

# Insecticide Management Options for EAB

R. Chris Williamson

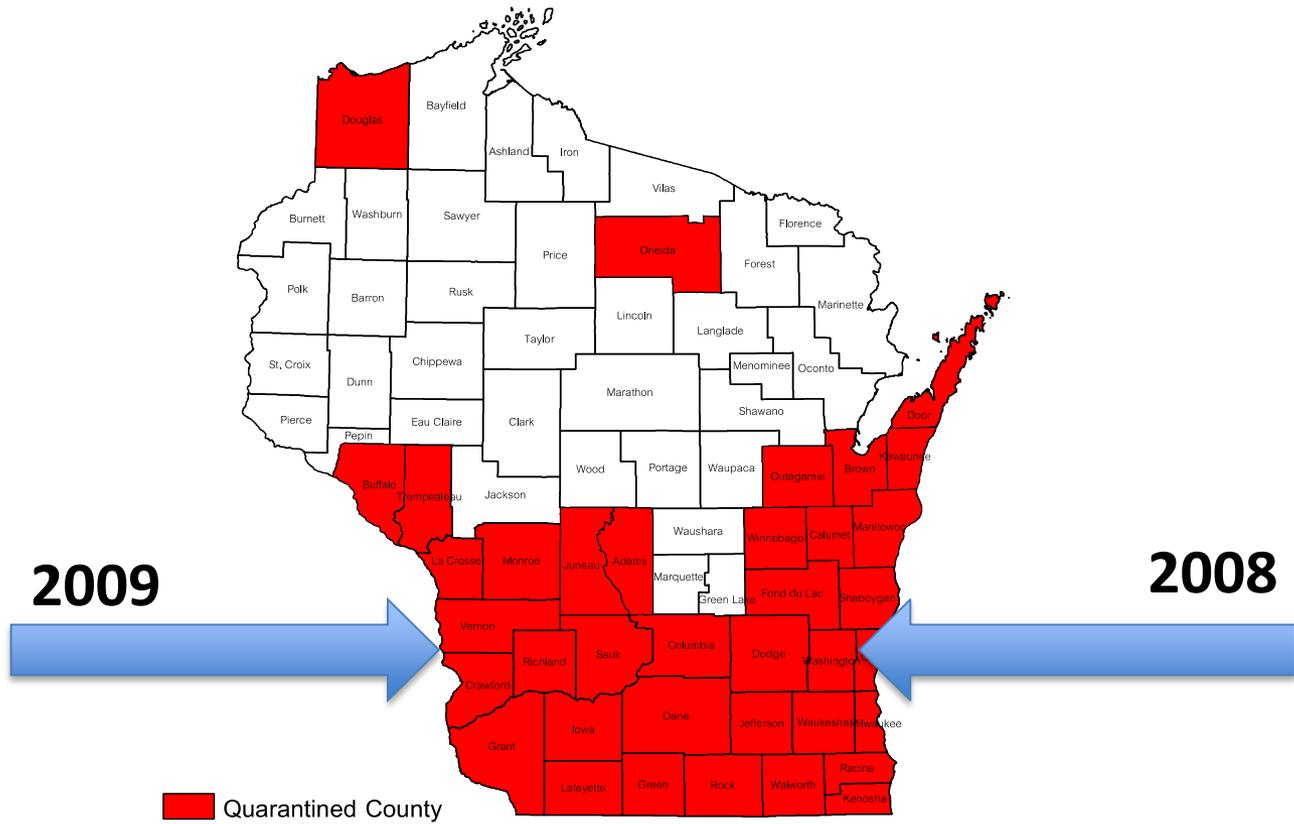
Department of Entomology

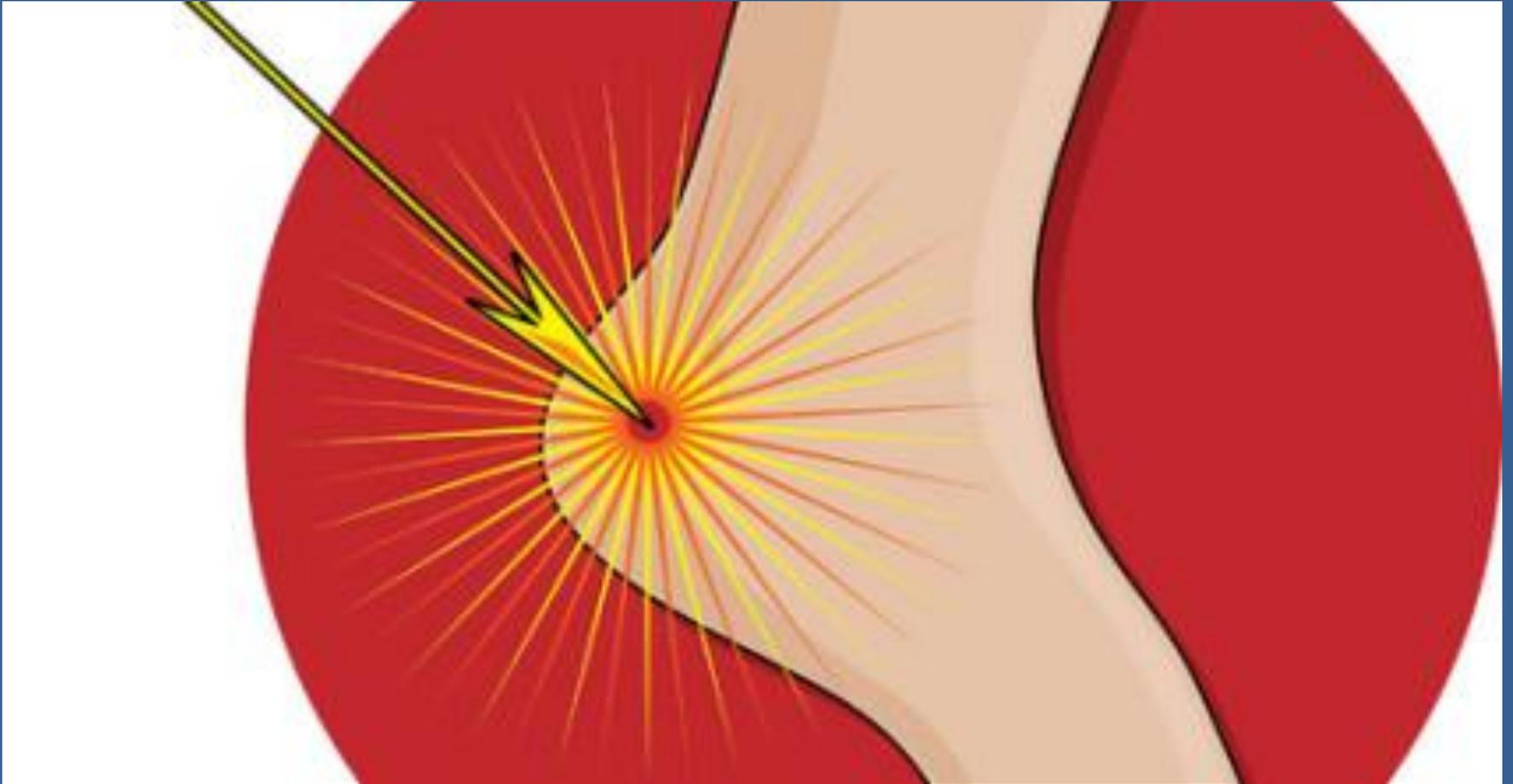
University of Wisconsin-Madison

# History of EAB in Wisconsin

- 1<sup>st</sup> discovered at Fireman's Park (Newburg, WI) in Aug. 2008
  - Wood pallet company  $\approx$  1/8 mile (0.4 km) from infested ash trees
- Dendrology studies suggest that ash trees had likely been infested since early 2000 ( $\approx$  7 yrs)
- Since 2008, has been detected in 29/72 (40%) Wisconsin Counties

# Emerald Ash Borer Quarantine





No effective early infestation detection  
tool/method/strategy

# Management Options for EAB

- Removal and Replacement of Ash trees with Alternative Species
- Biological Control (pathogens, predators and parasitoids)
- Insecticide Treatments?

