



Emerald Ash Borer

2017

Agenda

Emerald Ash Borer

Life Cycle

Host Trees

Recognizing EAB

Signs & Symptoms

Distribution

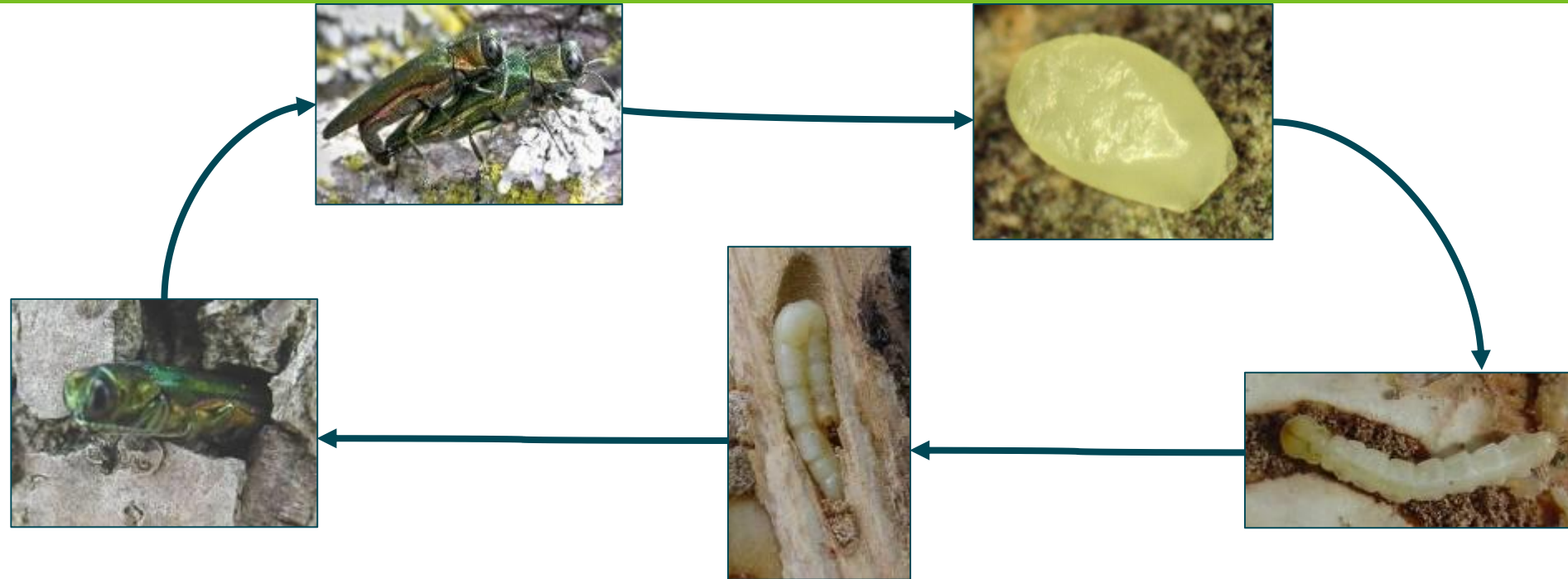
Management

Reporting



Life Cycle

Life Cycle



	J	F	M	A	M	J	J	A	S	O	N	D
a	a	a	a	a	a	a	a	a	a	a	a	a
n	n	n	n	n	n	n	n	n	n	n	n	n
b	b	b	b	b	b	b	b	b	b	b	b	b
r	r	r	r	r	r	r	r	r	r	r	r	r
a	a	a	a	a	a	a	a	a	a	a	a	a
p	p	p	p	p	p	p	p	p	p	p	p	p
r	r	r	r	r	r	r	r	r	r	r	r	r
y	y	y	y	y	y	y	y	y	y	y	y	y
n	n	n	n	n	n	n	n	n	n	n	n	n
l	l	l	l	l	l	l	l	l	l	l	l	l
g	g	g	g	g	g	g	g	g	g	g	g	g
e	e	e	e	e	e	e	e	e	e	e	e	e
p	p	p	p	p	p	p	p	p	p	p	p	p
t	t	t	t	t	t	t	t	t	t	t	t	t
v	v	v	v	v	v	v	v	v	v	v	v	v
c	c	c	c	c	c	c	c	c	c	c	c	c
Immature (under bark)												
Adult (free living)												

How Does EAB Kill Trees?

