Invasive Tree Insects & Iowa

IWCA Conference

Invasive Species

2023

Mike Kintner
EAB and Spongy Moth Outreach & Regulatory Coordinator
Iowa Department of Agriculture & Land Stewardship

Spongy Moth

A NEW common name

Formerly known as ‘Gypsy’ Moth

London UK© K.Wang

Selected by the Entomological Society of America in March 2022

[‘Gypsy’ considered culturally offensive, especially to people from Romania]

Spongy Moth

Lymantria dispar

- Invasive leaf feeding insect from Europe
- Prefers oaks, although generalist
- Healthy deciduous trees recover
- Already stressed deciduous trees at risk
- Introduced in Boston, MA in 1860's

Male

Female

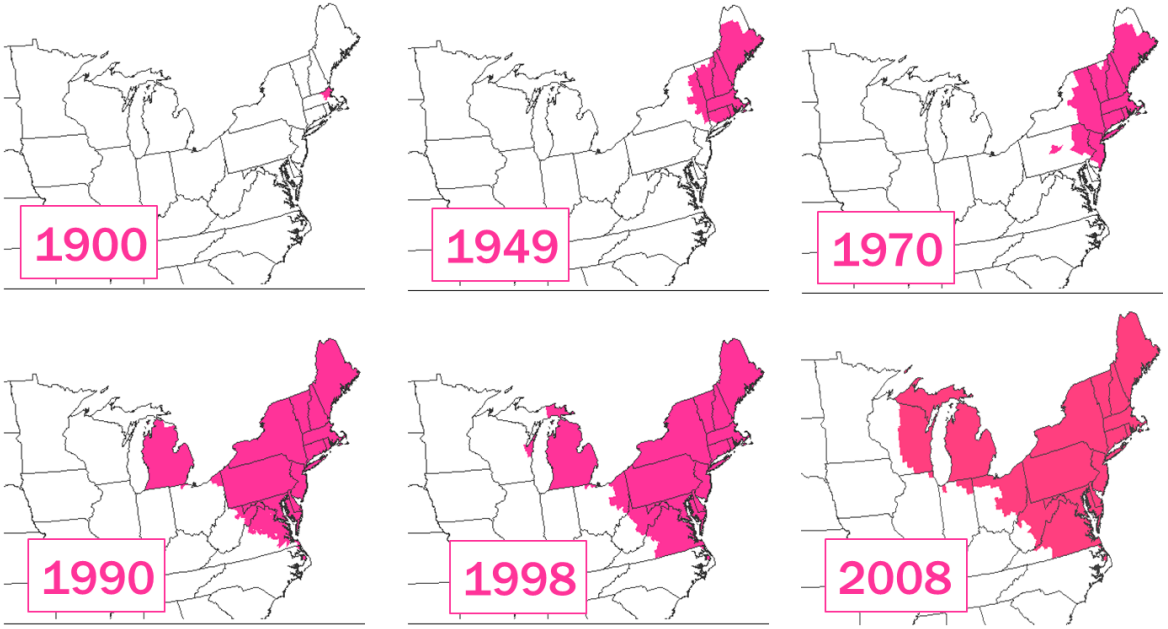
Bill McNee, Wisconsin Dept of Natural Resources

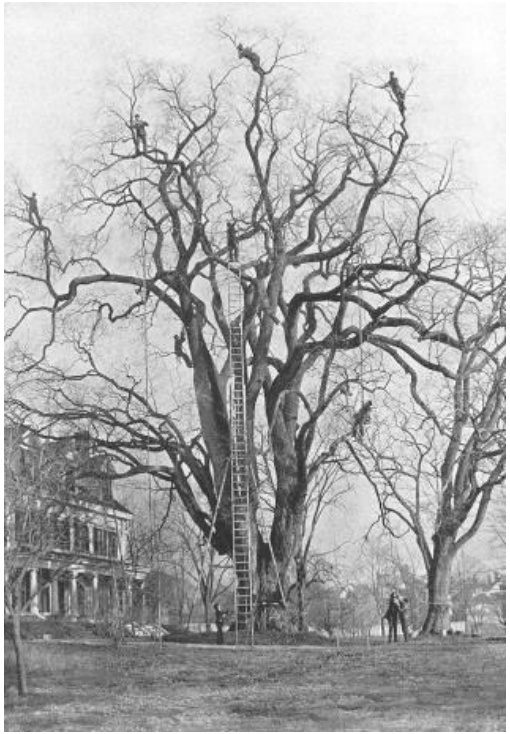
Larva (caterpillar)

Tim Tigner, Virginia Department of Forestry

Feeding damage (larvae)

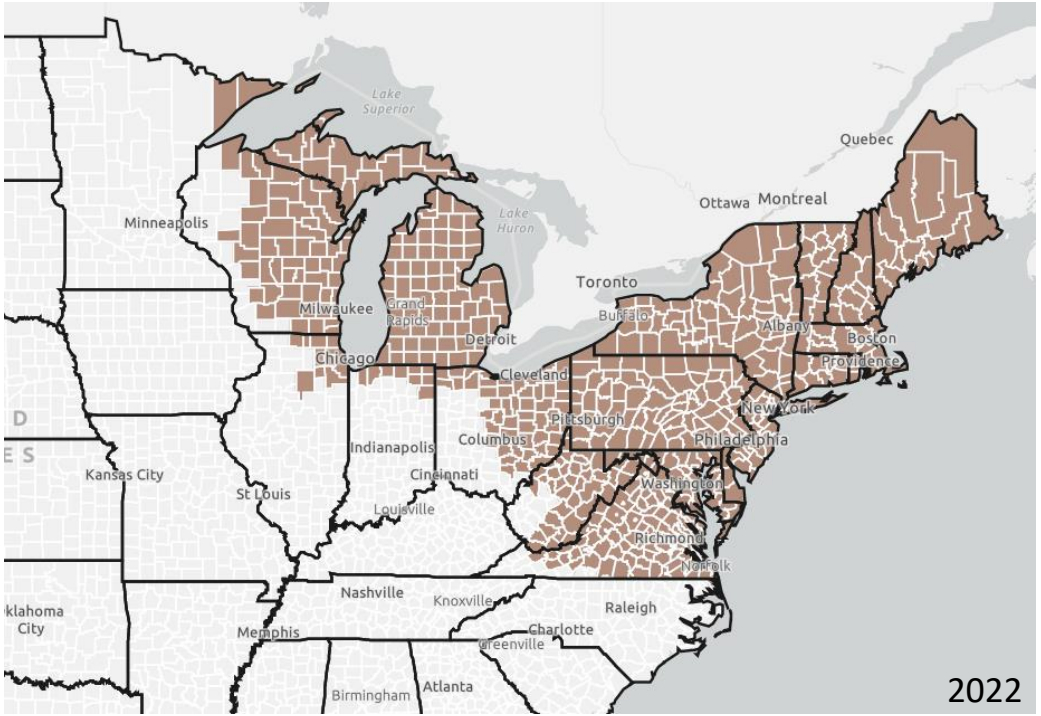
Spread through the years…

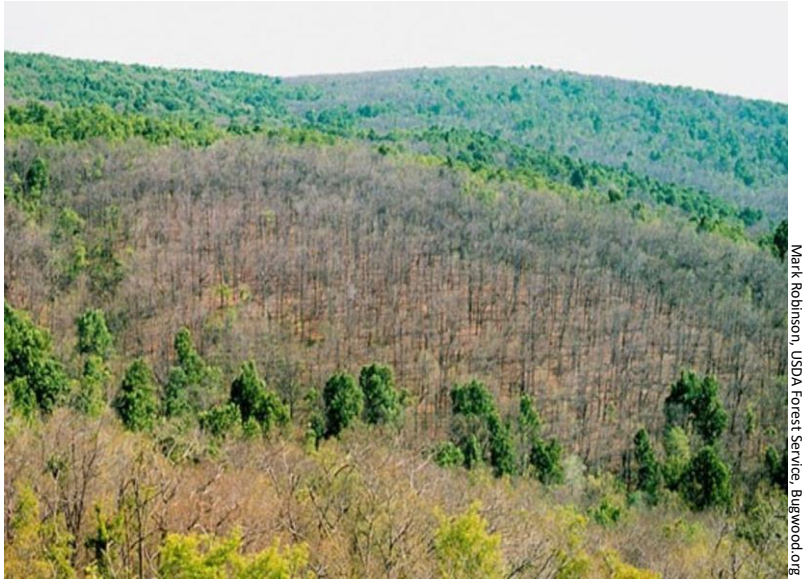




Early efforts

Established Spongy Moth areas (Federal Quarantine)



