

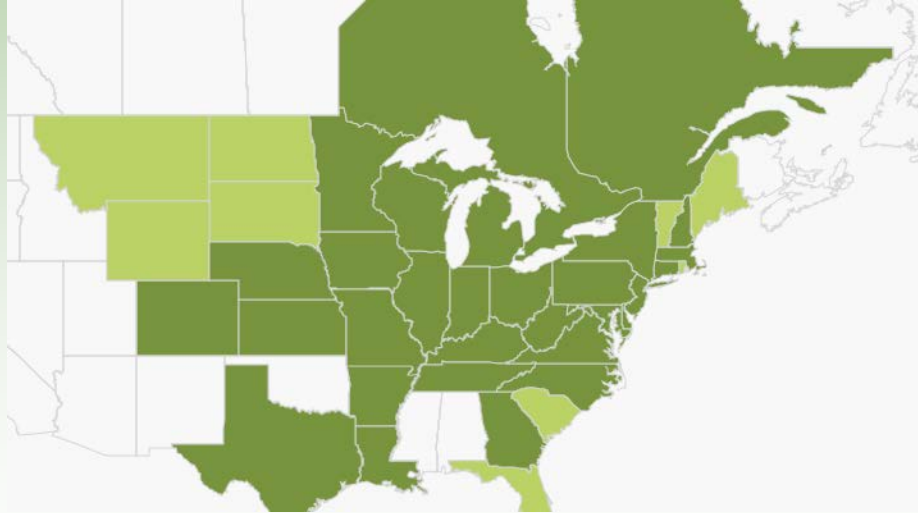
Emerald Ash Borer

Agrilus planipennis



History in the US

- First found in 2002 in Detroit, Michigan
- Came to USA from Asia on solid wood packing material carried in cargo ships or airplanes.
- Arrived in Pennsylvania in 2007 in North Park



Since Discovery...

- Killed hundreds of millions of ash trees in North America
- Cost municipalities, property owners, nursery operators and forest products industries hundreds of millions of dollars
- Quarantines were established to prevent the insects spread
 - Logs and hardwood firewood were not allowed to be moved out of areas where EAB was detected
 - Most of insect spread from movement of firewood

Life Stages

- Larvae
 - Creamy white, legless
 - Flattened, bell-shaped body segments
 - Terminal segment bears a pair of small appendages
 - Can reach 1 inch in length



Life Stages

- Adult
 - Bright metallic green
 - ½ inch long, flattened back
 - Purple abdominal segments beneath wing covers
 - Can fly ½ mile from host tree



What does EAB do?

- Adult beetles lay eggs on the bark of ash trees. When the eggs hatch, the larvae (immature beetles) bore into the bark and feed on the transportation tissues (cambium) of the tree. This disrupts the movement of nutrients and water within the tree, girdling it and causing tree death

Signs and Symptoms

- Canopy dieback
 - Begins in top 1/3 of canopy
 - Progresses until tree is bare



Signs and Symptoms

- Epicormic Shoots
 - Sprouts grow from roots and trunk
 - Leaves often larger than normal



Signs and Symptoms

- Bark Splitting
 - Vertical fissures on bark due to callous tissue formation
 - Galleries exposed under bark split



Signs and Symptoms

- Serpentine Galleries and D-shaped Exit Holes
 - Larval Feeding galleries typically serpentine
 - Galleries weave back and forth across the woodgrain
 - Packed with frass (sawdust and excrement)
 - Adults form D-shaped holes upon emergence



Signs and Symptoms

- Increased woodpecker activity/damage
 - Several Woodpecker species feed on EAB larvae/pupae
 - Peck outer bark while foraging
 - Create large holes when extracting insects



Dead Ash Trees Are Dangerous

- EAB girdles underneath bark
- Water is not flowing through cambium
- Wood becomes dry and brittle
- Unsafe to climb

Susceptible trees

- In North America, it has only been found in Ash trees
 - Trees as small as 1 inch have been infested by EAB
- Healthy, dying, and stressed trees are all susceptible
 - Dying and stressed trees are preferred for feeding
- After infestation, death can occur in 3-4 years

Control

- Mechanical - Tree removal
 - Low cost if done before infested
- Chemical - Insecticide
 - Variety of methods
 - Costly and must be repeated
 - If the tree has 50% dieback, it is too late for any treatment
- Biological – Predatory native ground wasp (*Cerceris fumipennis*)
 - Solitary hunting wasp that preys on wood-boring buprestid beetles
 - Adult wasp catches and paralyzes a beetle with its stinger, carries it back to its nest, drags the beetle inside and then lays an egg on it
 - The egg hatches and larvae eats the beetle

Emerald Ash Borer Infestation in Pennsylvania



Not Found
 2008
 2010
 2012
 2014
 2016

2007
 2009
 2011
 2013
 2015



(62 out of 67 Counties infested by 09/15/ 2016)



Questions???

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