

# Emerald Ash Borer: Implications for Minnesota Forests

Susan Burks

Invasive Species Program Coordinator  
Division of Forestry



# Emerald ash borer (EAB)

- Most serious forest pest in the eastern U.S.
- Attacks, kills all ash species
- Stressed and healthy trees
- Large and small trees
- Includes all forest types where ash occurs







Pennsylvania Department of Conservation and Natural Resources - Forestry Archives, Pennsylvania Department of Conservation and Natural Resources, [www.forestryimages.org](http://www.forestryimages.org)

# One to Two Year Life cycle



James W. Smith, USDA APHIS  
PPO



Pennsylvania Department of Conservation and Natural Resources - Forestry Archives,  
Pennsylvania Department of Conservation and Natural Resources, [www.forestryimages.org](http://www.forestryimages.org)

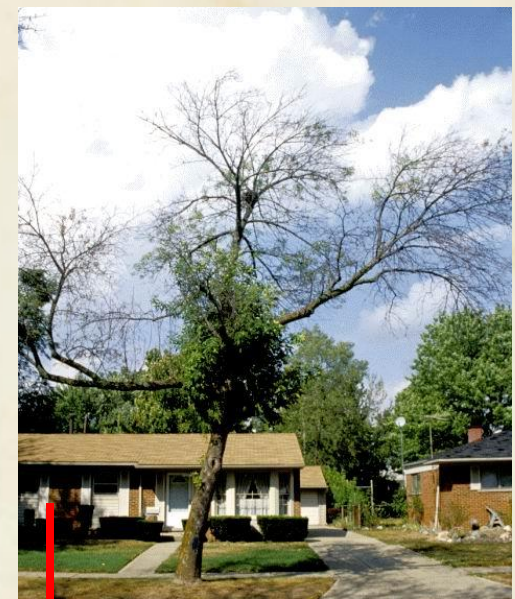




# How did it get here?



**Early 1990s: Introduced into North America (Detroit)**



**Late 1990s: Ash decline and dieback widespread in SE MI**

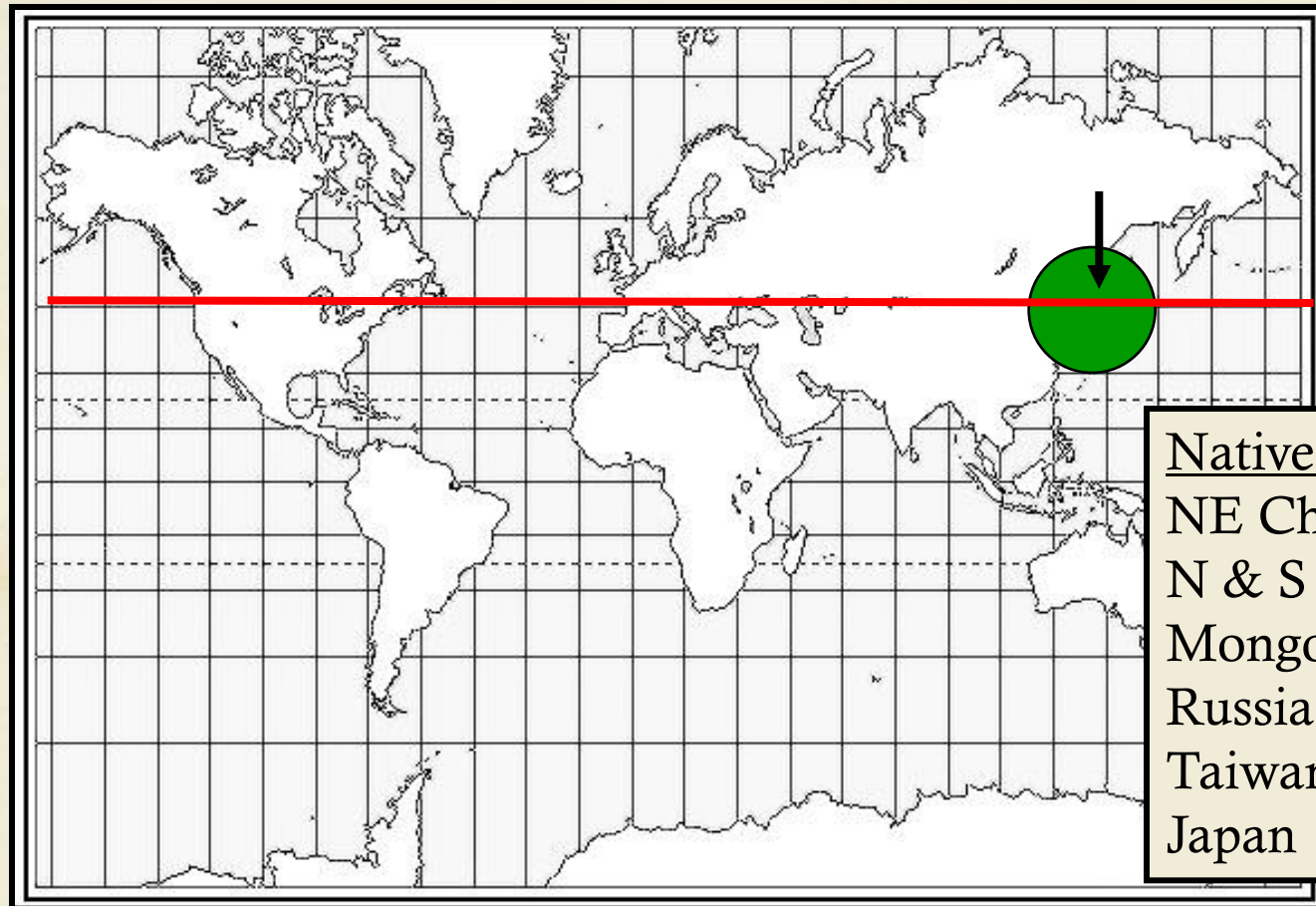


**2004: Millions of ash dead in SE Michigan**



**2002: EAB identified**

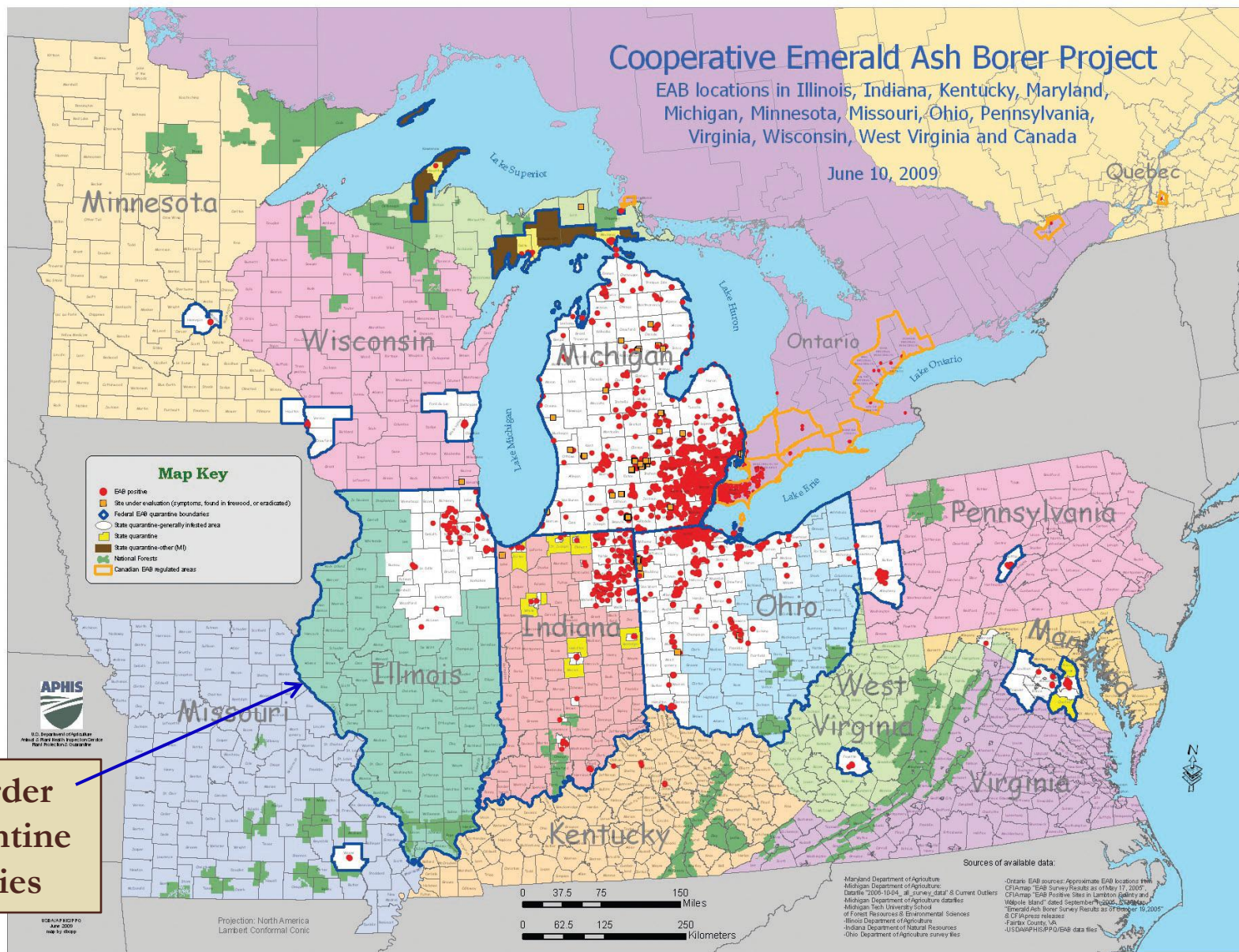
# Where did EAB come from?



