

# Guide to Forest Insects and Diseases<sup>1</sup>

## Damage confined to leaves, buds and shoots:

**Defoliating Insects.** Affected needles with a reddish cast, insects or signs of their feeding present. Needles and buds are partially or totally consumed. Caterpillar or beetle-like insects usually present on foliage in early spring or summer. Leaves chewed, mined, skeletonized or webbed. Viewed from a distance, affected trees have a brownish or yellowish cast. -----7

**Sap-Sucking Insects and Mites.** Curled or discolored foliage. Whole insects or cast skins and small (1-2 mm long). Cottony tufts, galls, and honeydew sometimes present. -----37

**Galls Caused by Insects.** Abnormal, misshapen, swollen or spherical growth on needles or leaves, or in the bark or twigs. Insect larvae or frass present inside the galls. -----52

**Bud and Shoot Insects.** Malformed, enlarged buds on young growth, commonly encountered on terminal buds of branches. In some cases, multiple leaders result. -----100

**Foliar Diseases (including needles).** Foliage yellow, brown, or spotted (insects largely absent); orange, yellow, or black pustules or other fungal fruiting bodies present. Fruiting bodies are very small. -----113

**Abiotic Disorders.** Foliage or buds yellowing, browning, or dying after exposure to early or late frosts, air pollutants, drought, or winter damage; entire crown may show signs of stress or die as a unit; cause of the damage may not be apparent but signs of insect or disease agents are generally absent. -----204

<sup>1</sup> Adapted from “Insects and Diseases of Alaskan Forests” (Holsten et al., 2001)

## Damage primarily on cones and seeds:

**Galls Caused by Insects.** Abnormal, misshapen, swollen, or spherical growth in the cones or seeds. Insect larvae or frass present inside the galls. -----99

**Moths and Midges.** External evidence of insect activity is difficult to see. Galleries are small in diameter and are commonly found within the cone axis, cone scales, and seeds. Boring dust is reddish to light brown and fine. -----94

**Cone Rust.** Enlarged cones on Chihuahua pine, with orange spores under papery outer covering. -----175

## Damage confined to branches and stems:

**Witches' Brooms.** Prolific sprouting of adventitious buds on branches infected with mistletoe or fungi.

Needles retained on those caused by dwarf mistletoe. ----177

Needles cast on those caused by fungi, only to reappear the next year. -----123

**Cankers and/or Animal Damage.** Large patches of dead bark on live trees, sometimes exposing wood; often on main tree bole; fruiting bodies of fungi may be present. -----147

Strips or sections of bark removed by animals, fungi follow wounding. -----213

**Stem Decay.** Wood is hollow, pitted, spongy, breaks into crumbly pieces, or is stained in color. Fruiting bodies of fungi may be present. Older trees, or those physically injured in the past usually affected. -----132

**Bark Beetles.** Insect activity characterized by boring dust and/or resin on bark and around base of trees. Galleries commonly found under bark and usually less than 0.6 cm in width, at times into the sapwood, rarely penetrating the wood. Boring dust reddish to light brown and fine. -----55

**Wood Borers.** Larval borings are usually granular. Galleries penetrate into the sapwood and, at times, into heartwood of weakened or recently killed trees or logs. -----87

**Abiotic Disorders.** Globe-shaped, large, woody growths or swellings on branches or stems of ponderosa and various hardwoods (burls). -----212

**Damage confined to roots and lower stem:**

**Root Diseases.** Entire crown shows signs of stress (yellowing foliage, needle or leaf loss, stress cone crop) or dies as a unit; wood or root tissues are killed or decayed and may have fungal structures; fruiting bodies of fungi may be present at base of tree or on the ground nearby; trees may die standing, snap at the lower bole, or uproot with a characteristic small root ball and extensive decay in the broken stubs of primary roots; fallen trees in disease centers tend to lie in a random pattern. -----189

**Windthrow.** Individual or patches of trees exhibit stem breakage or uprooting with a large soil plate and primary roots attached; fallen trees typically lie parallel to one another in a similar direction of the windstorm; signs of disease agents may be present (e.g. root disease). -----209

**Noninfectious Disorders.** Dead and dying trees found in small or large groups, not usually solitary trees. Entire crown of tree shows signs of stress and dies as a unit similar to damage by root disease. Fruiting bodies of pathogenic fungi usually absent, but weakly pathogenic and saprophytic fungi (those restricted to dead tissues) and secondary insects may be present. -----204