

Cercosporidium Blight of Leyland Cypress and Related Conifers

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INTRODUCTION: *Cercosporidium* blight is a serious disease on a wide range of coniferous plants (Table 1). It was first reported in 1887 on *Sequoiadendron giganteum* [*Sequoia gigantea* (Lindl.) Decne.] in Pennsylvania (Ellis and Everhart 1887). In recent years, Leyland cypress (*X Cupressocyparis leylandii*) and the redcedars (*Juniperus virginiana* and *J. silicicola*) have become particularly important host plants of *Cercosporidium sequoiae* (Ellis and Everh.) Baker and Partridge, due to their increasing popularity as landscape plants, privacy plantings, windbreaks and Christmas trees.

Table 1: Current host range of *Cercosporidium sequoiae* (Alfieri *et al.* 1993; Farr *et al.* 1989; Ridings 1970; Sutton and Hodges 1990; Baker *et al.* 2000).

<i>Chamaecyparis pisifera</i> (Sieb. & Zucc.) Endl,	<i>Juniperus chinensis</i> L.
<i>Cryptomeria japonica</i> D. Don	<i>Juniperus silicicola</i> (Small) Bailey
<i>Cryptomeria japonica</i> var. <i>elegans</i> (Henk. & Hochst.)	<i>Juniperus virginiana</i> L.
<i>Cupressus arizonica</i> Greene	<i>Sequoiadendron giganteum</i> (Lindl.) Buchholz
<i>Cupressus lusitanica</i> Mill.	<i>Sequoia sempervirens</i> (D. Don) Endl.
<i>Cupressus macrocarpa</i> Hartw.	<i>Taxodium distichum</i> Rich.
<i>Cupressus sempervirens</i> L.	<i>Thuja orientalis</i> L.
<i>Juniperus communis</i> L.	<i>Thuja plicata</i> Donn.
<i>Juniperus communis</i> var. <i>depressa</i> Rafin.	<i>X Cupressocyparis leylandii</i> = <i>Cupressus macrocarpa</i> <i>x Chamaecyparis nootkatensis</i>

PATHOGEN: *Cercosporidium sequoiae* (Ellis and Everh.) Baker and Partridge [*Asperisporium sequoiae* (Ellis and Everh.) Sutton and Hodges; *Cercospora sequoiae* Ellis and Everh.; *Cercospora cryptomeriae* Shirai; *Cercospora thujina* Plakidas] is a dematiaceous hyphomycete producing elongate, cylindrical, medium brown, 3 to 5 euseptate, verrucose conidia (Fig. 1). Conidial sizes range from 36-60 microns long, by 5-5.5 microns wide. Brown, cylindrical, fasciculate conidiophores developing from epidermal to subepidermal stromata produce conidia holoblastically from conidiogenous cells located at their geniculate apices (Fig. 2). Conidiophores measure approximately 60-80 microns long and 5-8 microns wide with up to 5 transverse septations dividing their length (Baker *et al.* 2000) and (Sutton and Hodges 1990). When sporulating, this fungal pathogen can be seen through a hand lens or dissecting microscope as greyish-brown tufts on necrotic needles and young twigs.

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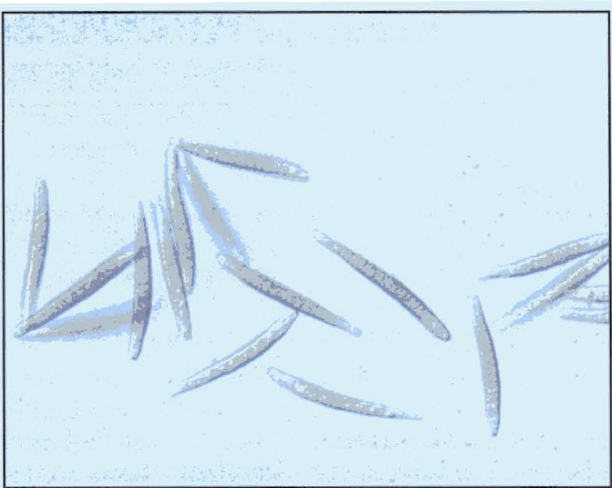


Fig. 1. Conidia produced by *Cercosporidium sequoiae*.



