

TCD Survey and Research Update

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MDC Forest Pathologist
January 30, 2017



Survey participants

Missouri Department of Agriculture

USDA APHIS Farm Bill funds and state funds



Missouri Department of Conservation

USDA Forest Service and state funds



Approach

- Lindgren funnel traps (4 or 8 funnels) with WTB pheromone pouch attached
- Visual Survey
- Branch sample collection



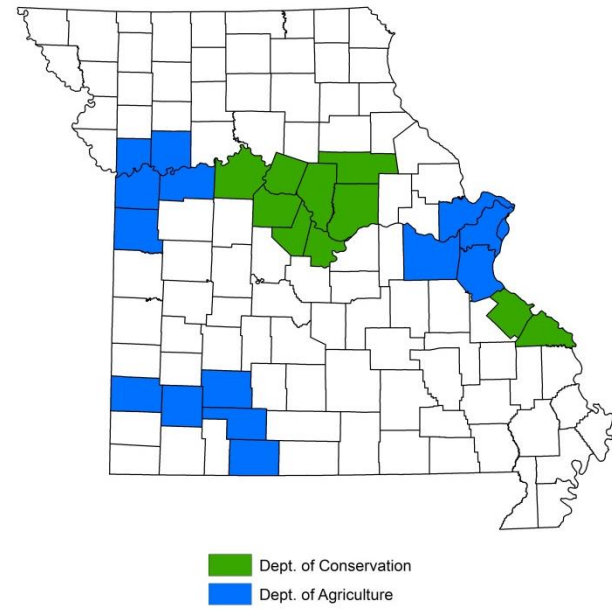
Survey challenges

- Traps effective ~ 30 feet
- Traps require biweekly servicing through season (May-August)
- Difficult to find declining walnut trees in 2016