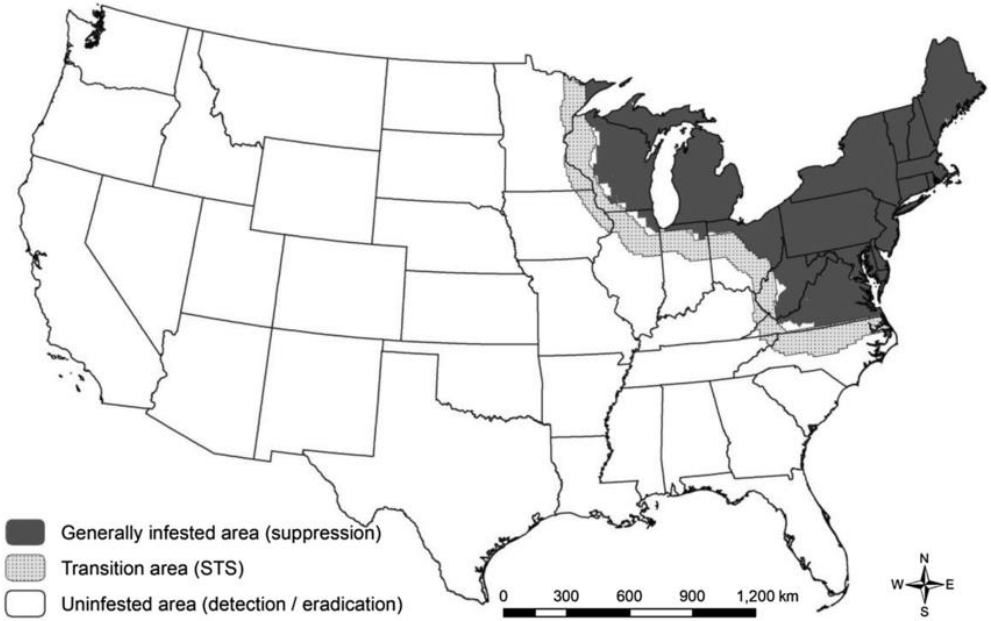


Mark Robinson, USDA Forest Service, Bugwood.org

Outbreaks → defoliation

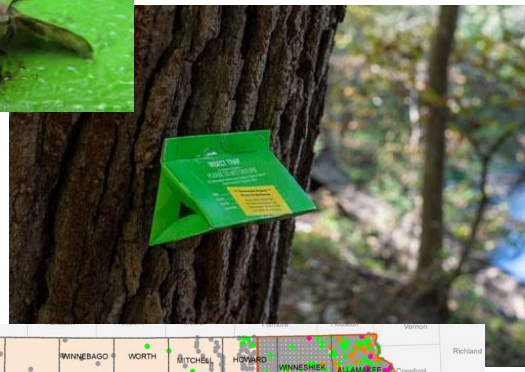
Annual Trapping Survey

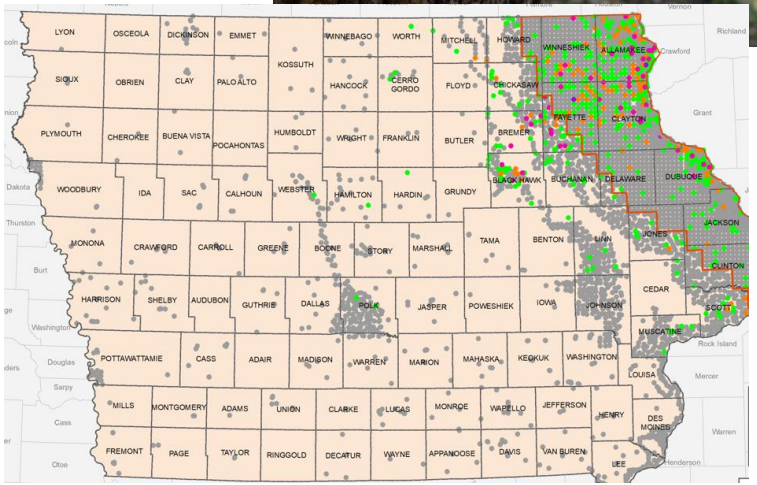
NE IOWA = transition area (Slow-the-Spread zone)



Male moths

Delta trap w/ female pheromone





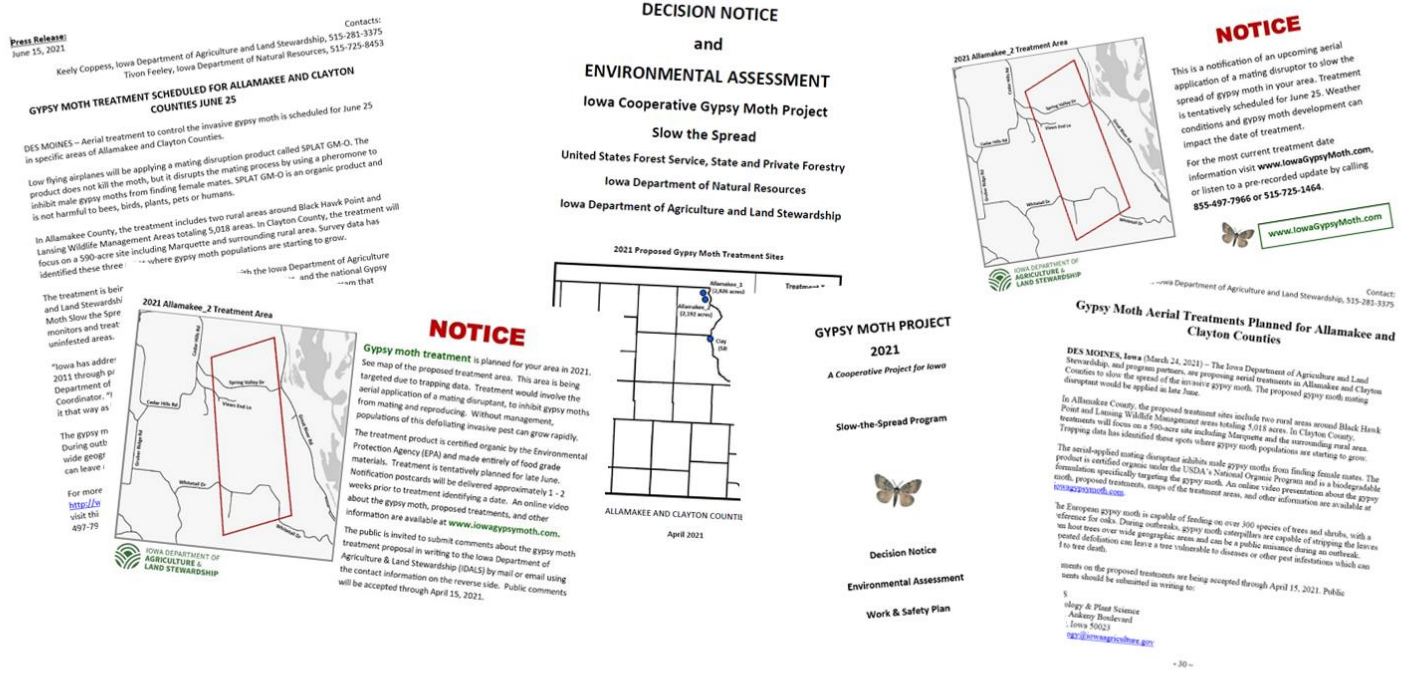
4,000+ traps statewide

Treatment

- Air tractor treatment with mating disputant (does not kill spongy moth)
- Pheromone ‘scent’ of female applied to area
- Disrupts male moths’ ability to find females to mate with

Aerial mating disruption treatment in NE Iowa

Prior to aerial treatment…



Press Release:
June 15, 2021

Contacts:
Keely Coppess, Iowa Department of Agriculture and Land Stewardship, 515-281-3375
Tivon Feeley, Iowa Department of Natural Resources, 515-725-8453

GYPSY MOTH TREATMENT SCHEDULED FOR ALLAMAKEE AND CLAYTON COUNTIES JUNE 25

DES MOINES – Aerial treatment to control the invasive gypsy moth is scheduled for June 25 in specific areas of Allamakee and Clayton Counties.

Low flying airplanes will be applying a mating disruption product called SPLAT GM-O. The product does not kill the moth, but it disrupts the mating process by using a pheromone to inhibit male gypsy moths from finding female mates. SPLAT GM-O is an organic product and is not harmful to bees, birds, plants, pets or humans.

In Allamakee County, the treatment includes two rural areas around Black Hawk Point and Lansing Wildlife Management Areas totaling 5,018 areas. In Clayton County, the treatment will focus on a 590-acre site including Marquette and surrounding rural area. Survey data has identified these three [illegible] where gypsy moth populations are starting to grow.

The treatment is beir[illegible] with the Iowa Department of Agriculture and Land Stewardshi[illegible] and the national Gypsy Moth Slow the Spre[illegible]ram that monitors and treat[illegible] uninfested areas.

"Iowa has addre[illegible] 2011 through pa[illegible] Department of [illegible] Coordinator. "I[illegible] it that way as [illegible]

The gypsy m[illegible] During outb[illegible] wide geogr[illegible] can leave [illegible]

For more [illegible] http://w[illegible] visit thi[illegible] 497-79[illegible]

2021 Allamakee_2 Treatment Area

IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

DECISION NOTICE
and
ENVIRONMENTAL ASSESSMENT
Iowa Cooperative Gypsy Moth Project
Slow the Spread
United States Forest Service, State and Private Forestry
Iowa Department of Natural Resources
Iowa Department of Agriculture and Land Stewardship

2021 Proposed Gypsy Moth Treatment Sites

Allamakee_2 (5,018 acres)
Allamakee (2,592 acres)
Clay (58

ALLAMAKEE AND CLAYTON COUNTIE

April 2021

NOTICE

Gypsy moth treatment is planned for your area in 2021. See map of the proposed treatment area. This area is being targeted due to trapping data. Treatment would involve the aerial application of a mating disruptant, to inhibit gypsy moths from mating and reproducing. Without management, populations of this defoliating invasive pest can grow rapidly.

The treatment product is certified organic by the Environmental Protection Agency (EPA) and made entirely of food grade materials. Treatment is tentatively planned for late June. Notification postcards will be delivered approximately 1 - 2 weeks prior to treatment identifying a date. An online video about the gypsy moth, proposed treatments, and other information are available at **www.iowagypsymoth.com.**

The public is invited to submit comments about the gypsy moth treatment proposal in writing to the Iowa Department of Agriculture & Land Stewardship (IDALS) by mail or email using the contact information on the reverse side. Public comments will be accepted through April 15, 2021.

GYPSY MOTH PROJECT
2021
A Cooperative Project for Iowa

Slow-the-Spread Program

Decision Notice

Environmental Assessment

Work & Safety Plan

2021 Allamakee_2 Treatment Area

IOWA DEPARTMENT OF AGRICULTURE & LAND STEWARDSHIP

NOTICE

This is a notification of an upcoming aerial application of a mating disruptor to slow the spread of gypsy moth in your area. Treatment is tentatively scheduled for June 25. Weather conditions and gypsy moth development can impact the date of treatment.

For the most current treatment date information visit **www.IowaGypsyMoth.com**, or listen to a pre-recorded update by calling **855-497-7966 or 515-725-1464.**

www.IowaGypsyMoth.com

[illegible]owa Department of Agriculture and Land Stewardship, 515-281-3375

Gypsy Moth Aerial Treatments Planned for Allamakee and Clayton Counties

DES MOINES, Iowa (March 24, 2021) – The Iowa Department of Agriculture and Land Stewardship, and program partners, are proposing aerial treatments in Allamakee and Clayton Counties to slow the spread of the invasive gypsy moth. The proposed gypsy moth mating disruptant would be applied in late June.

In Allamakee County, the proposed treatment sites include two rural areas around Black Hawk Point and Lansing Wildlife Management areas totaling 5,018 acres. In Clayton County, treatments will focus on a 590-acre site including Marquette and the surrounding rural area. Trapping data has identified these spots where gypsy moth populations are starting to grow.

The aerial-applied mating disruptant inhibits male gypsy moths from finding female mates. The product is certified organic under the USDA's National Organic Program and is a biodegradable formulation specifically targeting the gypsy moth. An online video presentation about the gypsy moth, proposed treatments, maps of the treatment areas, and other information are available at [illegible]owagypsymoth.com.

The European gypsy moth is capable of feeding on over 300 species of trees and shrubs, with a preference for oaks. During outbreaks, gypsy moth caterpillars are capable of stripping the leaves from host trees over wide geographic areas and can be a public nuisance during an outbreak. Repeated defoliation can leave a tree vulnerable to diseases or other pest infestations which can lead to tree death.

