



Cornell University



Fir Broom Rust

Melampsorella caryophyllacearum (Schröt)

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Introduction

Over the past few years fir broom rust has become a problem for some Christmas tree growers in Upstate New York. As the acreages of Fraser and other firs increase we are likely to see more of this disease. In the worst cases in NY, fir broom rust caused distortions that made hundreds of trees un-marketable. However with monitoring and early detection, growers can control this disease.

Symptoms and Signs

Fir broom rust gets its name from the proliferation of shoots on affected fir stem ends, which leads to broom-like growths. These growths may occur randomly anywhere on the tree but are most likely to show up around the base of the tree first. Their appearance can disfigure landscape trees and leave Christmas trees unsalable.

The affected fir needles on the brooms are stunted and curled downward. An orange, rusty coloration (masses of spores) may be noticed on the lower needle surface in mid-summer. These fungus-infected needles are shed during the fall and winter. In the spring new needles which are also stunted and curled grow from the infected shoots causing the brooms to grow larger each year.

Host Plants:

Primary: Only true firs (*Abies* sp) are affected by this disease including Fraser (*A. fraseri*), balsam fir (*A. balsamea*), white fir (*A. concolor*) and grand fir (*A. grandis*). The Douglas fir (*Pseudotsuga menziesii*) is not susceptible.

Alternate: Chickweeds (*Cerastium* and *Stellaria* species). Both the common (*C. vulgatum*) and mouseear (*S. media*) chickweeds may become infected by this fungus.

Disease Cycle:

The fungus that causes this disease (*Melampsorella caryophyllacearum*) also infects chickweeds. In fact, for the fungus to complete its life cycle, it must move from chickweed to fir and back.

In the spring, fungal spores produced on infected chickweed are carried on air and can infect newly emerging stems and needles of fir trees. The infected fir branches do not show symptoms until the beginning of the next growing season when infected shoots will emerge from these branches. In the summer spores from those shoots infect chickweed, continuing the cycle. However, once infected, branches remain diseased even without chickweed present.

Disease Management:

To break the life-cycle and control the spread of this disease, eradicating the chickweed is essential. Commercial growers should look for chickweed in the groundcover, between the rows and throughout the planting so it can be controlled where necessary. The spores of this fungus may also move short distances into the field from chickweed in nearby hedgerows and vacant land so these areas should also be checked. If chickweed is present in areas where it cannot be controlled, consider growing a tree species other than firs in these areas.

Pruning the affected branches of the fir trees back to the healthy portion will be helpful. It is important to remember that those brooms that are missed will grow into bigger brooms each year. So even after chickweed is controlled and new infections have stopped, missed brooms may be noticed in future years.

At this point there is no information available on the effectiveness of fungicides for control of this disease.

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Figure 1. Trees removed due to disfiguration caused by this disease. Note the lower branches are most heavily infected.



Figure 2. Small, easily missed broom in the interior of the tree.



Figure 3. Sporulation seen in the fall on the underside of needles.