

Management

Dwarf mistletoe can be managed by removing all host trees during harvest and altering forest renewal practices. Management practices vary greatly depending on the tree, age of the stand, species of dwarf mistletoe, severity of infection, geographic location and economic considerations.

When harvesting heavily infected forests, both commercially desirable and undesirable host trees should be cut down. Remove trees where residual infections border the stand or plant an alternate non-host species in a 20 metres (66 feet) wide buffer adjacent to the infected area. The buffer should be cleared of host trees every five years to prevent spread of the disease.

Fire is dwarf mistletoe's greatest natural enemy but often it does not burn everything, leaving infected trees behind. These residual infections should be removed soon after the fire to prevent infection of young trees. Remove infested trees mechanically or by applying herbicide.

On high-value sites, such as plantations and recreational areas, lightly infected trees can be saved by removing infected branches.



Dwarf mistletoe killed jack pine trees



Opening in the forest caused by mistletoe

Dwarf Mistletoe

Destructive Tree Disease



For more information on dwarf mistletoe of conifers call:

The Tree Line

204-945-7866
or Toll Free 1-800-214-6497

or write:

Manitoba Conservation

Forestry Branch
200 Saulteaux Crescent
Winnipeg, Manitoba R3J 3W3

manitoba.ca/conservation/forestry



Witches' broom on spruce

Symptoms and Damage

The most obvious sign of the disease is large swellings and abnormal growth of infected branches called witches' brooms. Another sign is aerial shoots of the dwarf mistletoe plant protruding from infected branches.



Aerial shoots on spruce

This parasitic plant removes nutrients from the tree, starving and eventually killing the portion of the branch growing beyond the point of infection. The brooms are heavy and often break off when they die leaving the tree susceptible to other diseases. Heavily infected forests contain deformed, stunted, dying and dead trees.

Dwarf mistletoe causes extensive damage. It reduces both the quantity and the quality of commercial timber. The parasite infects trees of all ages, causing reduced growth, deformity and eventually death. Seedlings and saplings are killed more rapidly by the disease than older trees. The quantity and viability of seed produced by infected trees is reduced.

Dwarf mistletoes, *Arceuthobium* spp. are parasitic plants that infect coniferous trees. Two species of dwarf mistletoe occur in Manitoba. Eastern dwarf mistletoe, *Arceuthobium pusillum*, is a parasite of black spruce, white spruce and, to a lesser degree, tamarack larch. Lodgepole pine dwarf mistletoe, *A. americanum* is a parasite of jack pine in Manitoba. Both species are widespread throughout the forested regions of the province.



Witches' broom on pine

Heavily infected forests with an abundance of large witches' brooms, together with dead and dying trees, are a source of fuel for fires. Also, in high-use recreation areas, numerous heavily infected trees are unsightly and a serious safety hazard.

Life History

Dwarf mistletoe is a parasitic flowering plant that gets the majority of its nourishment from its host through a well-developed root system. This root system grows underneath the bark and the plant appears as aerial shoots on infected branches. These short shoots are olive green on spruce and greenish-yellow on jack pine. There are both male and female plants.

Pollination of the female flower occurs in late spring. Berries are formed on the ends of stalks on the female plant. Each berry contains a single green coloured seed. The berries mature between mid-August and mid-September. Internal pressure builds and causes



Aerial shoots on pine

the seed to be forcibly discharged up to 18 metres (60 feet). The seed is covered in a sticky substance called viscin, which allows it to adhere to wherever it lands. The seed will only survive if it has landed on the needles or bark of a living host tree. Seed dispersal occurs in the same year as pollination on spruce and in the year following pollination on jack pine.

Seed germination begins in May. A root-like structure grows out of the seed and penetrates the surface of the host tree. A root system develops underneath the bark. It takes two to three years to produce aerial shoots and four or five years to produce mature seed. The branch swells at the point of infection and the formation of a broom begins. The dwarf mistletoe plant is perennial on the host tree but dies when the tree dies.



Dwarf mistletoe berries