# Are Insecticides Effective?

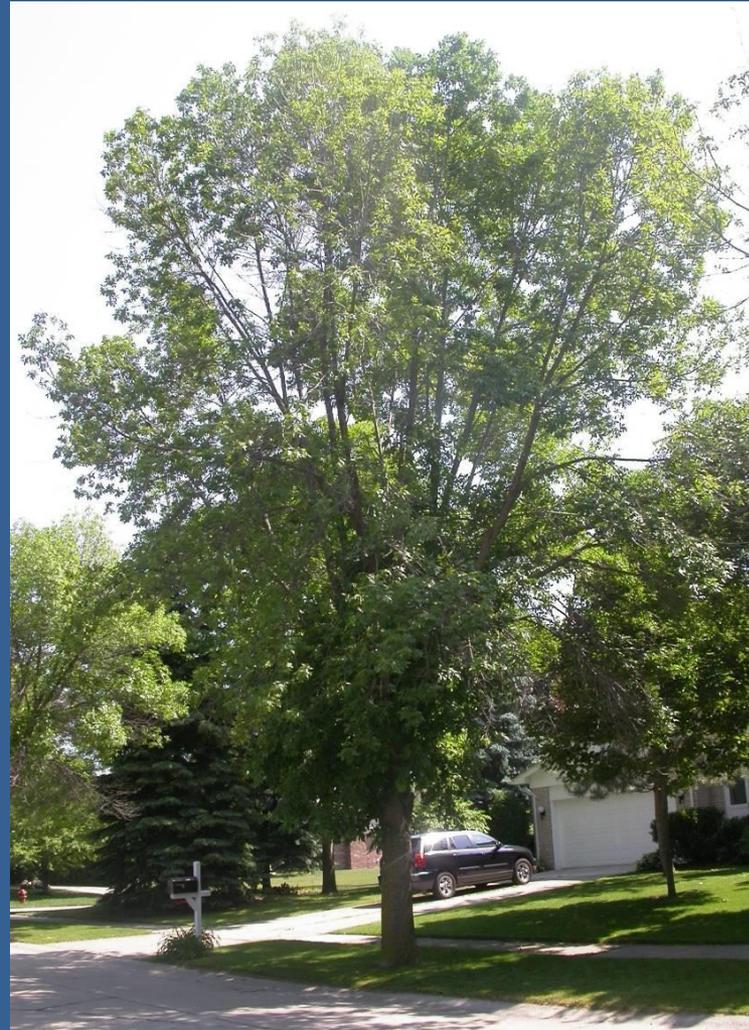
- Eradication = **NO!**
- Tree Protection = YES!
  - Primarily for high-value, specimen, heritage or legacy ash trees
  - NOT for EAB infested ash trees with > 40-50% canopy thinning/dieback
  - NOT likely cost effective for woodlots or forested areas\* (borerGONE?)

# Myth: EAB Insecticide Treatments Do NOT Work!

- FACT: Insecticide treatments are effective against EAB!
- High success rate in healthy ash trees with < 40-50% canopy dieback
- Products have been evaluated by numerous university researchers
- EPA requires efficacy data to register products for use against EAB



Non-treated  
Tree



Insecticide Treated  
Tree

# Myth: Only ONE Effective EAB Insecticide Treatment!

- FACT: Six effective insecticides
  - Five active ingredients currently available
    - Azadirachtin
    - *Bacillus thuringiensis*
    - Clothianidin
    - Dinotefuran
    - Emamectin benzoate
    - Imidacloprid
- NO single treatment is the best choice in all cases
- Several factors influence products selection
  - Size of tree (DBH)
  - Level of infestation (canopy dieback)
  - Location of tree
  - Soil Moisture

# Myth: Insecticide Treatments are “Too Expensive”

- FACT: Insecticide treatments are economical! ( $\approx$  \$1.96/DBH)
- Treatment is often less expensive than removal and replacement (utilize EAB cost calculator-Purdue)
- Consider tree benefits
  - Property value (difficult to replace comparable tree size)
  - Environmental impact due to loss of tree canopy