Fig. 2. Stroma and conidiophores of *Cercosporidium sequoiae*.

SYMPTOMS: Symptoms of *Cercosporidium* blight can be observed initially on the infected needles of lower twigs and branches closest to the main stem (Fig. 3). Blighted needles and young twigs develop a rusty brown necrosis that may appear patchy throughout the lower canopy (Fig. 4). As infection continues, this disease generally spreads upward and outward on susceptible plant tissue. On severely infected plants, only the tips of branches may remain green. Infected seedlings and young plants may be killed (Sutton and Hodges 1990). Disease development is favored by warm, humid, wet weather or by overhead irrigation in nursery and greenhouse settings. In Florida, infections may remain active all year long. Conidia of *Cercosporidium sequoiae* may be spread naturally by wind and water splash. Movement of inoculum to susceptible plants within a nursery may also occur by way of contaminated clothing, equipment, resident pets, or birds.



Fig. 3. Patchy necrosis of infected Leyland cypress twigs. Note the green tips of infect twigs - a common symptom of *Cercosporidium* blight.

Development of other foliar diseases of redcedar and Leyland cypress may resemble *Cercosporidium* blight (Ridings 1970). In landscapes, symptoms of *Phomopsis* blight of redcedar first appear on the tips of lower branches. In nursery settings, tip blight may occur at any level in the canopy. The pathogen, *Phomopsis juniperivora* Hahn, produces pycnidia on infected foliage and as conidia are exuded from these structures, tendrils of hyaline spores may be observed (McRitchie and Schubert 1985). Macroscopically, *Phomopsis* pycnidia and spore tendrils are easily differentiated from the greyish-brown tufts comprised of conidiophores and conidia produced by *C. sequoiae*. *Pseudocercospora juniperi* (Ellis and Everh.) Sutton and Hodges can cause a severe blight of *Juniperus virginiana* in the southeastern states, but seems to be less common

than *Cercosporidium* blight and is less active than *C. sequoiae* in nursery settings (Sutton and Hodges 1990). Also, *P. juniperi* can induce the development of juvenile needles on older infected branches unlike *C. sequoiae* (Ridings 1970). Still, microscopic examination of the pathogen is the only accurate way to determine which disease is active.

CONTROL: Effective control of *Cercosporidium* blight depends on combining cultural and chemical controls. Purchase and retain only those stock plants which are visibly free of disease, and destroy stock plants showing *Cercosporidium* blight symptoms. Do not propagate from infected stock plants. Reduce disease initiation and development by limiting overhead irrigation to early morning

hours. Washing contaminated clothing and decontaminating hands with a hand soap disinfectant after handling infected plant material and prior to working with healthy plants will help reduce disease spread. Decontaminating pruning shears and hedging machines with approved quaternary ammonium disinfectants or alcohol may be effective in curtailing the spread of *Cercosporidium* blight.

When combined with cultural controls, fungicides such as Spectro 90 WDG, Chipco 26019, Banner MAXX and Heritage WG should help avoid development of *Cercosporidium* blight, if applied prior to symptom expression or when disease-conducive environmental conditions exist. Fungicide labels are always subject to change and should be reviewed carefully prior to use (Simone *et al.* 1999). **ANY FUNGICIDE SHOULD BE APPLIED**

ACCORDING TO LABEL DIRECTIONS. Plants as well as people and animals can be injured if pesticides are mixed or applied incorrectly.

SURVEY AND DETECTION: Blighted needles on lower twigs and branches and a rusty brown necrosis throughout the lower canopy are suspect symptoms of *Cercosporidium* blight on older containerized plants or established landscape specimens. Young infected plants and cuttings may be completely blighted or killed. Using a hand lens will help determine if a fungus is present on blighted tissue. Observing greyish-brown tufts of fungal mycelium may indicate the presence of *Cercosporidium sequoiae*.



Fig. 4. Hedgerow of Leyland cypress exhibiting rusty brown necrosis of the lower canopy associated with *Cercosporidium* blight.

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