



Go, Plant Heroes!

 Like 104

Take the [Plant Hero Pledge](#) and explore the site to learn more about the bad guys that threaten plants. Wanna do more? The first step in finding the bad guys is knowing where to look! Learn how to identify and then start [mapping the host trees in your neighborhood](#)!

Plant Heroes Curriculum Hub: *A repository for school-based educational materials*

Daniel Stern
Sentinel Plant Network Manager
American Public Gardens Association
dstern@publicgardens.org



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Emerald-Ash-Borer-Bashing
Aponi Star

She may be the youngest of the crew, but is very wise and crafty with winged insects. She helps locate a nasty bug called the Emerald Ash Borer. To protect trees, Aponi can use a special wasp to kick out the unwelcome borer.



Asian-Longhorned-Beetle-Battling
FRANKIE BARKER

He is the fastest rope climber in his high school, and the first to be seen high above in the treetops. Frankie is passionate about protecting trees, especially from the nasty Asian Longhorned Beetle. Frankie is goin' after them!



Ramorum-Blight-Bravin'
Nate Green

It's funky and it's mean. When we need the facts, we count on Nate Green! He knows that oak trees and other plants are getting hassled by a wicked water mold. Destructive pathogens, you now have a reason to run!



Redbay-Ambrosia-Beetle-Bustin'
Laura Wilkins

As a freshman college student, Laura studies ecology and science. She is a born leader and fierce fighter. Don't let her smile fool you-she is after her dreaded enemy, the Redbay Ambrosia Beetle!



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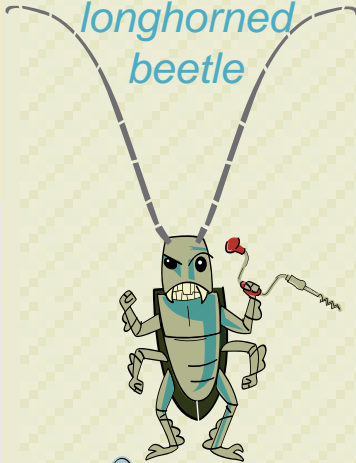
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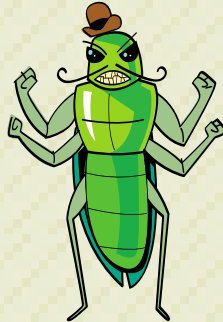
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Asian
longhorned
beetle



Emerald
ash borer



Light brown
apple moth



Walnut twig
beetle



Redbay
ambrosia beetle



Gypsy moth



Ramorum blight



Asian citrus psyllid



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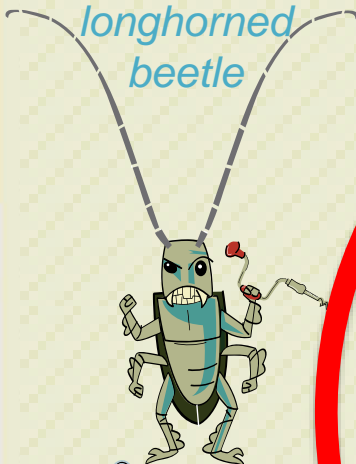
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Asian
longhorned
beetle



