Emerald Ash Borer Update

Missouri Invasive Forest Pest Council
January 30, 2016

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State Entomologist
Missouri Department of Agriculture
2016 EAB Survey and Detections

- **2016**: 16 new counties confirmed
- **2017**: Camden and Miller
- 232 purple traps placed
- 33 trap trees (data available February)
- Visual Survey
- Citizen Reports
- MDA, PPQ, USACE, MU, MDC
Carter: PPQ Shoemaker visual survey, Ozark Natl Scenic Riverway

Cass: rural residence report to MDC

Clinton: rural residence report to MDC

DeKalb: MDA purple trap

Dent: PPQ Shoemaker visual survey, Mark Twain Natl Forest

Franklin: MDA purple trap

Iron: PPQ Shoemaker visual survey, Mark Twain Natl Forest

Laclede: MDC Conservation Area

Phelps: PPQ Shoemaker visual survey, Mark Twain Natl Forest

Ray: rural residence report to MDC

Ripley: PPQ Shoemaker visual survey, Mark Twain Natl Forest

Shannon: PPQ Shoemaker visual survey, Current River Cons Area

St. Francois: PPQ Shoemaker visual survey, MDC Knob Lick Tower

Ste. Genevieve: PPQ Shoemaker visual survey, Mark Twain Natl Forest

Stoddard: PPQ Shoemaker visual survey, Mingo Natl Wildlife Refuge

Texas: PPQ Shoemaker visual survey, Mark Twain Natl Forest
New EAB State Detections in 2016
Texas, Nebraska, Delaware, Oklahoma, Alabama
EAB Federal Quarantine

31 EAB Compliance Agreements in Missouri
Firewood, Mulch, Lumber, Pallets

Movement of EAB regulated articles **cannot** exit Federal quarantine boundaries without Federal permits.

Movement of EAB regulated articles **within** Federal quarantine boundaries (excluding protected areas) does not require Federal permits but may require State permits.

Check for and follow any relevant interior State EAB quarantine regulations before moving regulated articles. For more information: 866-322-4512

**Map Key**
- Red diamond: Area subject to Michigan Department of Agriculture and Rural Development regulatory policies
- Green area: Indian Reservation

Cooperative Emerald Ash Borer Project

Federal EAB Quarantine & Authorized Transit

January 3, 2017

USDA United States Department of Agriculture

Map of the United States showing quarantine boundaries and states affected by the EAB quarantine regulations.
2017 Missouri EAB Survey

- MDA Purple Trap Survey
  - SW Missouri (Springfield, Joplin, Neosho, etc)
  - Central MO
  - East Central
  - Northeast
  - North Central
  - NW Missouri
- MU (Columbia Campus)
- PPQ Visual
- USACE (St. Louis District)
- MDC – Citizen report follow-ups
EAB Biological Control

A. EAB adult
B. Egg parasite: *Oobius agrili*
C. Larval parasite: *Tetrastichus planipennisi*
D. Larval parasite: *Spathius agrili*

Egg parasite (B) attacks EAB eggs; larval parasitoids (C and D) attack EAB larvae or immature stage. EAB adults are approx $\frac{1}{2}$ inch in length.

Photos: J. Plunkett, MN Dept Ag, Howard Russell, Bugwood.org, Houping Liu, Bugwood.org
Spathius agrili

- In China, 30–50% parasitism
- Up to 85% in some stands
- No-choice host specificity tests in China: no non-targets attacked
- Tests in U.S.: other Agrilus were attacked, but at lower rates
- Some indication that the two-lined chestnut borer could serve as a possible host.

Jennifer Ayer, Bugwood.org
In China, 20–40% parasitism

Results of no-choice assays indicate that T. planipennisi is highly specific to EAB
In Michigan lab tests, EAB parasitism rates near 60%

Results of no-choice assays show *O. agrili* could develop on two-lined chestnut borer, bronze birch borer and red-necked cane borer, but has a clear preference for EAB.
Biocontrol Releases To Date

Possible 2017 Releases
MO EAB Biocontrol Release History

- (2012) Wayne County
- (2013) Wayne County
- (2014) Platte County
- (2016) Clay and St. Charles Counties and the City of St. Louis.
EAB Biocontrol Recovery

Recovery
- No
- Yes

Latitude: 51.690, Longitude: -107.795
Spathius galinae
Yellow Pan Traps

- Checking for establishment of parasitoids.
- Two sites in Wayne county surveyed in 2016
- 21 traps total
- 6 collection periods
- ~5–day collection period each
- Late May to Mid September
- Collections being screened by Juli Gould, USDA APHIS PPQ