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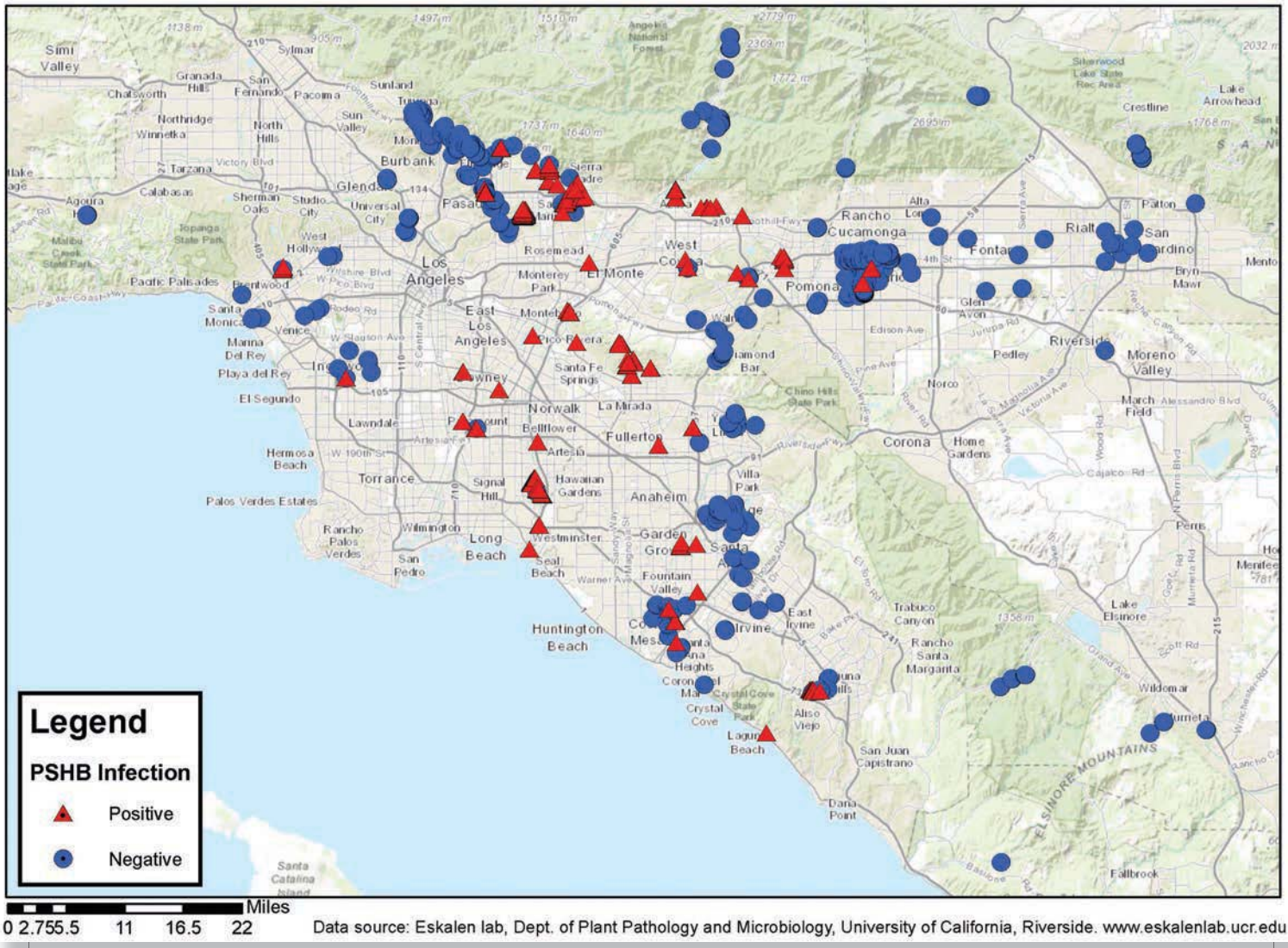
Polyphagous Shot Hole Borer/Fusarium Dieback Distribution Map in Southern California (August 27, 2013)



Polyphagous Shot Hole Borer/ Fusarium Dieback Update

By Tim Spann
Research Project Manager

Drs. Akif Eskalen and Richard Stouthamer, UC Riverside, are continuing to survey for the polyphagous shot hole borer (PSHB) and monitor its spread. They are utilizing city and county street tree maps to identify where the beetle's preferred hosts are planted so they can efficiently track it through Southern California's urban areas. Their most recent map of survey results from August 27, 2013 shows that there has been movement to the south and northwest. To the south, infested trees are now found through Orange, Santa Ana and Costa Mesa, and there have been a number of finds between Aliso Viejo and Laguna Hills. These latter two locations represent a significant move to the southeast and put the known infestation boundary very close to commercial groves. The beetle has also moved on the northwest front, moving north of Glendale towards Burbank, and in the area immediately north of Brentwood.

As mentioned in previous articles, there are three fungi now known to be associated with PSHB: *Fusarium euwallacea*, *Graphium* sp., and *Sarocladium* sp. (formerly *Acremonium* sp.). Dr. Eskalen's team is continuously learning more about these fungi and their detailed relationship with PSHB. For example, his team now knows that the primary food source for the adult beetles is the *Fusarium* and for the larvae it is the *Graphium*. In addition, it's believed that the *Sarocladium* is antagonistic to other fungal species and helps to keep the galleries free of invading fungi. Most recently, Dr. Eskalen has questioned why there is no fungal growth in the gallery immediately surrounding the beetle eggs. He believes that there may be a bacteria involved, which keeps the fungi from consuming the eggs. By understanding this unique and delicately balanced ecosystem it may be possible to find the system's Achilles heel and use that in controlling this important pest.

Dr. Tim Paine, UC Riverside, and his team have been actively working to understand the PSHB life history and have been investigating control methods. For control they have been testing solarization and pesticides. In solarization studies with infested logs they found that clear plastic helped to reduce beetle numbers more quickly than black plastic, but after 12 weeks the reduction in beetle activity was similar for the two types of plastic. Although both types of plastic substantially reduced beetle populations, neither completely eliminated the beetle after 12 weeks.

In pesticide trials, Dr. Paine's team has been surface treating 1 foot logs of uninfested castor bean with Safari 20 SG (dinotefuran), Onyx (bifenthrin) and Danitol (fenpropathrin). The treated logs are then placed in buckets with sections of infested castor bean as a beetle source. The treated logs are checked for attacks at two week intervals for eight weeks. In these studies, Onyx performed the best, allowing the fewest beetle attacks for six weeks; however, none of the pesticides were effective at preventing beetle attack at eight weeks.

In their studies of host preference, Dr. Paine's team found that in field collection of 20 species seven stood out as having the highest attack rates and gallery densities: red willow, box elder, Japanese maple, castor bean, coast live oak, camellia and palo verde. In bucket studies where clean logs were exposed to attack, California sycamore, avocado and liquidambar had the highest attack rates. It's worth noting that in their studies 'Zutano' has been the main avocado variety examined. They are continuing to collect samples of other avocado varieties to see if there are any differences in preference.

The researchers working on this important pest are making advancements at a rapid pace. For the latest information and survey maps you are encouraged to visit Eskalen Lab's PSHB website at http://eskalenlab.ucr.edu/avocado.html.