



## Redwood Barn Nursery

1607 Fifth Street Davis, California

### New pest threatens our urban forest.

“New” is a relative term in urban forestry.

In 2003 a new insect pest was found in Los Angeles County. In 2012, a similar pest was identified in an avocado tree. Shortly thereafter, two species of ambrosia beetles were found, carrying a disease that infects trees infested by the borers. Many of the tree species were dying in large numbers, while others were affected with more limited injury.

It quickly became apparent that this was a serious threat to our urban tree canopy.

The first common name given was “Polyphagous Shot Hole Borer.” This reflects the host range: “poly” means many and “phagous” means eaten. A second, closely related borer was also identified, so the two are now grouped under the name “Invasive Shot Hole Borers”, or ISHB.

The disease that they carry from tree to tree comprises three different species of *Fusarium*, one of which can be lethal to the tree. This disease can grow in the cambium of some species, and then produces a by-product that is eaten and “farmed” by the shot hole borers. As it spreads in the tree, it blocks the water-conducting tissue, and the tree gradually dies.

With any new pest, urban forestry researchers quickly try to determine:

- How readily and quickly can it spread?
- What are the present and likely geographic boundaries of the pest?
- How severe is the impact?
- What is the host range? Does it attack only certain types of trees, and are there differences between those hosts with respect to severity of impact?
- How readily can it be controlled? Will quarantines and/or targeted insecticide applications be effective?

#### **How does it spread?**

Borers are commonly spread in wood that is moved from place to place, i.e., spread by people. It is now established and spreading in six Southern California counties. Unfortunately, it has also been found in the Bay Area (San Jose). Given the rate and nature of its spread, it is likely to arrive in our area within just a few years.

Insecticides and quarantines are not likely to manage this pest. Best management practices will involve monitoring susceptible species, managing dieback on non-reproductive hosts, and removing infested/infected reproductive hosts. Ongoing training of arborists, municipal tree managers, and landscapers will be imperative.

#### **How severe is the current and likely impact?**

The host range is staggering.

“High levels of infestation of susceptible host trees have resulted in high levels of mortality. The currently recognized host range for the beetle-fungus complex includes more than 200 tree



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species that can be attacked by the beetle, more than 100 species that can support growth of the fungus, and 37 species that can be used as a reproductive host by the beetles.”

While it causes dieback on some commercial crop species such as avocados, the real threat is to our street and shade trees including, unfortunately, those native to the Sacramento Valley. Species killed include our native cottonwoods and willows, the widely planted London plane and the related Western sycamore, and other natives including big leaf maple, box elder, and, tragically, Valley oak (*Quercus lobata*).

### **Implications for urban forest management.**

- Species attacked but not killed by the insect/disease will need more frequent arborist visits for pruning.
- Species likely to be killed will need to be monitored for infestations, then removed and replaced. This monitoring needs to be a specific budget item for the city, the school district, and the university as they manage thousands of trees.
- Management plans will need to be adopted for heritage trees of host species. This could include more frequent inspections, targeted use of pesticides, strategic pruning, and replacement plans.
- Lists of recommended trees will need to be modified to remove reproductive host species from city, park, and greenbelt plantings. Homeowners should only site them, if at all, where the impact of infestation and dieback can be managed safely.
- The number of native species used in our city plantings will be significantly reduced.
- Replacement plans for the widely planted species such as London plane and Valley oak will need to be developed and implemented over the next several years.

The loss of our Valley oak will have a serious impact on our city’s tree canopy. The ISHB attacks the white oak group, but not the red oaks. So, folks looking for a very large, majestic oak tree may want to consider Texas red oak, Shumardi red oak, or some others in that group. Tree Davis has been planting these red oaks for several years, with many establishing well along Russell Boulevard. They are proving well adapted to our climate with minimal irrigation.

### **Continuing education will be the key.**

Tree policies adopted by the city and the school district will need to be adjusted regularly in the face of new information about these and other pests.

Because pest infestations occur on a generational or multi-decadal timeline, it can be hard for the public to see, um, the forest for the trees (sorry). The history of urban forestry in the United States is one of new pests wiping out whole populations of some tree species such as chestnuts, elms, and now ash trees.

### **Planting for the future**



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With roughly 20 to 25% of our city's tree canopy comprised of species that are threatened by climate change and new pests and diseases, it's important to plan for a long-term changeover to new, vetted species.

*A new resource for choosing trees!*

A couple of years ago the city arborist, working with a committee of local tree experts, embarked on a comprehensive review of hundreds of species and varieties of trees. The goal was to develop a large database and a series of lists for different situations.

Planning for higher temperatures and more extreme weather events, avoiding current and imminent pest problems, minimizing nuisance pests and litter, avoiding species with poor branch structure and root issues requires professional input.