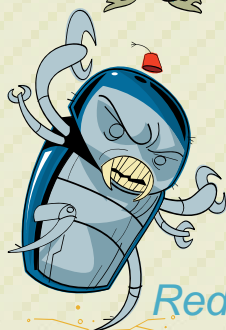
Emerald
ash borer



Light brown
apple moth



Walnut twig
beetle



Redbay
ambrosia beetle



Gypsy moth



Ramorum blight



Asian citrus psyllid




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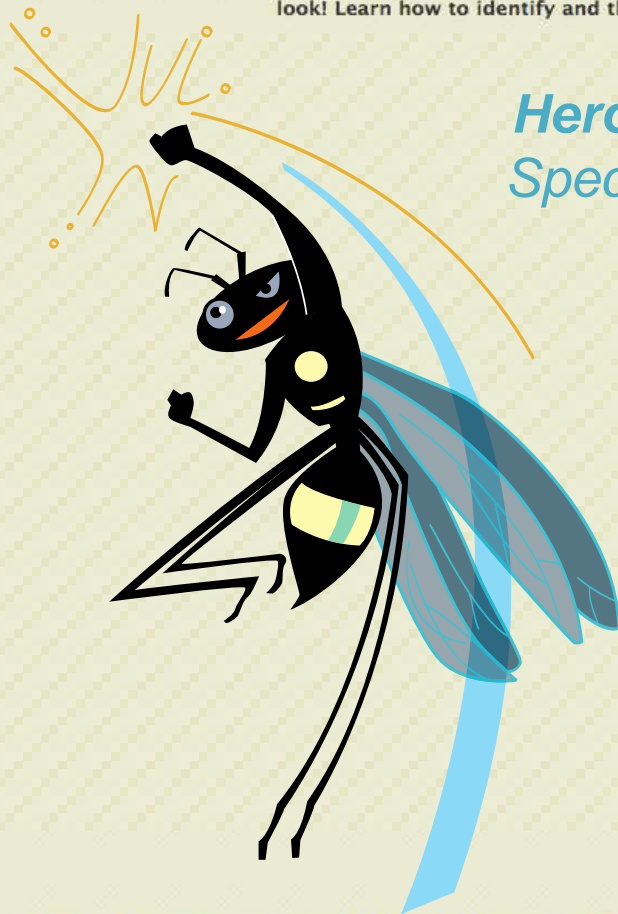
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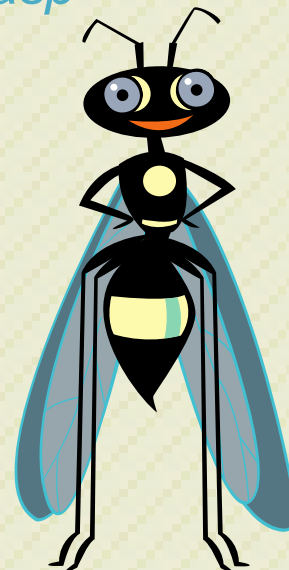
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Hero Helper! Spechid wasp



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WASP WATCH

Spencer was investigating her invasive (in a nutshell) guest during a business trip to a nearby residential area in Washington, D.C. While strolling to check her new listing with that dog, she noticed a pair of local bee enemies in a corner hole.

After the game, she went back to inspect some plants, realized that there were ground nests and eventually saw a small wasp entering the tunnel. She took a picture of the bug and looked it up to see if it had its flying friends in the area. What she got back and learned that this was the most common wasp, *Crucianus imperator*, known for nesting around oak trees.

Spencer's science techniques helped local officials find and remove a stand of infested oak trees (the bug is this part of the plot) and prevent EAB from a great big into the nearby National Forest!



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Home • Lesson Search • Lessons / Activities

Lessons

Beetle Busters-Community Leaders (Lesson 4)

New Recruits--Action Campaigns The class will discuss how people obtain new information and will identify attributes of effective awareness and advertising campaigns. Students will then complete an activity in which they discuss Beetle Busters action campaign plans, target audiences for messaging, and their connections to important...

Age: Trees (9-12)
Subjects: Science, Social Studies
Skills: Discussing, Forming Concepts, Identifying Attributes and Components
Time: One Class Period

OPEN LESSON

Trees in Trouble-SOD Experts

Students search a curated list of websites to gather known information about SOD. They then formulate lists of questions to ask an "SOD expert" and discuss as a class.

Age: Saplings (5-8)
Subjects: Science, Language Arts
Skills: Gathering Information, Analyzing, Formulating Questions, Drawing conclusions, Discussing
Time: 2-3 Class Periods

OPEN LESSON



Filter Lessons

Age

- Any -

Subjects

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Skills

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Standards

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Region

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Keywords

- Any -

Apply

Suggestions?

Click [here](#) to tell us about it!



