



# Invasive Shot Hole Borers + Fusarium Dieback

## How to Sample a Suspect Tree

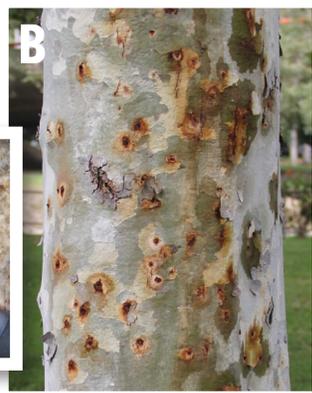
### WHY AND WHEN TO SAMPLE

Invasive Shot Hole Borers (ISHB) are beetles that attack trees and vector the fungal disease Fusarium Dieback (FD). Lab tests can verify fungal infection and confirm the presence of the beetles. This handout describes the process of properly collecting samples from a suspect tree.

Signs and symptoms of ISHB-FD may look very similar to those caused by other pests. Make sure the signs and symptoms you observe in the tree are consistent with ISHB-FD infestation before you consider taking a tissue sample. You should sample from a suspect tree **only if**:

- The tree is a known reproductive host of ISHB (find the ISHB host list at [www.ishb.org](http://www.ishb.org)), AND
- You see multiple round entry holes 0.85mm in diameter (about the size of the tip of a medium ball point pen) in the trunk and/or branches (A), AND
- The holes are accompanied by other symptoms like staining (B, pictured on California sycamore), gumming, frass, OR sugar exudate

Find more information on ISHB-FD identification at [www.ishb.org](http://www.ishb.org).



### DISINFECTING TOOLS

Sampling tools that come into contact with potentially infected wood should be disinfected to prevent spreading FD to other plants. Spray or soak tools using one of the following solutions:

- 5% bleach
- 70% ethyl alcohol
- Diluted Lysol® concentrate

### REPORT A SUSPECT TREE

If you have a suspect tree, please visit [www.ishb.org](http://www.ishb.org) to use the ISHB Detection and Management Assessment tool. Depending on assessment results, this tool may guide you to reporting trees in new areas of infestation (e.g. a new city or county) or among new host species.

### COLLECTING WOOD SAMPLES



Remove any sap or powdery exudate covering the entry hole of the beetle gallery.

If a beetle is trapped in the sap, you may include it in your sample. See **back page for collecting/handling beetle samples.**



Carefully remove the bark around the gallery hole with a clean knife. Do not include the bark in your sample - this helps to reduce contaminants in the sample and increases the chances of detecting the fungi in the lab.



Make a box-shaped incision around the gallery hole 1/4 to 3/4" deep (deeper is generally better). Carefully pry the sample out with the knife.

Dead or diseased tissue is often stained brown or black. Make sure the sample includes both dead (stained) and live (unstained) tissue.



Place the sample in a sealed plastic bag. Refrigerate wood samples until you are ready to mail them. Do not freeze wood samples. Make sure that the bag does not include any live beetles.

## COLLECTING/HANDLING BEETLE SAMPLES



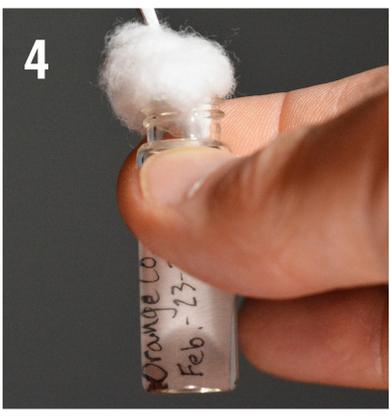
1 You may find a beetle: at the entrance of the gallery; trapped in sap during visual inspections of the trees; or caught in an ISHB trap, if trapping is included in your monitoring program (find out more about trapping guidelines at [www.ishb.org](http://www.ishb.org)).



2 Collect the beetle to confirm its identification. Female ISHB are ~2 mm long and range from brown to black in color. Only females can fly and disperse. Males are smaller (~1.6 mm), and rarely seen outside the tree.



3 Place the beetle in a small tube or vial containing alcohol. Do not submit live beetles.



4 Before submitting, remove alcohol and add a small piece of cotton, tissue paper, or paper towel with just a drop of alcohol and reclose.

## SUBMITTING SAMPLES

1. Label all samples with the date, tree host species, and location of collection.
2. Complete a specimen submission form (PDR - Pest and Damage Record) available at [www.cdfa.ca.gov/Plant/ppd/PDF/PDR\\_form.pdf](http://www.cdfa.ca.gov/Plant/ppd/PDF/PDR_form.pdf). In the "Submitter's remarks" section, please note **ISHB-FD sample**.
3. Send samples to:

California Department of Food and Agriculture, Plant Pest Diagnostics Center, 3294 Meadowview Road, Sacramento, CA 95832

If possible, send samples via overnight delivery.

*Note:* if submitting both a wood sample and a beetle sample, each should have its own PDR and be packaged separately.

### Wood Samples

On the shipping label, note Attn: Albre Brown. In the "Lab" section (upper right) of the PDR, check the "Plant Path" box.

### Beetle Samples

On the shipping label, note Attn: Alexey Tishechkin. In the "Lab" section (upper right) of the PDR, check the "Ento" box.

### Who can submit samples?

CDFA is authorized to accept and analyze samples from any source in California. However, only designated entities – such as County Agricultural Commissioners – are exempt from service sample fees, which are itemized by laboratory on the CDFA website at [cdfa.ca.gov/plant/PPD/feeschedule.html](http://cdfa.ca.gov/plant/PPD/feeschedule.html). On the PDR, the billing address should be indicated in the fields for "Quarantine shipper/broker."

## CONTACT CDFA

For questions regarding wood or beetle samples, contact Albre Brown (mycology) at [albre.brown@cdfa.ca.gov](mailto:albre.brown@cdfa.ca.gov) or Alexey Tishechkin (entomology) at [alexey.tishechkin@cdfa.ca.gov](mailto:alexey.tishechkin@cdfa.ca.gov).

## RESOURCES

[www.ishb.org](http://www.ishb.org) - ISHB, UC Cooperative Extension central website

[www.cdfa.ca.gov](http://www.cdfa.ca.gov) - California Department of Food and Agriculture

[ucanr.edu/sites/eskalenlab](http://ucanr.edu/sites/eskalenlab) - Eskalen Lab, UC Davis

[www.ipm.ucanr.edu](http://www.ipm.ucanr.edu) - UC Statewide IPM Program

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