

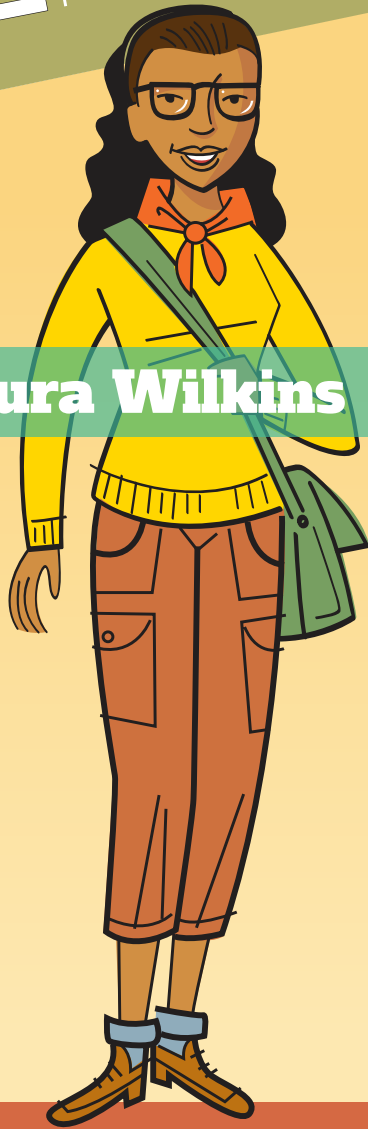


Help the Plant Heroes protect our forests
by slowing the spread of pests and diseases!

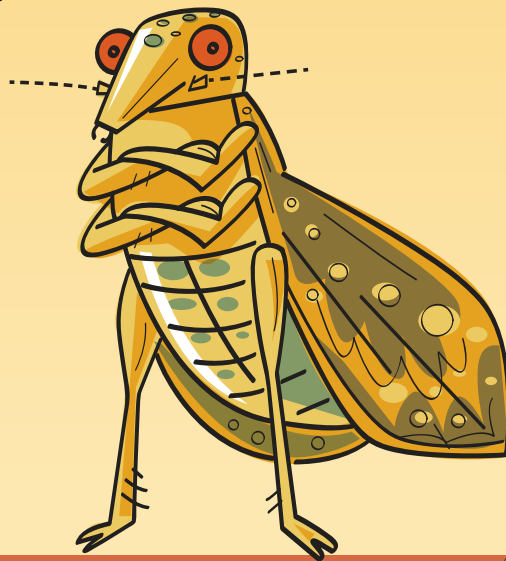
PLANTHEROES.ORG
ADVANCED
ACTIVITY
BOOK

INSECT ASIAN CITRUS PSYLLID

Laura Wilkins



BE A PLANT HERO!
Help Laura slow the
spread of the
Asian citrus psyllid!



Plant
Protection
Program

AMERICAN PUBLIC GARDENS ASSOCIATION



Meet the PLANT HEROES!



LAURA WILKINS

From: Athens, Georgia
Hobbies: playing the trumpet,
gardening, studying ecology

FRANKIE BARKER

From: Shrewsbury, Massachusetts
Hobbies: climbing trees, camping

NATE GREEN

From: Tacoma,
Washington
Hobbies: going on
adventures, learning
about fungi

APONI STAR

From:
Southeast
Illinois
Hobbies:
learning
more about
entomology
(the study of
insects)



plantheroes.org

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The Plant Heroes are four friends who love spending time in nature more than anything else! They enjoy climbing trees, walking trails, and camping.

The heroes are learning about why our forests are in danger. There are insects and fungi that can impact trees, sometimes affecting the health of whole forests. Trees may become sick or die when they are weakened by an invasive species, a living thing that can cause damage to existing organisms when it is introduced to a new environment.

