

Conifer Tree Diseases, Disorders, Insect, and Mite Treatment Options – 2021

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Any management options, including those identifying specific active ingredients, are for the convenience of the reader. The bolded active ingredients mentioned in this publication are those that are most commonly available in pesticides used in South Dakota for Turf & Ornamentals and the inclusion of an active ingredient shall not be taken as an endorsement or the exclusion of one labeled for use a criticism regarding effectiveness. Please read and follow all label instructions and the label is the final authority for a product's use on a particular pest or plant. Not all active ingredients listed are available to the public and some require a commercial pesticide license. It is the reader's responsibility to determine if they can legally apply any product identified in this publication.

Conifer Diseases and Disorders

| Name | Species | Symptoms | Management |
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| Cedar-apple rust - <i>Gymnosporangium juniperi-virginianae</i> , cedar-hawthorn rust – <i>G. globsum</i> . a fungus. | Primarily eastern redcedar, and Rocky Mountain juniper. Some creeping juniper cultivars are also susceptible. Occurs throughout the state. | The reddish-brown galls form on twigs over two years. The mature galls produce orange-gelatinous tendrils (horn) during moist spring weather. Infested cedar stems may become swollen and the branch dies above the infected point. The galls from cedar-apple rust persist for one season while those from cedar-hawthorn rust may last for many years. | Treatments are not applied since the disease usually does little harm to its juniper host and the treatment window too wide. |
| Cytospora canker – <i>Valsa kunzei</i> , a fungus. | Primarily blue spruce. Black Hills spruce may also be infected. Occurs throughout the state and is more common during and following droughts. | The needles on the infected lower branches turn brown in the spring. These branches generally have spots or streaks of bluish white resin (black fruiting bodies may be found beneath the resin patches). The disease is generally limited to branches and is most common in trees over 15 years old. Phomopsis twig blight of spruce presents similar symptoms. | Prune out all infected branches before the spring rains or postpone till summer. Disinfect pruning tools between cuts. Maintain health by mulch and irrigation. Cambistat as a soil drench can reduce symptoms. |

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| <p>Diplodia tip blight – <i>Diplodia pinea</i> (<i>Sphaeropsis pinea</i>), a fungus.</p> | <p>Primarily Austrian pine, but also found on ponderosa, Scots, and mugo pine.</p> <p>Occurs throughout the state.</p> | <p>Symptoms occur in late spring with new shoots and needles becoming stunted. In the fall, small black fruiting bodies may be found at the needle base beneath the papery sheaths and on cone scales.</p> <p>Trees may be infected without showing symptoms until they are affected by drought, hail or other stressors.</p> | <p>Chlorothalonil, copper, mancozeb, myclobutanil or thiophanate-methyl applied just as the buds are opening (usually early May) and repeat just before the needles completely emerge and again in 10 days.</p> <p>Propiconazole can be injected into trunks in late fall to protect the new candles the following spring.</p> |
| <p>Dothistroma needle blight – <i>Dothistroma septospora</i> (<i>Mycosphaerella pini</i>) a fungus.</p> | <p>Austrian and ponderosa pine are the most common species affected by this disease.</p> <p>Occurs throughout the state.</p> | <p>Symptoms occur in late summer or fall and are first seen on the lower crown and older needles. Needles have yellow and tan spots that become red to brown bands with yellow halos. The base of needle remains green though small black fruiting bodies may be seen in the spring erupting through the needle.</p> | <p>Copper or mancozeb fungicides applied as the new growth expands (mid-May) and repeated in late June. Ponderosa and Austrian pines should also receive a third application in mid-July.</p> |
| <p>Elytroderma needle cast – <i>Elytroderma deformans</i>, a fungus.</p> | <p>Ponderosa and lodgepole pine.</p> <p>Occurs in the Black Hills.</p> | <p>Symptoms occur in the spring when groups of year-old needles turn reddish-brown except for the base. Needles usually drop by October. Often confused with Diplodia but can be separated by the brown lesions that often occur in the inner bark of twigs infected with elytroderma. The formation of witches' brooms is a common occurrence.</p> | <p>No effective chemical treatments. Remove heavily infested trees.</p> |
| <p>Juniper blight - caused by one of three fungi: <i>Phomopsis juniper-ovora</i>, <i>Pseudo-cercospora juniperi</i> or <i>Kabatina juniperi</i>.</p> | <p>Phomopsis and kabatina are found on eastern redcedar and Rocky Mountain juniper as well as the Chinese and creeping junipers. Rocky Mountain juniper is most susceptible to kabatina. Cercospora is generally found on eastern redcedar and Rocky Mountain juniper.</p> | <p>Cercospora blight symptoms occur in late summer with the oldest needles on the lower, inside branches turning bronze or red and the symptoms are limited to the interior needles.</p> <p>Phomopsis and Kabatina blight affects shoot tips and these turn yellowish-brown to red, eventually becoming brown.</p> <p>Kabatina symptoms occur on previous season's shoots in April and May with the brown tissue dropping by June.</p> <p>Phomopsis symptoms occur during the growing season from May to July as the newly expanding shoots become infested.</p> | <p>Copper or mancozeb applied three times - mid June, early July and mid-July for Cercospora. Phomopsis can be treated with copper, mancozeb, propiconazole, or thiophanate-methyl at 14-day intervals beginning in mid-May and continuing until growth ceases or dry weather begins.</p> <p>Kabatina is difficult to effectively control as it enters through a wound, typically those caused by insects, and infection occurs in the autumn. Thiophanate-methyl is labelled for treatment of Kabatina</p> |

