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Sphaeropsis Tip Blight of Pines

The symptoms and identification, disease cycle and control of Sphaeropsis tip blight.

Loren J. Giesler, Extension Plant Pathologist

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Browning and death of tips is quite common in older, well-established pine plantings. Such damage is often due to Sphaeropsis tip blight, a fungal disease caused by *Sphaeropsis sapinea* (syn. *Diplodia pinea*). Infection kills major branches and may even kill the entire tree under severe disease pressure.

Sphaeropsis sapinea can infect young trees, but the disease becomes increasingly more common and destructive as trees approach 30 years of age. Tip blight commonly occurs in landscape, windbreak and park plantings; but is seldom found in natural pine stands. Several pine species can be infected. In this region the disease is most severe on Austrian pine (*Pinus nigra*) and ponderosa pine (*P. ponderosa*), but it can also damage Scots pine (*P. sylvestris*) and mugo pine (*P. mugo*).

Symptoms and Damage

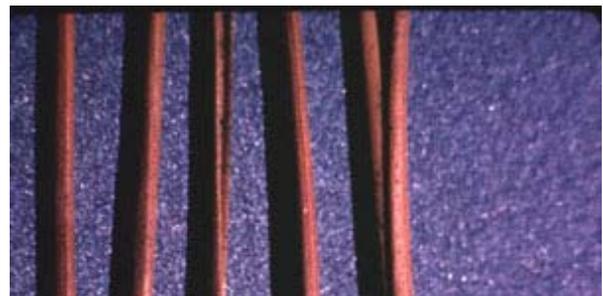
The most conspicuous symptoms of Sphaeropsis tip blight are stunted new shoots with short, brown needles (*Figure 1*). Needles on infected new shoots turn tan or brown while still encased in the fascicle sheaths. Entire new shoots are killed rapidly.

Damage may be confined to the new shoots, particularly on trees with shoots infected for the first time. New shoots throughout the entire tree may be infected, but damage is generally first evident on the lower branches. Trees that are repeatedly infected will not only have dead new shoots, but also dead needles on older shoots.

The severity of damage may vary considerably among major branches. Occasionally, after two or three successive years of infection, tree tops are extensively



Figure 1. Dead, stunted needles at branch tips. (Courtesy D. Wysong, University of Nebraska)



damaged. Death of older tissue may be so extensive that branches are killed back to the main stem. Repeated infections reduce growth, deform trees and ultimately kill them.

Small, black fruiting bodies called pycnidia, in which *S. sapinea* spores develop, form on needles, fascicle sheaths, scales of second-year seed cones and bark. The fruiting bodies can be seen with the naked eye or a 10X hand lens. These black bodies are usually numerous at the base of needles (*Figure 2*) and are easily found on the short needles of shoots infected the previous year, particularly on those needles that have turned ashen-gray and are easily detached. Fruiting bodies can also be easily found on the scales of second-year seed cones (*Figure 3*).

The presence of dead new shoots with stunted needles and small, black fruiting bodies at the base of needles and on cone scales are diagnostic clues of this disease. Sphaeropsis tip blight can be confused with damage to shoots caused by pine tip moths; however, moth damage may be indicated by the presence of larvae or by tunnels within the affected part of the shoot.

Disease Cycle

The time of formation of pycnidia on cones and needles varies with rainfall. When rainfall is above normal in late summer, high numbers of pycnidia develop on infected first-year needles and on second-year seed cones. In most years, however, pycnidia are not numerous on these needles and cones until the following spring.

Spores are dispersed primarily by rain splash and highly moist conditions are needed for infection. High relative humidities are required for spores to germinate and for the fungus to grow and infect needles and shoots.

Infection of current-year shoots occurs from April to mid-June; however, new shoots are most susceptible during a two-week period beginning when buds open. Symptoms on new shoots are visible in late May, with the full extent of tip blighting becoming evident by late June or July.

Second-year seed cones are initially infected in late May. Numerous pycnidia develop on infected second-year cones, and the increased damage to older trees probably is related to this fungus buildup. Infected seed

Figure 2. Fruiting bodies on infected needles. (Courtesy D. Wysong, University of Nebraska)



Figure 3. Fruiting bodies on infected seed cones. (Courtesy D. Wysong, University of Nebraska)



cones often are observed on otherwise healthy pines, which indicates that the fungus builds up on seed cones of older pines before new shoots are extensively infected.

Figure 4. Branch with hail injury where a *Sphaeropsis* infection has occurred. (Courtesy M. Harrell, University of Nebraska)

Infection of new shoots occurs in the absence of wounds. Older shoots and branches may become infected when tissues are injured by insects, hail or pruning (*Figure 4*). When tip blight occurs in a natural forested area it usually follows severe hail injury to the trees.

The low amount of infection on young trees is attributed to the sparsity of their cones, which limits spore inoculum. Young trees adjacent to older, cone-bearing pines can be infected by inoculum produced on the cones of the older trees.

Control

Infection of new shoots can be reduced significantly with fungicidal treatments applied twice during the period when current-year shoots are most susceptible. This period begins with the opening of shoot buds and extends for about two weeks. In Nebraska, an application made during the third week in April and repeated the first week in May provides optimum disease control in most years. Fungicides applied after mid-May are usually ineffective. Read and follow all label directions carefully before making any application.

Pruning infected branches and tips will improve the aesthetic quality of infected trees, but will do little to reduce disease spread since the major source of inoculum is infected seed cones that may remain on the tree.

Avoid pruning or shearing in Christmas tree or other pine plantings when conditions favor infection because of the danger of infection through wounds.

Fungicides^a available for *Sphaeropsis* tip blight control.

Fungicide Common Name	Trade Name	Aerial Application	Professional(P)/ Homeowner(H) Use
Benomyl	Benlate (DuPont)	Yes	P
	Benlate SP (DuPont)	No	P
Bordeaux Mixture	Bordeaux Mixture (ACME)	No	H
Copper Salt	Camelot (Griffin)	No	P
	Liquid Copper Fungicide (Bonide)	No	H
Mancozeb	Protect T/O (Cleary Chem. Co.)	Yes	P
Mancozeb + Copper Hydroxide	Junction (Griffin)	No	P
Propiconazole	Banner MAXX (Novartis)	No	P
	Systemic Fungicide (Ferti-lome)	No	H
Thiophanate methyl	3336 F (Cleary Chem. Co.)	Yes	P
	3336 WP (Cleary Chem. Co.)	Yes	P
	Cavalier 50WSB (Lesco, Inc.)	Yes	P
	Cavalier 4.5 F (Lesco, Inc.)	Yes	P

This list is presented for information only and no endorsement is intended for products listed nor

criticism meant for products not listed. Consult the product label for specific application rates. Read the label carefully before making any application.

