

Black Knot, *Apiosporina morbosa*



Black knot on a *Prunus* tree.

If you have cherry or plum trees you might have noticed enlarged, black swellings on some of the branches that are quite noticeable once the trees have lost their leaves for the winter. These growths are a plant disease called black knot caused by the fungus *Apiosporina morbosa* (= *Dibotryon morbosum*) which is native to North America. This fungus infects many trees and shrubs in the genus *Prunus*, but not all species are equally susceptible.

The fungus overwinters in infected wood and knots. In the spring, infective ascospores produced on the surface of the knots are forcibly discharged during rainy weather and are blown around by wind or dispersed by rain splash. Spores that settle on succulent green twigs of the current season's growth can cause new infections if the twigs remain wet for

a sufficient length of time. The fungus grows internally for a while before symptoms start to show.

After a twig or branch is infected, soft green to brown swellings develop during the first year, often starting to form near the point of leaf attachment, as the fungus disrupts normal branch growth and causes the plant to form these tumor-like growths. Initial symptoms are very subtle, however, so they are often not noticed at this point, especially when leaves cover the tree. The following year the swellings change to an olive-green color with a velvety texture, then rupture as they enlarge, darken, and harden to form the



Knots are less noticeable when there are leaves on the tree.



Knots can girdle branches or even the trunk.

characteristic irregular, rough, hardened, black knots that can be up to a foot or more long and encircle the branch. Ascospores are generally produced in the knots the following spring, to repeat the infection cycle. The fungus continues to grow in infected wood during cool weather, causing the knots to elongate several inches each year. If left unmanaged, the disease becomes worse each year. When a knot completely

encircles a branch the leaves beyond the gall wilt and die. Infections are less common on the main limbs or trunk, but can occur there, having a greater impact on tree health. Older knots may turn white or pink in late summer as they are taken over by *Trichothecium roseum*, a fungal parasite, and many are invaded by boring insects.



An old knot with white fungal growth.

Black knot is a disfiguring disease, but it can also kill trees when knots girdle large limbs or trunks. Infected trees lose vigor and are more susceptible to winter injury the more knots they have. Ornamental plants can become



misshapen as growth on branches beyond the knots becomes stunted, and production on fruit trees declines. Damage varies greatly, with some large trees showing little impact from many galls, while young or highly susceptible species can suffer leaf wilt, leaf, shoot and branch death, and even death of the tree.

Disease management is focused on removing sources of inoculum. This means monitoring susceptible trees for knots and pruning out any visible knots in the winter, before ascospore discharge begins in the spring. Since the galls remain very small the first year and are often overlooked, it may take 2 years of pruning to completely remove all existing infections. The branch should be cut 6 to 8 inches below the symptomatic tissue since the fungus grows beyond the edge of the knot itself. Disinfect the pruning tools between cuts (dip in 10% bleach or alcohol solution) and destroy the prunings by burning or burying, or remove from the site, to prevent new infections – the knots can still release spores after removal from the tree. Removing any wild plum or cherry trees within 500 feet of your desirable plants that could harbor the disease will help reduce black knot problems.

Prune out small galls before the fungus resumes growth in the spring.

When planting new *Prunus* species, try to choose varieties with high levels of resistance and avoid known susceptible varieties, especially if there is a history of the disease in the area. American plum (*P. americana*), Canadian plum (*P. nigra*), chokecherry (*P. virginiana*, including 'Schubert' and 'Canada Red'), European plum (*P. domestica*), and purple leafed plum (*P. cerasifera*) are among the most susceptible types. Cherries – both ornamental and edible – are less susceptible. Amur chokecherry (*P. maackii*), apricot (*P. armeniaca*), and flowering almond (*P. triloba*) are rarely affected. There are some plum cultivars that are only moderately susceptible or resistant to black knot, but they may not be hardy in our climate. Inspect nursery stock carefully before purchase to be sure trees are disease free.



Remove very susceptible trees from the landscape, if possible, to limit problems with black knot.

Fungicides are not recommended, as they are not effective in most situations, and must be used in conjunction with the aforementioned cultural controls anyway.

– Susan Mahr, University of Wisconsin – Madison

Additional Information:

- Black Knot – UW-Extension Garden Fact Sheet XHT1056 at hort.uwex.edu/articles/black-knot
- Black Knot – on the American Pathological Society website at www.apsnet.org/edcenter/intropp/lessons/fungi/ascomycetes/pages/blackknot.aspx
- Black Knot – on the University of Minnesota Extension website at www.extension.umn.edu/garden/yard-garden/trees-shrubs/black-knot/
- Black Knot – on the Cornell University IPM website at www.nysipm.cornell.edu/factsheets/treefruit/diseases/bk/bk.asp