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Botryosphaeria Dieback and Canker

(Tom Creswell, creswell@purdue.edu)

Dieback and canker diseases caused by *Botryosphaeria*, *Sphaeropsis*, *Diplodia* and other closely related fungal pathogens are exceptionally common on woody landscape plants. This group of diseases are often referred to collectively as *Botryosphaeria* diseases and this article will follow that convention to discuss them as a group. Examine any mature oak tree long enough and you're likely to find at least some stems dying due to *Botryosphaeria*. Check the base of dying stems of cranberry bush viburnum and you're likely to find a *Botryosphaeria* canker. Look closely at sunken cracked stems and dieback on redbud and, you guessed it, more *Botryosphaeria*.

Botryosphaeria is opportunistic and is often seen killing individual branches that have been wounded or attacked by other diseases, providing an entry point for the fungus. (Fig 1) Stress factors like drought, freezing or defoliation due to disease or insect attack increases susceptibility to infection, and reduces plant defenses so that existing infections often move faster down the stem. However, wounds are not required for infection. In susceptible trees and shrubs, the fungus may attack the smallest twigs and later spread to larger branches where they cause cankers.



Figure 1: This crabapple tree was attacked first by fire blight and later by *Botryosphaeria* canker, killing the main trunk.

Symptoms: Discoloration and death of leaves on individual stems may point to *Botryosphaeria* canker at the base of the dying stem (Fig 2). As the canker girdles a stem, the portion of the stem above the canker gradually dies. Smaller twigs with immature bark may become discolored as the pathogen spreads. Symptoms may vary depending on the plant species infected. In many cases the infection fails to completely encircle the stem, resulting in stems with half necrotic and half living stem tissue (Fig 3).

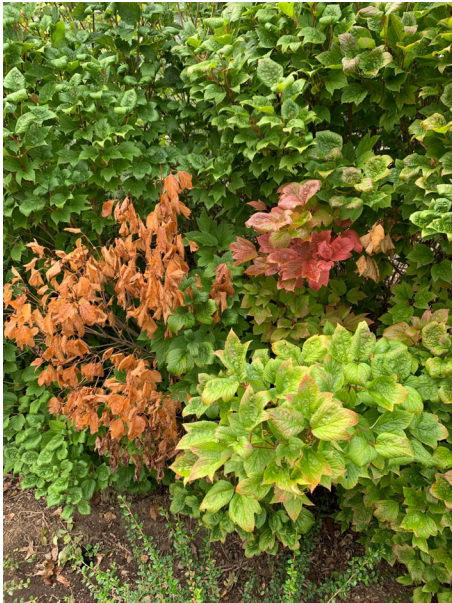


Figure 2: A viburnum hedge with dieback caused by *Botryosphaeria*. Leaf color may progress from yellow to red to brown as branches die.



Figure 4: This *Viburnum x burkwoodii* stem has a large *Botryosphaeria* canker at the base, killing the branch above that point. After the branch was pruned out the remainder of the shrub survived.



Figure 3: A rhododendron stem showing one-sided necrosis caused by *Botryosphaeria* infection. The tan to brown discoloration in the wood is typical of *Botryosphaeria* on many deciduous trees and shrubs.

Botryosphaeria cankers usually cause bark to be cracked, sunken and discolored (Fig 4). Fruiting bodies of the fungus appear as pinhead-sized black specks embedded in the bark, which may be raised in small bumps covering the cankers.

Management:

Prevention of infection depends mainly upon avoiding unnecessary wounding and minimizing environmental stresses that induce susceptibility. Avoid allowing trees and shrubs, especially those recently transplanted, to become drought stressed. Keep plants in good condition and in moderate growth. Avoid high fertilizer rates that induce rapid, succulent growth that may be more susceptible to infection.

Prune out and destroy any dead branches at least six inches below discoloration in the bark or sapwood. Be sure to clean pruning tools with a disinfectant after working on infected plants.

Fungicides have not been effective at preventing infections, and once the fungus is inside the wood fungicides can't touch it, so they are generally not recommended in the landscape.

Avoid using highly susceptible plants, such as *Viburnum trilobum* or *Salix spp.*, in drought prone sites.