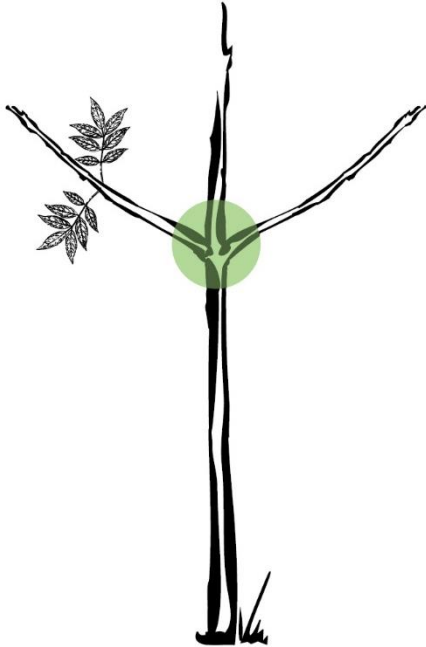




Host Trees

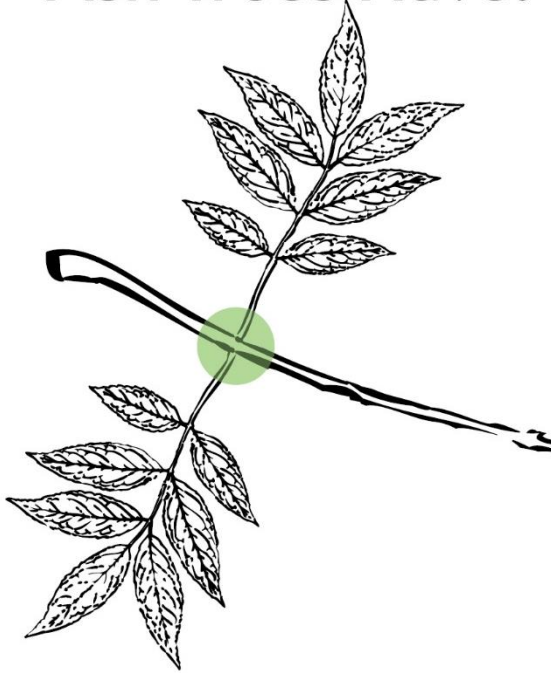
Ash Tree ID

Ash Trees Have:



Opposite Branching

Ash Trees Have:



Compound Leaves

Ash Trees Have:



5 to Many Leaflets

Host Trees



Susceptibility

Black ash

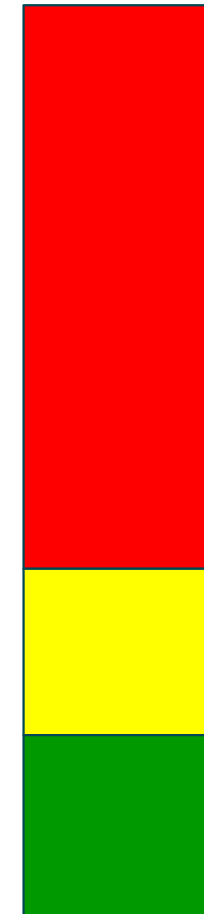
Green ash

White ash

Blue ash

Manchurian ash

high



low

Black Ash Cultivars

- Fallgold

Green Ash Cultivars

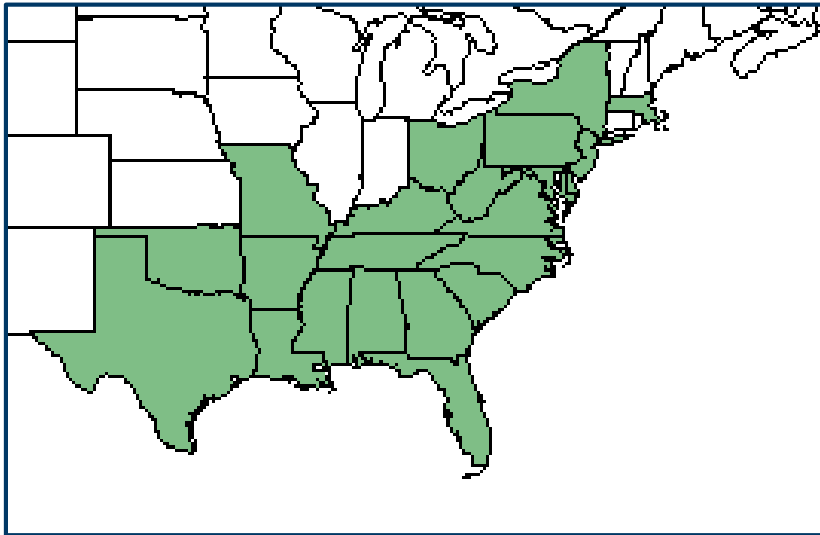
- Bergeson
- Cimmaron
- Marshall
- Patmore
- Summit