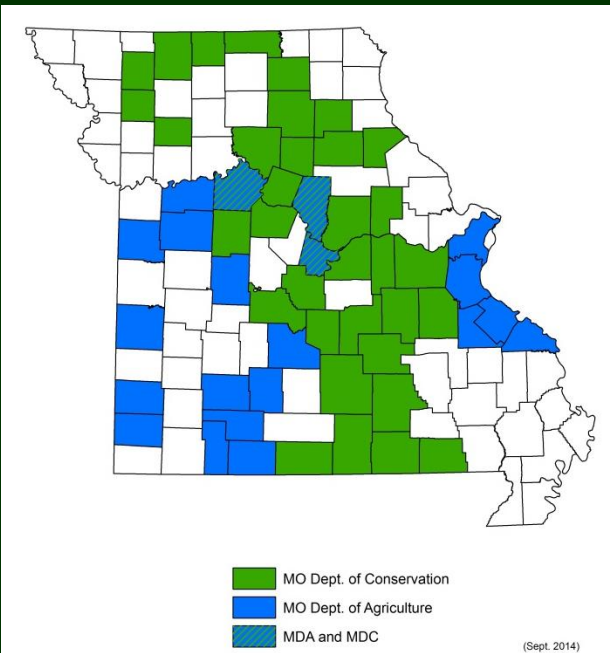


Rotation between counties/regions each year

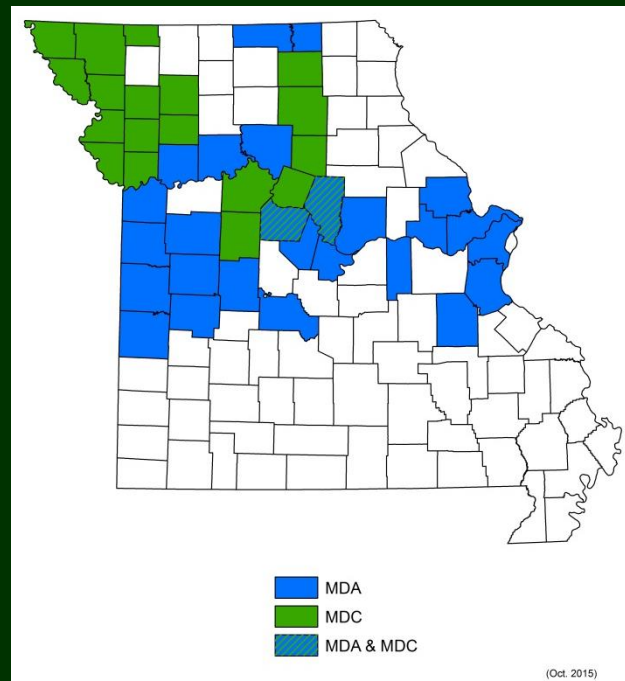
2013



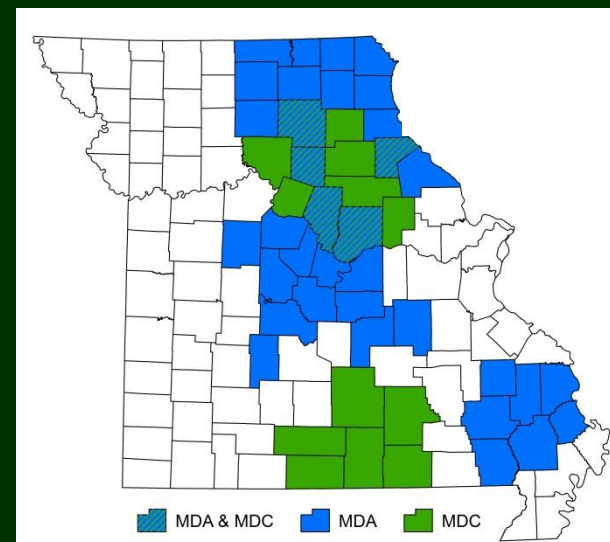
2014



2015



2016



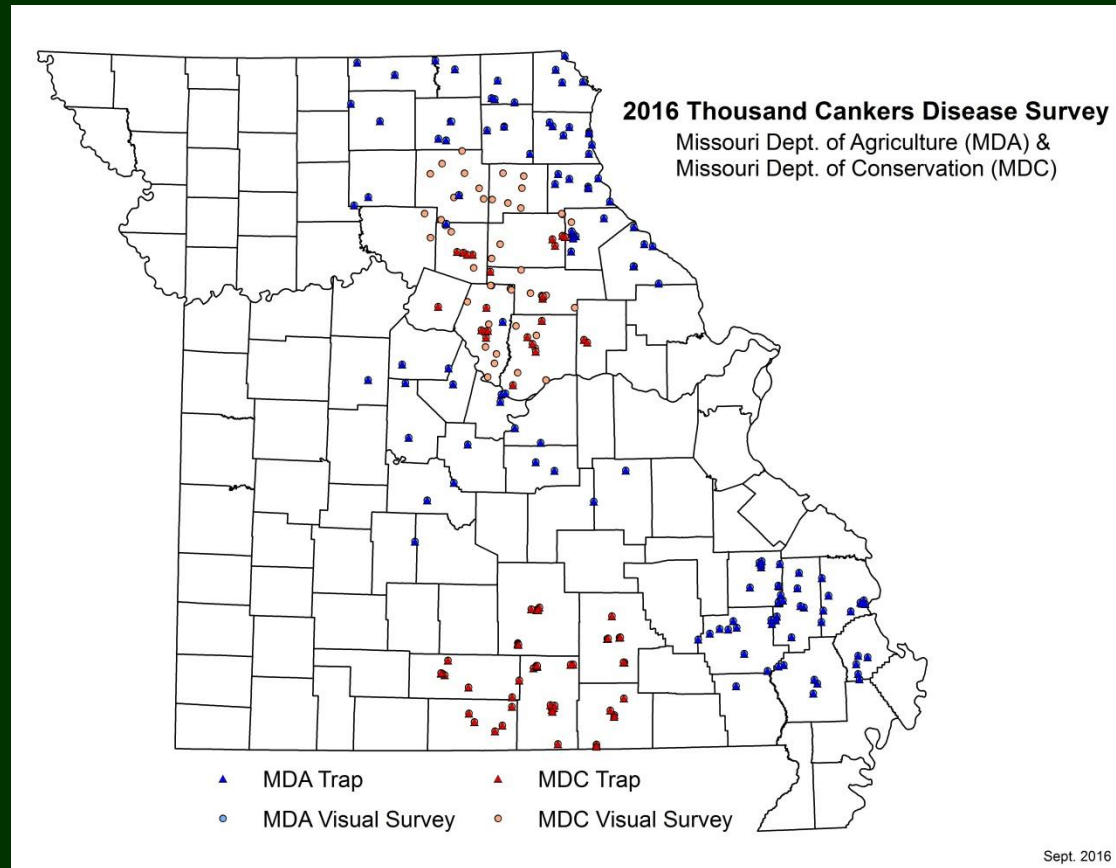