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About this Lesson

Click on any of the terms below to see similar lessons

Age: Trees (9-12)
Subjects: Science, Social Studies
Skills: Discussing, Forming Concepts, Identifying Attributes and Components
Region: Midwest, Northeast, Northwest, Southeast, Southwest
Keywords: Asian Longhorned Beetle

Remind you of something cool?

We would love to hear about it! To submit your suggestion for the Plant Heroes Curriculum Hub, [click here.](#)



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Beetle Busters-Community Leaders (Lesson 4)

Lesson:

Activity Description:

New Recruits--Action Campaigns

The class will discuss how people obtain new information and will identify attributes of effective awareness and advertising campaigns. Students will then complete an activity in which they discuss Beetle Busters action campaign plans, target audiences for messaging, and their connections to important audiences.

Objective:

- Students will understand how the invasive ALB can have a large impact on their lives and their communities.
- Students will understand how, when, and where to search for the ALB (and the signs of its activity) and how to prevent the beetle from spreading to other communities.
- Students will understand how to mobilize their peers, family, and community members to search for, raise awareness about, and eradicate the ALB.

Pre-Activity Prep:

- Make enough copies of the Beetle Busters Action Campaign Plan worksheet for student groups.
- Optional: Check out current Beetle Busters TV, radio, and print ads online.

Doing the Activity: The activity can be found on Page 26 of the PDF linked below.

Materials: Beetle Busters Action Campaign worksheet

Time: One Class Period

[Click here to open lesson in new window: Link](#)

Source:

USDA APHIS, www.AsianLonghornedBeetle.com



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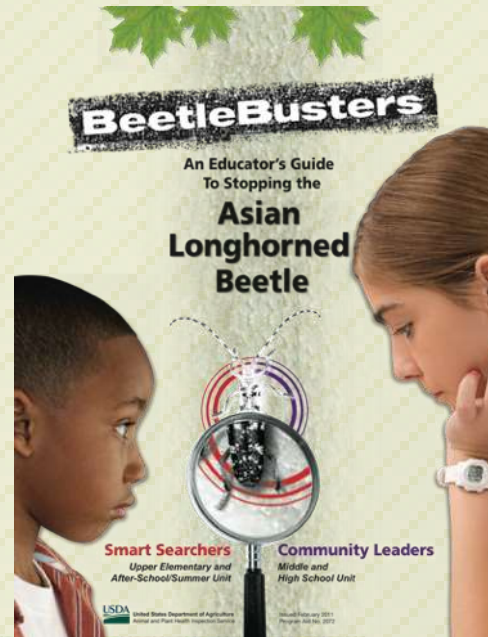


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Beetle Busters-Community Leaders (Lesson 4)



[Click here to open lesson in new window: Link](#)

Source:

USDA APHIS, www.AsianLonghornedBeetle.com



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In the classroom



Photo: Joe Pugliese for Wired Magazine // http://www.wired.com/magazine/2011/01/ff_khan/



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- GLOSSARY
- INTERACTIVE TRACKING MAP
- REPORT THE INVADERS!
- VIDEOS