White Ash Cultivars

- Autumn Applause
- Autumn Blaze
- Autumn Purple
- Baltimore
- Greenspire
- Northern Blaze
- Rosehill
- Skyline

Secondary Host Tree

- Olive Family - Oleaceae
- White Fringetree, *Chionanthus virginicus*
- AKA fringe tree, snowflower tree, flowering ash, old man's beard, grandfather graybeard





Recognizing EAB

Confirmation



“S” shaped
galleries



EAB Larva

Confirmation

1/8" width



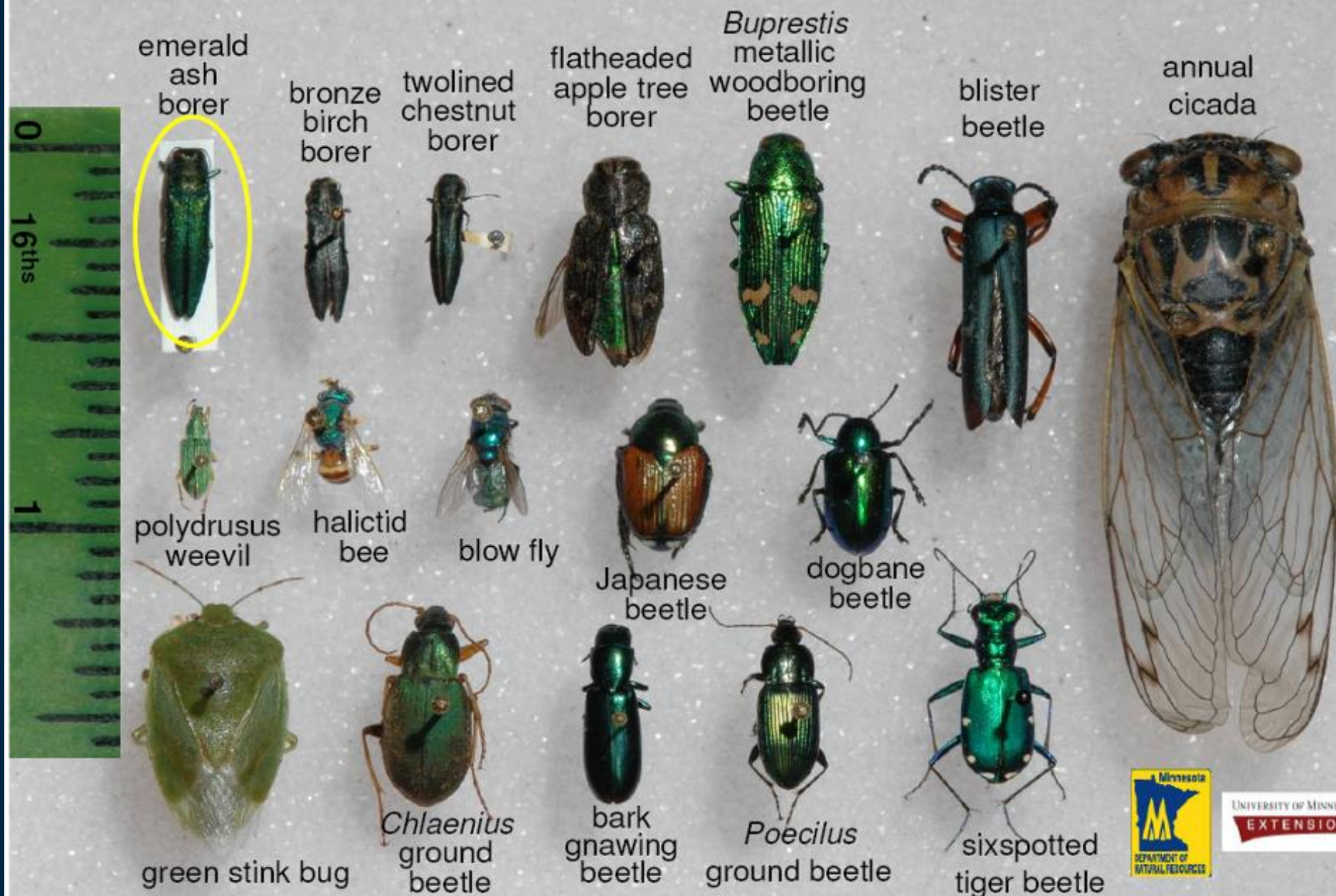
“D” shaped exit holes



EAB Adult

Insects in Minnesota That May Be Confused with Emerald Ash Borer

Jeff Hahn, University of Minnesota Extension
Val Cervenka Minnesota Dept. of Natural Resources