# Myth: Insecticide Treatment are “Dangerous”

- FACT: Insecticide treatments pose minimal risk (Frequently asked questions regarding potential side of systemic insecticides used to control EAB, Hahn et al. 2011)
- All products have been thoroughly tested and reviewed by EPA prior to registration



# Insecticide Options for Protecting Ash Trees from Emerald Ash Borer

**Second Edition**

Daniel A. Herms, Deborah G.  
McCullough, David R.  
Smitley, Clifford S. Sadof,  
Whitney Cranshaw

# Homeowner EAB Insecticide Treatment Options

- 1) Bayer Advanced Tree and Shrub Insect Control (clothianidin + imidacloprid)
- 2) Ferti-loam Systemic Tree and Shrub Drench (imidacloprid)
- 3) Gordon's Tree and Shrub Insect Killer (imidacloprid)
- 4) The Max Tree and Shrub Insect Killer (imidacloprid)
- 5) Optrol (imidacloprid)

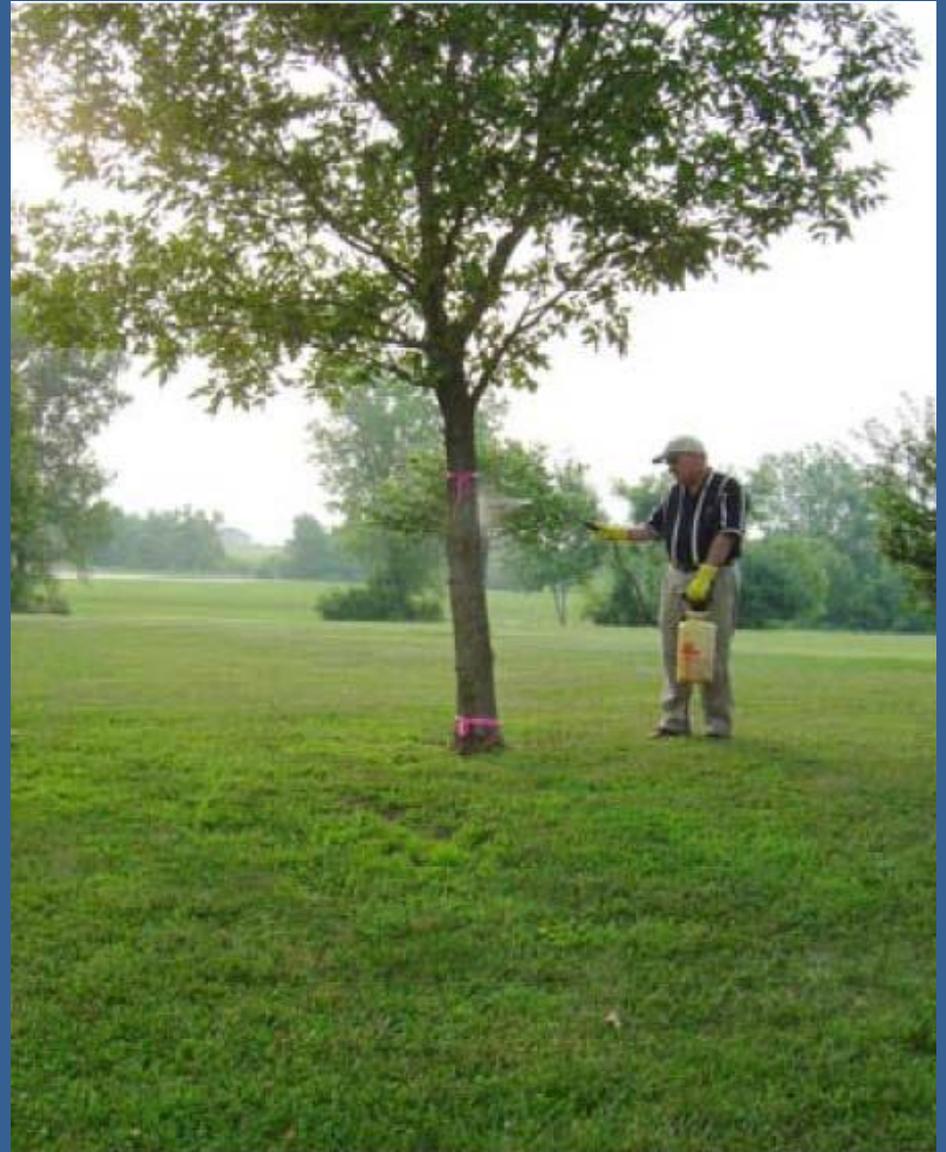
Other products may exist, consumer market changes regularly!