Current research shows that EAB from China cluster with populations here; assumed U.S. population is from China

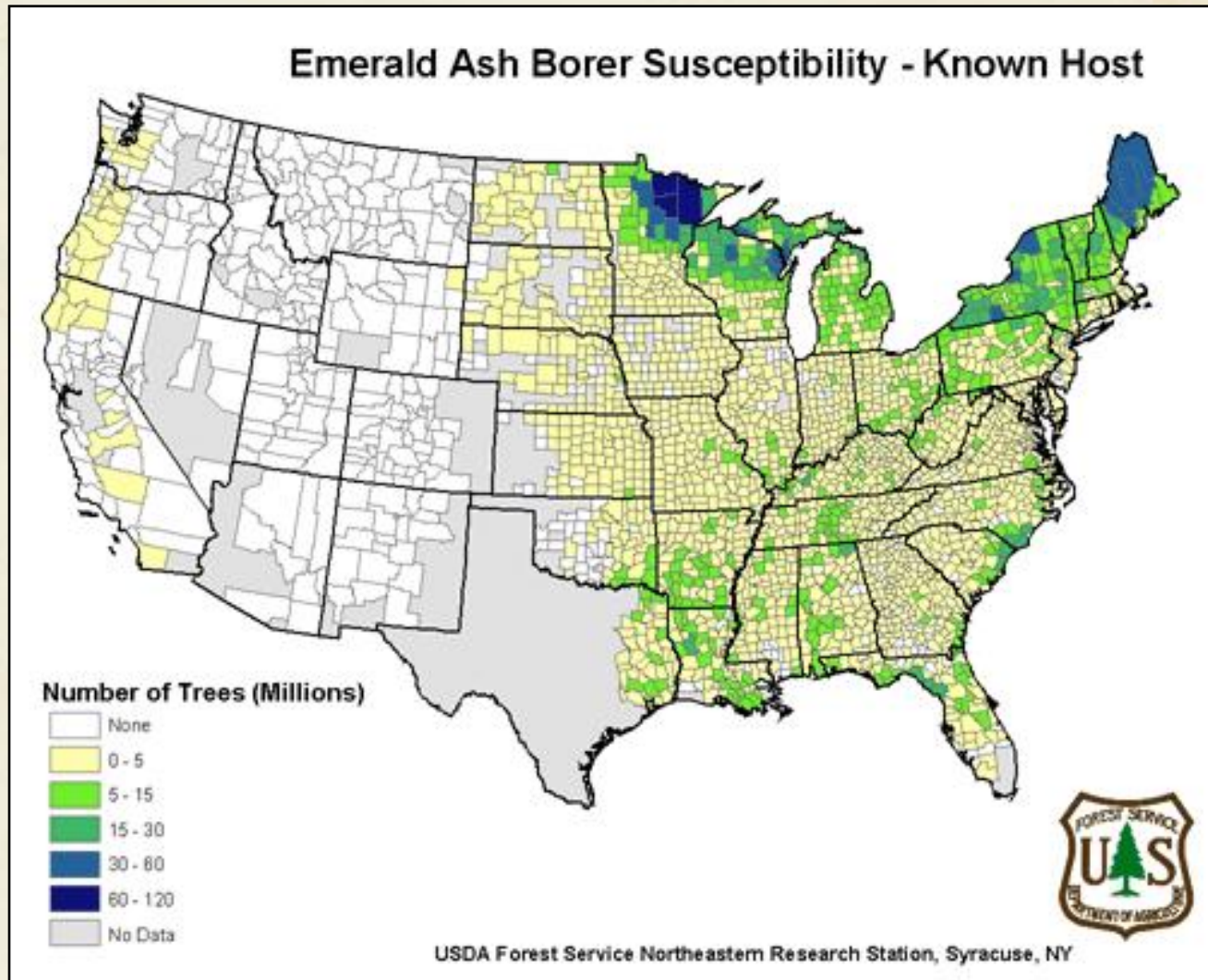


# Where is EAB now?





# What is at risk?



Over 800 million ash trees in Minnesota forests and communities

**Ash: third most abundant tree in our forests**

# Secondary Spread is through Firewood (and other ash wood products)



- Recreation
- Home heating







# What is the state doing to prepare?

- **Planning Efforts**
  - MDA Response Plan
  - Minnesota Readiness Plan
  - DNR Preparedness Plan
- **Response & Regulation**
  - State & federal quarantine on all ash wood products & hardwood firewood in four MN counties
  - Interagency incident command (ICS)
  - Firewood restrictions on all DNR lands
- **Outreach**
  - First Responders training & mobilization
  - Public open houses
  - Joint news & education campaigns





# Key EAB Partner Agencies:

- **Minnesota Department of Agriculture** - lead agency over terrestrial invasive pests not yet established in MN; regulates within-state trade (i.e. quarantines)
- **USDA Animal and Plant Health Inspection Service** – lead agency over invasive pests not yet established in the US; regulates international & between states trade; funding partner for regulatory actions
- **DNR** - lead agency managing established forest pests; responsible for conserving Minnesota forest resources
- **USDA Forest Service, State & Private Forestry** - manages national forests; technical support & funding partner for state & private forest management
- **UMN** - provides education, research & technology development; technical support on all aspects of mgmt

