



Stone Fruit IPM for Beginners

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Chapter 9

Black knot

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Black knot

A fungal disease caused by *Apiosporina morbosa*, previously named *Dibotryon morbosum*.

Hosts

Plum, tart and wild cherry. Rarely on peach, nectarine and apricot. Additional cherry species susceptible to black knot are chokecherry (*Prunus virginiana*) and European bird cherry (*P. padus*). Other species of cherries like pin cherry (*P. pennsylvanica*), sand cherry (*P. pumilla*), tart cherry (*P. cerasus*), Nanking cherry (*P. tomentosa*) and Western sand cherry (*P. var. besseyi*) are more tolerant.

Time of concern

Early bloom until new growth has slowed, usually mid-summer.

Damage, symptoms, disease cycle

Affected trees have irregular thick, black swellings 1 to 6 or more inches in length on twigs and branches, often very conspicuous. Limbs with severe infestations have poor growth and production. Severely affected trees can degenerate to a worthless condition in a few years.

The black knot pathogen overwinters in infected branches and galls in infected trees or pruned branches. During rain in spring, the knots release ascospores that are carried by wind and physical contact. Spores that land on susceptible young branches, twigs and leaf stems germinate and penetrate bark to establish infections. Infections are favored by frequent wetting periods and temperatures above 55 degrees Fahrenheit.

During the infection process, the fungus stimulates host tissue to swell, become olive colored and are noticeable by fall or next spring. After the first year, the infected areas are swollen, black, rough irregular galls. Galls produce and release ascospores starting approximately two years from infection. As the galls age, they are brown and start to disintegrate. Galls are often invaded by boring insects.



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Black knot on wild plum in woods. Remove all infested trees within 500 feet of plum plantings.



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This black knot on a plum has been invaded by a boring insect, as indicated by the lighter-brown frass in the center.

IPM steps for beginners

Avoid purchasing nursery stock with visible gall symptoms and watch trees closely in first year for new galls. Plum varieties with some resistance to this disease include Shiro, Santa Rosa, Methley, Early Italian, Fellenberg, Seneca, Damson, Blufree, NY9, Au Rosa and President. Very susceptible varieties include Stanley, Valor, Shopshire and Rosy Gage.

Effective black knot management requires cultural and chemical approaches. Cut out all knots, including those on nearby wild hosts, to reduce chances for future infections. Remove knots before bud break when knots begin to release spores. Make pruning cuts to include the knots plus another 5 to 8 inches of growth closer to the trunk to remove infected tissue not yet showing symptoms.

Promptly remove pruned branches with knots from the site and burn to eliminate these as a source of infection. Managing black knot in a site where the disease has been established is at least a two-year project to eliminate knots that emerge the following year.

Start chemical treatments early, approximately bud break/opening in spring as protectant sprays. The most important sprays are from early bloom to early June. Fungicides are applied at seven to 10-day intervals from green tip/tight cluster to about mid-June when the active shoot growth stops.

Products

(Important: Check product labels to make sure the product is labeled for the crop.)

- ▶ Chlorothalonil is available under various product names such as Daconil, Docket DF, Bravo, Chloronil and Echo. Chlorothalonil is an effective contact fungicide also useful for brown rot. Check the label as some regions restrict this product use later in the season.
- ▶ Fenbuconazole (Indar) is used by the commercial fruit industry. It is a systemic material also effective for brown rot. Rotate with other materials to help avoid chances for fungal resistance.
- ▶ Topsin M is relatively effective. Add captan to help reduce chances for developing resistance to the fungicide by the black knot pathogen.
- ▶ Captan is not real effective by itself for black knot. Caution: Captan applied after bloom under slow, drying conditions may cause leaf burn (shot-holes) and after shuck off can cause fruit spotting in Stanley and some other European and some Japanese plum varieties.
- ▶ Wettable sulfur and copper materials are only moderately effective for this disease.

Ready for more precision

Black knot can be confused with crown gall, a bacterial disease that will occasionally cause galls in branches of tree fruit. Surfaces of black knot tend to be darker and rougher than crown galls.

Regional susceptibility of tart cherries to black knot seems to differ greatly, with some areas such as Ontario having heavy infestations and others such as Michigan reporting little or no problems.

References

Ogawa, J. M. 1995. Compendium of Stone Fruit Diseases. American Phytopathological Society, St. Paul, MN

McFadden-Smith, W., Northover, J., and Sears, W. 2000. Dynamics of ascospore release by *Apiosporina morbosa* from sour cherry black knots. *Plant Dis.* 84:45-48.