# Professional EAB Insecticide Treatment Options

- Azadirachtin
  - TreeAzin (Trunk Injection, BioForest Technologies)
- *Bacillus thuringiensis*
  - boreGONE (Adulticide, Phyllom BioProducts)
- Dinotefuran
  - Safari (Basal Bark Spray or Soil Drench/Injection, NuFarm)
  - Transtect (Basal Bark Spray or Soil Drench/Injection, Rainbow Scientific)
- Emamectin Benzoate
  - ArborMectin (Trunk Injection, Rainbow Scientific)
  - Treeäge (Trunk Injection, Arborjet), RUP\*
- Imidacloprid
  - Merit (soil drench or injection); numerous other brands
  - Xytect (soil drench or injection)
  - Pointer (Trunk Injection, ArborSystems)
  - IMA-Jet (Trunk Injection, Arborjet)
  - Imicide (Trunk Injection, Mauget)

## Basal Bark Spray

## Soil Drench



# Trunk Injection Technologies





508 Main St  
Newburg, WI

Study Site

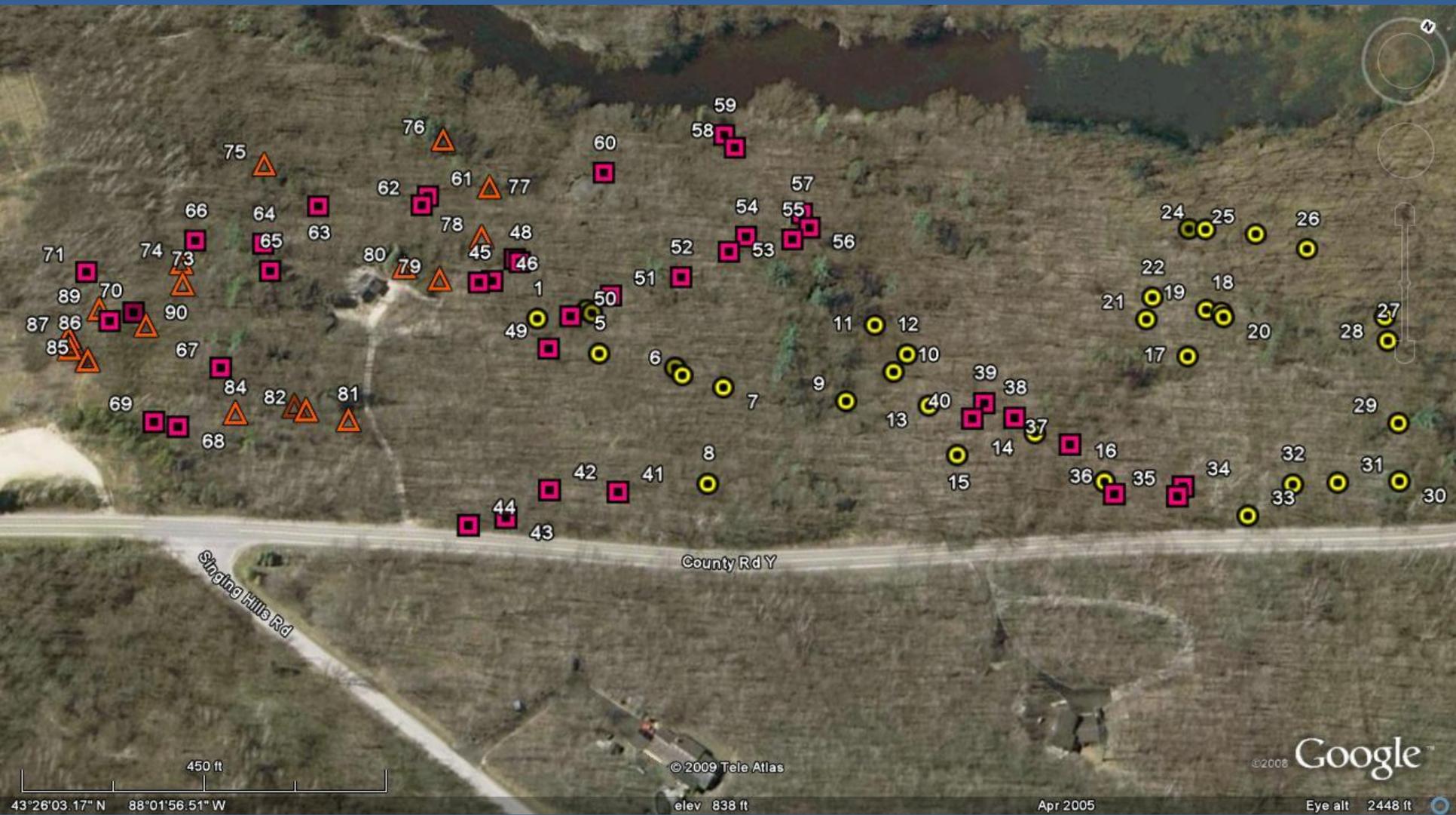
# Materials and Methods

- Riveredge Nature Center: 72 acre forested area along the Milwaukee River  $\approx 3/8$  mile (0.6 km) from EAB epicenter
- Ash is estimated at 20% of forest canopy
- Mixed stand of green and white ash
- $\approx 15$ -20% canopy dieback at initiation of study

# Materials and Methods

- Seven insecticide treatments + control
- Insecticide treatments applied annually 2009-2013
- 10 replications/treatment (80 total trees)

Treatment	Application Rate	Application Timing
Untreated	---	---
Treeäge (emamectin benzoate)	8.0 ml/injection site	27 May, 2009*
Safari (dinotefruan)	10.0 g/DBH (0.79 g ai/cm diameter)	1 July 2010, 6 July 2011 and 30 June 2012