Among other partners

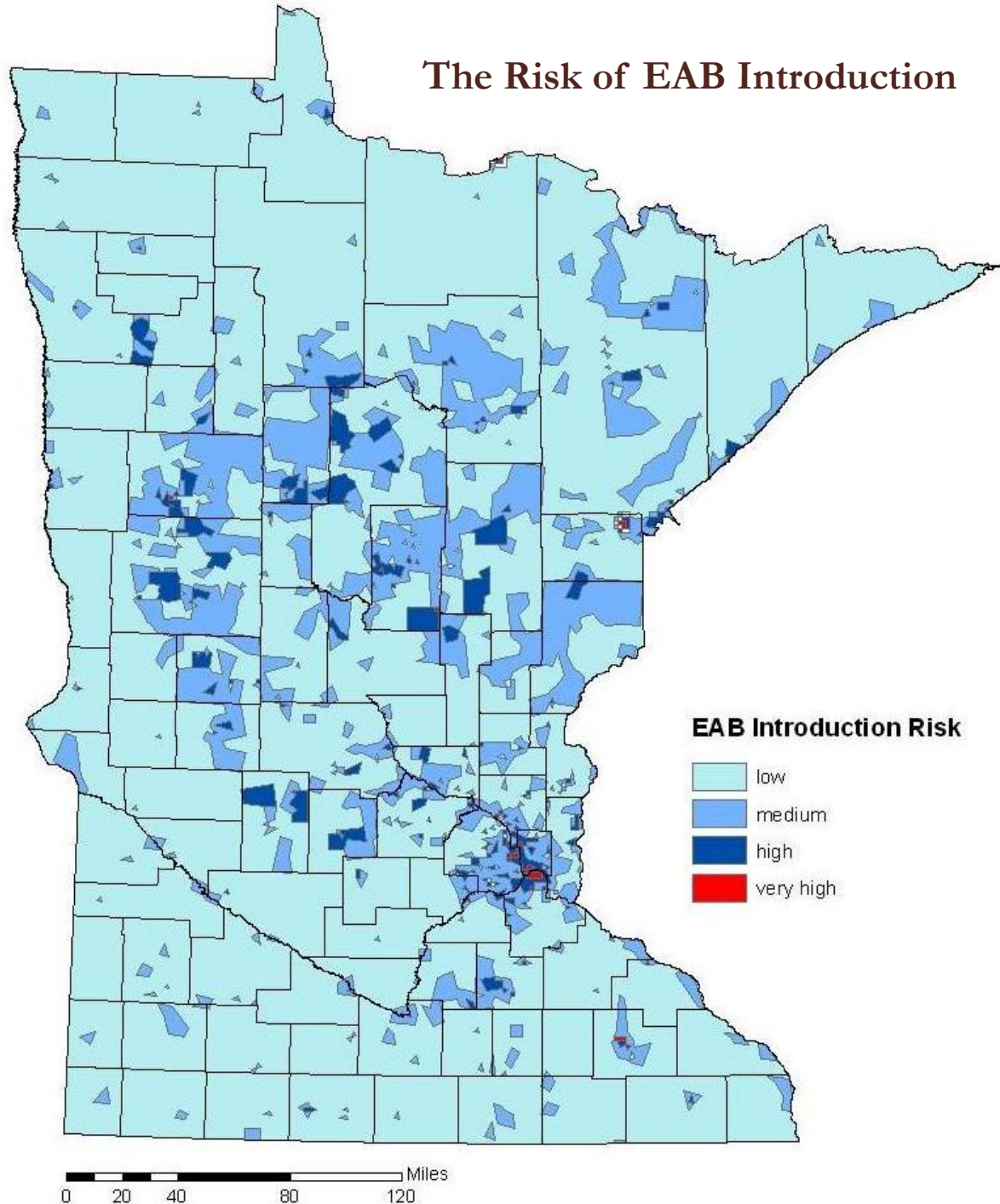


# Survey Methods



Trap Trees  
Sticky Traps  
Alert Citizens

## The Risk of EAB Introduction





# Diagnosing EAB: Under the bark



[www.insectimages.org](http://www.insectimages.org)

- Bark splits over the galleries
- Look for characteristic “S” shaped, serpentine galleries, made by larvae under the bark





# Diagnosing EAB: Direct evidence

Look for characteristic D-shaped exit holes, often high in the tree



Adults emerge from May to late June (this yr, 1<sup>st</sup> of June)



Note - by the time D-shaped exit holes are present, a new generation of beetles has emerged and spread to other trees.





## Prior to Infestation

- No resistance found in native ash, so all ash trees are vulnerable
- EAB population numbers are strongly correlated to the volume of phloem
- Phloem reduction limits future EAB population growth & thus slows potential spread
- Where possible & consistent w/ site-level guidelines & stand mgmt objectives:
  - Thin to diversify the stand & encourage non-ash species
  - Harvest stands dominated by mature ash
  - Shorten rotation for ornamental ash
- Avoid planting or seeding ash

Pest is so new, there has been little time to develop forest management guidelines



# Slow Ash Mortality components

- **SLAM** is being researched in Michigan
- **Trapping program** to detect & delineate EAB populations
- **Forest inventory** to describe ash abundance and distribution
- **Pest suppression** to reduce population numbers
