

Dispatch

Shothole borers now in San Jose	4
Preparing for wildfire	5
<i>Arundo</i> in San Ramon Creek	6
Stinkwort workshop	8
2024 Cal-IPC Symposium	9
Herbicide survey results	10
Field safety through an equity lens	12
Site hygiene videos	13

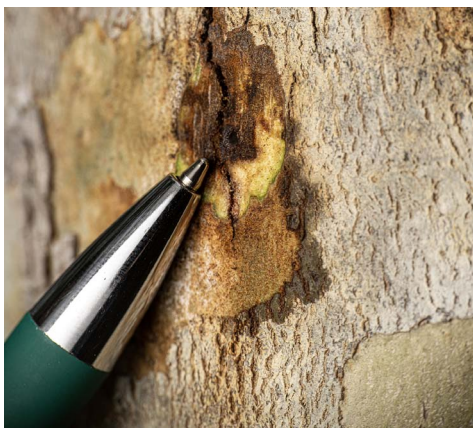
Bad news borers arrive in San Jose

Randall Oliver, UC Statewide IPM Program

A tiny tree-killing beetle that has plagued Southern California for more than a decade has recently been identified in Northern California, in the city of San Jose. Known commonly as invasive shothole borers (ISHB), the sesame seed-sized beetles attack and reproduce in more than 65 species of trees found in California, including both native and introduced landscape trees. In San Jose, infested trees have been identified in two of the beetles' favorite host species, sycamores and box elders. Other highly susceptible hosts, such as willows and cottonwoods, are also common in the city's riparian areas.

Surveying and trapping efforts are just gearing up, so the full extent of the infestation is not yet known. However, based on the high level of infestation in some trees, it appears the beetles have been in the area for some time, perhaps several years. Additionally, it is possible they exist elsewhere in Santa Clara County and beyond.

Previously, the beetles were known to be established in seven Southern California counties, including Los Angeles, Orange, Riverside, San Bernardino, San Diego, Santa Barbara, and Ventura. In addition, a single beetle was found in a trap in Santa Cruz County in 2014 and in San Luis Obispo County in 2016, but no further beetles were detected in either



Entry holes are round and about 0.85 mm wide, the size of a ball point pen tip. Photo: Krystle Hickman, UC IPM.



Galleries within ISHB infested castor bean. Photo: Akif Eskalen, UCANR.

county. A multi-agency working group has been surveying and monitoring the beetles' presence in California for several years, noting that they have been moving northward and eastward from established areas in Southern California, possibly through the movement of infested green waste and firewood. The beetles are not strong flyers.

Many of the trees infested by invasive shothole borers decline significantly, become safety risks, and eventually die. The beetles have killed hundreds of thousands of trees in Southern California. How can such small beetles do so much damage to trees? In part, because they can multiply so rapidly without natural enemies to keep them in check.

In addition, they are not acting alone. Although the beetles tunnel through the live wood of trees, they do not eat it. When they bore into trees, creating the tunnels where they will raise their young, the beetles also introduce a *Fusarium* fungus that is their food source. Over time, that fungus expands and leads to a disease that blocks the tree from transporting water and nutrients, killing the tree.

As in Southern California, it is probably too late for an early detection and rapid response program to eradicate the ISHB/*Fusarium* Dieback pest/disease complex. However, the threat can be effectively managed and is not a reason to panic. The most important step in the management process is conducting an ongoing visual survey and trapping program that



Dr. Beatriz Nobua-Behrmann leads a training session to help Southern California volunteers monitor and report sightings for invasive shothole borers. Photo: Krystle Hickman, UC IPM.

identifies the most severely infested trees. These "amplifier trees" can be a source of beetles to infest other trees in the area. ISHB/FD can be kept under control through the removal of amplifier trees, combined with ongoing active monitoring of infestations.

Additionally, insecticide/fungicide combinations can be applied via trunk sprays, soil drenches, soil injections, or trunk injections to save high-value trees, such as heritage trees. Lightly to moderately infested trees generally do not need to be treated and may be managed through selected removal of infested branches.

Since the beetles spend most of their life inside the host tree, identification of infestation relies on observation of signs and symptoms on the infested tree. The main sign of infestation is the presence of entry and exit holes in the trunk, branches, or both that are perfectly round and roughly the size of the tip of a medium ballpoint pen. Additional signs and symptoms can include wet staining around the holes, sawdust-like boring dust, gumming, and sugary buildup (common in avocado trees).

Since every host species responds differently to the pest/disease complex, the combination of signs and symptoms observed might vary. However, entry holes are always present in infested trees. Branch

(Continued on page 14)

Bad News Borers

(Continued from page 4)
dieback is often a symptom of an advanced infestation. Since many other pests and diseases can cause similar symptoms, proper pest identification is critical.

Proper management of green waste is also essential to stopping additional spread.

Chipping infested wood to one inch or smaller will kill 99.9% of the beetles. Chips that are 3 inches or smaller will kill 98% of the beetles. To eliminate the beetles from the wood, chipping should be followed by other steps like composting or solarizing. If the area is already infested, chips can be used as mulch for the surrounding trees. Chips that have not been composted or solarized should not be used as mulch in a different location.

Visit www.ishb.org for more information.



Trunk of a heavily infested California sycamore.
Photo: Beatriz Nobua-Behrmann, UC Cooperative Extension.

Stinkwort

(Continued from page 8)

participants had their own version of breakout groups and documented their brainstorming with Jamboards.

A field trip to a nearby percolation pond overrun by stinkwort and managed by Valley Water gave participants a first-hand look at a typical invaded site and the challenges of some on-the-ground management efforts. It also reinforced the importance of collaborative action in addressing invasive species challenges.

If you see stinkwort, remember to report it! Help with early detection by mapping it on Calflora or iNaturalist.

Civicorps and HH4C

(Continued from page 13)

mountain bikers to those doing major land restoration projects. Though as an organization Cal-IPC does not often focus on soil pathogens, site hygiene best management practices to stop their spread are essentially the same actions used to prevent weed introductions. By following basic site hygiene practices, the spread of weeds as well as soil pathogens can be reduced by up to 99%! Watch the video online at www.cal-ipc.org/dontspoil

We hope you enjoy the videos, and send them along to your friends, family, and colleagues!

Create a plan for the future with Cal-IPC.

Together, we're making a difference in the fight to protect California's wild places from the threat of invasive plants. Create a legacy with Cal-IPC, to continue this important work.

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