Merit 2F (imidacloprid)	6.0 ml/DBH (0.576 g ai/cm diameter)	27 May 2009, 19 May 2010, 9 May 2011, 19 April 2012 and 7 May + 7 May 2013
Merit 2F (imidacloprid), 2 applications	6.0 ml/DBH/application (0.576 g ai/cm diameter/application)	3 June + 2 July 2009, 19 May + 8 July 2010, 9 May + 6 July 2011, 19 April + 30 May 2012 and 7 May + 13 June 2013
Bayer Advanced Liquid (clothianidin + imidacloprid), 2 applications	29.6 ml/DBH/application (0.436 g ai/cm diameter/application)	3 June + 2 July 2009, 19 May + 8 July 2010, 6 May + 6 July 2011, 19 April + 30 May 2012 and 7 May + 13 June 2013
Bayer Advanced Granular (clothianidin + imidacloprid + fertilizer), 2 applications	56.0 g/DBH/application (0.569 g ai/cm diameter/application)	3 June + 2 July 2009, 19 May + 8 July 2010, 6 May + 6 July 2011, 19 April + 30 May 2012 and 7 May = 13 June 2013
Bayer Advanced Liquid (clothianidin + imidacloprid)	59.2 ml/DBH (0.872 g ai/cm diameter)	3 June 2009, 19 May 2010, 6 May 2011, 19 April 2012 and 7 May 2013



Singing Hills Rd

County Rd Y

Google

450 ft

© 2009 Tele Atlas

© 2008

43°26'03.17" N 88°01'56.51" W

elev 838 ft

Apr 2005

Eye alt 2448 ft



Edge attack is most common

5449384

# Materials and Methods

- Average tree size:
  - 12.4 DBH (8.3-17.2 DBH)
- Treatment applications:
  - Trunk Injection (Arborjet)
  - Soil Drench
  - Soil Application (granular)
- Treatment Evaluation:
  - % Canopy Decline/Dieback (Smitley et al. 2008)