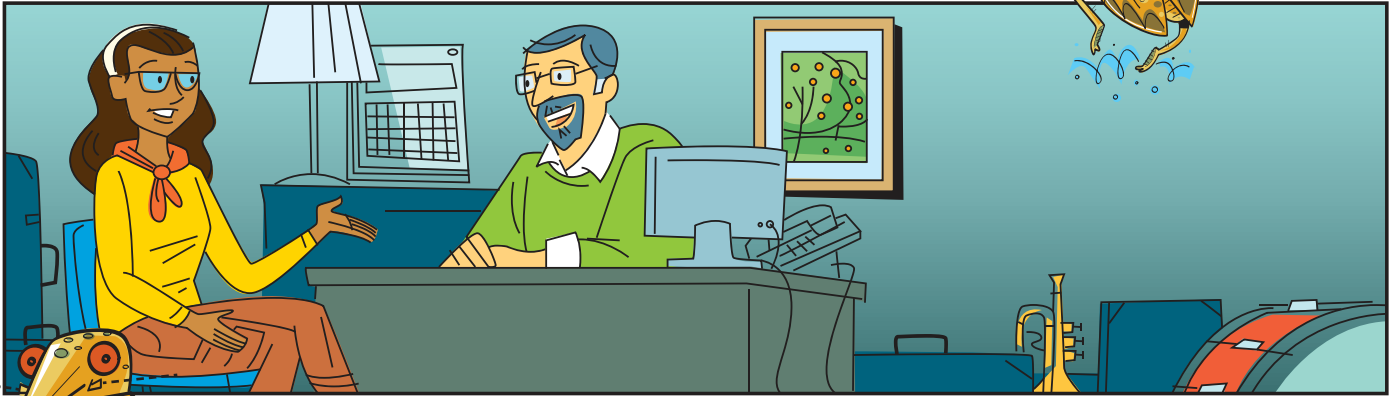
Follow Laura to learn the story of how she helped slow the spread of the Asian citrus psyllid...



ORANGE YOU GLAD YOU ASKED?



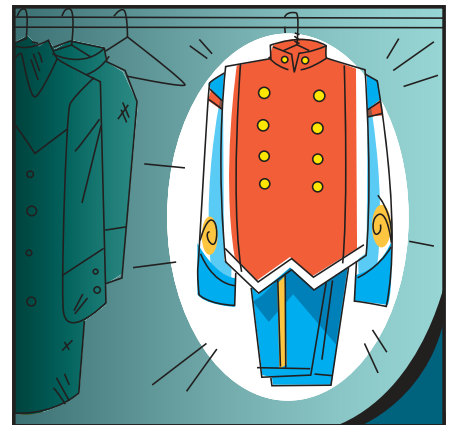
PLANT HEROES



Laura plays trumpet in her high school band in Athens, Georgia. Their band director, Mr. Mason, has been talking about doing a fundraiser to upgrade their band uniforms. He mentions that he's spending Thanksgiving with a cousin in Florida who lives on an old orange farm.

The farm's been out of business for several years...

... but his cousin said he could get a truckload of oranges anytime, so long as "he did the pickin'."



Mr. Mason suggests that they could easily sell the fruit at their winter holiday performance and use the money to get new uniforms!

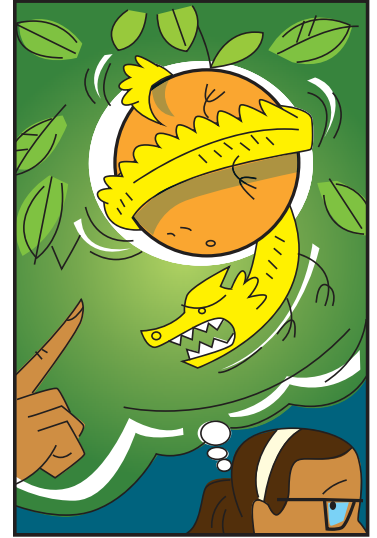
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The story makes Laura think about her family's visit with her Aunt Linny in Mobile, Alabama last winter.



She remembers enjoying all of the citrus in her aunt's garden and her disappointment to learn that she couldn't bring any home because it hadn't been inspected and might be carrying Asian Citrus Psyllid and the deadly citrus greening disease, also called "yellow dragon disease".



