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BLACK KNOT OF ORNAMENTAL PLUM AND CHERRY

Black knot is caused by the fungus *Apiosporina morbosa* (syn. = *Dibotryon morbosum*). This disease is common on many ornamental and flowering *Prunus* species in the landscape as well as on wild plums and cherries (especially wild black cherry, *Prunus serotina)* in woodlots and forests. Black knot was first reported as a destructive disease in Massachusetts in 1811. Although the disease can be found throughout North America, it is most common in the northeast.

Black knot is also a destructive disease of domestic plum and prune trees in home and commercial orchards. Apricots, peaches, and flowering almonds are occasionally damaged. The disease affects only woody tissues and can develop on twigs, branches, and scaffold limbs. Losses result from extensive dieback of girdled limbs and stunting of the growth beyond the visible knots. Infected trees may also produce few flowers or fruit. Trees can be severely weakened, disfigured, and in extreme cases, even killed as a result of infection.

SYMPTOMATOLOGY AND DISEASE CYCLE:

Symptoms of black knot are easily recognized during the winter, when they appear as distinctive, dark-brown to black charcoal-like swellings or growths (Figures 1 and 2). Knots can develop on twigs, branches, scaffold limbs, or trunks of trees (Figure 3). The conspicuous cylindrical or spindle-shaped knots do not appear until the second year of infection. They continue to enlarge from year to year and develop their characteristic rough appearance. Large, girdling knots result in dieback of branches and twigs. Girdling knots on the main trunk can kill trees.

Figure 1. Distinctive charcoal-like swelling of twig infected by the fungus causing black knot.

Although black knots are most outstanding on dormant trees, new infections can be detected early in the season and appear as soft, green swellings. As these age, they gradually turn hard and black.

Figure 2. Black knot girdling small twig.

Figure 3. Black knot cankers developing on large scaffold limbs.

The fungus overwinters in the knots on infected twigs and produces spores in spring. Humidity and temperature are the most important factors governing the spread of black knot disease. Release of spores depends on rainfall and temperature during early spring. These spores are the source of new infections. Newly emerging shoots are highly susceptible. They can be infected soon after budbreak and throughout the period of active shoot elongation. However, studies have shown that most infections probably occur just before bloom or after petal fall. Wet spring weather is favorable for disease since rain is important for discharging the spores from the knots. In addition, wind and rain help to spread the spores to the susceptible tissues. Spores of black knot are capable of penetrating non-wounded tissues, so they do not require wounds in order to infect.

Most infections occur in spring but symptoms are often not visible until fall when they appear as small, often inconspicuous swellings on the twigs. These knots gradually enlarge, mature, and take on their diagnostic rough, black appearance during the winter and the following spring. Small twigs usually die within a year of infection whereas larger branches may live for several years before becoming girdled and killed by the fungus.

DISEASE MANAGEMENT:

Black knot is managed using a combination of culture, pruning, sanitation, properly timed fungicide sprays, and resistant varieties. **Of these, pruning and sanitation are essential** to any control program--fungicide sprays are relatively ineffective unless old knots are pruned and removed from the vicinity of the tree. Infected tissues should be pruned *before budbreak* (and before the knots develop the white or pink appearance). Cuts should be made at least 6-8” below any visible swellings or knots.

Sanitation also includes scouting and removing and/or pruning of any wild plum or cherry trees found in woodlots within 600 ft. of the landscape tree in question. Since these wild trees are highly susceptible to black knot, they are important sources of fungal inoculum.

Cultural methods that contribute to managing this disease involve maintaining tree vigor. These include watering during periods of drought, fertilizing when necessary (as determined by a soil test), mulching, and avoiding all unnecessary stresses for the tree.

Resistance is another option for managing this disease. However, since this is a

genetic trait, decisions about selecting resistant varieties need to be made at the time of purchase. There are unfortunately only a limited number of ornamental *Prunus* species with resistance to black knot. One example is Amur cherry or amur chokecherry (*Prunus maackii*) Goldrush® (*P. maackii* 'Jefree'), which appears to be resistant to black knot.

Edible or domestic plum varieties differ in their susceptibility to black knot. The cultivars Stanley, Damson, Bluefree, and Shropshire are considered to be highly susceptible; Fellenburg, Methley, Milton, Bradshaw, and Early Italian are moderately susceptible; Formosa, Shiro, and Santa Rose are slightly susceptible; and President is considered highly resistant. In general, Japanese varieties are less susceptible to black knot than most American varieties.

The final strategy for disease management involves the proper selection, timing, and application of fungicide sprays. Thorough coverage of all parts of the tree is necessary and the sprays should be applied until run-off. Among the fungicides registered for use on ornamental *Prunus* species in Connecticut are chlorothalonil and mancozeb + copper hydroxide. Applications are usually made when the tree is dormant (just before budbreak) and are continued until flowers have fallen (petal-fall). Organic options are limited, but a single lime-sulfur spray before budswell has been found to reduce black knot problems. The fungicide label should be consulted for information on specific tree hosts, dosage rates, and safety precautions.

If plum, cherry, or prune trees are being grown for edible fruit, please consult the fact sheet *Disease Control for Home Plum Orchards*. This guide contains information on fungicides registered for use on edible fruit.

March 2008 (revised)