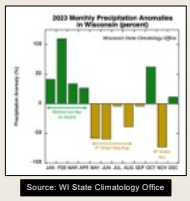
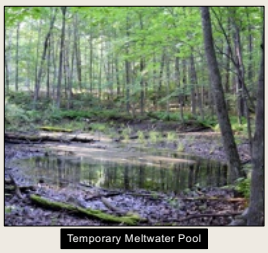


Source: WI State Climatology Office



Temporary Meltwater Pool

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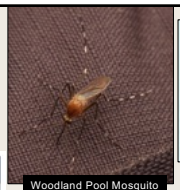
Mosquitoes

- 2023: Mosquito activity varied greatly around the Midwest
- Moderate WNV cases

Wisconsin 2023 WNV Data Source: DHS

Type	Number of cases
Human confirmed	12
Human probable*	6
Deaths**	1
Hospitalizations**	17
Mosquito pools	35
Equine (horse)	5
Avian (bird)	5
Counties reporting West Nile virus activity	14

*Probable cases have presumptive positive laboratory results without confirmatory testing at CDC.
**Deaths and hospitalizations are included among the confirmed and probable cases.



Woodland Pool Mosquito (*Aedes canadensis*)

Cattail Mosquito (*Coquillettidia perturbans*)

Northern House Mosquito (*Culex pipiens*)

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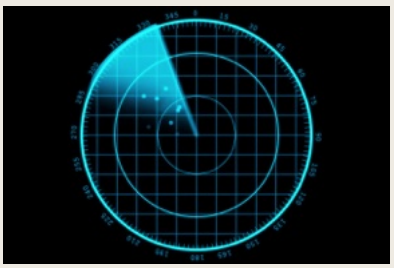
Nursery & Landscape pests to have on your radar:



- Spotted lanternfly
- Box tree moth
- Elm zigzag sawfly

- **Not yet in Wisconsin**
- *If you suspect any of these, **please report**!*

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Spotted Lanternfly

- Invasive Fulgorid planthopper from southeast Asia
  - Spread to Japan and Korea
  - Arrived in USA in 2014 (PA)
  - Not yet in WI…
- Eggs can easily be transported
- SLF feeds on 100+ plant species
  - Tree of Heaven (*Ailanthus altissima*)
  - Fruits: grapes & tree fruits
  - Hops
  - Landscape/forest trees (maple, walnut, poplar, willow, etc.)

SLF Adult

Early instar SLF Nymph

4th instar SLF Nymph

Photo Credits: Lawrence Barringer, Pennsylvania Department of Agriculture, Bugwood.org

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Damage & Impacts

- Nymphs & adults possess sucking-type mouthparts
  - Restricted to a liquid diet (phloem feeders)
- Feeding location varies by life stage:
  - Nymphs: leaves, petioles, branches, and young stems (of wide range of plants)
  - Adults: trunk and branches (mostly on trees)
- Primary Impacts: oozing wounds, branch/twig dieback, honeydew
  - Also – fungal growth & nuisance impacts
- Bottom line: doesn't kill plants; messy nuisance (trees); reduced yield (grapes)
  - Can kill TOH, grapes, black walnut saplings

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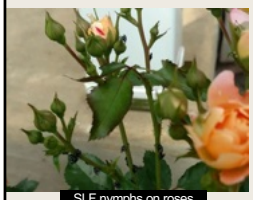
Damage



SLF nymphs on roses

Fungal Growth at Base of Tree

SLF adults covering tree trunk

Photo Credits: Lawrence Barringer, Pennsylvania Department of Agriculture, Bugwood.org

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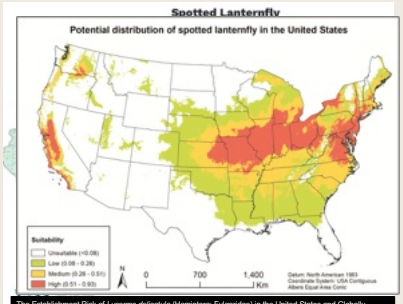
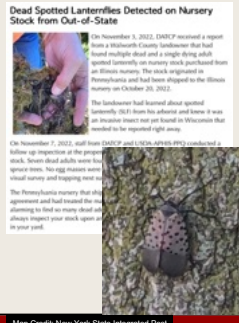
Current SLF Distribution & Potential Range



The Establishment Risk of *Lycorma delicatula* (Hemiptera: Fulgoridae) in the United States and Globally. Wakie, et al. J. Econ Entom. 2019.



Map Credit: New York State Integrated Pest Management Program & Google Maps

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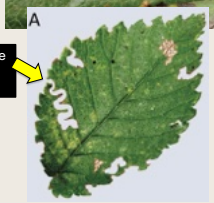
Elm Zigzag Sawfly

- Invasive sawfly; native to Asia
  - *Also an invasive pest in Europe*
- Host: elms
- Found in:
  - Quebec, Canada – 2020
  - VA – 2021
  - NC, MD, PA, NY – 2022
  - VT, MA, OH – 2023

Elm zigzag sawfly larva



A

Distinctive feeding damage

Photo source: First records of elm zigzag sawfly (Hymenoptera: Argidae) in the United States. 2023. K. Oten, et. Al.

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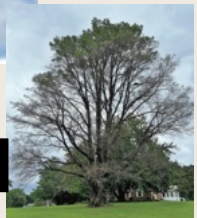
Elm Zigzag Sawfly

- Damage caused by larvae
  - Use chewing mouthparts
  - Chew zigzag notches out of leaves
  - Complete defoliation can occur

Damage on individual elm leaf



Defoliation from heavy population

Table 1. Documented host species of EZS in the United States

Species	Common name	Location (state)
Ulmus americana	American elm	PA, NC, MD, NY
Ulmus alata	winged elm	NC
Ulmus parvifolia	Chinese elm	VA
Ulmus procera	English elm	VA
Ulmus pumila	Siberian elm	VA
Ulmus rubra	slippery elm	MD
Ulmus x 'Cathedral'	Japanese x Siberian hybrid	VA

Photo source: First records of elm zigzag sawfly (Hymenoptera: Argidae) in the United States. 2023. K. Oten, et. Al.

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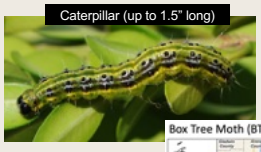
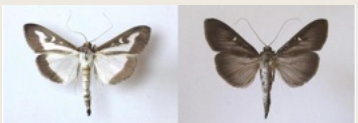
Box Tree Moth

- Invasive caterpillar; native to Asia
  - Also a problem in Europe
- Host: Boxwoods
- Found in:
  - Canada (Toronto) – 2018
  - New York – 2021
  - Michigan – 2022



Caterpillar (up to 1.5" long)



Typical color form adult

Dark color form adult

Credit: Szabolcs Sáfián, University of West Hungary, Bugwood.org

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Box Tree Moth

- Damage caused by caterpillars
  - Use chewing mouthparts
  - Consume foliage
  - Create silken webbing

Caterpillar with silken webbing

Extensive webbing

Significant damage (Europe)

Questions?

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