Her aunt explained they can't move the fruit because they would risk introducing this pest to a new area...

WAIT, how would this be any different?



Laura suggests to Mr. Mason that they look for a more "official" supplier of fruit, and after a little searching online, they discover a fruit association that has a fund-raising program and guarantees all of its produce is inspected by the USDA. They put together their order and start marketing the band's fruit sale event.



It was a huge success! They got new uniforms, and knowing that they did it without introducing a new pest makes the whole school proud. They even had enough extra money to take an end of the year

FIELD TRIP!!!



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The Tiny Insect Behind it All

The Asian citrus psyllid is TINY—about the size of a grain of rice! It feeds upside down with its abdomen sticking up, almost as if it is standing on its head. Inside its body, the psyllid carries a bacteria that causes a disease in citrus trees called Huanglongbing.



WHAT IS A PSYLLID?

Psyllids are tiny flying insects related to aphids that feed on plants by sucking out liquids from leaves and stems. If there are too many psyllids eating off one plant, this can hurt the plant.

Want to learn more about them? Check out page 2 of your field guide!



See if you can spot any insects near you that are as small as the psyllid. Did you find one? Can you figure out what type of insect it is? Draw it below:

MY TINY INSECT



Trees in Trouble



The bacteria the psyllid carries causes damage to the tree. When this happens, the tree will show different clues, called signs or symptoms, that it is suffering from Huanglongbing. Learn more about the signs and symptoms of Huanglongbing by labeling each photo from 1 to 4 with the right description.



1
Trees with Huanglongbing have fruit that does not mature properly, has shriveled seeds, and very little juice.

2
The bacteria Huanglongbing causes leaves to turn yellow and eventually fall.

3
Leaves often have yellow blotches.

4
The best way you'll know if a tree has Huanglongbing is if you spot the psyllids or their nymphs on or under the leaves.



Lifecycle Maze



The Asian citrus psyllid goes through several changes during its lifetime. Adult psyllids lay eggs on the tips or bottom of leaves on citrus trees. The eggs hatch into nymphs, and then change into adults. Learn more about the lifecycle of the Asian citrus psyllid by completing the maze below!