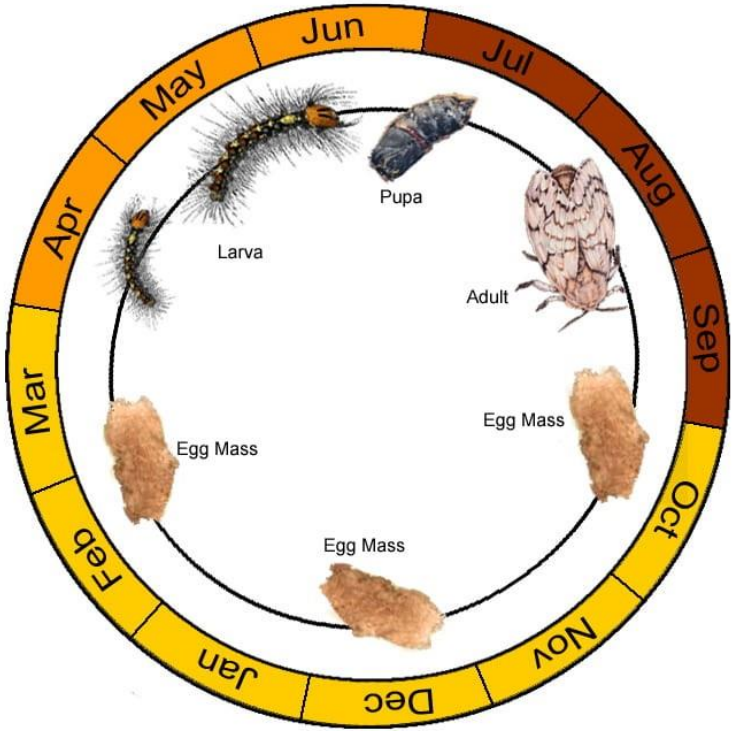
[illegible]ments on the proposed treatments are being accepted through April 15, 2021. Public [illegible]ments should be submitted in writing to:

[illegible]
[illegible]ology & Plant Science
[illegible] Ankeny Boulevard
[illegible], Iowa 50023
[illegible]ary@iowaagriculture.gov

-30-

Environmental Assessment in accordance with National Environmental Policy Act (NEPA)
Decision Notice & Finding of No Significant Impact (FONSI) – signed by U.S. Forest Service

Life Cycle



Ohio Department of Agriculture

USDA-APHIS-PPQ

Egg mass

500-100 eggs

- Spongy moth do not build tents
- Likely result of the native tent caterpillar or fall webworm

Emerald Ash Borer

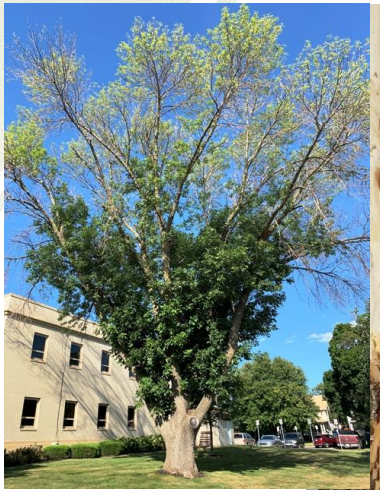
Image: IDALS, Entomology & Plant Sci.

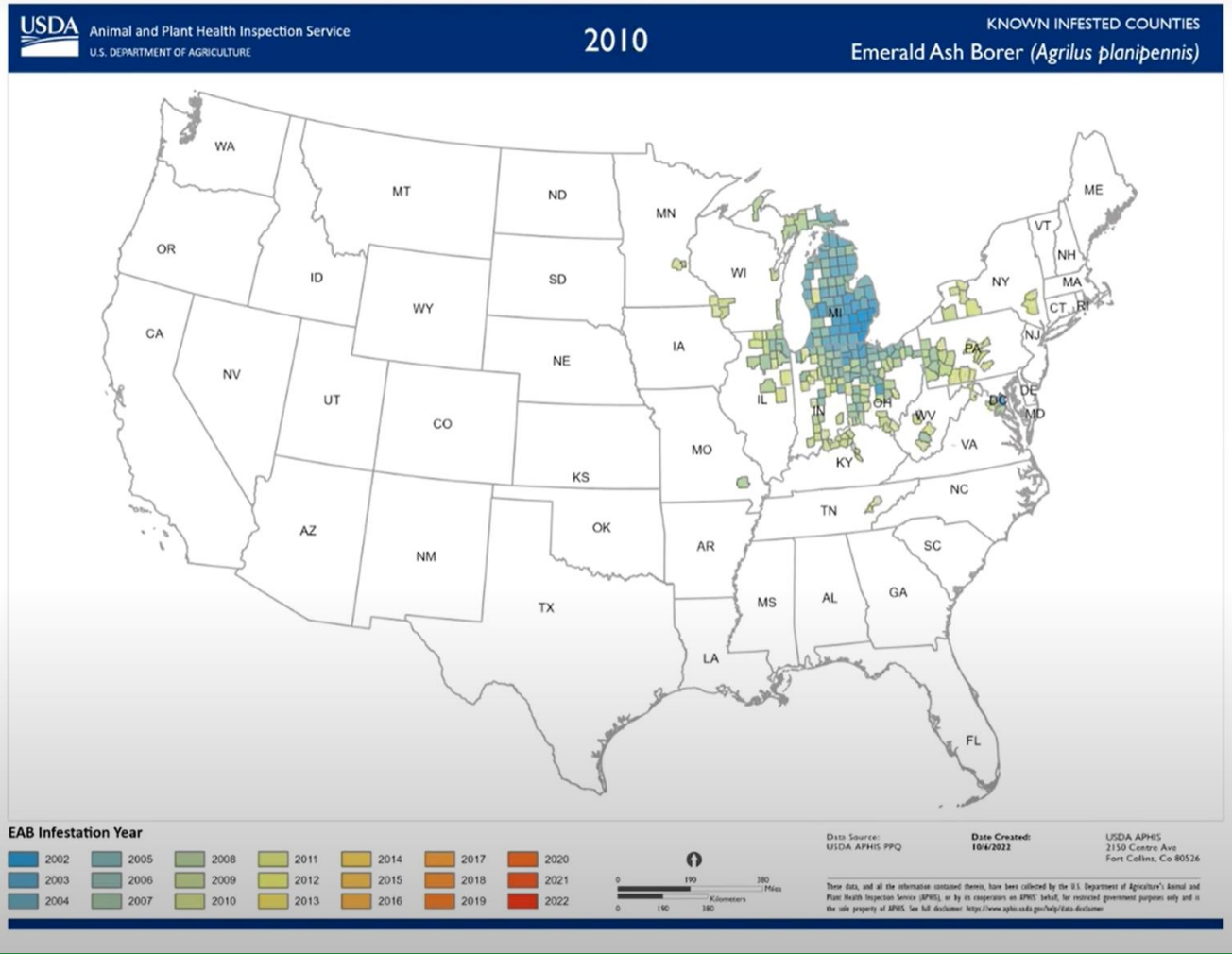
Image: IDALS, Entomology

Emerald Ash Borer (EAB)

Agrilus planipennis Fairmaire

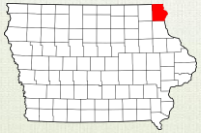
- Invasive, wood-boring insect from Asia
- Attacks & kills ash trees (*Fraxinus* species)
- Primary pest = fatal to both stressed & healthy ash trees
- Larval feeding disrupts transport of water & nutrients
- First discovered in U.S. in 2002 (Michigan)

