

## Black Knot on Plums

This article was originally posted in *Scaffolds Fruit Journal* 19(4), 12 April 2010.

Plum growers should remember that black knot can quickly devastate plum trees that are not protected with fungicides during the critical period between white bud and the second cover spray. The most effective fungicide is chlorothalonil (Bravo and generics), but fungicides alone will not provide adequate control if black knots from previous years are left in the trees. Thus, the first step in controlling black knot is to remove all visible knots during winter pruning. Knots that are pruned out of trees should be burned or composted well away from the orchard. Knots left on the ground or in orchard perimeters can still discharge spores that will be blown into orchards.

The danger posed by leaving pruned-out black knots near an orchard became painfully evident in our own research plots last year. We had severely infected plum trees left from a recent fungicide trial, but we dutifully pruned out all of the knots before the start of the growing season. We dumped these knots in the corner of a woodlot about 50 feet away from an open field where we planting new plum trees later that spring. Because we had removed the knots and presumably had no significant source of inoculum, I ignored early-season fungicide

sprays in my new planting. My errors became apparent by September of last year when black knots started appearing in the new growth of the trees we had just planted. I erred twice, first by failing to burn the black knots and then by failing to protect my newly planted trees with chlorothalonil. Many of those trees had to be pruned back severely to get rid of the black knots, and the affected trees will now take an extra year to come into production.

Some wild *Prunus* species can harbor black knots and produce spores that can blow into adjacent orchards. Chokecherry bushes (*Prunus virginiana*) are particularly susceptible. Hedgerows in the vicinity of new plantings should be scouted in late winter or spring, and any black knots in the hedgerows should also be removed and burned before the new planting is established.

Black knot is caused by the fungus *Apiosporina morbosa*, known also as *Dibotryon morbosum*. Ascospores from the shiny black knots on trees (Fig. 1) are released during rain periods in spring and infect new growth on trees. Growing spurs can become infected, but most infections occur on growing terminal shoots. Some ascospores may be released soon after plum trees reach bud break, but most are



**Figure 1. Black knot on 'Stanley' plum.**

released between white bud and one week after petal fall. There is no known secondary cycle for black knot, so the disease cannot spread after the supply of ascospores is exhausted in late spring or early summer.

Although infections occur during spring, they do not become evident until many weeks later. Sometimes infections develop into knots that can be recognized as such by September (Fig. 2). Those knots will turn black and produce ascospores the following year. In many cases, however, the only evidence of infection in autumn is a slight swelling of the twigs. Those swellings turn into recognizable knots the following growing season and then produce ascospores two years after the initial infections occurred. Individual knots produce spores for only one season, but tissue just below existing knots can erupt with new extensions of the original black knots, and that new tissue can produce knots the following year.

Plum cultivars vary in susceptibility to black knot. Most European plum varieties are quite susceptible whereas Asian plums tend to be more resistant.

As noted earlier, chlorothalonil is far more effective against black knot than any other fungicide. Some chlorothalonil labels specify that sprays can be applied no closer than 10-days apart, but sprays applied at that interval will probably be adequate for protecting trees from black knot. Chlorothalonil cannot be used after shuck split, so it is important to utilize the shuck-split application so as to provide extended protection for against any black knot spores that might be released shortly after shuck split. In a recent study, we found that both Indar and Pristine, when applied during bloom to control brown rot, also suppressed black knot. However, these products were less effective than chlorothalonil.



**Figure 2. Twig swellings and immature black knots as they often appear the first autumn following infection. (File photo by Joe Ogradnick.)**

*Updated by Dave Rosenberger 15 April 2014*