Interactive Tracking Map

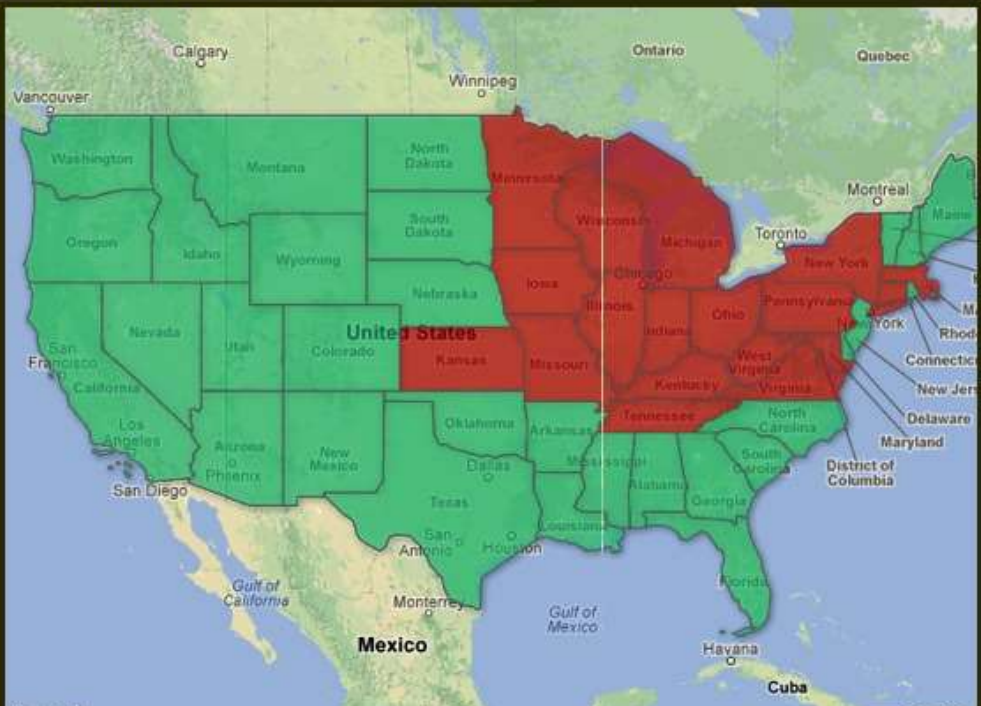
Map courtesy of USDA - Animal and Plant Health Inspection Service's **Hungry Pests** campaign. The pests targeted by the Hungry Pests initiative are federally regulated invasive species whose introduction into the United States and spread within the country is assisted by the activities of the general public. These pests have the ability to cause significant harm to U.S. agricultural and environmental resources. Visit the [Hungry Pests website](#) to learn more about this campaign, find additional outreach materials and learn how to leave Hungry Pests behind!

SELECT A PEST BELOW TO SEE WHAT STATES ARE IMPACTED.

-  Asian Citrus Psyllid
-  Asian Longhorned Beetle
-  Citrus Greening
-  Emerald Ash Borer
-  European Grapevine Moth
-  European Gypsy Moth
-  False Codling Moth
-  Giant African Snail
-  Imported Fire Ant
-  Khapra Beetle (wp)

COUNTRY VIEW

TRACK BY STATE SELECT A STATE



Map data ©2013 Google, INEGI, MapLink - Terms of Use Report a map error



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GLOSSARY

INTERACTIVE TRACKING MAP

REPORT THE INVADERS!

VIDEOS

[Home](#) · [Learn More](#)

Videos

Check out the cool videos in these Plant Heroes playlists!

Asian Longhorned Beetle



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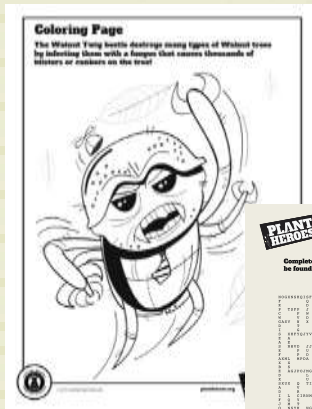
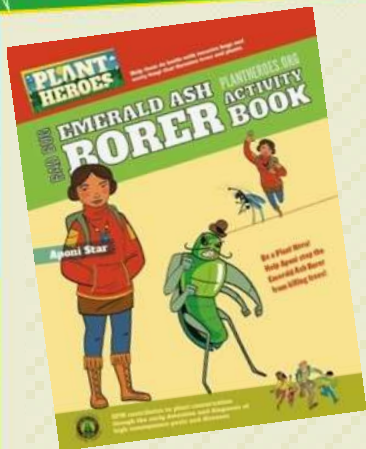


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PLANT HEROES Find each of the following words.