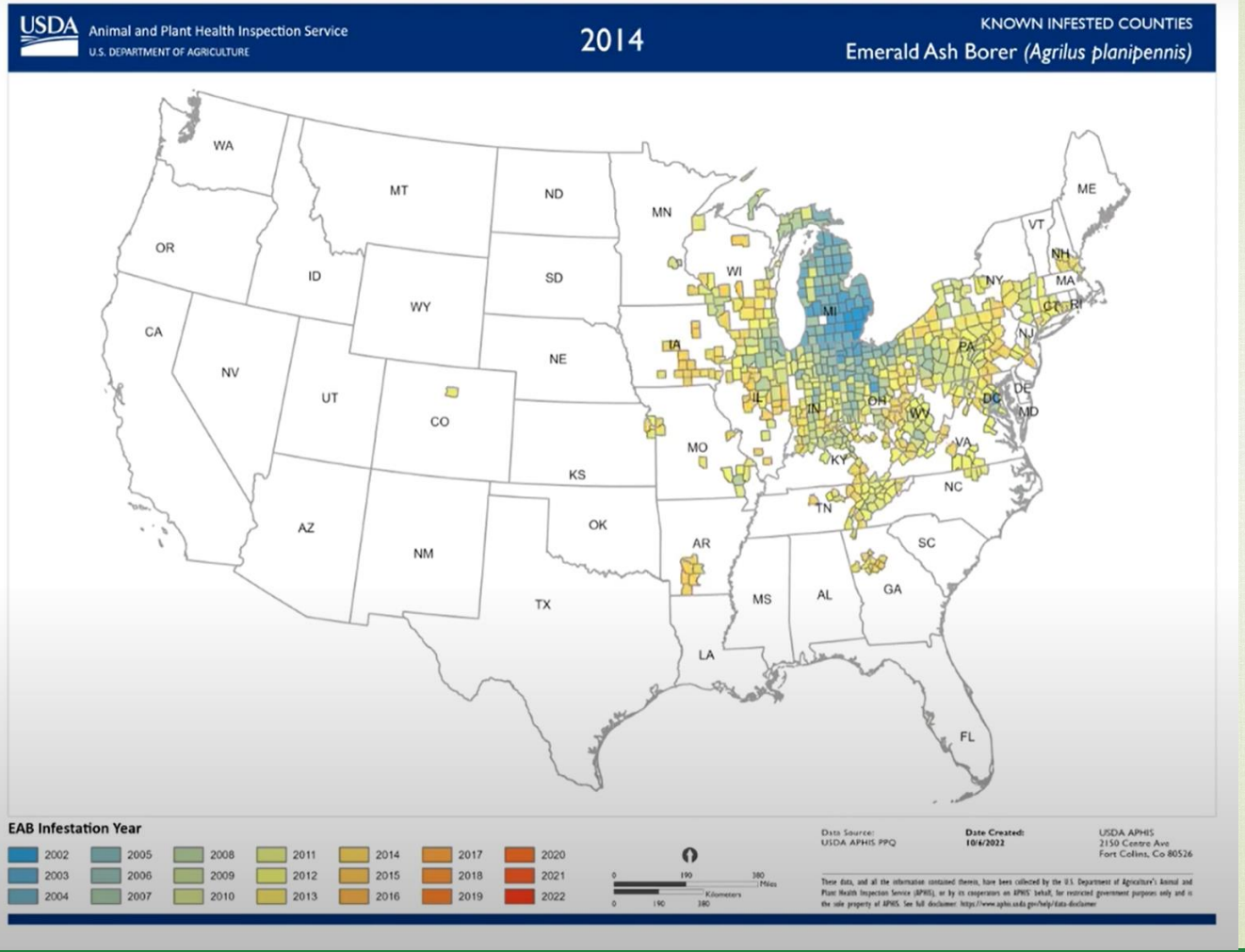




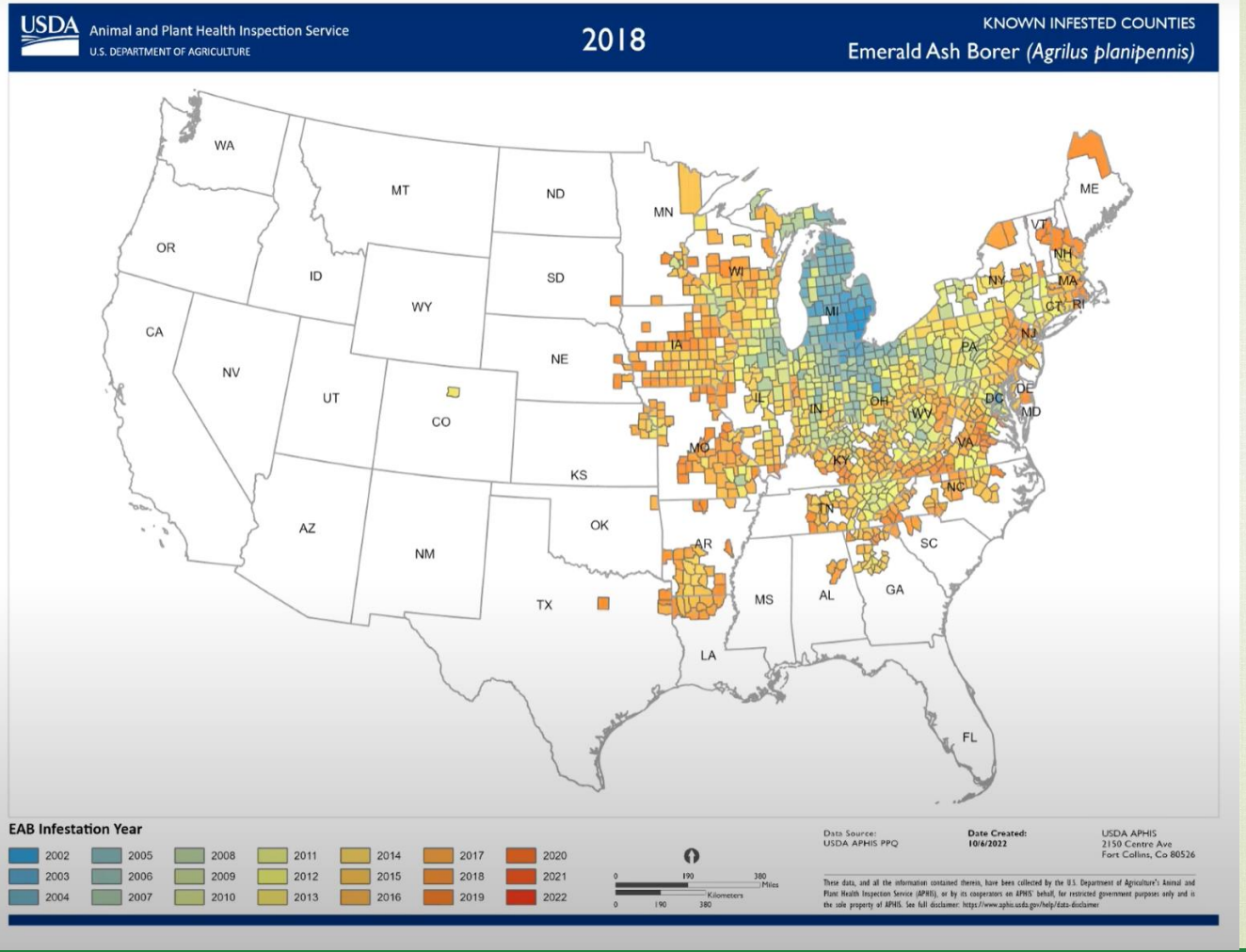
2010

First IA detection

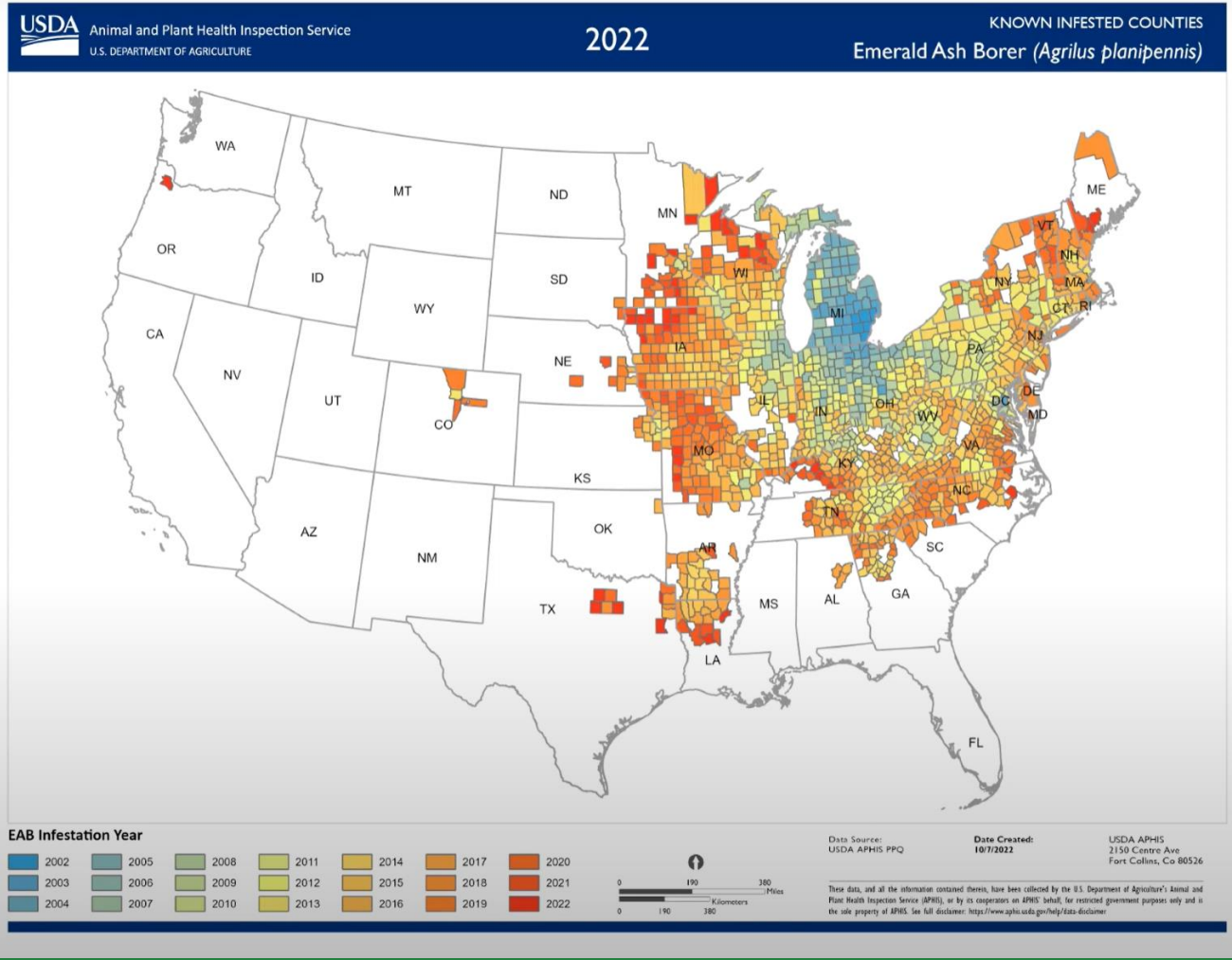



USDA
Animal and Plant Health Inspection Service
U.S. DEPARTMENT OF AGRICULTURE
2014
KNOWN INFESTED COUNTIES
Emerald Ash Borer (Agrilus planipennis)
WA
OR
CA
ID
NV
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MS
MI
IN
KY
TN
AL
OH
WV
GA
FL
SC
NC
VA
PA
NY
ME
VT
NH
MA
CT
RI
NJ
DE
MD
DC
EAB Infestation Year
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
0 190 380 Miles
0 190 380 Kilometers
Data Source:
USDA APHIS PPQ
Date Created:
10/6/2022
USDA APHIS
2150 Centre Ave
Fort Collins, Co 80526
These data, and all the information contained therein, have been collected by the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS), or by its cooperators on APHIS' behalf, for restricted government purposes only and is the sole property of APHIS. See full disclaimer: https://www.aphis.usda.gov/help/data-disclaimer

2014

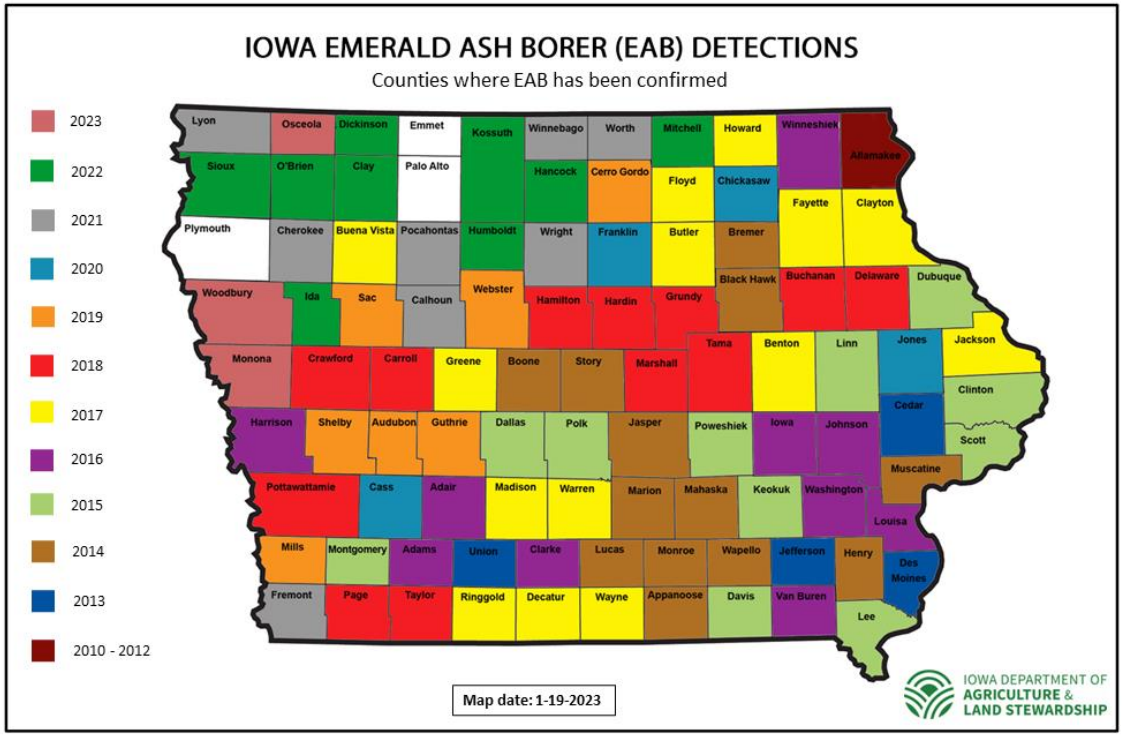

USDA
Animal and Plant Health Inspection Service
U.S. DEPARTMENT OF AGRICULTURE
2018
KNOWN INFESTED COUNTIES
Emerald Ash Borer (Agrilus planipennis)
WA
OR
CA
ID
NV
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MS
MI
IN
KY
TN
AL
OH
WV
GA
FL
SC
NC
VA
PA
NY
ME
VT
NH
MA
CT
RI
NJ
DE
MD
DC
EAB Infestation Year
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
0 190 380 Miles
0 190 380 Kilometers
Data Source:
USDA APHIS PPQ
Date Created:
10/6/2022
USDA APHIS
2150 Centre Ave
Fort Collins, Co 80526
These data, and all the information contained therein, have been collected by the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS), or by its cooperators on APHIS' behalf, for restricted government purposes only and is the sole property of APHIS. See full disclaimer: https://www.aphis.usda.gov/help/data-disclaimer