UNIVERSITY OF MINNESOTA
EXTENSION



Signs & Symptoms

Symptom Progression

EAB Status	Symptoms	Years Infested
Small larvae present	None	1
Large larvae present / Emerging adults	Woodpecking possible	2
Increasing larvae numbers 	Woodpecking likely Bark splits possible	3
	Canopy impacts visible	4
	Dead trees present	5-6

Woodpecker Damage

- Mid / Top canopy
- Branches 3-6" in diameter
- Bark transitions to rough
- Bark blinding / flaking
- Dime sized woodpecker holes
- Light colored woodpecker holes
- Oval shaped



Woodpecker Damage



Bark Splits



Native Damage

- Trunk
- Lower canopy
- Dead limbs





Distribution

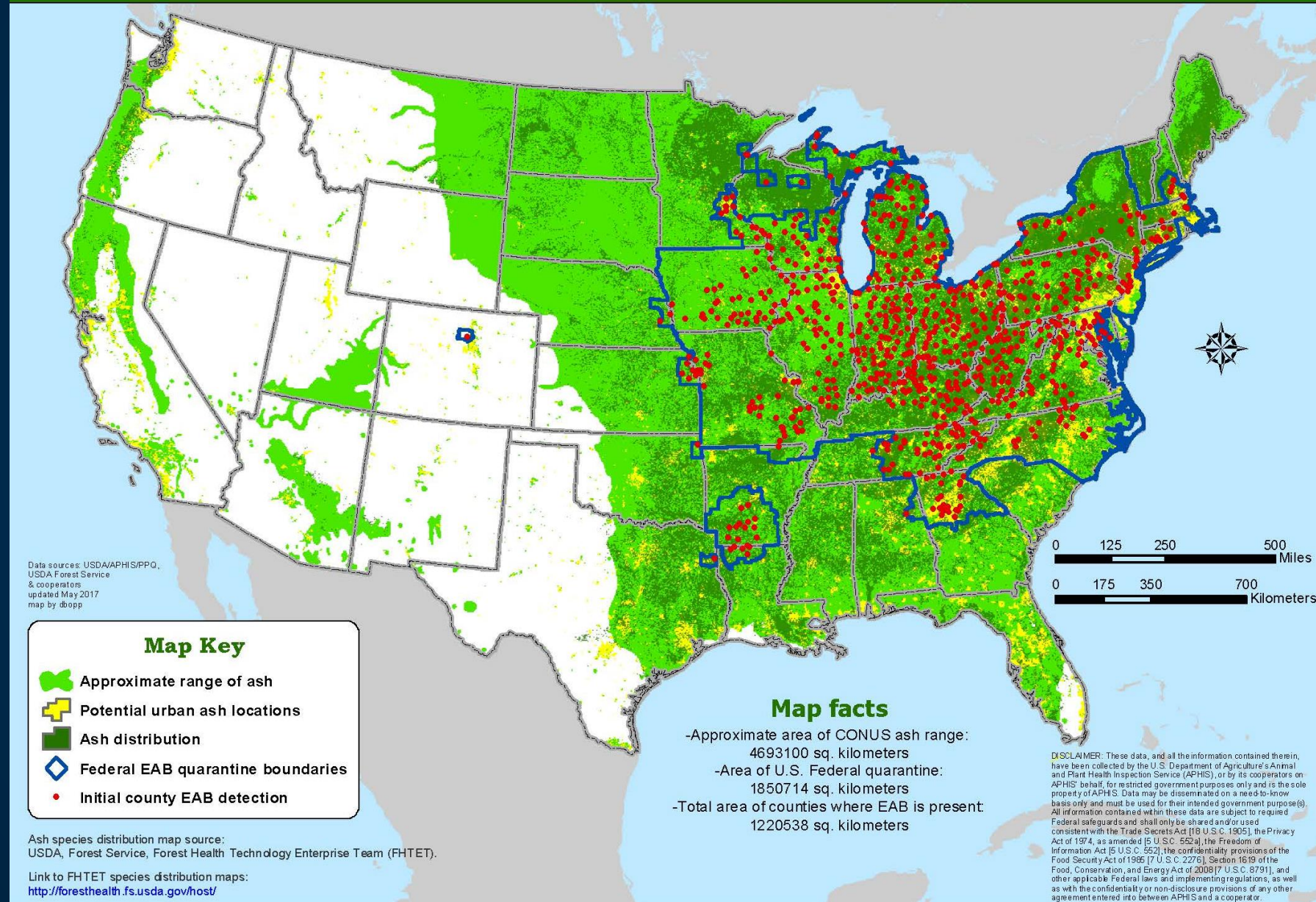


United States
Department of
Agriculture

Cooperative Emerald Ash Borer Project

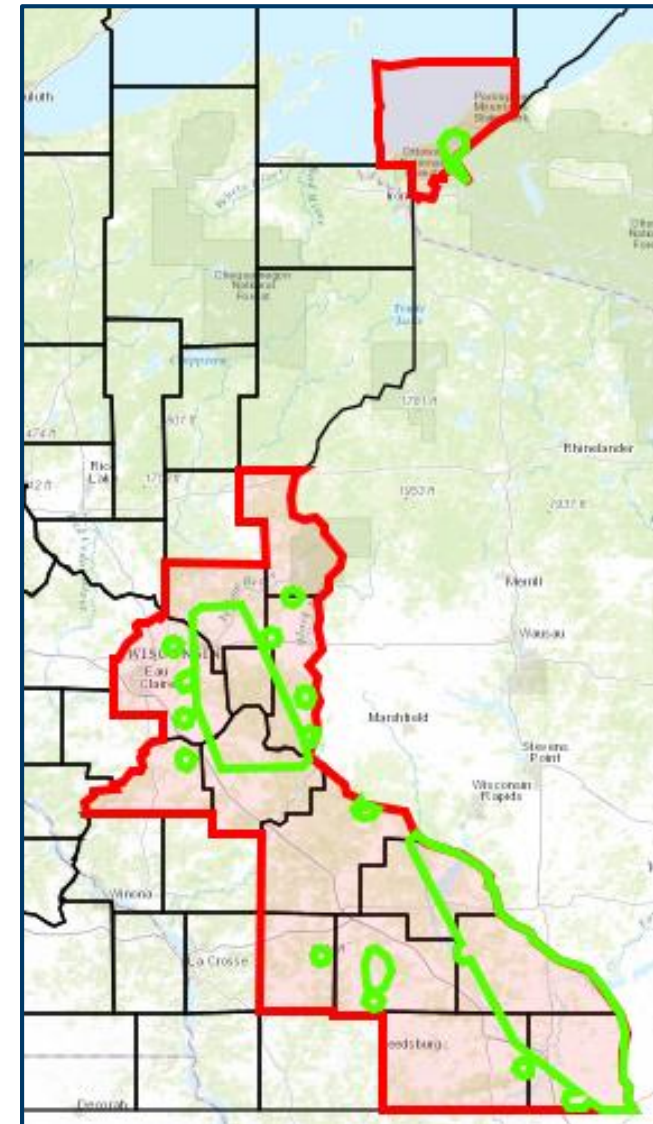
Approximate range of ash species in the Contiguous U.S.
with EAB positives and Federal quarantines