SPRING CARBON FOLIAGE PLAGUE BERRY MYOLOGY DISEASE ENTOMOLOGY DISEASE DISEASE PYLORI GERMS

Name: _____ Date: _____

M L O H M S M O S I N T O M O L L A S W
 I L L C H E L Y X O S I C E C P C S I
 E C H A R D E R N A C C A I O M Y W
 N L P E A S C M M A M P L O E M Y A
 T L I N V A S I Y F S I L L D M S I T N
 O M H O J U G L A N S A Y C G E I T E V
 W E J O E N Y V A C C E A O C I N A
 E S L L C E D M U D O U G C O Y L
 M O T M C I G Y K T O N E I A X
 N U G I S I N N X C K I C V P X S I
 R O Y A O I A C C I O Y T T E C
 T C C E I S D A W M T F P L
 S A C O O S N O B R E I J O L
 T A X R A L S E C C O M C I O M O
 L A E I J M O D E F A E S I D C
 X O Y S T I E C A D A K L U G E R
 C P U G L L B Y T M S T E
 N V A L Y E O U M A C C H C I
 O A O Y L L E T M C E L L Y E P
 O S N M W C I L B L Y L S M E

PLANT HEROES Complete the maze and then find the words. The words can only be found along your maze path.

Name: _____ Date: _____

PLANT HEROES Find and circle these words:

LARVAE LARVAE GALLERY DISEASE BARRAGE PAPA

NAME: _____

D	L	A	L	L	C	T	U	N	L
I	R	E	W	O	D	T	A	S	
S	I	V	N	I	C	R	S	S	W
T	E	F	A	N	U	E	V	U	S
E	S	A	D	E	I	T	A	G	F
Y	S	P	U	C	P	P	R	P	U
M	A	L	E	G	U	F	A	M	C
U	T	D	S	E	C	T	E	C	T
Y	N	Y	N	D	A	M	G	I	M
P	R	I	R	E	L	L	A	G	M

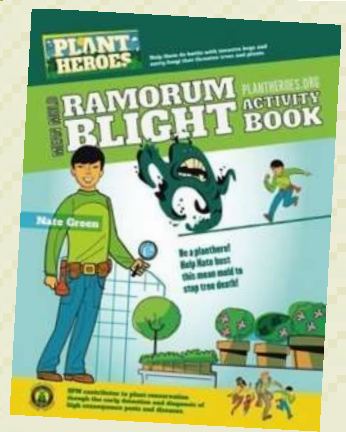
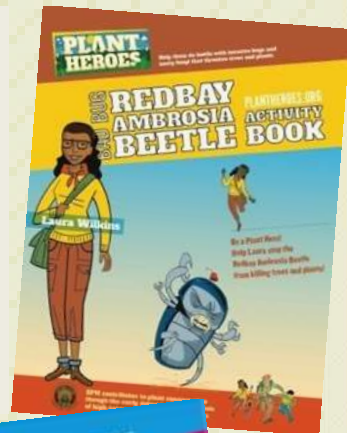
PLANT HEROES Feeding gypsy moth larvae can eat all the leaves on a tree which is called defoliation. When this happens it can weaken and even kill the tree!

PLANT HEROES Name: _____ Date: _____

PLANT HEROES Find and circle these words:

LARVAE LARVAE GALLERY DISEASE BARRAGE PAPA

NAME: _____



PLANT HEROES Find and circle these words:

LARVAE LARVAE GALLERY DISEASE BARRAGE PAPA

NAME: _____

D	L	A	L	L	C	T	U	N	L
I	R	E	W	O	D	T	A	S	
S	I	V	N	I	C	R	S	S	W
T	E	F	A	N	U	E	V	U	S
E	S	A	D	E	I	T	A	G	F
Y	S	P	U	C	P	P	R	P	U
M	A	L	E	G	U	F	A	M	C
U	T	D	S	E	C	T	E	C	T
Y	N	Y	N	D	A	M	G	I	M
P	R	I	R	E	L	L	A	G	M

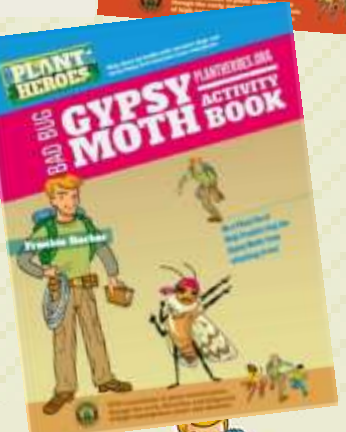
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PLANT HEROES Find and circle these words:

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NAME: _____



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PLANT HEROES

outdoors





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The Official Plant Heroes Field Guide

ASIAN CITRUS PSYLLID

ASIAN LONGHORNED BEETLE

EMERALD ASH BORER

GYPSY MOTH

LIGHT BROWN APPLE MOTH

RAMORUM BLIGHT

REDBAY AMBROSIA BEETLE

WALNUT TWIG BEETLE



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ASIAN CITRUS PSYLLID

ASIAN LONGHORNED BEETLE

EMERALD ASH BORER

GYPSY MOTH

LIGHT BROWN APPLE MOTH

RAMORUM BLIGHT

REDBAY AMBROSIA BEETLE

WALNUT TWIG BEETLE



Adult beetles spend the winter within cavities in the bark of the trunk. They resume activity by late-April and most fly to branches to mate and initiate new tunnels for egg galleries. During this tunneling the *Geosmithia* fungus is introduced and begins growing in the tree's wood. Photo Credit: Steven Valley, Oregon Department of Agriculture, Bugwood.org

← Prev

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ASIAN LONGHORNED BEETLE

Life Cycle



UGA0949054



UGA5017021


Close up of Asian Longhorned Beetle larva in the wood of a host tree.



UGA4798041

<< 4 stages of the Asian Longhorn Beetle life cycle. Top; left to right: Egg, Pupa, Adult Bottom: Larva

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REDBAY AMBROSIA BEETLE

Host Trees



Sassafras leaves in the summer.



<< Leaves and fruit of Pondberry, *Lindera melissifolia*, which is a federally endangered plant and one of our native shrubs vulnerable to Laurel Wilt.

Close-up of sassafras showing three different leaf shapes that frequently occur on the same plant! >>

Beautiful fall color of the sassafras tree, *Sassafras albidum*, one of the members of the Laurel family that is susceptible to Laurel Wilt. >>



<< Leaves and fruit of pondspice, *Litsea aestivalis*, which is one of our native shrubs vulnerable to Laurel Wilt.

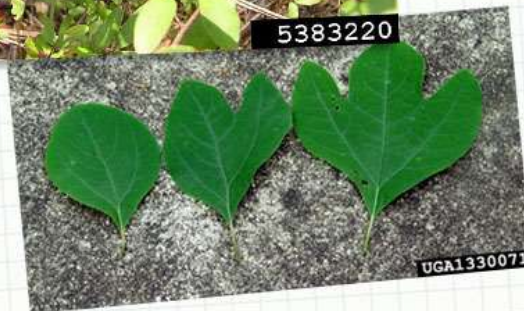


PHOTO CREDITS

1330066, 1330071 Chris Evans, River to River CWMA, Bugwood.org • 5143026 The Dow Gardens Archive, Dow Gardens, Bugwood.org • 5383220 James Johnson, Georgia Forestry Commission, Bugwood.org 2513052 Jerry A. Payne, USDA Agricultural Research Service, Bugwood.org

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REDBAY AMBROSIA BEETLE

Symptoms



Close-up showing the discoloration of redbay leaves caused by Laurel Wilt.

UGA2200003

Close-up of entrance holes created by the Redbay Ambrosia Beetle. These tiny holes are often less than 0.04 inches (1 millimeter) wide! >>



UGA2199088



5383216

Close-up of redbay bark showing the sawdust tubes created by burrowing beetles. >>

Tiny hole to the left of finger is the entrance hole of the Redbay Ambrosia Beetle. The dark stains in the wood are caused by the Laurel Wilt fungus that the beetle introduced. >>



UGA2199086

<< Redbay tree showing the flush of green "epicormic" shoots on the lower trunk, which is a good clue that the tree is infected.



UGA2110017

PHOTO CREDITS



Community tree mapping project
Additional Educator Resources

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Home • Parents/Teachers

Community Tree Map

The first step in helping to find the bad guys is knowing where to look! Check out the map below to see where real Plant Heroes have been mapping the host trees in their neighborhoods. Zoom in to see additional details on specific trees and who mapped them! Click [here](#) to see how to contribute!