2018



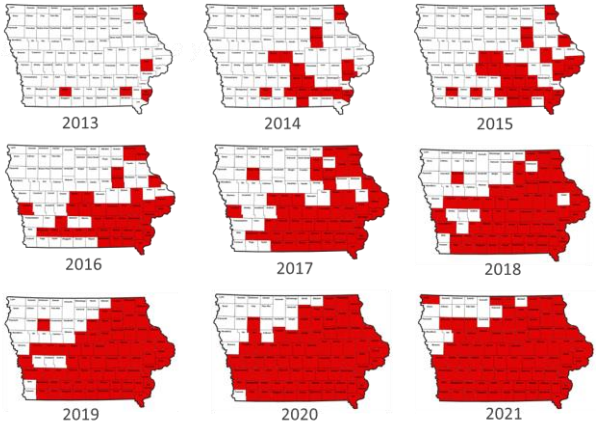
2022

Detected in 36 states



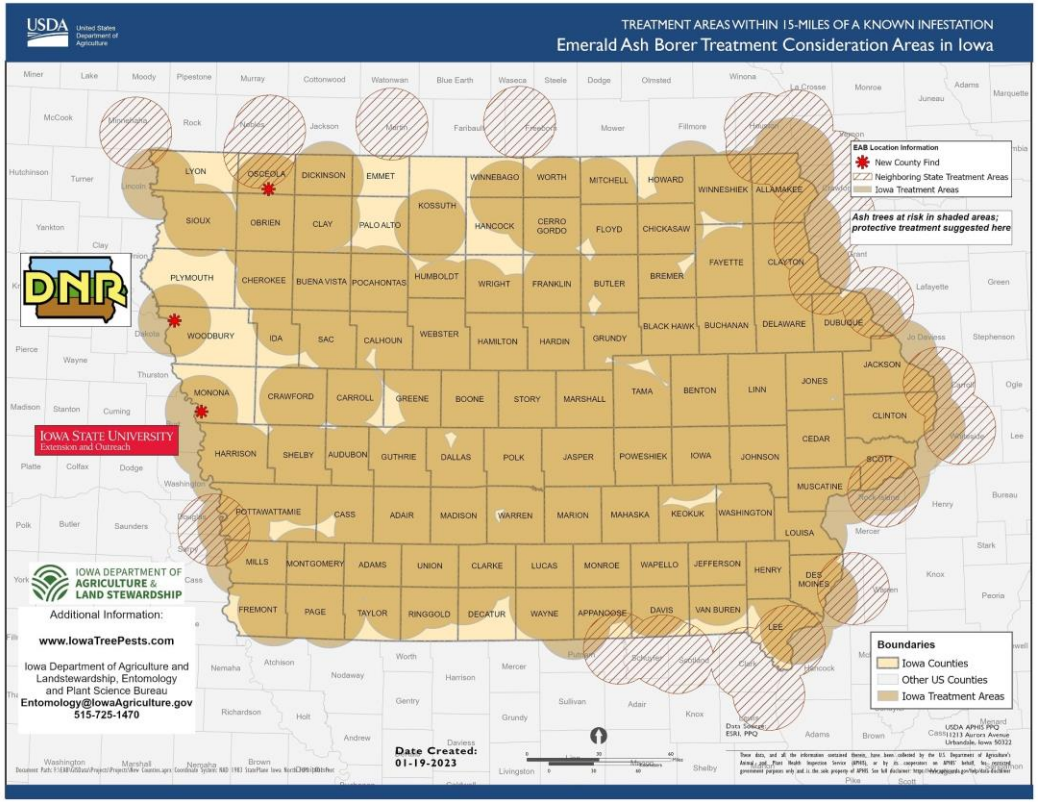
Iowa Department of Agriculture & Land Stewardship, Entomology & Plant Science Bureau, Entomology@IowaAgriculture.gov, 515-725-1470

Iowa Dept. of Ag & Land Stewardship issues a news release for first county finds



Available at: www.iowatreepests.com

Darkened areas indicate 15-mile radius around confirmed EAB sites



= **EAB high risk areas!**

ISU specialist suggest <u>preventative</u> treatments for <u>healthy</u> ash trees within risk zone

Treatment

DIY products for trees up to 20” dia. DBH

Professional treatment methods include:

- Soil injection
- Soil drench
- Basal trunk spray
- Trunk injection

For more on treatments…

See **ENT 0057**

Emerald Ash Borer Management Options

The emerald ash borer (EAB) is an exotic insect that is destructive to ash trees (*Fraxinus* species). It is considered one of the most destructive tree pests ever seen in North America. Although the adult beetle causes minor feeding damage on ash foliage, the larval stage feeds beneath the bark and disrupts water and nutrient flow within the tree, which leads to tree death. Larvae actively feed from early summer through fall.

The insecticide products listed in this publication work best as preventive treatments for healthy ash trees planted in yards or parks. Healthy trees have full crowns, elongating branches, and bark held tightly to the trunk and branches. It is not practical or cost effective to treat woodlot trees where timber production is the primary goal. Right-of-way ash trees may be good candidates for treatment, but will most likely be governed by municipal guidelines.

Properly applied systemic insecticides provide effective and consistent protection from EAB. Unprotected ash trees will die as a result of borer feeding. Before using an insecticide, several factors must be considered:

- Identify the tree as ash using the Interactive Tree Identification Key (extension.iastate.edu/forestry/iowa_trees/tree_id.html).
- Determine if the ash tree is already infested with EAB using Common Problems of Ash Trees (store.extension.iastate.edu/Product/1482).
- Estimate the tree’s value in the community (see Table 1). Some benefits of urban trees include helping clean the air, slowing stormwater runoff, raising property values, storing carbon, and reducing energy costs.

Table 1. Estimated annual economic benefit of ash trees for a single family residence in Des Moines, Iowa*

Trunk Diameter (inches)	Black Ash	Green Ash	White Ash
5	$35	$33	$32
10	$86	$86	$95
15	$141	$147	$177
20	$181	$197	$266
25	$215	$250	$359
30	$209	$300	$478
35	$191	$346	$488
40	$191	$376	$346

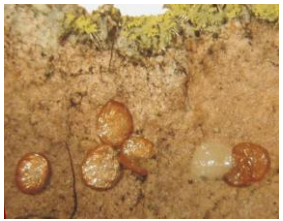
* Based on National Tree Benefit Calculator (www.treebenefits.com).

IOWA STATE UNIVERSITY
Extension and Outreach

ENT 0057 December 2020

EAB Life Cycle (typically 1-year cycle in IA)

Adults
(late May – Aug)



Eggs
(on ash bark)

Larvae
(summer/fall larval growth)

Larvae tunnel beneath bark

Pupae
(in wood or bark; early spring)

D-shaped exit holes

Revolves around ash trees

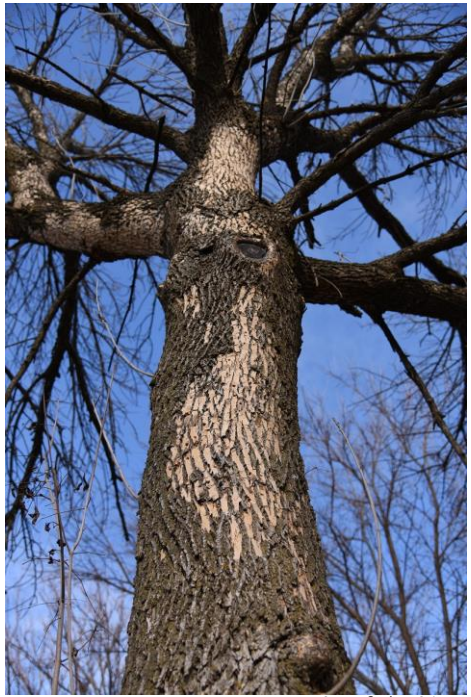
EAB Signs & Symptoms

Canopy thinning, crown dieback, or suckering

IDALS, Ent. & Plant Science

Vertical cracks

Woodpecker damage, aka ‘flecking’



