

Mediterranean Oak Borer

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Mediterranean oak borer (MOB), *Xyleborus monographus*, is an emerging threat to valley and blue oaks (*Quercus lobata*, *Q. douglasii*) in California and Garry oaks, a.k.a. Oregon white oaks, (*Q. garryana*) in Oregon. These are the only hosts found in North America to date, but in the beetle's native range of Mediterranean Europe and North Africa, the host list includes other oaks and related species. At this time, the pest has been confirmed extensively in Napa, Sonoma, Lake, and Sacramento counties in California and confirmed in southern and eastern Portland-metro areas in Oregon.

Identification

MOB is an ambrosia beetle (Figure 1), which is a specialized group of bark beetles that differs from other bark beetles by boring through the bark and into sapwood (xylem) rather than burrowing just below the bark surface in living cambium and phloem tissue. These beetles do not feed on trees but live in symbiosis with fungi they cultivate in their galleries (tunnels) as a food source. In the case of MOB, several different “ambrosia” fungal species have been found in association with the beetles and galleries, some of which are also known pathogens.

Damage

MOBs typically attack upper branches in the tree canopy first, moving to lower and larger branches and stems as populations build. Initial damage can often look like dieback from drought or other environmental stress factors, except beetle-attacked trees will have visible frass (sawdust-like powdery excrement) that collects in bark cracks, spider webbing, and at the base of the tree. Both the galleries and the introduced “ambrosia” fungi harm trees (Figure 2), leading to dieback and increased likelihood of branch failure. Death of mature trees can occur as quickly as 2-3 years after initial attack (Figure 3).

Figure 1: Mediterranean oak borer (MOB) adult



Diagnosis

MOB can be distinguished from other ambrosia beetles that might attack the same host species using microscopic morphological features of the insect and by characteristic features of the galleries. Due to the small size of the insect and the similarities with other native ambrosia beetles, lab diagnosis is required for definite confirmation of this pest.

Management

While most ambrosia beetles typically attack trees under physiological stress, many non-native insects do not require this predisposition to attack trees. Observations in the field suggest that MOB is most

likely to attack stressed trees but has also been found in trees that appeared outwardly healthy prior to attack. Proper cultural care including correction of nutrient deficiencies, addressing soil compaction, adequate irrigation, and mulch will reduce but not fully eliminate risk of infestation.

No research exists yet regarding management of this specific pest. However, research and experience with similar invasive ambrosia beetles in Southern California (Polyphagous and Kuroshio shot-hole borers) can help to inform management decisions. Insect treatments by root flare injection have been effective in preventing infestation of trees in that region. Additionally, a combined insect and fungal treatment by root flare injection has proven effective in reducing the likelihood of mass infestation and eventual mortality of trees that are already attacked. Contact your Bartlett Arborist Representative to learn more about a program for maintaining tree health and management options for infestations.



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References

- [1] <https://ucanr.edu/sites/mobc/> Accessed on August 4, 2023
- [2] K. Ripley and W. Williams. 2022. "Forest Facts: Mediterranean Oak Borer *Xyleborus monographus* (Fabr.). Oregon Department of Forestry. Accessed on: August 4, 2023. [Online]. Available: <https://www.oregon.gov/odf/Documents/forestbenefits/fact-sheet-mediterranean-oak-borer.pdf>

Figure 2: MOB galleries with staining from ambrosia fungus

Photo credit: <https://ucanr.edu/sites/mobpc/>



Figure 3: Dead valley oak due to infestation by Mediterranean oak borer

Photo credit: <https://ucanr.edu/sites/mobpc/Impact/>

