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Prevention and Control of Cercospora Needle Blight Disease in Junipers and Cedars

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Description of the Disease

Cercospora needle blight is a fungus disease commonly found in eastern redcedar and Rocky Mountain juniper windbreaks. The disease is most prevalent in eastern Nebraska where higher humidity and rainfall in late spring and early summer help spread infecting spores. It infects foliage on the lower branches close to the main stem of susceptible trees in the windbreak. Not all trees in a windbreak are equally susceptible – some may be very resistant. Continued infection on a susceptible tree affects the interior foliage on the lower portion of the tree, eventually defoliating the lower branches. Successive seasons of infection will result in dying, dead and bare branches working upward and outward until the tree is killed, usually over five to seven years. Best control is attained when the problem is addressed before the tree is 50 percent defoliated. See NebGuide G87-858, *Juniper Blight Diseases*, for a more complete description of the Cercospora needle blight and other diseases of junipers.

Factors That Influence the Infection and Spread of Cercospora Needle Blight in Windbreaks

Genetic Resistance

Trees vary in their susceptibility to infection by diseases. It's common to see a windbreak where one tree is completely defoliated and dead while the adjacent trees are unaffected. As with any living organism, the different genetics of an individual tree will determine its degree of susceptibility. In a windbreak planting, those trees that are the most genetically resistant to a disease should be the trees on which to concentrate your control efforts to maintain their health and vigor. Trees that show very little to no resistance should be eliminated.

Weather and Soil Conditions

Cool and wet weather in spring through summer increases humidity and prevents the evaporation of morning and evening dew from tree foliage. These conditions are ideal for the spread of fungal spores which infect new growth. Additionally, abundant rainfall will often create excessively wet or waterlogged soils. This is a particular concern on heavy, clay soils that do not drain well, or in low lying sites where water may pond for long periods of time. Cedars and junipers cannot tolerate saturated soils and often suffer root system dieback, weakening the trees and causing them to be more susceptible to the spread and infection of fungal diseases.

Excessive Grass Competition

Smooth bromegrass is a sod forming grass that can stunt the growth of trees in windbreaks. Bromegrass is a cool-season grass, is very competitive for water and nutrients, and usually starts growing in the spring well before the trees break dormancy. Windbreaks that have thick bromegrass established among the trees are often less vigorous and stunted. These stressed windbreaks are much more likely to have problems with Cercospora, as well as other insect and disease problems, than windbreaks that are free from bromegrass. Additionally, when smooth bromegrass is left unmowed in a windbreak, it reduces air circulation around the lower portion of the trees. As a result, tree needles stay damp longer, favoring the spread of fungal spores and increasing the risk of infection.

Windbreak Density

Closely spaced and crowded conditions caused by planting trees too close together in the row or between rows, or by volunteer deciduous trees growing in the cedar and juniper rows, can also cause poor air circulation and higher humidity within the windbreak, much the same as does unmowed bromegrass. When trees start growing into each other, they often become stressed and should be thinned out. Removing infected trees from the original windbreak should not affect the effectiveness of a multi-row windbreak. However, single- or two-row windbreaks may not allow for a drastic thinning and still retain their wind protection ability. In this case, individual tree removal needs to be more selective.

Actions for Controlling Cercospora Needle Blight Disease and Improving the Vigor of Windbreak Trees

Preventative

When designing a new windbreak, consider planting other conifer species besides redcedar or juniper. Alternating pines with cedars or junipers within the same row, or including other evergreens such as spruces, pines or firs (depending on the location of the tree planting) in the windbreak design is a good idea. Because of the wetter conditions, do not plant Rocky Mountain juniper east of Highway 281 in Nebraska. Plant trees at least eight feet apart within the row and 12 feet apart (minimum) between rows. This will allow room for the trees to grow and spread out as they get older. Finally, do not plant smooth bromegrass in your windbreak, and keep smooth bromegrass from encroaching or getting established in the windbreak.

Cultural

Help prevent Cercospora infection by thinning crowded cedar or juniper windbreaks to allow for growing space and better air circulation. Where Cercospora needle blight is already present in the trees, cut and remove from the windbreak trees that are the most strongly affected by the disease. These trees

often have the thinnest crowns. In a maturing multiple-row windbreak where in-the-row spacings are four to eight feet, remove at least 30 percent but no more than 50 percent of the trees. The remaining trees will grow better and be healthier while still providing long-term wind protection. Selectively remove the most heavily infected trees or those with the poorest vigor. Spray smooth bromegrass with a post-emergence herbicide to kill the grass and "release" the trees. This is especially helpful for younger trees that are trying to get established.

Chemical

Cercospora needle blight can be successfully controlled by applying a fungicide to protect susceptible foliage during the infection period. Liquid or wettable powder forms can be used. Adding a "sticker" to the mix with water may increase retention of the fungicide to the tree foliage and improve its protection. A standard strength Bordeaux mixture (4 pounds of copper sulfate and 4 pounds of hydrated lime in 50 gallons of water), or a commercially available liquid copper fungicide are recommended. The Bordeaux mixture also is commercially available as a wettable powder, though for large projects it is generally cheaper to make it yourself by following the steps below:

1. Dissolve the copper sulfate (4 pounds) in 3 gallons of water in a non-metal container.

2. Dissolve the hydrated lime (4 pounds) in another container with 3 gallons of water.

3. While the solution is being agitated, slowly and simultaneously strain the copper sulfate solution and the lime-water mixture into 44 gallons of water.

4. Bordeaux spray deteriorates rapidly and should be used within two or four hours after preparation. One gallon of spray should be enough to cover six to 10 trees that are 10 to 15 feet tall.

For most of Nebraska, an initial application in mid-June, followed by a second application in late July is usually adequate. Additional applications may be necessary if frequent rains occur in August and September. Slightly earlier application dates may be necessary in southern Nebraska. Spray the foliage on the lower two-thirds of trees with minor disease evidence. Spray the entire trees that are more heavily infected. If more than 50 percent of the tree's foliage is infected or dead, it is questionable whether a fungicide application would be able to control the disease.

Combining Cultural and Chemical Methods for Maximized Cercospora Control

The most effective control against Cercospora needle blight is to properly manage the windbreak. Eliminating smooth bromegrass and thinning crowded, stunted trees, combined with fungicide applications during wet months or seasons should control the disease. Severe infestations may require a two-to-three year effort to bring the disease under control. If Cercospora is prevalent in the neighborhood, planting new windbreaks with evergreens other than cedar or juniper is a wise choice. Pines, spruces and firs are possible alternatives. Contact your local Nebraska Forest Service, Cooperative Extension, Natural Resources Conservation Service or Natural Resources District office for advice on tree species to plant.