IDALS, Ent. & Plant Science

Credit: Missouri Department Of Conservation

‘D’-shaped holes

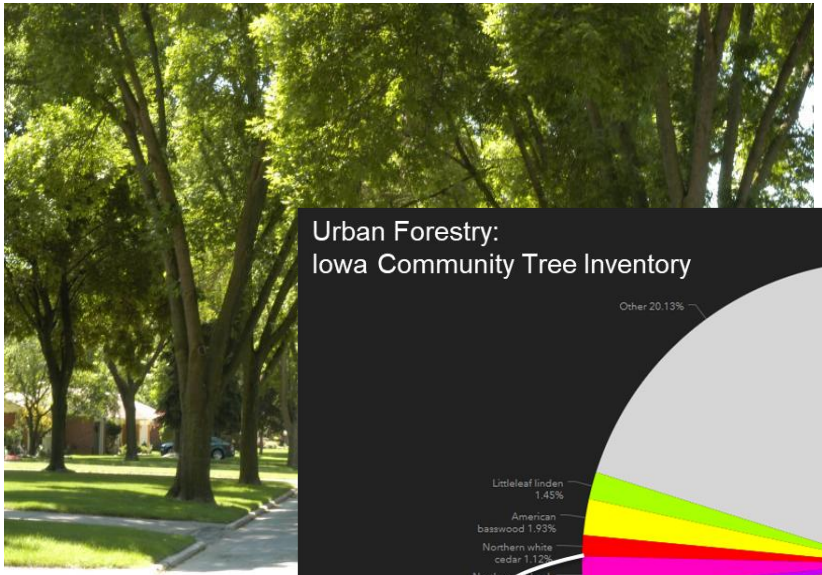
‘S’-shaped galleries

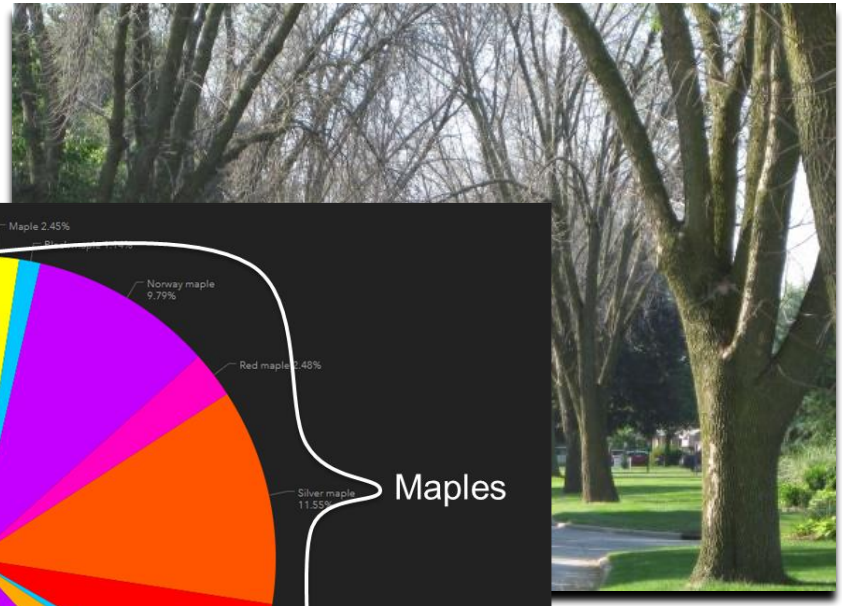
IDALS, Ent. & Plant Science

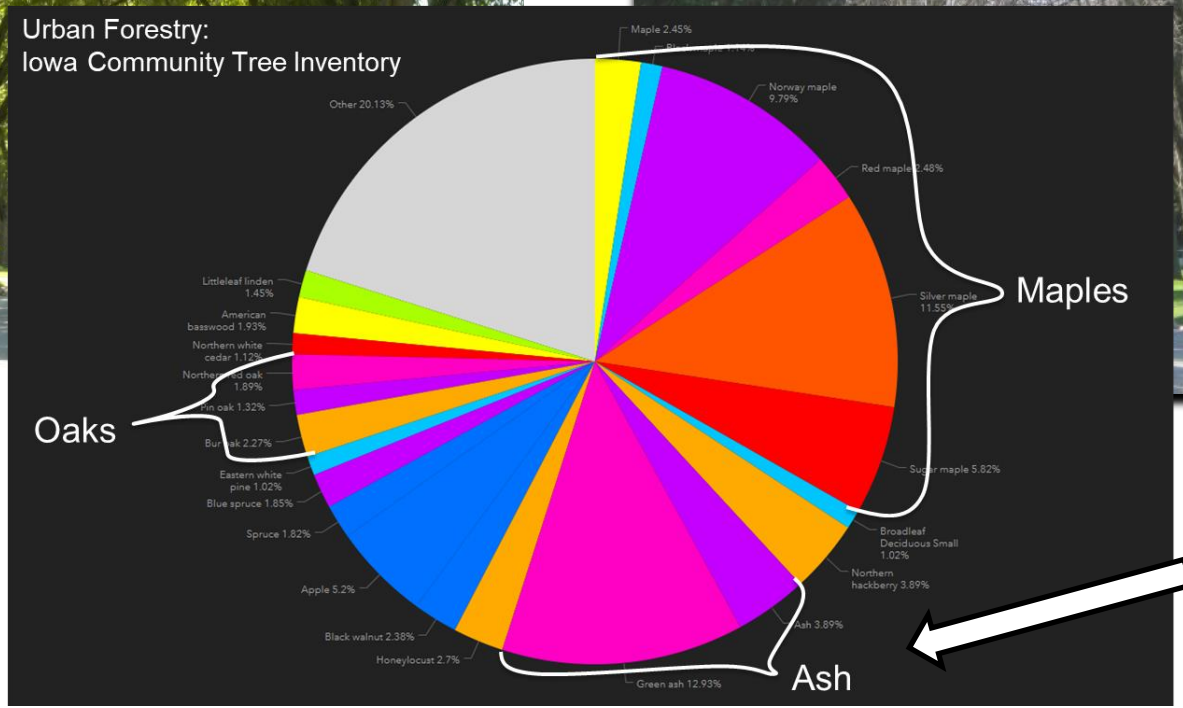
Photo credit: Dan Herms, Ohio State University

3 years

Ash trees usually die within 2-4 years of infestation



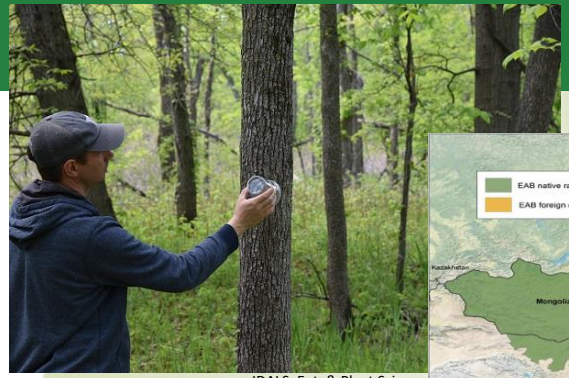



Urban Forestry:
Iowa Community Tree Inventory
Maple 2.45%
Norway maple 9.79%
Red maple 13.48%
Silver maple 11.55%
Sugar maple 5.82%
Broadleaf Deciduous Small 1.02%
Northern hackberry 3.89%
Green ash 12.93%
Honeylocust 2.7%
Black walnut 2.38%
Apple 5.2%
Spruce 1.82%
Blue spruce 1.85%
Eastern white pine 1.02%
Bur oak 2.27%
Pin oak 1.32%
Northern red oak 1.89%
Northern white cedar 1.12%
American basswood 1.93%
Littleleaf linden 1.45%
Other 20.13%
Maples
Oaks
Ash

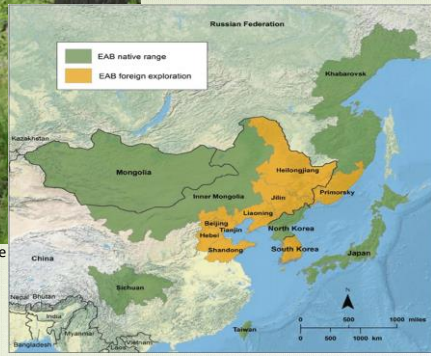
~17% ash

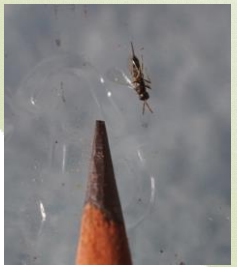
Biological Control & EAB

- USDA exploratory trips to Asia
- Found tiny (gnat-sized) parasitiods
- Quarantined in Brighton, MI
- Years of testing and environmental assessment
- USDA EAB Rearing Facility (Brighton, MI) provides parasitoids to cooperators for approved sites
- Goal = protect ash regeneration and restore canopy over time



IDALS, Ent. & Plant Science





IDALS, Ent. & Plant Science

Asian Longhorned Beetle

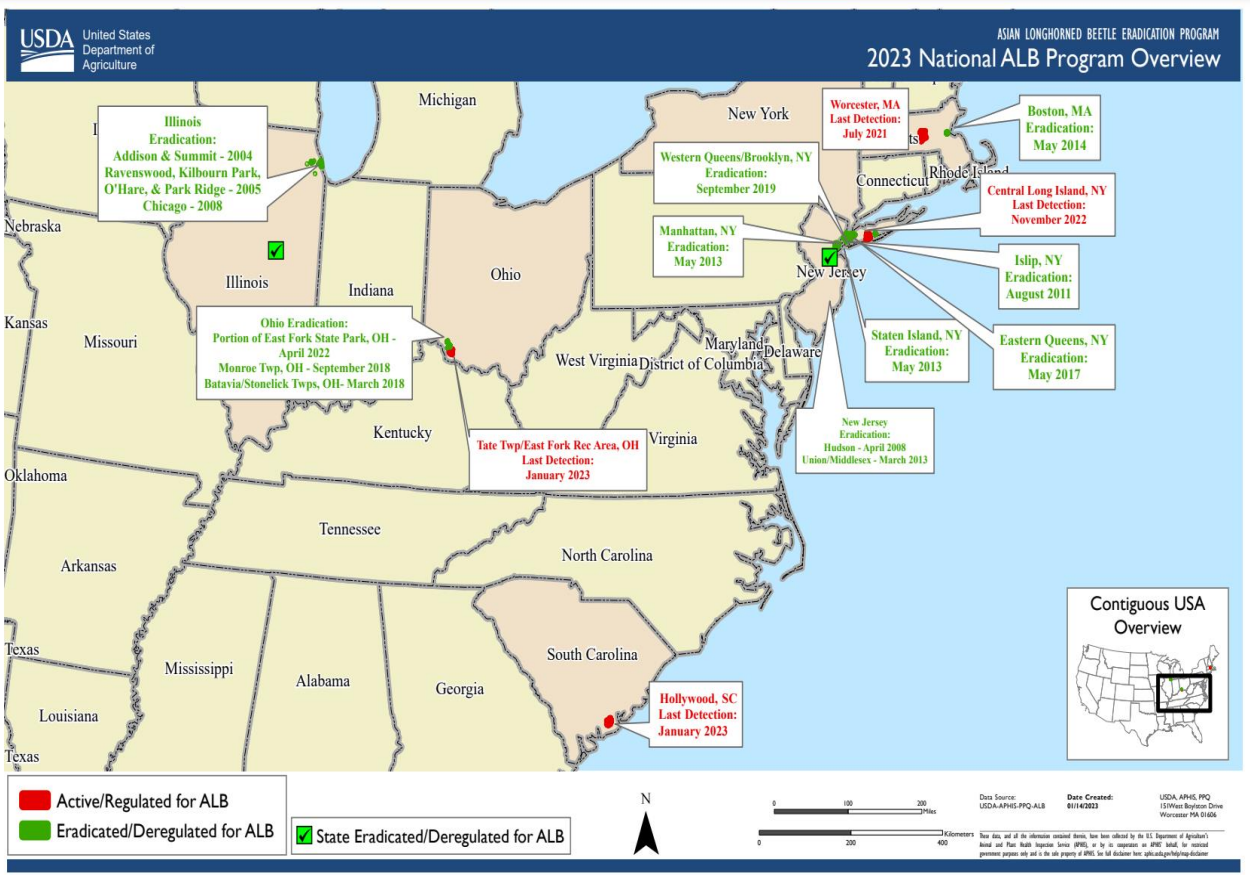
Asian Longhorned Beetle (ALB)