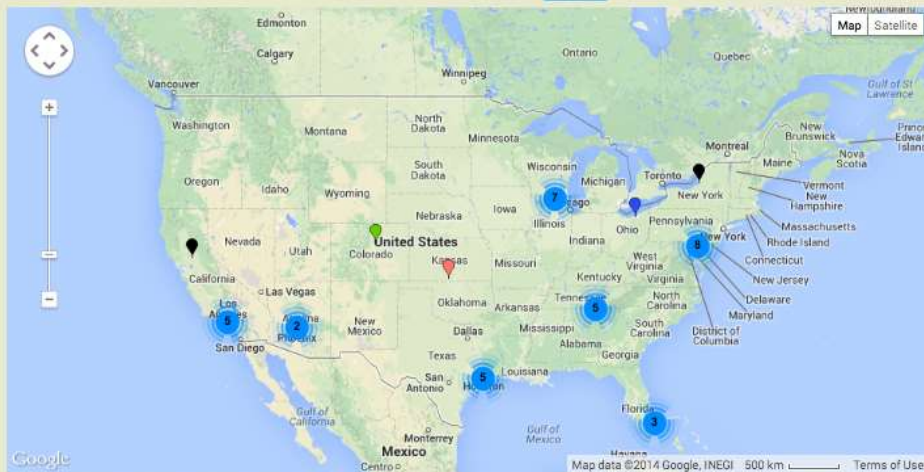
Filter by Invader

- Any -

Filter for a Group Map

- Any -

Apply



Add a tree using your location

Add a tree by entering an address



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Plant Hero Details

Group Map:

Mr. Murgels Class

Organization / Site:

Denver Botanic Gardens Field Trip

Email (optional):

jmurgel@taftelementary.org

Tree Info

Invader:

Emerald Ash Borer

Green ash

Location:

800 York Street

Denver, CO 39° 43' 45.552" N, 104° 57' 35.5176" W

This is one of about 5 trees that my 4th grade class mapped in the neighborhood outside the Denver Botanic Gardens in 2012. Subsequent classes, have mapped additional trees on our school ground and in nearby neighborhoods.

Want to help some more? Add Another Tree:



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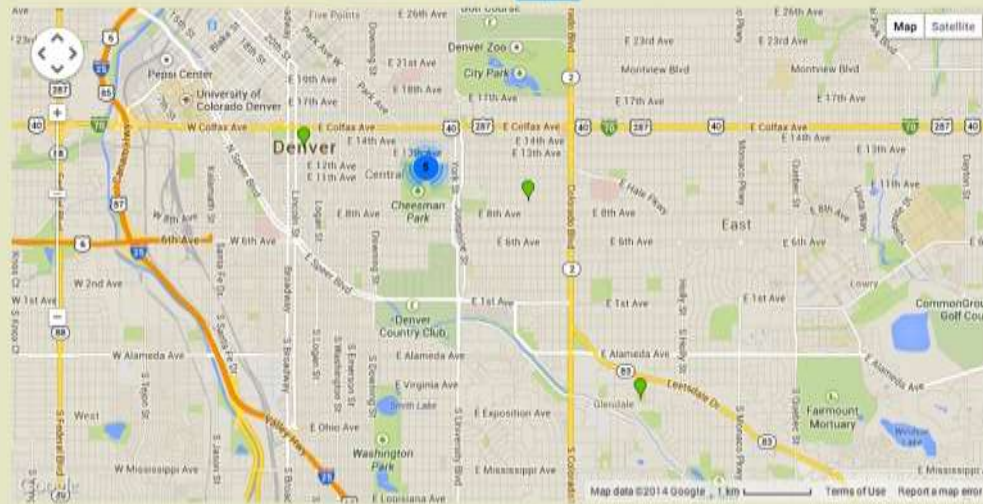
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Any

Filter for a Group Map

Mr. Murgels Class

Apply





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GLOSSARY

INTERACTIVE TRACKING MAP

REPORT THE INVADERS!

