

Conifer Tree Insect, Mite, Disease and Disorder Recommendation - 2014

Dr. John Ball, Forest Health Specialist, South Dakota Department of Agriculture; Extension Forestry,
South Dakota State University, e-mail john.ball@sdsu.edu

Any treatment recommendations, including those identifying specific active ingredients, are for the convenience of the reader. The active ingredients mentioned in this publication are generally 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 in forms available to the general public and some may require a commercial pesticide license. It is the reader's responsibility to determine if they can legally apply any product identified in this publication. **Active ingredients in bold are the most commonly available in garden centers and may be used by the general public. See the publication *Commonly Available Garden Center Pesticide – 2014*.** Others are limited to commercial use.

CONIFER DISEASES AND DISORDERS

| NAME | SPECIES | SYMPTOMS | CONTROL |
|--|---|---|---|
| Cedar-apple rust - <i>Gymnosporangium juniperi-virginianae</i> , cedar-hawthorn rust – <i>G. globosum</i> . a fungus | Primarily eastern redcedar, and Rocky Mountain juniper. Some creeping juniper cultivars are also affected. 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 rarely applied, since the disease usually does little harm to its juniper host, nor are there currently any common available fungicides for homeowner use on this disease. |
| Cytospora canker – <i>Leucostoma 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) though the disease often begins as only a few blobs of reddish resin forming in an small canker. The disease is generally limited to branches and is most common in trees over 15 years old. | Prune out all infected branches before the spring rains or in the summer. Disinfect pruning tools (Lysol Disinfectant) between cuts. Maintain health by mulch and irrigation. |
| Diplodia tip blight – <i>Diplodia pinea</i> (<i>Sphaeropsis pinea</i>), a fungus | Primarily Austrian pine, but also found on ponderosa, Scots, and mugo pine. Occurs throughout the state. | 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. Trees may be infected without showing symptoms until they are affected by drought, hail or other stressors. | Propiconazole, copper or chlorothalonil applied just as the buds are opening (usually early May) and repeat just before the needles completely emerge and again in 10 days. |

| | | | |
|---|--|---|--|
| <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>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 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. 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 control. Remove heavily infested trees.</p> |
| <p>Juniper blight - caused by one of three fungi: <i>Phomopsis juniperovora</i>, <i>Cercospora sequoiae</i> var. <i>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. 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 needles. Phomopsis and Kabatina blight affects shoot tips and these turn yellowish-brown to red, eventually becoming brown. Kabatina symptoms occur on new growth in April and May with the brown tissue dropping by June. Phomopsis symptoms occur during the growing season from May to September.</p> | <p>Copper applied three times - mid June, early July and mid July for Cercospora though this is not a common disease. Phomopsis can be treated with copper, mancozeb or propiconazole at 14-day intervals beginning in mid May and continuing until growth ceases or dry weather begins. No effective control for Kabatina as it enters through a wound, typically those caused by insects, and infection occurs in the autumn.</p> |
| <p>Lirula needle cast – <i>Lirula macrospora</i>, a fungus</p> | <p>Black Hills spruce is the most susceptible. Rarely found in state.</p> | <p>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.</p> | <p>A treatment of chlorothalonil in mid-May followed by a second in two weeks.</p> |

| | | | |
|--|--|--|---|
| <p>Pine wilt – <i>Bursaphelenchus xylophilus</i>, a nematode</p> | <p>Scotch, mugo and Austrian pines. Found mostly south of US Hwy 14 and primarily in the southwestern part of the state.</p> | <p>Symptoms begin in midsummer with foliage yellowing then browning. Infected trees generally die later 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 15 years old.</p> | <p>Sawyer beetles carry the nematode to host trees hence remove and burn infested trees before the beetles emerge, usually early May. 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 by a commercial service.</p> |
| <p>Rhizosphaera needle cast – <i>Rhizosphaera kalkhoffii</i>, a fungus</p> | <p>Primarily Colorado blue spruce. Most common East River.</p> | <p>Symptoms occur in midsummer with the previous season needles turning yellow then purplish-brown by late winter. Small black fruiting bodies emerge from the needle stomates in the spring.</p> | <p>Chlorothalonil, with the first application when new growth is ½ inch long and the second about three weeks later.</p> |
| <p>SNEED, (Sudden Needle Drop) <i>Setomelanomma holmiii</i>, a fungus</p> | <p>Primarily Colorado blue spruce, may be found across the state.</p> | <p>The 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. However, positive identification will require a sample to be sent in.</p> | <p>Chlorothalonil applications when new growth begins to expand in spring and repeated two weeks later. This disease may only be a secondary stressor, present on trees already declining from other stresses.</p> |
| <p>Sirococcus shoot blight, <i>Sirococcus strobilinus</i>, a fungus</p> | <p>Primarily Colorado blue spruce, may be found across the state.</p> | <p>The young shoots are killed, the needles are shed and the tip of the bare shoot droops to form a curve.</p> | <p>Chlorothalonil applications when new needles are ½ to 1-inch long (late May) and repeat 3 to 4 weeks later.</p> |

