

Akif Eskalen

Extension Subtropical Plant Pathologist, Dept. of Plant Pathology and Microbiology, University of California, Riverside.

Introduction:

Phytophthora mendei (*P. citricola*) and *P. cinnamomi* have been associated with trunk canker and collar rot of avocado. The pathogen infects the crown, lower trunk and limbs of older trees. The disease develops after crowns, limbs, or trunks become infected through wounds, such as injuries from equipment, pruning, vertebrate chewing, and wind damage. Spore spread and disease development are favored by excess soil moisture and wet conditions. Contaminated equipment and tools that wound healthy trees can cause a new infection. The pathogens also cause avocado fruit rot.

Symptom:

Avocado trunk canker and collar rot usually originate at or below ground level but can occur higher above ground, especially where trunks or lower limbs have been wounded (Fig1). The canker appears as a region of dark bark that often exudes red resin, which becomes brownish to white and powdery as it dries. The lesion infects the inner bark and outer layer of wood, killing cambium and phloem. Discoloration rarely extends deeper into wood than the outer woody layer (Fig 2). Affected trees show a gradual loss of vigor and decline of the top. Foliar symptoms are similar to those caused by *Phytophthora* root rot. Diseased fruit have a distinct circular black area that usually occurs near the bottom or lowest spot on the fruit. Internally, the rot extends into the flesh, darkening it in the same pattern as on the affected surface (Fig 3). Affected fruit are often touching the soil or are hanging on low branches.

Disease Management:

The measures recommended for the control of *Phytophthora* trunk canker disease are similar to those described for *Phytophthora* root rot. In fruit, prevention of infection is challenging because it is likely caused by the splashing of *Phytophthora* spores from the soil surface to the fruit during rainy weather. Any practice that helps reduce splash, such as a layer of leaves or mulch, may help.

Cultural Practices:

- Provide favorable soil conditions
- Use certified disease-free nursery stock
- Plant resistant rootstocks
- Pruning tools should be disinfected before moving to the next tree
- Prevent soil or water movement from infested areas
- Avoid sprinkler irrigation wetting the trunk
- Irrigate carefully, not too much water
- Provide appropriate nutrition

Chemical Control:

- Systemic fungicides
- Fosetyl-AI (Aliette[®]) or potassium phosphonate can be applied as soil drench, foliar spray, trunk paint, trunk injection (buffered) or with irrigation water Trunk injection (buffered solution)
- Metalaxyl (Ridomil[®]) can be applied as granular, a drench or with irrigation.

References:

Bender, G.S. 1999. *Phytophthora* canker or collar rot. AV-521. UC Cooperative Extension, Univ. California Davis, Davis, USA.
 El-Hamalawi, Z.A. and Menge, J.A. 1994. Avocado trunk canker disease caused by *Phytophthora citricola*: investigation of factors affecting infection and disease development. Plant Dis. 78:260-264.
 Hong, C., Gallegly, M., Browne, G., Bhan, R., Richardson, P., Kong, P. 2009. The avocado subgroup of *Phytophthora citricola* constitutes a distinct species, *Phytophthora mendei* sp. nov. Mycologica, 101:833.



Fig 1. Avocado trunk canker and collar rot symptom



Fig 2 Avocado trunk canker symptom under the bark



Fig 3. Avocado fruit rot symptom