- Invasive, wood-boring beetle from China
- Large feeding tunnels weaken and eventually kill trees
- Feeds on heartwood & sapwood
- First discovered in U.S. in New York (1996)

Adult beetle

Larva

- Eradication is possible with this pest!
- Early detection is vital for containing it
- As close to Iowa as Chicago in 1998
- Eradicated in Chicago in 2008



Not eradicated in OH, SC, NY, & MA

ALB HOST TREES

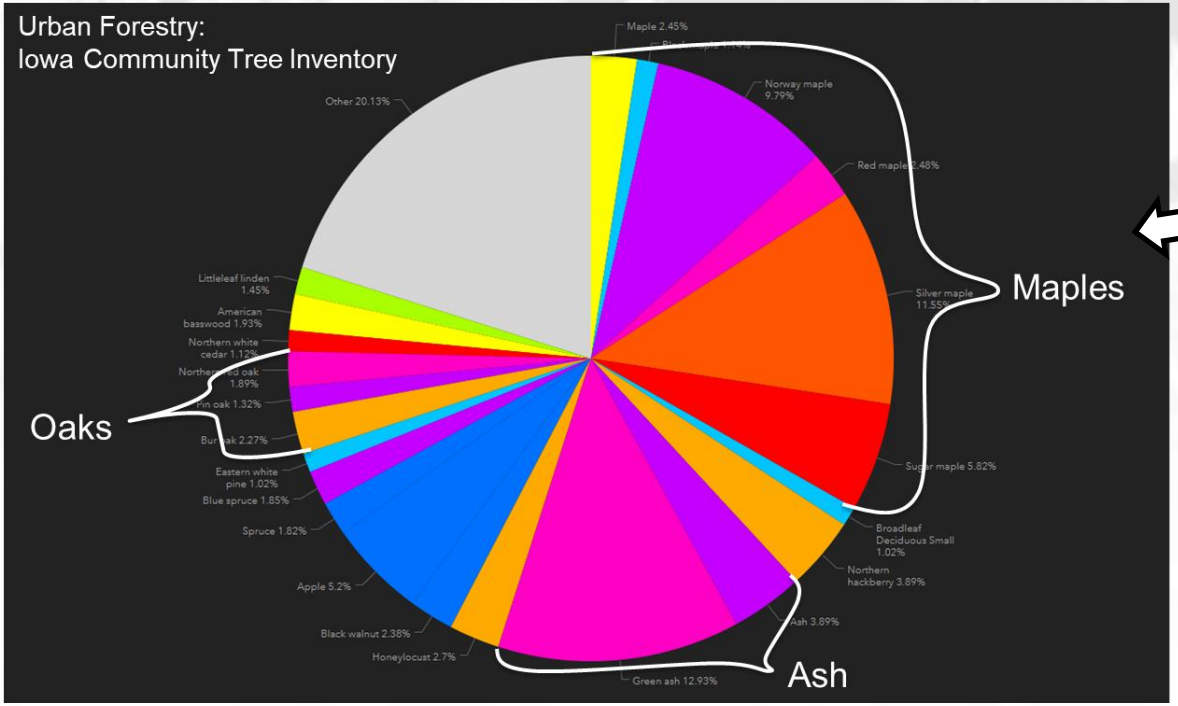
In the United States, known ALB host trees include all species of the following 12 genera:

- Ash (*Fraxinus*)
- Birch (*Betula*)
- Elm (*Ulmus*)
- Golden raintree (*Koelreuteria*)
- Horsechestnut/buckeye (*Aesculus*)
- Katsura (*Cercidiphyllum*)
- London planetree/sycamore (*Platanus*)
- Maple (*Acer*)
- Mimosa (*Albizia*)
- Mountain ash (*Sorbus*)
- Poplar (*Populus*)
- Willow (*Salix*)

ALB HOST TREES

In the United States, known ALB host trees include all species of the following 12 genera:

- Ash (*Fraxinus*)
- Birch (*Betula*)
- Elm (*Ulmus*)
- Golden raintree (*Koelreuteria*)
- Horsechestnut/buckeye (*Aesculus*)
- Katsura (*Cercidiphyllum*)
- London planetree/sycamore (*Platanus*)
- * Maple (*Acer*)
- Mimosa (*Albizia*)
- Mountain ash (*Sorbus*)
- Poplar (*Populus*)
- Willow (*Salix*)



~33% maples

Iowa Statistics:

- 17% Ash
- 33% Maple

Signs & symptoms

- Crown die-back
- Egg-laying site
- Approximately ½ inch round exit holes
- Sawdust-like frass (excrement) on branch crotches or ground

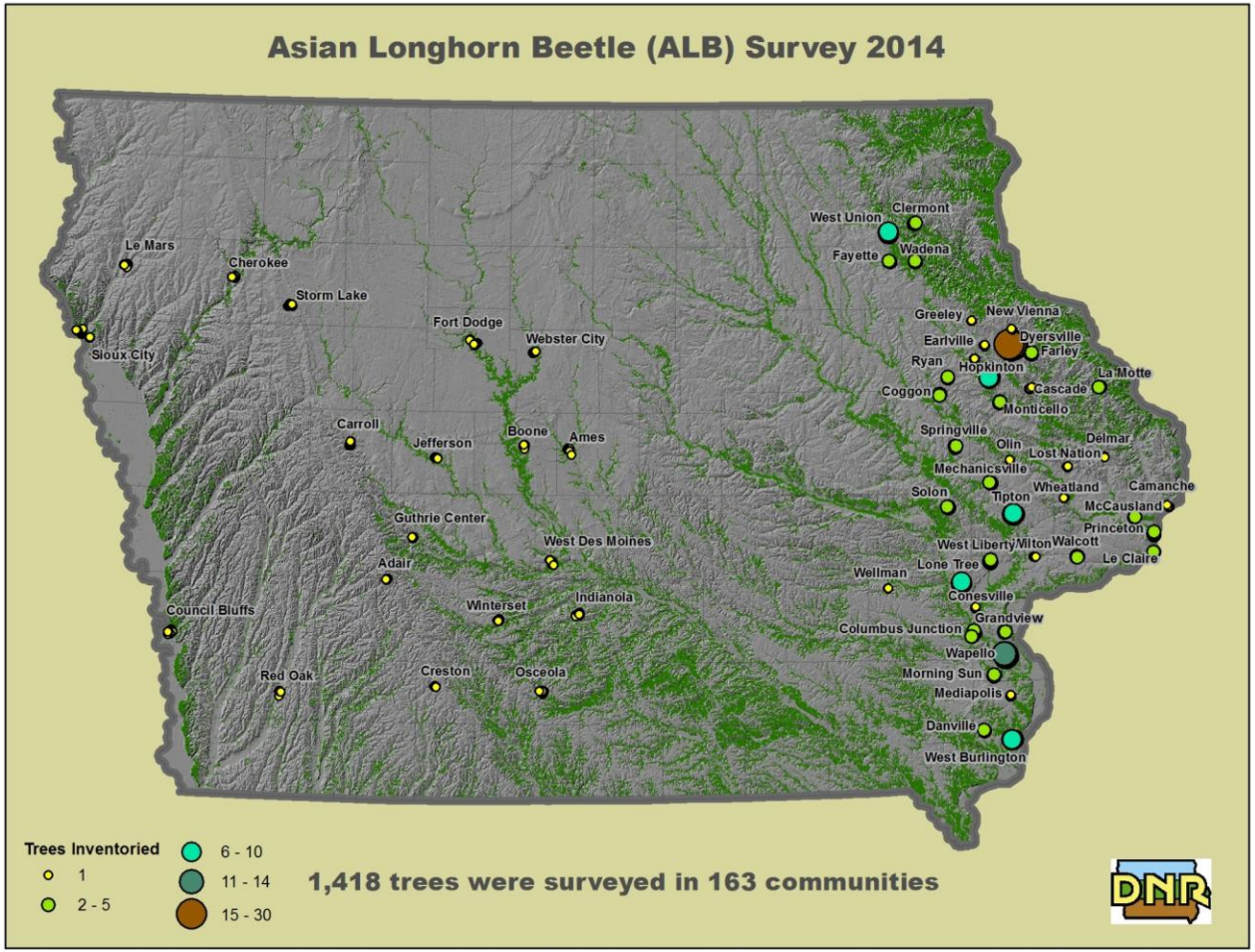
Internal signs on living or recently cut wood

Photo credit: Joe Boggs, The Ohio State University

- Feeding galleries through wood
- Pupal chambers

Larry R. Barber, USDA Forest Service, Bugwood.org

Courtesy of Melody Keena [Bugwood image 5431706]

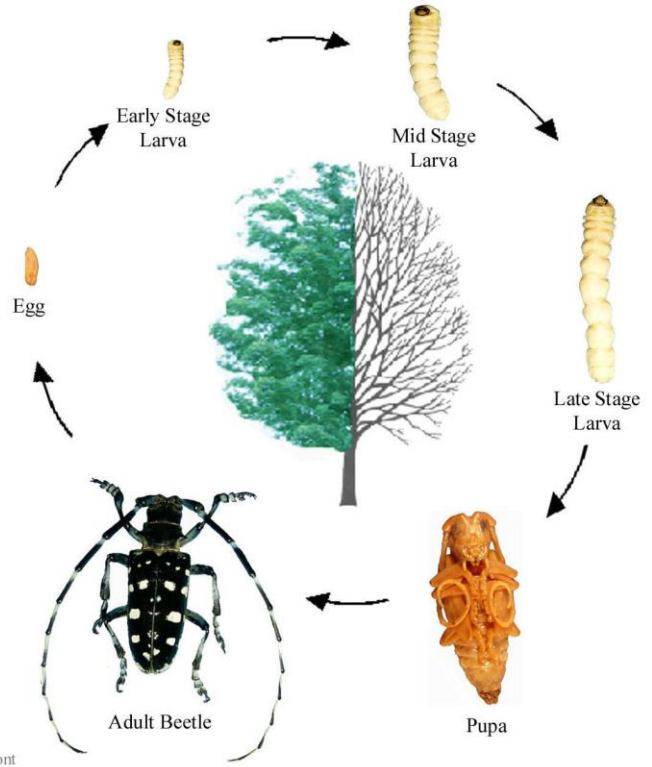

Asian Longhorn Beetle (ALB) Survey 2014
West Union
Clermont
Wadena
Fayette
Le Mars
Cherokee
Storm Lake
Fort Dodge
Webster City
Sioux City
Greeley
New Vienna
Dyersville
Earlville
Farley
Ryan
Hopkinton
La Motte
Coggon
Cascade
Monticello
Carroll
Jefferson
Boone
Ames
Springville
Olin
Delmar
Lost Nation
Mechanicsville
Solon
Tipton
Wheatland
Camanche
McCausland
Princeton
Guthrie Center
West Des Moines
West Liberty
Milton
Walcott
Le Claire
Adair
Lone Tree
Wellman
Conesville
Council Bluffs
Winterset
Indianola
Grandview
Columbus Junction
Wapello
Red Oak
Creston
Osceola
Morning Sun
Mediapolis
Danville
West Burlington
Trees Inventoried
1
2 - 5
6 - 10
11 - 14
15 - 30
1,418 trees were surveyed in 163 communities
DNR

Asian Longhorned Beetle Lifecycle

Adults and ovipostion scars

Emergence holes

Adult emerging from tree



Copyright 2001, The University of Vermont

Larva in tree

Pupal chamber in tree

Diagram by Michael Bohne

Most of life spent burrowed inside wood, out of sight – can hitchhike

Quarantines in known areas !