  - Sanitation (remove infested trees)
  - Clustered trap trees (serve as sinks)
  - Phloem reduction
  - Insecticides (to protect high value trees &/or create buffer to help contain population)
- **Compliance agreements** to minimize spread during harvest operations & wood utilization





# Long Term Implications

- Eventually the entire state **will** become generally infested.
- If no new infestations, general infestation may take years (average annual spread is 4 miles/yr)
- Once area is infested, tree mortality begins to appear in 4 to 5 yrs, slowly at first
- Rate of mortality speeds up after 10-15 years
- Close to 100% mortality is expected
- Theoretical donut hole effect may allow future ash regeneration to survive – but that hasn't been seen yet in MI

In the meantime, markets & cultures will have to adjust, just like they did with the Chestnut Blight



# Using Insecticides

- Only practical on high value urban or historic trees
- Several insecticides are labeled for EAB
  - Soil drench or injections
  - Trunk sprays or injections
- Soil treatments take several weeks to a few months to translocate through out the tree
- Bayer product available to home owners, but not effective on trees over 15” dbh
- Products vary, but trunk injections have been the most effective (some for 2 yrs)
- Home owners should wait until EAB infestations are within 10-15 miles of home

Once treatments start, they will have to  
continue for the life of the tree.

EAB is not going away!



Emerald ash borer:  
*coming to a neighborhood near you!*

