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Apple Branch Canker Diseases

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Symptoms & Damage

Apple branch cankers are often caused by several wood-colonizing fungal pathogens, including *Diplodia* and *Neonectria* species. Common symptoms are brown lesions on branches and branch dieback. Wood tissue underneath these lesions appears reddish-brown to dark brown in color with hard consistency. Lesions are elliptical and sunken, sometimes forming a callus in older wood. Over time, lesions grow into cankers, causing a series of concentric calluses and sunken bark layers.

Photos of apple branch cankers in apple orchards near Sebastopol, California (photos taken by Ellie Andrews).

Once pathogens cause the canker, they produce their overwintering fruiting bodies (pycnidia and perithecia) on dead branches and become a source of inoculum. Most canker pathogens release their spores during precipitation (rain, dew, fog, etc.) which usually coincides with dormant pruning. Once the fungal spores land on exposed wounds, such as fresh leaf scars, pruning wounds, and broken branches, they can colonize and cause disease. Fruits can also be infected, causing rot at the lenticels, black rot, and eye rot on the calyx end. Branch canker diseases can be significant in regions with high rainfall, including coastal regions. Apple branch canker diseases in California are prevalent in the Sebastopol area of Sonoma County and are worsened by high fall rains.

Management Recommendations

Scout for dark lesions and cankers on branches on a regular basis. Prune and remove diseased branches to reduce pathogen spread. Prune out cankers and any visible diseased tissue in the early summer. At this time of the year, symptoms are easy to see, and the spread of the fungus is least likely due to dry weather. In addition, remove dead branches a few inches below the canker tissue during dormant pruning. Sanitize pruning tools with either 70% isopropyl alcohol or 70% ethanol between each cut or tree. Alternatively, a 5% bleach solution can be used for sanitizing pruners, but it may cause degradation of pruning tools.

Ensure pruning cuts are flush against the remaining branch. Apply three-cut method to promote faster sealing (callusing) on large branches. Registered pruning wound protectants can be used to prevent new infections. Remove pruning debris from the orchard immediately to prevent pathogen spore dispersal from infected branches to nearby trees. Diseased wood can be burned.

Promote strong plant health throughout the year with appropriate water and nutrient inputs (such as fertilizers, compost, cover crops, etc.) to support plant health and resilience to stress.

Areas for Future Research

Biofungicides such as *Trichoderma*-based products show good efficacy on grapevine trunk disease pathogens. However, more research trials are needed with common apple canker pathogens.

Approved copper-based materials are organically acceptable options to help control fungal diseases in fruit trees. Be sure to select the product appropriate for your use (backyard or commercial). Read the label of the product and carefully follow all instructions on the label to use it effectively and safely. However, bear in mind that more trials are needed to evaluate whether annual copper-based fungicide applications could effectively control branch canker pathogens besides European canker caused by *Neonectria ditissima* (formerly *Nectria galligena*).

Proactively manage diseases:

Help apple trees not just survive, but thrive!

References & Resources

→ UC IPM: European Canker
→ UC IPM: Apple
→ UC IPM: General Properties of Fungicides Used in Apples
→ Pacific Northwest Pest Management Handbook: Apple (Malus spp.)-Nectria Canker (European Canker)