May 1, 2017



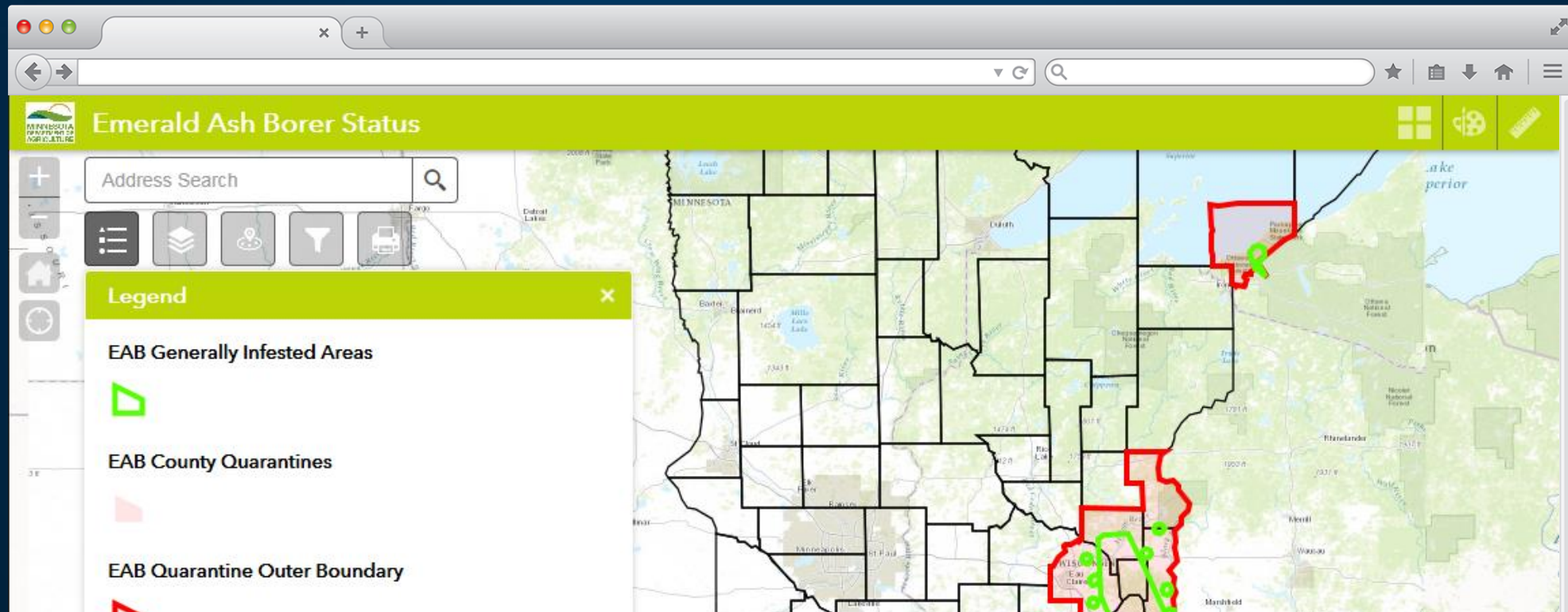
Minnesota Distribution

- Generally infested area in green within red EAB quarantined counties
- Quarantined Counties
 - Ash
 - EAB
 - Hardwood Firewood (<4 feet in length)