2016 survey: 47 counties

MDA

- 3 surveyors
- 122 traps
- 124 visual surveys

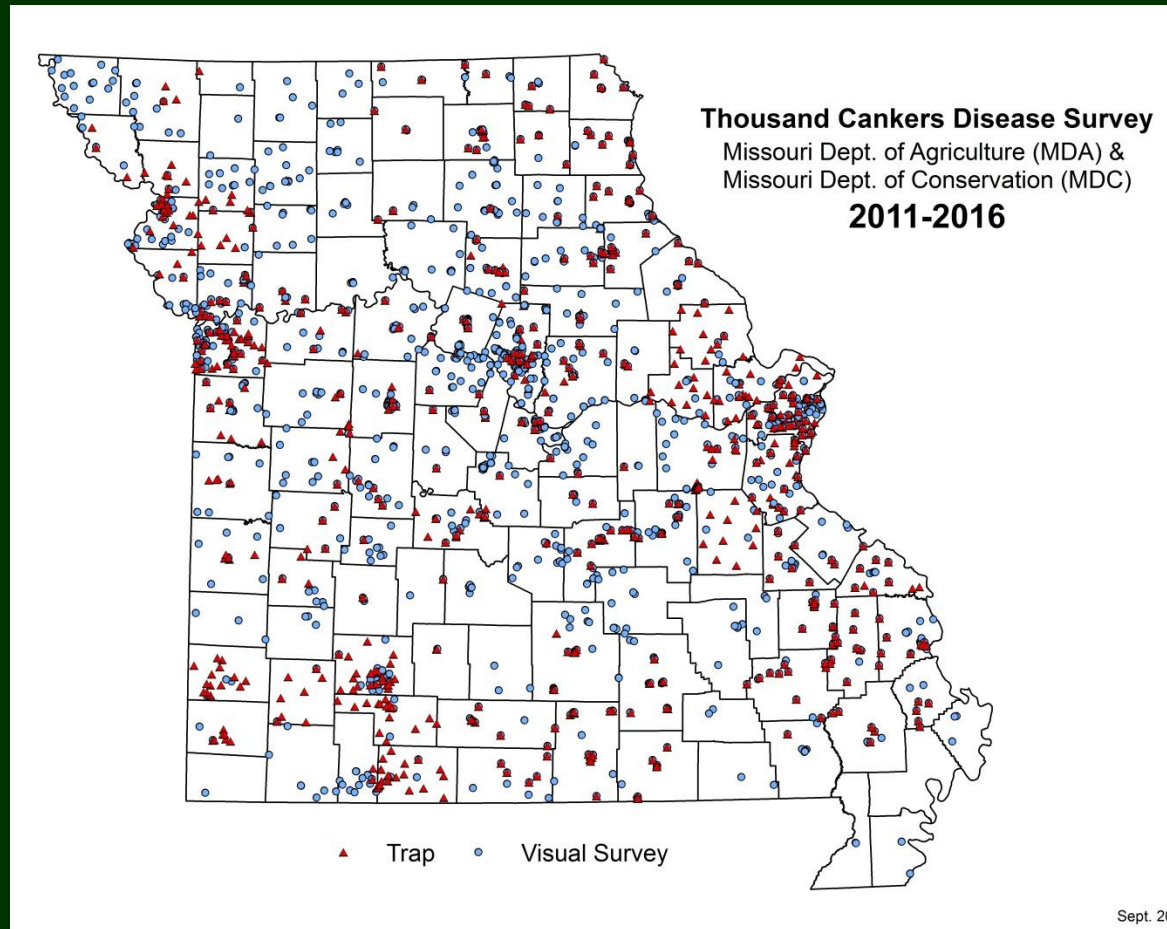
MDC

- 2 surveyors
- 74 traps
- 119 visual surveys



Survey history

- 1809 visual surveys (since 2010)
- 814 traps (since 2012)