We need trees for sites that are irrigated, and sites that aren't; for areas where winter rainfall drains, for streets and parking lots, parks, and greenbelts, for sites that have higher-density housing or solar panels that might limit the height and spread of the tree, and more.

The trees you'd pick to plant downtown won't be the same species you'd use in a residential neighborhood or next to a soccer field.

Developers need lists of approved trees for their subdivision plans, and it's useful to homeowners to see the diversity of what they might choose from for their own yards.

That broad-based expert committee wrapped up its work earlier this year. Two of the lists are now available for landscape and tree professionals as well as the public, with more to come: <https://www.cityofdavis.org/city-hall/urban-forestry/what-is-a-city-tree/climate-ready-trees>.

Increasing high temperatures, and longer and more severe droughts, are the greatest concern. Examples: coast redwood is not tolerant of the increasingly severe droughts we're experiencing. Incent cedars were badly damaged by an extreme heat event in September 2023.

Our daytime high temperatures in a few decades will likely be similar to what is now experienced in Barstow, Redding, or Albuquerque. Trees from the American Southwest, from Mediterranean climates, Australia, southern or northern Africa, and desert regions around the world will likely prove successful here.

*Continued evaluation is a must as local factors may prove challenging.*

- Desert Museum palo verde is a hybrid from a southwestern species that seemed very promising and has become very popular in Southern California. Tolerant of extreme heat and drought, with pretty flowers and soft-textured foliage, it has a lot to recommend it. But planted in our rich agricultural soils, it grows too fast, can develop poor branch structure, and break apart. From the standpoint of a city street tree, it requires too much pruning. Fine for homeowners who are willing to give it the care it needs, but not suitable for parks or street trees.



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- Ceanothus Ray Hartman, a hybrid California lilac that has a tree-like growth habit, is very popular in coastal areas. Again, in our rich soils it simply grows too fast. Late season rainfall can lead to root and crown rot.

New pests have infested certain tree species locally.

- Borers killed all the California white alders in Davis in the 1980s, and another species of borer disfigures Raywood ash trees.
- “Nuisance pests” may take some species out of consideration. Asian woolly hackberry aphid on Chinese hackberries (but not other species in the same genus), and crape myrtle aphids on Lagerstroemias, leave a sticky residue beneath the tree canopy all summer. They hardly hurt the tree, but the sticky drip makes them unsuited to public spaces, patios, and courtyards, not to mention back yards.

As you review the tree lists, look for the notes regarding these types of pests.

### Speaking of new trees....

What was that pink-flowered tree that was blooming all over town a few weeks ago? Is that our native Western redbud?

While Western redbud (*Cercis occidentalis*) is planted locally, it is nearly always grown as a shrub. The nearly identical tree you saw blooming was the Oklahoma redbud (*Cercis canadensis texensis* ‘Oklahoma’). It has the same flower form and color, with similar but glossier heart-shaped leaves, a nice round growth habit and modest size, it’s proving to be an ideal choice for homes on smaller lots, sidewalk strips, and other difficult spots.

Like our native redbud, Oklahoma redbud has good drought tolerance, but it can also tolerate irrigation. And, as noted, it’s more readily trained to a single leader (i.e., grown as a tree, not a shrub).

Selected with care, irrigated in their early years, and staked and trained properly, a tree can provide meaningful shade in a decade, and significant cooling and air-cleansing for many generations.

The most important thing we can do to make Davis more habitable for residents fifty years from now is to plant trees today.

Resources about Invasive Shot Hole Borers:

<https://ucanr.edu/sites/pshb/pest-overview/>

Updated list of host species: <https://ucanr.edu/sites/pshb/pest-overview/ishb-reproductive-hosts/>

Polyphagous Shot Hole Borer and Fusarium Dieback in California

[C. Umeda](#), [A. Eskalen](#), [T. Paine](#), Published 2016, Environmental Science, Biology



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Tiny pest, big impact. As of 2025, invasive shothole borers are established in Southern California and in the Bay Area (San Jose). The insect causes some branch die-back of many species. A fusarium disease carried by them infects certain species, leading to tree mortality. This has serious implications for many of the common species in our city's urban forest.

Source: Gevorik Arakelian, L.A. County Department of Agriculture  
<https://ucanr.edu/site/invasive-shothole-borers/pest-overview>





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An increasingly popular small tree, the Oklahoma redbud (*Cercis canadensis texensis* 'Oklahoma') looks very similar to our native Western redbud but has better tolerance of landscape irrigation. It is also drought tolerant. These were flowering all over Davis in February and March.



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Red oaks are excellent large, spreading shade trees for the Davis area with lustrous leaves, broad canopy, and nice fall color.