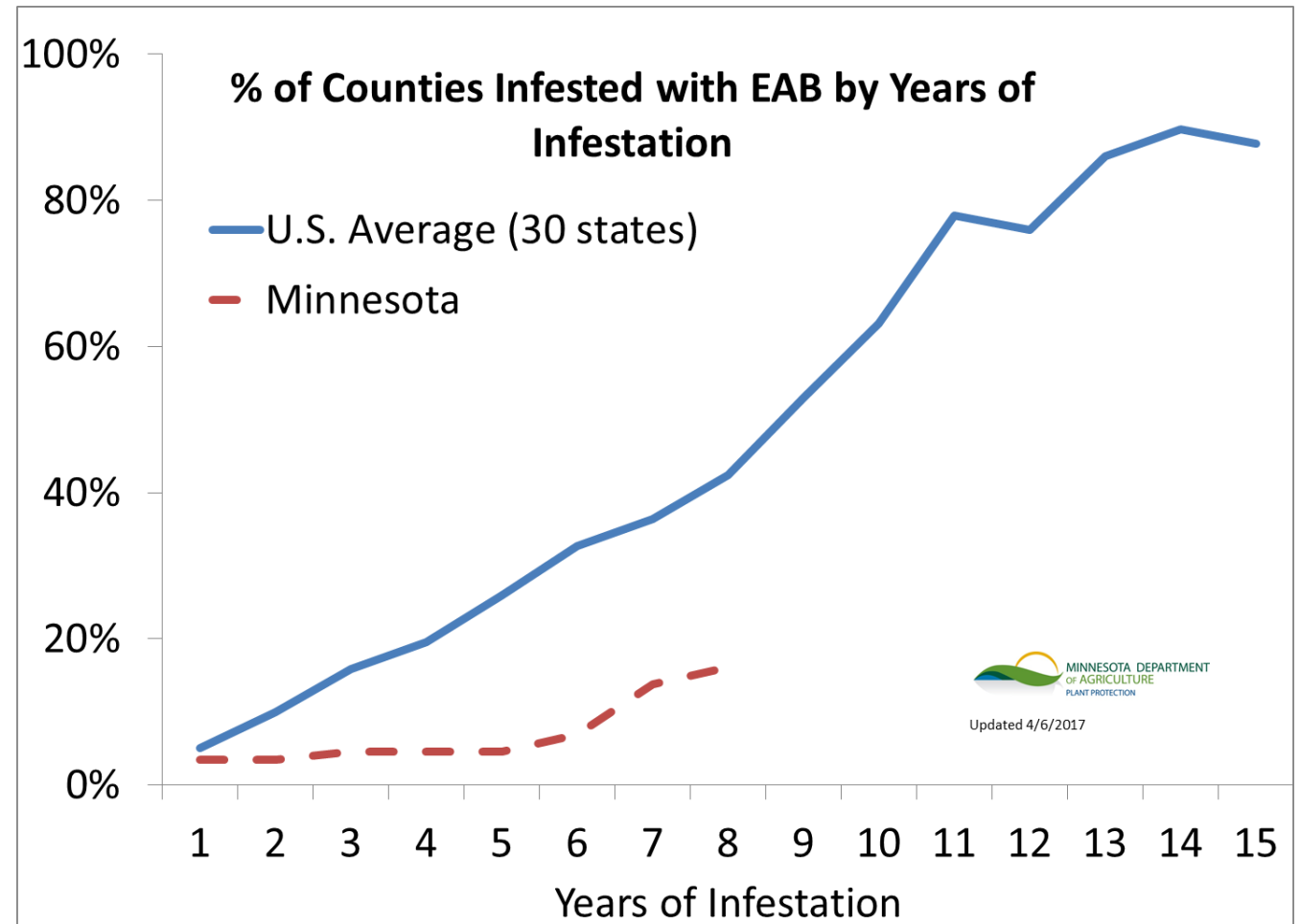
Interactive Map

- mda.state.mn.us/eabstatus
- Closest known infested ash tree



Slow Spread

- Cold weather
- Education
- Outreach
- Aggressive management
- Quarantines
- Sanitation





Management

Management Options

- Removals
 - Before EAB
 - Trees exhibiting woodpecker damage
 - Dead trees
- Treatments
 - Before EAB
 - After EAB infests a tree
- Do Nothing
- Wait, decide later