START →

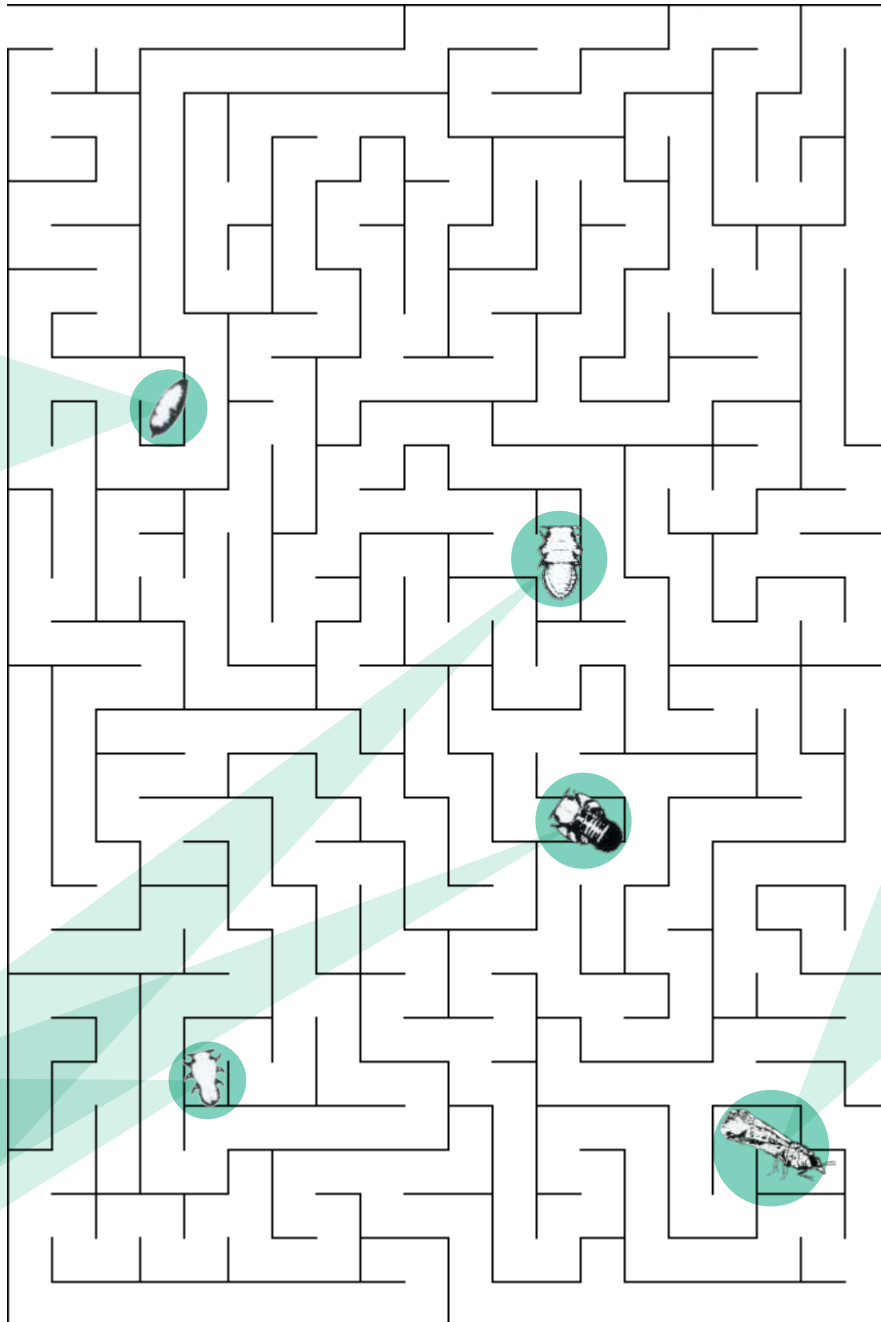
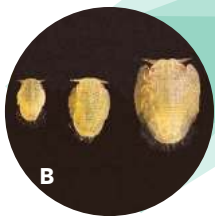
EGG

The psyllid starts its life out as a golden-colored egg as tiny as a grain of sand!



NYMPH

As it matures, the psyllid turns into a nymph. Nymphs are like the teenage stage of the Asian citrus psyllid—they aren't quite adults, but they aren't kids either! They have not yet developed wings and they are very hungry! To learn more about nymphs, follow along on page 3 of your field guide.



ADULT

The psyllid changes into an adult with mature wings, and female psyllids are ready to lay eggs. A female can lay nearly 1,000 eggs in her lifetime!



FINISH



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Delicious Citrus



The Asian citrus psyllid feeds on citrus trees and closely related plants. Citrus plants can be small bushes or trees with evergreen leaves (leaves that stay on the plant all winter long). They often have white, sweet-smelling flowers and edible fruits. Citrus plants love warm, tropical climates and grow on the west coast in California, and along the southern US all the way to Florida on the east coast!

Use arrows to match the description of the citrus tree with the citrus fruits below!

1. I am a tree that grows 30 feet tall with sweet-smelling white flowers. My stem often has thorns, and my leaves are oval shaped. People crush my round fruit to drink as a juice for breakfast.

2. I am a tree that grows 10-15 feet tall with sharp spines and round fruits. I have fragrant whitish-purple flowers. My fruit is often squeezed to make a delicious pie.

3. I grow to 10-20 feet tall. I have whitish-purple flowers and my yellow fruit is extremely sour!

4. I grow up to 30 feet tall. I have many short thorns along my stem, white flowers, evergreen leaves with bumpy margins, and large, round fruit with pink flesh that is both sour and sweet.

Can you think of any other citrus fruits?
Name them in the space below!

.....



