

Extension is expanding its **online education** and resources to adapt to COVID-19 restrictions.

Black knot

Quick facts

- Black knot is a common fungal disease of *Prunus* trees including ornamental, edible, and native plum and cherry trees.
- Hard swollen black galls (tumor like growths) form on branches and occasionally on trunks.
- Many *Prunus* trees tolerate black knot. Tolerant trees have many galls throughout the tree with few negative effects on the health of the tree.
- Some *Prunus* trees are more severely affected by black knot. In these trees, leaves and shoots wilt and die on branches with galls.
- Management will vary depending on how severely the tree is affected by black knot.

How to identify black knot



Branch symptoms

- Black knot galls are most noticeable during fall and winter after all the leaves have fallen.
- Knobby, swollen black growths called galls grow along the length of stems and branches.
- In early summer, young galls or new areas of growth on the edges of older galls are covered with velvety, olive-green spores.
- These galls turn black and hard by the end of the summer.
- Infected branches may bend to one-sided due to growth of the gall.
- There can be anywhere from a few galls to hundreds of galls within the tree canopy.

Leaf symptoms

- Leaves remain healthy and green even on branches with galls in black knot tolerant trees.
- Leaves wilt, turn brown and die on branches with galls in trees that are highly susceptible to black knot.
- Brown, wilted leaves at the end of branches are often scattered throughout the tree on highly susceptible trees.

Trunk symptoms

- Large areas of rough black swollen bark form on the main tree trunk.
- Black knot galls on trunks are often cracked and may ooze sticky liquid.
- Wood decay fungi may enter the trunk through cracks caused by black knot galls and cause wood rot.



A young green gall and older black galls

Trees affected by black knot in Minnesota

Most susceptible (Likely to be damaged by black knot)

- American plum (*P. americana*)
- Canadian plum, including 'Princess Kay' (*P. nigra*)
- Chokecherry, including: 'Shubert' and 'Canada Red' (*P. virginiana*)
- European bird cherry (*P. padus*)
- European plum, including: 'Stanley' (*P. domestica*)
- Japanese plum (*P. salicina*)
- Purple leafed plum (*P. cerasifera*)

Less susceptible (may be infected but often tolerates black knot)

- Nanking cherry (*P. tomentosa*)
- Pin cherry (*P. pensylvanica*)
- Sargent cherry (*P. sargentii*)
- Sand cherry (*P. pumila*)
- Sour cherry (*P. cerasus*)
- Western sand cherry (*P. purmila* var. *besseyi*), including: Purple leaf sand cherry *Prunus x cistena*

Rarely affected

- Amur chokecherry (*P. maackii*)
- Apricot (*P. armeniaca*)
- Flowering almond (*P. triloba*)

How does black knot survive and spread?

- Black knot is caused by the fungus *Apiosporina morbosa*.
- The black knot fungus overwinters in the galls on branches and trunks.
- Spores are released during wet periods in the spring. The wind carries these spores to trees where they infect young green shoots or wounded branches.
- The fungus grows within the branch for several months with no outward symptoms of disease.
- As the fungus grows, it releases chemicals that make the tree grow extra plant cells that are unusually large. This unusual growth results in the swollen, woody galls.
- Galls are made up of both plant and fungal tissue.
- One year after infection, galls can be seen as a swollen area of the branch with a velvety olive green covering of fungal growth.
- Two years after infection, the gall has turned black and hard. These galls release spores in spring when wet.

- Sometimes, the branch and the gall die after spores are released in early spring. If the branch lives, the knot keeps getting bigger and produces new spores every spring.
- The gall can completely encircle and girdle a branch. When this happens, the leaves beyond the gall wilt and die.
- Although the black knot fungus will not cause the trunk to rot, the cracks from the infection can let in other wood rotting fungi.

How to manage black knot

Site and tree selection

- In areas where there are many wild *Prunus* sp. infected with black knot, avoid planting landscape and edible *Prunus* sp.
- If only a few infected wild *Prunus* sp. are present, prune out existing galls or completely remove infected plants to reduce the amount of fungal spores present before planting landscape and edible *Prunus* sp.
- Choose trees that have some tolerance to black knot. (See tree list above under “Trees affected by black knot in Minnesota”.)
- Inspect all trees and shrubs for black knot before purchasing them from the garden center. Do not purchase any trees with black knot galls.

Pruning out galls

- Black knot galls can be removed from infected trees through pruning. This will make ornamental plants look better and reduce the amount of fungal spores produced within the tree canopy each spring.
- Pruning out galls is not necessary in trees where black knot galls do not result in wilt and death of leaves and young branches.
- Pruning cuts should be made in late winter (February or March) when temperatures are below freezing. This will prevent black knot spores from infecting the pruning wound.
- Make the pruning cut at least 4 inches below the black knot gall.
- Infected branches should be removed from the area and burned, buried, or disposed of. Infected branches left below the tree will continue to release spores that can start new infections in the tree.
- To maintain a black knot free tree, it will be necessary to inspect the tree and prune out any new galls each winter.
- Cracked and oozing galls on trunks or large branches should be inspected by a **certified arborist** to determine if the tree is stable. Black knot will not rot wood but wood decay fungi can enter through cracks caused by black knot. These fungi cause wood rot that weakens the tree.

Using fungicides

- Fungicides can be used to protect young trees or trees that will be severely affected by black knot.
- Prune out any existing galls in late winter before applying fungicides in spring.
- Fungicide sprays must be applied in early spring to protect young green shoots.
- Begin fungicide treatment when flower buds are just beginning to open.
- Repeat sprays according to label instructions until shoots mature or weather is consistently warm and dry.
- Sprays work the best when applied before a rain event when temperatures are warmer than 60°F.
- Before applying fungicide read the label carefully.
 - The plant to be treated **MUST BE** listed on the label or the fungicide cannot be used on that plant.
 - Not all fungicides registered for use on ornamental *Prunus* varieties can be used on edible *Prunus* varieties.

For large trees, high-pressure spraying equipment is needed in order to get complete coverage. **Hire a professional arborist** who can safely operate all necessary equipment.

Fungicides with one of the following active ingredients are effective in protecting trees from black knot:

- Captan
- Chlorothalonil
- Thiophanate-methyl
- Lime sulfur

CAUTION: Mention of a pesticide or use of a pesticide label is for educational purposes only. Always follow the pesticide label directions attached to the pesticide container you are using. Be sure that the plant you wish to treat is listed on the label of the pesticide you intend to use. And observe the number of days between pesticide application and when you can harvest your crop. Remember, the label is the law.

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