VIDEOS

Report Invasive Bugs and Pathogens

Early detection is the key to stopping the bad guys! If you think you see symptoms of one of these plant pests or diseases, please notify your local cooperative extension office so they can come check it out!

Click on your state to find contact information for the cooperative extension office closest to you!



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PLANT HEROES

...and at home!

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WHY do plants need heroes?

WHO are the Plant Heroes?

HOW can you be a Plant Hero?



CROSSWORD PUZZLES

Learn new words, understand the bad bugs, and explore ideas to help you be a hero for trees!



PRINTABLES

The Heroes need a hand... yours! Color pictures and follow words to learn more about bad bugs!



COMICS

Each Hero helps trees and plants stay alive. Read about their adventures!



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Go, Plant Heroes!

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EQFJOF SUZWN TZYCQWY
 RUXJREDXLCCMDKZWB
 GJFSONXLGNRECNQVCZ
 NQWPFVOLAYBDIOUAOIP
 EWXURBDAXQCIUYCLBJ
 FPCWDOBUBKLCNWGIVYL
 XQCZUDTPUOYMNVR RWD
 BKBVECD ECVJORKDRIA
 JFZRCLOLCHEEVRQ NRE
 DSRFQ NORCTRIAZVCVV
 SEBHGFWXWOJYTATETU
 ALWEZIELBPKYSCSVSZ
 XOIUOJRBUCHIXXKZEV
 LHRLYYISAPVHZEEWRV
 GJHQKBF BPEAXAECXOM
 VTFFAJXPJUFRRHBNFK
 WYKBFERLNTQTQPYHSA
 QKVXHP E J LZDCAHARTQ

Word Bank

- ASH
- ~~BACKYARD~~
- BORER
- ~~FIREWOOD~~
- FOREST
- HOLES
- INVASIVE
- ~~PROTECT~~
- ~~REDBAY~~
- ~~TREE~~

Timer: 7:30
Score: 100

START OVER



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ACROSS

_____ trees! ▲

16.) Our hero _____ protects trees from getting infected by Sudden Oak Death.

17.) Living things can _____ only in places their needs can be met.

18.) A _____ tree can look like an Ash tree. ▼

DOWN

11.) The Plant Heroes use _____ to catch EAB. ▲

13.) An _____ that is not common to North America, can destroy plants and trees.

14.) EAB can _____ a hole through wood.

15.) the _____ ambrosia beetle has a fungus in it's ▼

1:37

SOLVE **START OVER**



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Plant Heroes

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Check out this great exhibit at the North Carolina Botanical Garden going on until December 8th!

Today's selection from the 25th annual "Sculpture in the Garden" exhibit - showing through December 8th!



Like · Comment · Share

Plant Heroes shared a link. November 19

Cool! The Chicago Botanical Garden is hosting a Connected Classroom Virtual Field Trip called "Emerald Ash Borer Invasion" on Wednesday December 4, 11:00 AM-Noon CST.

Join scientists, horticulturists, and educators in the labs and in the ... See More

- The Dawes Arboretum Outdoors
- Norfolk Botanical Garden Museum - Outdoors - Garden Center
- Kidzu Children's Museum, Chapel Hill NC Museum
- Quarryhill Botanical Garden Non-Profit Organization
- Franklin Park Conservatory Park - Environmental Conservation - Museum

Plant Heroes shared a link. November 21 near Chapel Hill, NC

http://www.plantheroes.org/sites/default/files/printables/Final_Ram_activitybook.pdf

Print offs like this Nate Green Activity Book are great and easy gifts to give your favorite Plant Hero this holiday season! Print one from www.plantheroes.org today!

http://www.plantheroes.org/sites/default/files/printables/Final_Ram_activitybook.pdf

Plant Heroes shared Don't Move Firewood's status. November 19



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[Super Quiz](#) [Color with the ...](#) [Emerald Ash B...](#)



[Big Bad Beetle ...](#)





Go, Plant Heroes!

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Suggestions?

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Thanks!



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