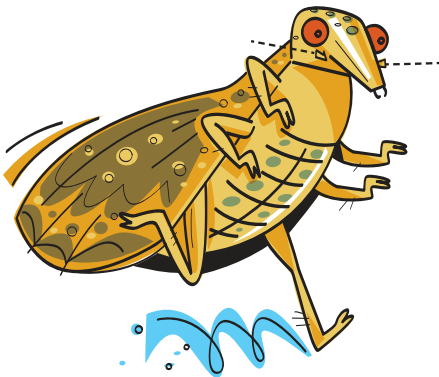
Time to Journal



1. What do you remember most about the Asian citrus psyllid?

2. What is the most interesting thing you learned in this book?

3. Can you think of some signs that a plant is not healthy?
If you have plants near you, observe them carefully and write down what you notice.

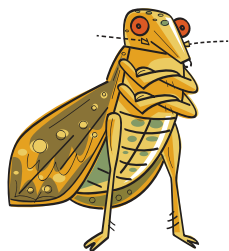


4. What is your favorite food or drink that comes from a citrus fruit?



Slow the Spread!

Laura is an Asian citrus psyllid expert, and she knows all the right ways to keep the psyllid from spreading further. Fill in the blanks below to learn Laura's tips and tricks!



WORD BANK:

ORANGES, LEMONS, YELLOW LEAVES, MOVE, GRAPEFRUIT, UNRIPE FRUIT, PSYLLIDS, LIMES, TANGERINES, LEAVES WITH SPOTS.



1. If you see a tree with Asian citrus psyllid with symptoms like _____, _____, and _____ call an expert for advice.

2. The Plant Heroes and I love planting trees. Make sure you buy your trees from nurseries near your house, and do not _____ any plants, plant parts, wood, or woodchips long distances.

3. Although you might want to share your tasty citrus fruits like _____, _____, _____, or _____ with your family and friends, be sure to only enjoy the fruits on your property—moving the fruits could also move some stowaway _____.

ANSWER KEY

Trees in Trouble: 1. top left; 2. bottom right; 3. bottom left; 4. top right.

Delicious Citrus: 1. oranges; 2. Limes; 3. Lemons; 4. Grapefruits.

Slow the Spread! 1. yellow leaves, unripe fruit, leaves with spots (in any order); 2. Move; 3. oranges, lemons, grapefruit, limes, tangerines (any order), psyllids.





Join our team of Plant Heroes and learn about trees, forests, and the natural world around you!

PLANTHEROES.ORG

You can be a Plant Hero!

Are you curious about plants and animals? Do you like asking questions about nature? Do you enjoy being outdoors and having fun, climbing trees, balancing on logs, or finding a new butterfly or beetle? If so, you are already on your way to becoming a Plant Hero! We invite you to join forces with Nate, Laura, Aponi, and Frankie to protect the plants and ecosystems we all love.

How can you become a Plant Hero?

Join our team and go on a journey with Nate, Aponi, Laura, and Frankie. As a Plant Hero, you will learn to notice when plants are in trouble. You will also find out ways you can act quickly to help find solutions in your own neighborhood. Follow their adventures and learn how they help plants and ecosystems stay healthy.

On the Plant Heroes website, you will find materials to help you learn about plants, forest health, and ecosystem balance. The more you know, the more you can help protect plants and ecosystems in your own yard, neighborhood, and community!

Plant Heroes strives to spark curiosity about nature and science in all children. Our program provides hands-on, nature-based learning materials for educators to engage children in topics of plant health, ecosystem balance, and forest health. We also spotlight the amazing work our public gardens do in protecting the plants and ecosystems we all depend on through our website and printed materials. Visit plantheroes.org today to learn more!

Plant Heroes is brought to you by the American Public Gardens Association, founded in 1940. Over the last eight decades, the Association has supported the work of public gardens in North America and beyond. Our mission is to champion and advance public gardens as leaders, advocates, and innovators in the conservation and appreciation of plants. Our vision is "A world where public gardens are indispensable" as they provide botanic, conservation, community, education, and economic resources to their community.

The Association is committed to increasing the knowledge of public garden professionals throughout North America through information sharing, professional development, networking, public awareness, and research, so that they have the tools to effectively serve visitors and members.



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