Top 10 Questions About Pine Tip Blight

Last week I wrote about pine wilt, a disease caused by a nematode that affects exotic pines (pines that are not native to North America) such as Scots and Austrian pines. This week I will address pine tip blight, a fungal disease that can affect Austrian, Scots, ponderosa, and mugo pines. The disease is most severe on mature trees (20 years or older). Repeated infections over several years can kill large sections of trees or entire trees.

Fig 1: new shoots are stunted. Needles are stunted and brown

1) What is the pathogen? Tip blight is caused by a fungus that has been called both *Sphaeropsis* and *Diplodia* over the years. Don't let the name changes trouble you. The most important consideration is to recognize the *disease*, and to be able to distinguish it from other pine problems.

2) When does disease occur?
Tip blight is a spring disease. The fungus survives the winter in previously-infected tissue. Then, during spring rains, the fungal spores splash around and infect the newly developing pine shoots (candles) just as they start to grow (usually in mid-late April).

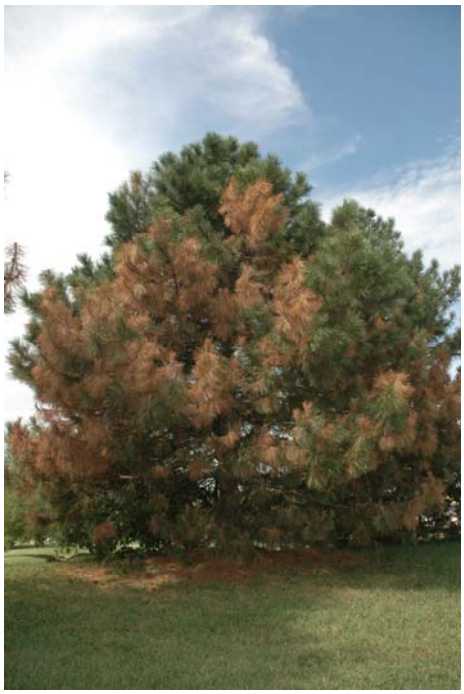

Fig. 2: Severe tip blight. Fungus has moved from tips into older parts of the branches.

3) What are the symptoms of pine tip blight?
The symptoms become obvious in late May or early June when the infected shoots and needles are *not* growing right. The shoots are stunted, and the emerging needles are stunted and brown (Figure 1). Small, sticky resin droplets often form on the infected needles. The damage usually starts in the lower branches and works its way up over several years. In trees that have been repeatedly infected for many years, damage is distributed throughout the crown. In addition to infecting the newest growth, the fungus can invade older tissues when trees are highly stressed or if they are wounded (by hail, storm damage, etc).

Interestingly, white pines are *not* susceptible to the tip blight phase, but they *are* susceptible to this "canker form" of the disease if they are wounded.

Fig 3: black specks on cones

In late summer or fall, tiny black spore-producing structures (called pycnidia) are formed on the scales of 2-year-old cones — it looks like black pepper has been shaken onto the undersides of the cones (Figure 3).

Tip blight can be confused with winter damage or infestation by the pine tip moth. However, winter damage usually causes shoot or needle death *before* the new needles emerge in the spring, and it is sometimes restricted to one side of the tree (the side facing the prevailing wind). Unlike tip blight, the tip *moth* causes a hollowed-out area in the tip/bud area, and the larvae are sometimes present. Plus, tip moth is more common in young trees.

In extreme cases tip blight can be confused with pine wilt. For example, tip blight was unusually severe in spring 2007. Some trees had tip blight infections throughout most of the crown, and many infections progressed to the highly damaging canker phase (Figure 2). With trees looking so brown, it was easy to mistake tip blight for pine wilt. To avoid confusion, look carefully at the symptoms and compare them to the descriptions and photos here and in other resources. If there is any doubt, bring a sample to your local K-State Research and Extension office to be forwarded to the K-State diagnostic lab.

4) Why was 2007 such a bad year for tip blight?

First, several years of drought left our pine trees stressed out and susceptible to disease. Second, the extreme freeze event of early April 2007 stressed out the trees even more and predisposed them to infection, especially the canker phase. Finally, many areas of Kansas experienced heavy rains in May, providing the means for the tip blight spores to spread around. These factors added up to a 'perfect storm' for tip blight last year.

Managing tip blight:

5) Does pruning help?

Removal of dead branches can improve the appearance of diseased trees but will not prevent infection. Many of the spores are produced on cones that remain attached to the tree. In addition, tissues that look healthy can secretly harbor the tip blight fungus. That is, there are "hidden infections" that we can't even see. Usually, pruning for tip blight means pruning off lower branches first, since they tend to be the first to become infected. Then the pruning task moves up the tree as the disease progresses over the years. If a tree

reaches a point where it is no longer pleasing or functional for the site, "one-cut pruning" (ie, tree removal) might be the best possibility.

6) What other tree care should I provide?
Trees should be adequately (not excessively!) watered and fertilized to maintain tree vigor. This will help a tree fight off tip blight on its own.

7) Should I use a fungicide?

This is a tricky question. The trouble is, unlike smaller plants like wheat, tomatoes, or soybeans, there aren't studies out there to tell us about tip blight "thresholds." As a general rule, if a tree has at least 30-50% of branches infected, the fungus is pretty well entrenched and it will be difficult for fungicides to really knock the disease down. And, if there is a lot of canker type infection, it is hard for fungicides to work. If a smaller portion of the canopy is affected, and it is mostly the tip-blight phase, fungicides are more likely to be successful over time. Finally, consider the aesthetics and site-enhancing value of the tree. In trees where the disease is caught early, and fungicides are used at the *right time* each year, the disease can be managed successfully and it can be worth the investment.

8*)* Okay, so what is the *right time*?

The critical time for fungicides is when the new shoots are expanding in the spring. If fungicides are applied at this time, new disease can be prevented. It is not a one-shot-deal. Fungicides will likely be needed each year to protect new annual growth. Each year, the first application should be made when new shoots start to elongate, which is usually around the third week of April. The tree should be sprayed again 10 to 14 days later, and possibly again 10 to 14 days after that if it is a wet year and the site has a history of disease. The timing should be adjusted slightly depending on host development in the spring, since every year is different. Spraying after this critical time will *not* be effective, because infection has already occurred and cannot be "cured." Once you see symptoms it is too late.

9) *What* should I spray, and how should I spray it?
Several fungicides are labeled for pine tip blight (*Sphaeropsis/Diplodia*). Thorough coverage is essential. A high-pressure sprayer may be needed to deliver the fungicide to the tops of tall trees. Homeowners should consider using a professional tree care service, especially for large trees where getting good coverage is difficult. Commercial products include those with the following active ingredients: propiconazole (*Banner MAXX, Spectator*); thiophanate-methyl (*Cleary's 3336F and 3336WP, AllBan, OHP 6672, T-Storm*); mancozeb (*Protect DF*); copper (*Camelot, Bordeaux mix*); mancozeb + copper (*Junction*); and thiophanate-methyl + chlorothalonil (*Spectro 90G*). Carefully read and follow all label instructions.

10) What about injections? Fungicide injections have been studied, but so far results have been inconsistent and injections are not recommended at this time.