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| Lirula needle cast – <i>Lirula macrospora</i> , a fungus. | Black Hills spruce is the most susceptible. Rarely found in state. | A common symptom is black bands on 2nd or 3rd year interior needles that late turn purplish-brown and this extends over the entire needle by fall. Despite the name, needecast, the infected gray needles may remain attached for several years due to the fungus disrupting the abscission zone. | A treatment of chlorothalonil when the new needles are about half-size, repeat 3 weeks later. |
| Pine wilt – <i>Bursaphelenchus xylophilus</i> , a nematode. | Scotch, mugo and Austrian pines. Currently found along or south of US Hwy 212. | Symptoms begin in midsummer with foliage yellowing then browning. Infected trees generally die that same fall with the gray needles hanging from the branches. The wood in the dead, infected trees will often be blue-stained. Typically infects trees more than 10 feet tall. | Sawyer beetles carry the nematode to host trees hence remove and burn infested trees before the beetles emerge, usually early April. Infected trees must be cut level to the ground as even a slight stump may harbor the nematode. High value trees can be injected with abamectin in early spring (April). |
| Rhizosphaera needle cast – <i>Rhizosphaera kalkhoffii</i> , a fungus. | Primarily Colorado blue spruce. Common throughout state. | Symptoms occur in midsummer with the previous season needles on lower branches turning yellow then purplish brown by late winter. Small black fruiting bodies with smooth margins emerge from the needle stomates in the spring. | Chlorothalonil , with the first application when new needles are half-size and repeat 2 weeks later. |
| SNEED, (Sudden Needle Drop) <i>Setomelanomma holmii</i> , a fungus. | Primarily Colorado blue spruce. Found across the state. | The 1st and 2nd year needles turn a brown to purple-brown and drop prematurely. One branch may be affected or all the branches. Small dark fruiting bodies can be found on the affected twigs. Positive identification will require a sample to be sent in. | This disease may only be a secondary stressor, present on trees already declining from other stresses. |
| Sirococcus shoot blight, <i>Sirococcus strobilinus</i> , a fungus. | Primarily Colorado blue spruce. Found across the state. | The young shoots are killed, the needles are shed and the tip of the bare shoot droops to form a curve. | Chlorothalonil applications when new needles are 1/2 to 1-inch long (late May) and repeat 3 to 4 weeks later. |
| Stigmina needlecast, <i>Stigmina lautii</i> , a fungus. | Primarily Colorado blue spruce. Found across the state. | Symptoms are like Rhizosphaera needlecast, purpling and loss of older needles, usually beginning with the lower branches but symptoms spread to upper canopy. Small dark fruiting bodies with spider-like margins can be found on the needles. This disease is becoming more common than Rhizosphaera. | Chlorothalonil applied when the new needles are half-size then every 2 weeks through August or until weather turns dry. Treat the entire canopy, not just the lower branches. |