Good news For MO

- No walnut twig beetles or TCD detected so far
- Dr. Donald Bright, Dr. Sharon Reed, Dr. Steven Seybold provided species confirmation

Research Summary

TCD
Positive
Tree in TN
9/15/2010



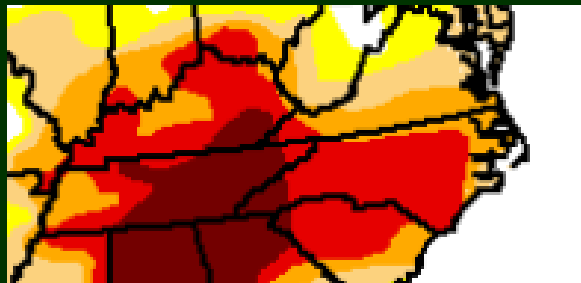
Same TCD
Positive
Tree in TN
8/29/2013



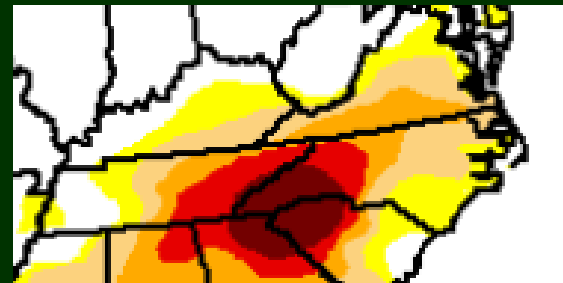
Griffin et al. 2014

US Drought Monitor

September 2007



August 2008



Abnormally Dry
Drought - Moderate
Drought - Severe

Drought - Extreme
Drought - Exceptional

Genetics?



Jay Pscheidt, Oregon State U.

Geosmithia morbida



Elizabeth Bush, Virginia Polytechnic Institute and State University, Bugwood.org



Jenny Juzwik, USFA Forest Service

- Small cankers do not increase over time
- Other common fungi cause bigger cankers

Walnut twig beetle

- Repeated attacks
- Attracted to stressed walnut trees



Growing list of insects carrying *G. morbida*

Walnut twig beetle



Pityophthorus juglandis

Ambrosia beetles



Xylosandrus crassiusculus



Xyleborinus saxeseni



Xylosandrus germanus



Weevils



Conotrachelus retentus



Himatium errans



Stenoscelis brevis



Stenomimus pallidus

Insect screening in MO

- 2012: Dr. Sharon Reed (MU Plant Science), MDC Forestry
 - 7,000+ specimens collected



Girdled walnut tree



Collecting tree sections for insect emergence



Screening insects for fungus

- 2017: MDC, MDA, Patti Hosack (MU Plant Diagnostic Clinic), Dr. Sharon Reed (MU Plant Science), APHIS funding

TCD kills walnut trees



Do we plant walnut trees?

- Plant on a good site
- Tree diversity
- Maintain tree health and vigor
- Monitor trees for symptoms



Plantation BMP research

- Dr. Matt Ginzel (Purdue University)
- *Juglans nigra* plantations, Washington State
- Monitoring walnut twig beetle dispersal
- Trap trees, pruning practices, insecticides



Log and tree treatments



Bud Mayfield, USDA FS



Bud Mayfield, USDA FS

- Biological control with fungi
- USDA FS, USDA ARS, UT-Knoxville, Cornell

Allow us to steam treat them



USDA APHIS and USDA Forest Service

Questions and comments



Save the Date

**Thousand Cankers Disease
Research & Management
Operational Meeting
June 13-15, 2017
Lafayette, Indiana**

Further information can be found at [the meeting website](#). Registration will begin March 2017.

Purpose: To gather and share all research, survey, management methods and regulatory information on Thousand Cankers Disease.

Hosted by

USDA Forest Service Forest Health Protection
USDA Forest Service R&D
Hardwood Tree Improvement and Regeneration
Center at Purdue University



**HARDWOOD TREE IMPROVEMENT
& REGENERATION CENTER**

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