Huddle Up and Hunker Down: The Winter Life of Beneficial Bugs

(Karen Mitchell, mitcheka@purdue.edu)

As the growing season winds down and cooler temperatures approach (despite today's unseasonable 81 degrees F), many beneficial bugs begin searching for their winter hideaways. While many people see fallen leaves as just more plant waste to dispose of, some of our beneficial bugs see a cozy bed to bundle up in for the winter. Insects have a variety of strategies to survive freezing temperatures, but common overwintering sites include under leaf

litter, inside hollow stems, buried underground, or tucked away in the crevices of tree bark. Of course, our homes may offer more luxurious winter accommodations to some insects. Here's a closer look at how a few beneficial bugs prepare for winter.

Lady Beetles, in their adult stage, are among the most recognizable beneficial insects, especially this time of year as they seek shelter in our homes (Fig. 1). Not all lady beetles overwinter in our windowsills; native beetles can survive Indiana's winter outdoors in a state of diapause, similar to hibernation. As temperatures drop, adult lady beetles huddle together under leaf litter and in tree cavities as they enter diapause. During diapause, their metabolism slows, and they will remain inactive until spring. Huddling together and slowing their metabolism isn't always enough; beetles also have an ability called supercooling, where proteins act like antifreeze, lowering the freezing point of the fluids in their bodies and preventing ice from forming.



Figure 1. Asian lady beetles seek shelter from cold temperatures inside homes and often congregate in the crevices of window frames. Photo Credit: John Obermeyer, Purdue Integrated Pest Management Specialist.

Brown Lacewing (Fig. 2) may be less recognizable than lady beetles, since they are small and most active at dusk and after dark, but these voracious predators of soft-bodied garden pests play an important role in our landscapes. Much like lady beetles, brown lacewings will enter into diapause with the cooler temperatures. Unlike lady beetles, brown lacewings can overwinter as adults, larvae, or pupae. Regardless of stage, they seek a winter shelter amongst plant debris or tucked into tree bark.



Figure 2. Adult brown lacewings are only 1/5 to 2/5 inch long. Brown lacewings, both the adult and larvae stage, are beneficial predators of soft-bodied pests such as aphids. Photo Credit: John Obermeyer, Purdue Integrated Pest Management Specialist.

The bumble bee may not prey on garden pests, but it is a pollination powerhouse (Fig. 3). While there are many different species in the Midwest, bumble bees nest in pre-existing cavities such as abandoned rodent burrows or even an abandoned bird house. A new queen bee emerges in early fall to mate before overwintering under leaf debris in diapause. Once temperatures warm in spring, the queen bee emerges to start a new colony, laying eggs of the season's worker bees.

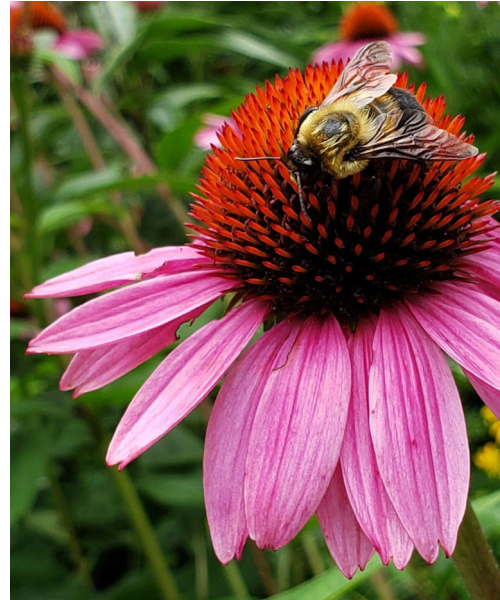


Figure 3. Bumble bee on purple coneflower. Indiana is home to 49 bumble bee species. Photo credit: Karen Mitchell, Purdue Home Horticulture Specialist.

Then there are the snowbirds: unlike most Indiana insects, monarch butterflies avoid freezing temperatures altogether by migrating to warmer climates. Whether the insect avoids or tolerates the freezing temperatures, it's important for gardeners to consider the overwintering sites of these beneficial bugs when deciding what to do with the loads and loads of leaf litter. Leaf litter not only shelters beneficial bugs, but also serves as a free mulch for trees and landscape beds, enriching both gardens and natural ecosystems.

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Editor: Kyle Daniel | Department of Horticulture and Landscape Architecture, 625 Agriculture Mall Dr., West Lafayette, IN 47907