



Black Knot Fungus in Stone Fruit (*Apiosporina morbosa*)

Overview

Black Knot is a serious fungal disease in both ornamental landscapes and home and commercial orchard settings. Indigenous to North America and most commonly found in the Northeast, this fungal pathogen can be found in *Prunus* species in forested and wild areas surrounding urban and suburban sites. Black knot fungus in stone fruit was first reported in 1811 causing significant damage in Massachusetts and first described in 1821 by L. D. Schweinitz from specimens collected in Pennsylvania. The fungus is characterized by hard, uneven, black, tumor-like galls or swellings on the twigs, branches, and stems of stone fruits in the *Prunus* family. This progressive fungal disease can result in leaf wilt and browning, twig dieback, misshapen or dwarfed growth habit, and reduced productivity and attractiveness in native, fruiting, and ornamental plums and cherries.

Life Cycle

Black knot is caused by the pathogen *Apiosporina morbosa*, and attacks stone fruits in the *Prunus* family. Most susceptible are plums and cherries, but apricot and peach can be infected to a lesser degree. The disease requires up to two years to mature but can form viable ascospores on young knots in the year following initial infection.

In the spring, when temperatures rise above 55 degrees, ascospores are produced on the overwintered knot formations found on twigs, branches and stems of the host plant. This usually times with bud and/or flower break for the host plants, with new succulent shoots being most susceptible to infection. Rain and wind events at this critical stage spread the projectile spores to new areas of the plant or to nearby hosts. When the spores settle on new shoot growth near leaf-start junctures, they can germinate in as little as 6 hours under ideal conditions.



The fungus grows within the shoot for months, releasing chemicals that make the plant produce extra, supersized plant cells leading to early knot formation. Often this abnormal cell production will result in distorted, shoot-bending growth or swellings that are light brown in color and rupture as they enlarge. Expanding leaves often hide these new knots which become more visible during the winter months following infection. During the second year, the elongating knots form a velvety green fungal covering which eventually hardens, turning rough and black by fall. Spores are released the following spring, and the cycle begins again.

Symptoms

Branch symptoms of black knot fungus in stone fruit are the prominent black galls visible during the dormant season. As mentioned, because of its progressive nature, the galls will grow and enlarge each year, ranging anywhere from ½ inch to 12 inches in length, reaching diameters up to 2 inches. Should the knot manage to completely encircle and girdle the twig or branch, both the branch and the gall will die.



Leaves toward branch tips from knots on infected branches usually wilt and brown but can remain normal on more tolerant species. When the fungus moves into larger scaffold branches or the main stem of the tree, the galls can appear as large swollen, rough, black areas which may crack and ooze sticky liquid. This level of black knot infection can be detrimental for the host tree as it allows infection by decay fungi which can lead to wood rot. Insect infestations can be a concern as well given the

host plant's stressed and weakened state.

Management Strategies for Black Knot Fungus in Stone Fruit

Black knot disease cannot be cured at this time with foliar fungicide applications or injections, but it can be suppressed to some degree if treated in conjunction with other cultural practices. Management hinges on infection severity and tolerance threshold. Early detection is vital in keeping spread and infection rates as low as possible.

For situations where new *Prunus* species are being added to a landscape or private orchard, choosing resistant or more tolerant species is the first step. A few tolerant plum varieties include 'Shiro', 'Castleton', 'Santa Rosa', 'Early Italian', and 'President'. Tart cherries and mahaleb cherry can be fairly tolerant to the disease as well. Inspecting any new additions before purchase or installation is highly recommended. Assessment of the surrounding site or locale for preexisting wild cherry or plums with black knot infections will determine whether installation is worthwhile or feasible. Placing plantings upwind from or removing existing infected trees will be important decisions. Tolerance and/or resistance levels of ornamental/flowering plum and cherry varieties is not well documented.

For established plum or cherry species in the landscape or orchard setting, vigilant inspection for knots and identification of new black knot infection sites is necessary to first line of defense. If found, black knot galls or newly forming ones can be carefully pruned out and destroyed. Pruning should be done in the dormant season when conditions are dry and around freezing. All pruning cuts should be made 4-8 inches below the knot or gall area and tools should be sanitized with a 70 percent solution of rubbing alcohol, especially if working between trees. In some cases, where knot formation has reached large limbs or stems, removal of entire branches or the tree may be required. All infected material should be bagged, burned, or destroyed to prevent reinfection and reduce inoculum levels.



Maintaining tree health is also a crucial step in any management program. Although black knot spores can germinate on even a healthy tree, providing adequate soil moisture and applying mulch correctly can minimize overall stress and prevent secondary disease and insect issues. [Soil sampling](#) and a tailored fertilization program that avoids excess nitrogen will sustain plant health and immunity while minimizing excessive new shoot growth.

Fungicide applications (both synthetic and organic) applied at budbreak and for several weeks following will aid in preventing spore germination on new shoots as they emerge and elongate. Season-long treatment may be required if disease pressure from outside sources is high or if weather conditions favor spore production and germination. All fungicide labels must be read carefully and followed as not every product can be applied to edible fruits.

When monitored and treated along with the above cultural practices, black knot fungus in stone fruit can be kept at tolerable levels, allowing *Prunus* trees to thrive and produce fruit and flowers displays without the unsightly black galls.

The foundation of [integrated pest management](#) is a program of periodic inspections, during which all plants are assessed in terms of insect, disease, nutritional, and physiological health. After inspection, plants are treated as needed with the most advanced biological, chemical, and cultural management tools, and the findings of each visit are summarized and reported to you in writing. At Burkholder Plant Health Care, our approach is to put our training and experience to work for you, ensuring that your landscape gets the attention and tailored management that it deserves. For comprehensive and effective [plant health care](#) for your landscape, such as managing black knot fungus in stone fruit, trust Burkholder PHC.