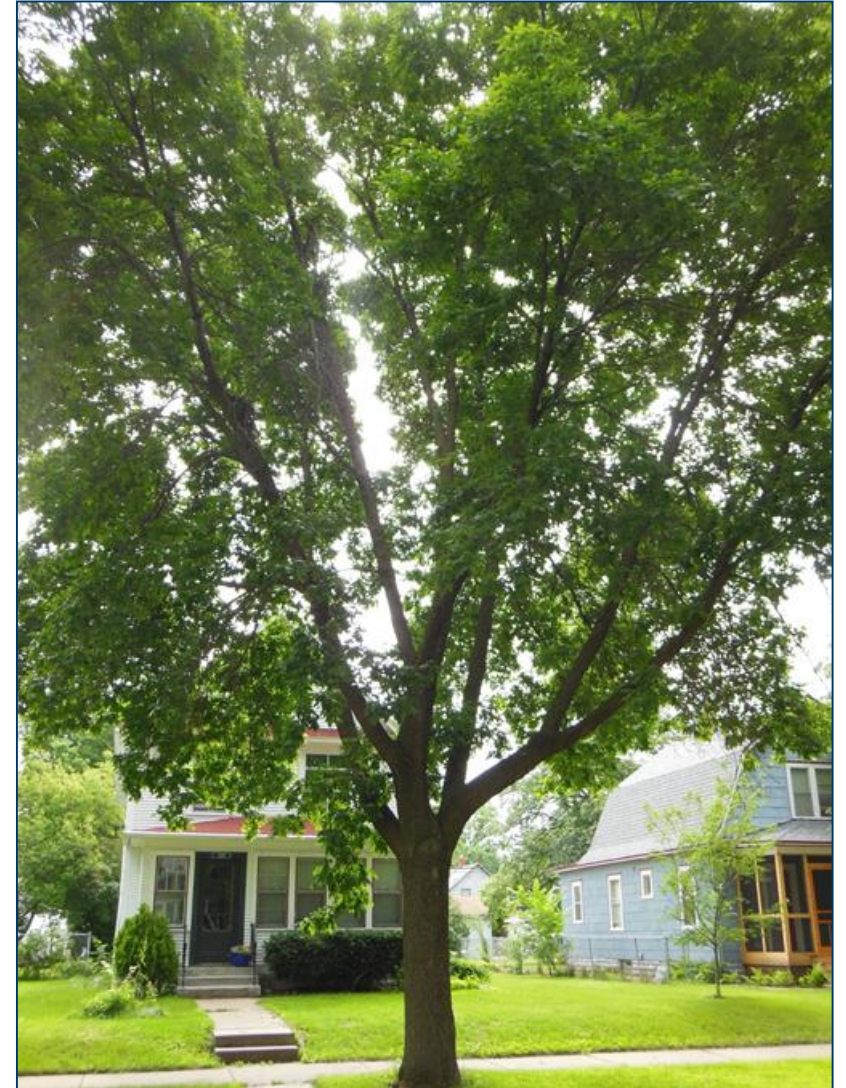
City Management

- Designated Staff
 - Visual survey and monitoring
 - Permits for private treatment of public trees
 - City's contracted treatment rate for private trees
 - In-house treatments (\$4.77/diameter inch)
- Diseased Tree Ordinance
- Hazard Tree Ordinance
- Diversified Replanting



Considering Insecticides

- How close is EAB?
- How healthy is the tree?
- How large is the tree?
- How many ash are there?
- How important is the tree?



Emerald Ash Borer

Homeowner Guide to Insecticide Selection, Use, and Environmental Protection

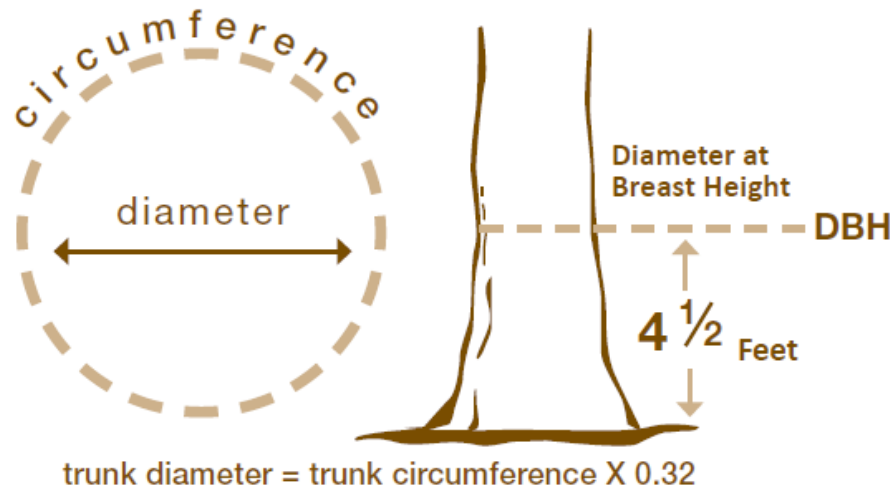
Before Using an Insecticide Consider the Following:

- What is the risk?
- Treatments need to be repeated
- Timing is everything

Insecticide Treatments

- Measure your ash tree

It is important to measure your ash tree to determine the appropriate treatment and to accurately follow the use instructions on insecticide labels.



CONVERSION TABLE

Tree Measurements at 4½ Feet Above Ground Level

Circumference – Inches	Diameter at Breast Height (DBH) – Inches
15	5
20	6
25	8
30	9.5
35	11
40	13
45	14
> 48 inches	> 15 inches

In general, large trees are best treated by a professional. For exceptions, check specific pesticide product labels.

How Insecticides Work

- Systemic
- Moves up the xylem and into leaves
 - Affects adults
- Can also move to the phloem and affect larvae



Forested Environments

- Egg Parasitoid

- *Oobius agrili*



- Larval Parasitoid

- *Tetrastichus planipennisi*



- Larval Parasitoid

- *Spathius galinae*



Biosurveillance

- Smoky winged beetle bandit wasp
 - *Cerceris fumipennis*
- Volunteer Program – Wasp Watchers





Reporting

Arrest the Pest

- Take pictures and notes
- Capture the insect or take a sample of the plant
- Report
 - City forester or designated staff
 - GLEDN app (Great Lakes Early Detection Network)
 - mda.state.mn.us/arrestthepest
 - Arrest.the.pest@state.mn.us
 - Call 888-545-6684 and leave a detailed message



Thank you!

Arrest the Pest

Arrest.the.Pest@state.mn.us

888-545-6684