ALB Look-Alikes

The real deal

Asian longhorned beetle
(*Anoplophora glabripennis*)

Whitespotted pine sawyer
(*Monochamus scutellatus*)

Cottonwood borer
(*Plectrodera scalator*)

Image credits: Jason Thatcher; catbirdcat on flickr; R. Anson Eaglin, USDA-APHIS

Spotted Lanternfly

Lawrence Barringer, Pennsylvania Department of Agriculture, Bugwood.org

Spotted Lanternfly

Lycorma delicatula

Photo: Peter L. Coffey, University of Maryland Extension

Photo: Dalton Ludwick / Penn State Agricultural Extension

- Invasive planthopper, native to China
- First U.S. discovery in 2014 (Pennsylvania)
- Piercing-sucking mouthparts to feed on the sap of over 70 plant species (including grape, apple, walnut, maple and ornamental plants)
- Excrete honeydew - encourages mold to grow that can damage plants

Nuisance !

Spotted Lanternfly

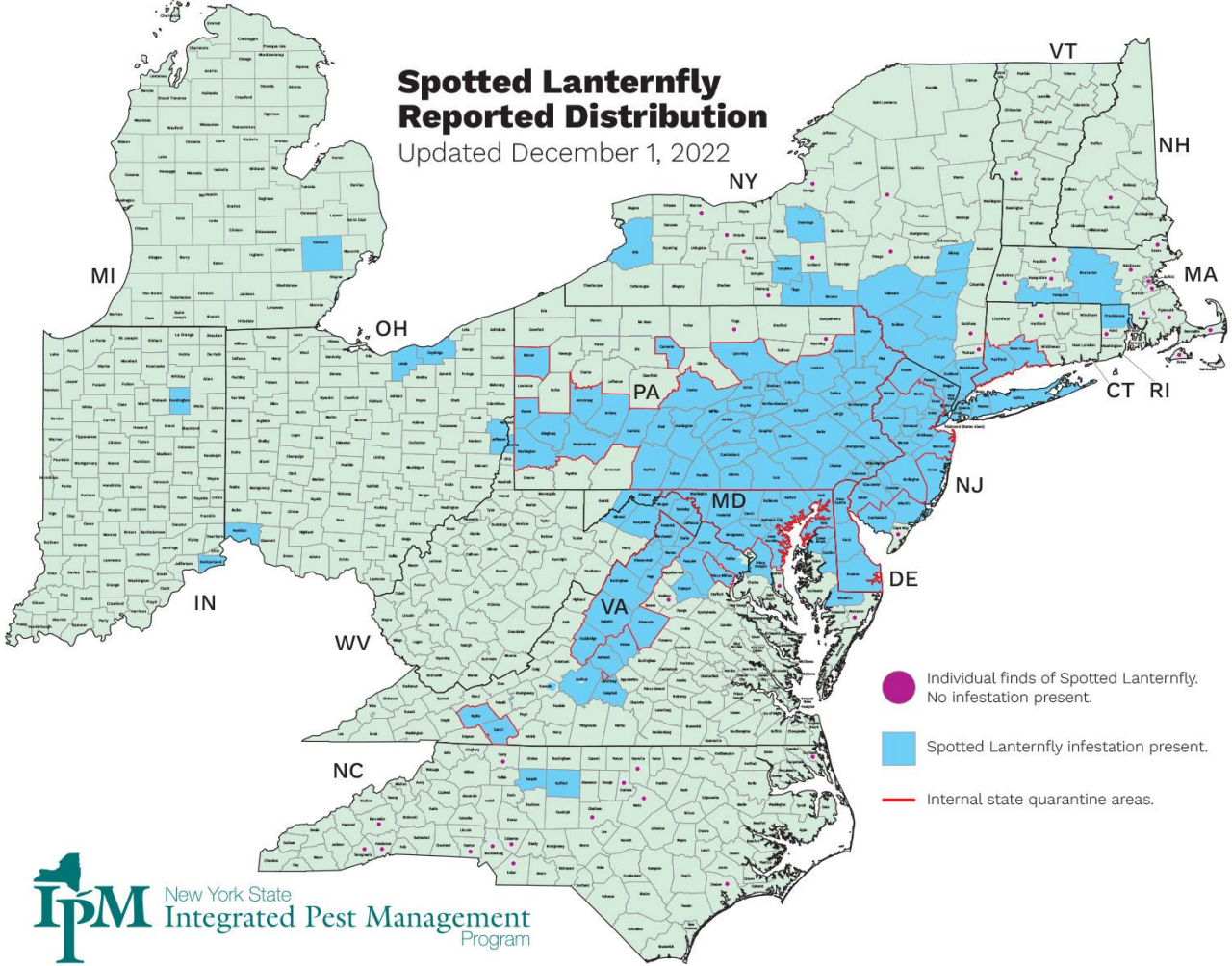
Lycorma delicatula

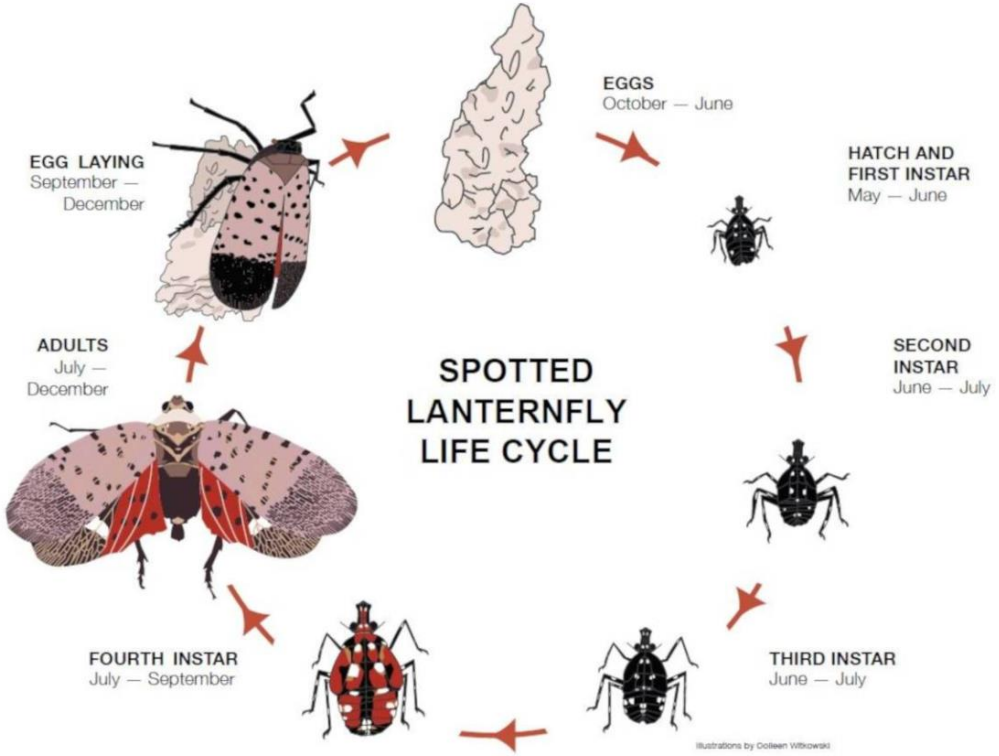
- Spread by hopping, flying or hitchhiking with humans
- Egg masses are laid on hard surfaces, including trees, outdoor furniture, vehicles, stones, etc.

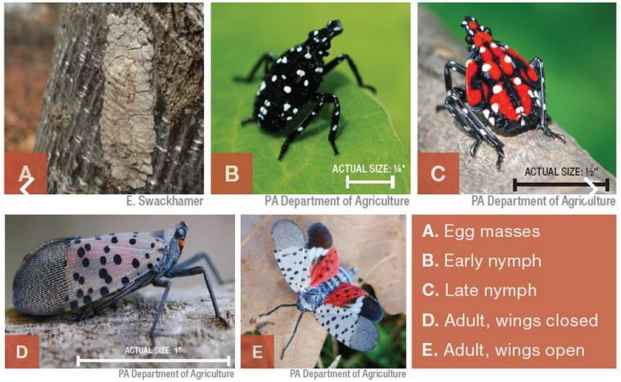
Examples of spotted lanternfly egg masses. **Credit: Heather Leach. All Rights Reserved.**

Amy Lutz/Shutterstock

Early detection is key!


Spotted Lanternfly
Reported Distribution
Updated December 1, 2022
VT
NH
NY
MA
MI
OH
PA
CT
RI
NJ
MD
DE
IN
VA
WV
NC
Individual finds of Spotted Lanternfly.
No infestation present.
Spotted Lanternfly infestation present.
Internal state quarantine areas.
New York State
Integrated Pest Management
Program





Egg mass: Up to 60 eggs

Instar nymphs = summer

- Iowa's only detection (July 2022)
- Isolated incident
- Determined no reproducing population
- IDALS issued news release

Des Moines Register

Sports Things To Do Opinion Business USA TODAY Obituaries eNewspaper Legals

NEWS

Iowa officials confirm invasive spotted lanternflies found in Dallas County

Allison Ullmann Des Moines Register

Published 4:06 p.m. CT July 27, 2022

IOWA TREE PESTS

HOME PEST PAGES ABOUT FIREWOOD CONTACT

Spotted Lanternfly

Home > Spotted Lanternfly

WHAT IS THE CONCERN?

Spotted Lanternfly

Spotted lanternfly (*Lycorma delicatula*) is an invasive sap-feeding insect from Asia that was first found in the United States in 2014, in Pennsylvania. This non-native pest is known to feed on a wide variety of fruit, ornamentals, and woody trees. Tree-of-heaven, another invasive species, is a favored host to the spotted lanternfly. Other preferred plants include grapes, hops, and the following trees: almond, apple, apricot, cherry, maple, nectarine, oak, peach, pine, plum, poplar, sycamore, walnut, and willow.

Click on the pictures for a high quality viewer

Damage and Symptoms

www.iowatreepests.com

Mike Kintner
Iowa Dept. of Agriculture & Land Stewardship
Entomology & Plant Science Bureau
515-745-2877
Mike.Kintner@IowaAgriculture.gov

www.IowaTreePests.com