0%



10%



20%



30%



40%



50%



60%



70%



80%



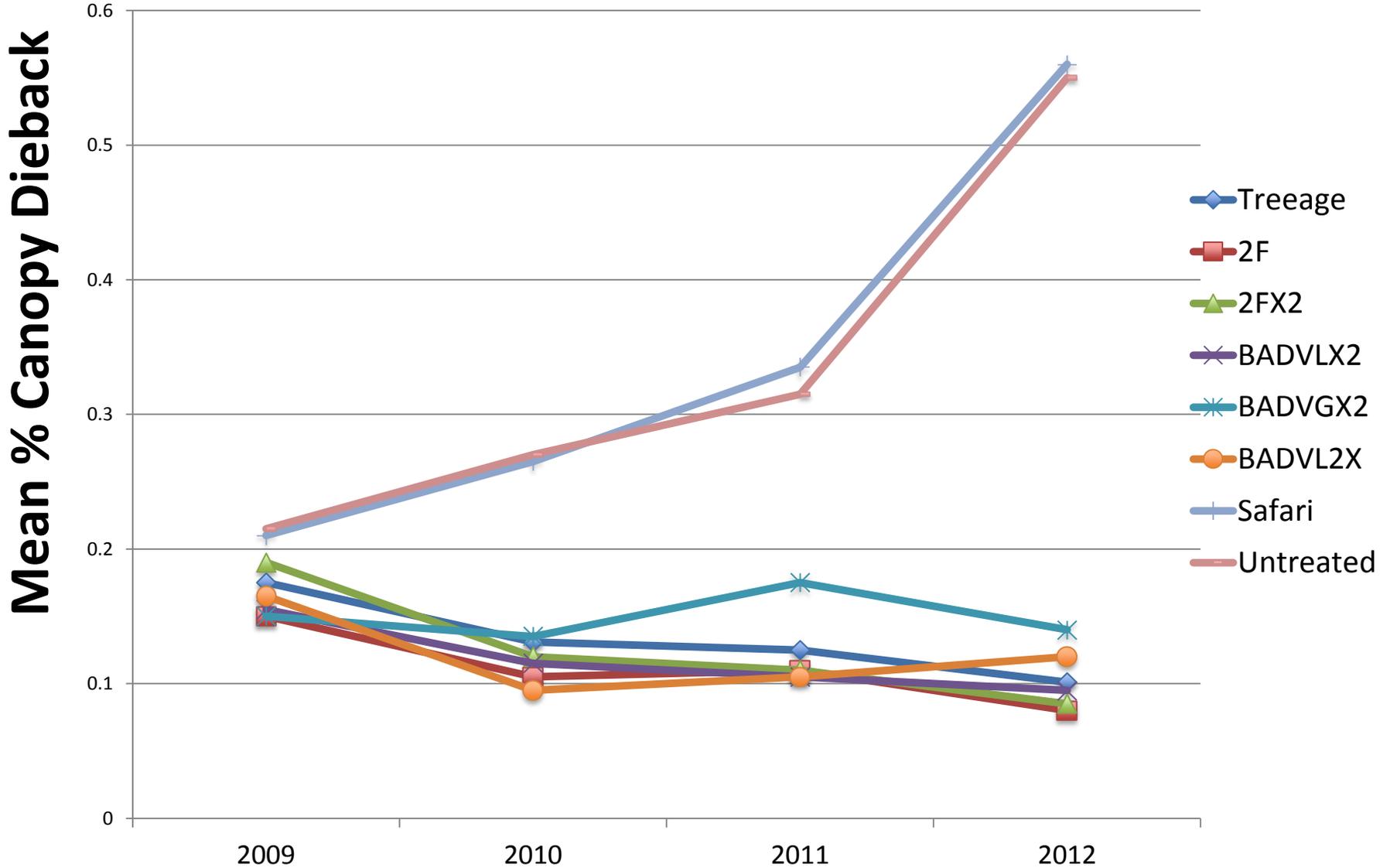
90%



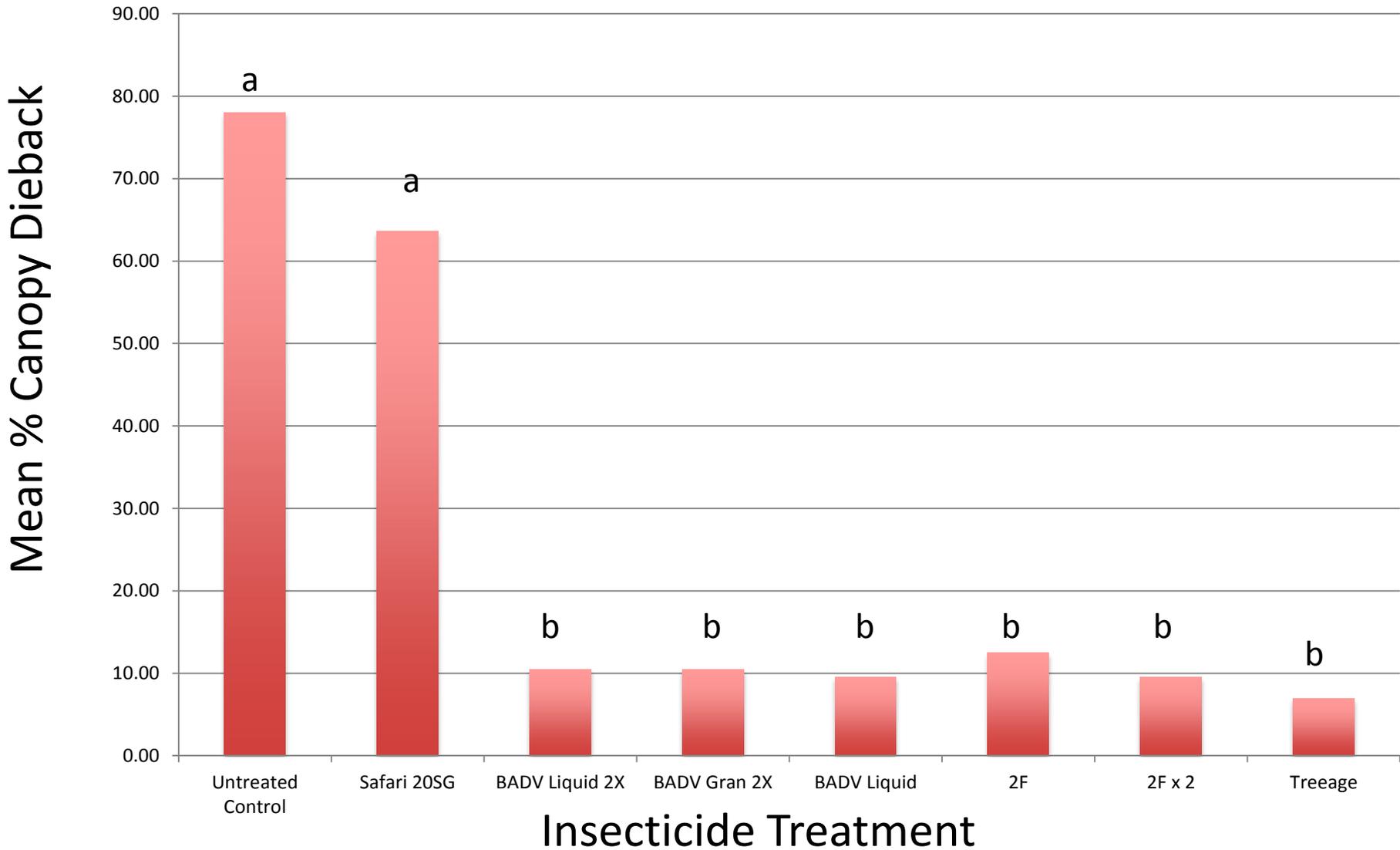
100%

Smitley et al. 2008

# Ash Canopy Dieback (August, 2009-2012) Riveredge Nature Center (Newburg, WI)



# Ash Canopy Dieback (August 2013) Riveredge Nature Center (Newburg, WI)





# Conclusions

- Insecticides are effective!
- Choosing to not make an insecticide application will likely result in tree death
- Application timing is important
  - e.g., Safari must be applied before July
- Annual treatment applications are necessary\*
- Treeäge may provide > 5 years residual control

Joe Keller ©2001  
GREEN BAY PRESS-GAZ.