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| Western gall rust – <i>Endocronartium harknessii</i> , a fungus. | Primarily ponderosa and Scotch pine are infected. Primarily in the Black Hills but found across the state. | A round gall on the branches of the tree. The woody gall will produce masses of orange spores each spring. | Resistance varies from tree to tree. The galls may be pruned from small, infested trees but once a tree is infected, repeated infections are very likely. |
| Weir's cushion rust – <i>Chrysomyxa weiri</i> , a fungus | Occurs on both Black Hills and Colorado blue spruce. The disease is more common in the Black Hills but now can be found throughout the state. | Needles on the current year's shoot develop yellow bands by late summer. The following year the infected needles have gold and yellow banding. Tiny yellow blisters also are found on the needles. | Chlorothalonil applied at bud-break and repeated two more times about 10 days apart. |
| Winterburn (browning) | All evergreens but arborvitae, firs and yews are most susceptible. | Needles turning brown or reddish brown. This is desiccation due to the needles transpiring during mild, windy winter conditions when water uptake is limited by cold or frozen stems or soils. | Plant susceptible plants such as yews in areas where they will not be exposed to winter sun or wind. Make sure that evergreens do not undergo moisture stress in late summer/early fall. |
| Winter kill | All evergreens. | Needles turning brown or reddish brown. The inner bark of twigs and branches may also have brownish streaks. | |

Conifer Insects and Mites

| Name | Species | Symptoms | Management |
|---|--|--|--|
| Cedar bark beetle - <i>Phloeosinus spp.</i> | Primarily junipers but some species may infest arborvitae. Found throughout the state. | Foliage on individual twigs wilts, dies, and breaks off, occasionally may affect entire tree. Small holes found in the trunk with galleries beneath. Larvae are white and legless, galleries are like those of elm bark beetles. | Remove and burn infested branches and trees. Treat trees with carbaryl or permethrin by early June. Treat the trunk and all branches larger than 1-inch in diameter. |
| Pine bark beetles – Engraver beetle <i>Ips calligraphus</i> , <i>I. grandicollis</i> and <i>I. pini</i> . Mountain pine beetle <i>Dendroctonus ponderosae</i> and red turpentine beetle <i>D. valens</i> . | Ponderosa pine. All pine bark beetles occur in the Black Hills region. Engraver beetles may be found throughout the state. Mountain pine beetle does NOT occur outside of the Black Hills region. | Engraver beetles: these insects typically infest the canopies of pines so usual symptoms are browning needles in the upper canopy. During droughts, entire trees may become infested and small pitch tubes may be associated with the attack, boring dust is commonly seen. Mountain pine beetle: needles on infested trees turn reddish-brown, boring dust may be found at base of tree. Pitch tubes (small masses of pitch) can be found along the trunk from 3 to 40 or 50 feet for mountain pine beetle attacks. Trees die within a year of attack by mountain pine beetle. The mountain pine beetle epidemic ended by 2016 and there is no need for preventative spraying of pines at this time. Red turpentine beetle: pitch tubes are found on the lower trunk from ground level to 3 to 5 feet. In the Black Hills, infested trees usually are already stressed by construction or fire. | Treat tree susceptible to engraver beetle attack, typically drought-stressed or fire-scarred trees with bifenthrin , carbaryl or permethrin (note these must be labeled specifically for bark beetles) in mid-April about the time apple leaf buds are opening. If appropriate, treat trees for mountain pine beetle attack with the same chemicals but by early June. Note: once a tree has been attacked, it is too late for treatment. No treatments are necessary for turpentine beetles. |
| Pine needle scale – <i>Chionaspis pinifoliae</i> (an armored scale) | All pines and spruce. Found throughout the state. | Look for white flecks on discolored needles. Heavy infestations give the needles a pale “snowy” look. Crawlers are very small (need 10x lens) and are reddish-brown. | Treat with horticultural oil , insecticidal soap (note: oil and soap can discolor Colorado spruce) or dinotefuran or pyriproxyfen one week after Tatarian honeysuckle blooms and another application when smooth hydrangea blooms with a third application in mid-July. |
| Pine sawfly – <i>Neodiprion spp.</i> | Ponderosa, Scots and Austrian pine. | Tufts of dry, straw-like needles or only stubs of needles. Larvae found in clusters on the previous season’s foliage. | Azadirachtin , carbaryl , insecticidal soap or Spinosad when larvae seen, usually late April. |