| | | | |
|---|---|--|--|
| Stigmata needlecast, <i>Stigmata lautii</i> , a fungus | Primarily Colorado blue spruce, may be found across the state. | Symptoms are similar to Rhizosphaera needlecast, purpling and loss of older needles, usually beginning with the lower branches. Small dark fruiting bodies can be found on the needles. A sample must be sent in to determine whether the disease is Stigmata or Rhizosphaera. | Chlorothalonil applied when the new growth begins to expand then every 10-days through August. |
| Western gall rust – <i>Endocronartium harknessii</i> , a fungus | Primarily ponderosa pine, Scots and mugo pine can be 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 arborvitaes, 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 | CONTROL |
|---|---|---|--|
| Cedar bark beetle - <i>Phloeosinus spp.</i> | Primarily junipers but some species may be found infesting arborvitae. | 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 similar to 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 – pine engraver beetle <i>Ips</i> and mountain pine beetle <i>Dendroctonus ponderosae</i> | Ponderosa pine. Both insects occur in the Black Hills region. Mountain pine beetle does NOT occur East River. <i>Ips</i> species may be found throughout the state. | 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 30 or 40 feet for mountain pine beetle attacks. Trees die within a year of attack by mountain pine beetle. Pine engraver beetle: this insect typically infests the canopies of pines so usual symptoms are browning needles in the upper canopy. During drought, entire trees may become infested; however pitch tubes rarely are associated with the attack, boring dust is commonly seen. | Treat tree susceptible to pine engraver beetle attack, typically drought-stressed or recently transplanted 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. Treat trees vulnerable to mountain pine beetle attack with the same chemicals but by early June. Note: once a tree has been attacked, it is too late for effective control. |
| Pine needle scale – <i>Chionopsis pinifoliae</i> , an armored scale | All pines and spruce. | Look for white-flecks or brownish foliage. Heavy infestations give the needles a pale “snowy” look. Crawlers are very small (need 10x lens) and are reddish-brown. | Treat with 2% horticultural oil or insecticidal soap as these do little harm to the natural enemies of scales. Acephate is also effective but harms natural enemies. All applications should be made beginning in late May (about one week after Tartarian honeysuckle blooms) and another application 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. | Carbaryl or insecticidal soap when larvae seen, usually late April. |
| Pine tip moth - <i>Rhyacionia spp.</i> | Ponderosa, Austrian or Scotch pine. Generally occurs only in southeastern South Dakota. | 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 , spinosad, or tebufenozide 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 | All pines but most common on mugo pines. | 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. 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 generally East River. | 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 early July. Can use high- pressure water to knock the nest off in early spring then rake and burn debris. |

| | | | |
|---|--|---|--|
| <p>Spruce spider mite - <i>Oligonychus ununguis</i></p> | <p>Primarily spruce, but also a problem on junipers.</p> | <p>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.</p> | <p>Treat with 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. Horticultural oil (2%) 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.</p> |
| <p>Zimmerman pine moth – <i>Dioryctria spp.</i></p> | <p>Austrian, ponderosa and Scots pine. <i>D. ponderosae</i> found mostly West River while <i>D. zimmermani</i> is found only East River. <i>D. tumicolella</i> may be found statewide but mostly West River.</p> | <p>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 only for <i>D. ponderosae</i>.</p> | <p>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 four weeks later.</p> |