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| Pine tip moth – <i>Rhyacionia</i> spp. | Ponderosa, Austrian, or Scotch pine. Found throughout the state. | Symptoms are dead and dying new shoots with expanded needles. Brown to orange larvae (3/8") found in pitch masses near the tips of shoots during the summer. | Treat with imidacloprid or permethrin or Spinosad just as needles begin to expand in May. Several generations per year so additional treatments may be needed in late June and July. |
| Pine tortoise scale – <i>Toumeyella parvicornus</i> , a soft scale A related species, striped pine scale <i>Toumeyella pini</i> , is found in the Black Hills. | All pines but most common on mugo and Scotch pines. Striped pine scale is also found on ponderosa pine. | Look for sooty mold, a black powdery substance, on needles and twigs. At the base of the needles there will be small reddish-brown global insect. | Imidacloprid as a soil drench in mid- September. Acephate or malathion applied in late June when mockorange are in bloom and repeated 10 days later to kills the hatched crawlers. |
| Spruce bud scale – <i>Physokermes piceae</i> , a soft scale | All spruce but most common on Black Hills and Norway spruce. Occurs throughout the state. | Small reddish-brown globular scales found in clusters at the base of twigs. They resemble buds so are often overlooked. Often associated with dying lower branches. | Treat trees when lindens begin to bloom (mid-June) with carbaryl or dinotefuran . Imidacloprid can be used as a soil drench in early fall for control the following season. |
| Spruce needleminer – <i>Endothenia albolineana</i> | All spruce, but most common on Colorado blue spruce. Occurs throughout state. | Small clusters of discolored needles webbed tightly together and flattened against the branch. Needles are hollowed-out with small hole near the base. Symptoms usually begin on the lower 1/3 of the tree. | Treat trees with carbaryl or permethrin in early April and late June. Can use high-pressure water to knock the nest off in early spring then rake and burn debris. |
| Spruce spider mite - <i>Oligonychus ununguis</i> | Primarily spruce, especially the dwarf Alberta spruce, but also a problem on junipers. | Yellowish to rusty-brown needles are a common symptom of an infestation and usually do not appear until mid-summer after the mite has become inactive. Silken webs may also be seen lacing across needles. Mites may be detected early in the season by shaking a branch over a white sheet of paper; the tiny slow-moving black or gray-green spots are most likely spruce spider mites. Spruce spider mite is a cool season mite, so it starts becoming active when silver maple leaves are expanding. Another period of activity is when the maples begin their fall color change. | Treat with abamectin , bifenazate , hexythiazox , or spiromesifen , two applications 6 to 10 days apart beginning when silver maples leaves begin to form. Pesticides containing tau-fluvalinate may be also be used for suppression only. Horticultural oil also shows promise (but will remove the blue coloration on spruce). Insecticidal soaps may be used but have limited effectiveness against this mite as soaps rarely penetrates the web and this can also be a problem with oils. |

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| Twospotted spider mite – <i>Tetranychus urticae</i> | Primarily junipers but also on pine and spruce. | <p>Chlorotic and stippled needles are a common symptom of an infestation. Foliage may drop prematurely. Silken webs may also be seen lacing across needles.</p> <p>Mites may be detected early in the season by shaking a branch over a white sheet of paper; the tiny slow-moving black or gray-green spots are most likely spruce spider mites.</p> <p>Twospotted spider mite is a warm season mite so is active during the summer.</p> | Treat with abamectin , bifenazate , hexythiaox , or spiromesifen two applications 6 to 10 days apart in late June and early July. Pesticides containing tau-fluvalinate may be also be used for suppression only. Horticultural oil also shows promise (but will remove the blue coloration on spruce). Insecticidal soaps may be used but have limited effectiveness against this mite as soaps rarely penetrates the web and this can also be a problem with oils. |
| Zimmerman pine moth – <i>Dioryctria spp.</i> | Austrian, ponderosa, and Scotch pine. <i>D. ponderosae</i> found mostly in the Black Hills region while <i>D. zimmermani</i> and <i>D. tumicolella</i> are found statewide. | Infested branches bend or break at the trunk. Masses of reddish pitch near where branch attaches to the trunk. Larvae creamy white for <i>D. ponderosae</i> , <i>D. zimmermani</i> larvae are greenish-brown while <i>D. tumicolella</i> is brownish. Larvae overwinter beneath the bark for only for <i>D. ponderosae</i> , the others hibernate in a web on the bark over the winter | Drench trunk and branches with bifenthrin or permethrin . <i>D. tumicolella</i> and <i>D. zimmermani</i> should be treated during the middle of August and the end of April. Treatment for <i>D. ponderosae</i> is first week in June and repeat 4 weeks later. |