

FOREST AND SHADE TREE PESTS

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Needle Rust of Pines

SIGNIFICANCE

Needle rusts, tree diseases caused by various species of the fungal genus *Coleosporium*, affect most species of pine throughout Florida. Although needle rust occurrences are widespread, and often alarming to individuals encountering them for the first time, their impact on a large scale is negligible. Pines infected with needle rusts rarely die, and generally recover rapidly. In the forest, needle rusts are of no consequence, usually occurring only on the lower branches of susceptible trees. Concern may be warranted, however, when severe infections occur on seedlings which, because of their small size, may be more vulnerable to diseases which destroy essential foliage. Ornamental trees which are valued for their aesthetic qualities may suffer losses in value and/or merchantability due to the discoloration and destruction of needles resulting from heavy needle rust infections.



Young pine seedling exhibiting moderate level of needle rust infection.

RECOGNITION

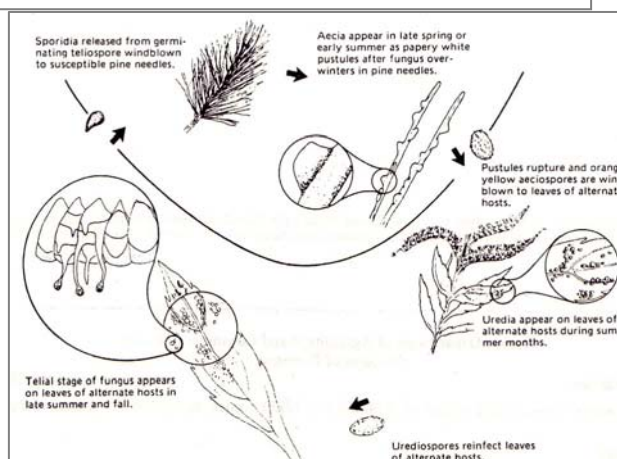
Infections are first noticed from spring through early summer when small, papery white pustules, called aecia (Fig. 1. A & B), begin to emerge on infected pine needles. Each aecium soon fills with yellow-orange spores that are later released into the air in small puffs or clouds when the needles are jarred or shaken in the wind (Fig. 1. C). Severe infections may give trees a "frosty" or "snowy" appearance. Infected needles eventually turn brown and fall from the tree.



Fig. 1. A) Pine needle lesions indicating developing aecial pustules. B) Fully developed aecial pustules. C) Ruptured aecial pustule releasing aeciospores.

INFECTION BIOLOGY

The spores produced on pines in the spring do not infect other pines, but as is typical of most rust fungi, they initiate infections on other plants referred to as alternate hosts. Common alternate hosts for *Coleosporium* spp. include goldenrods, asters, sunflowers, morning glories, and others, depending upon the particular species of *Coleosporium* involved. A different spore type is produced later in the summer on the infected leaves of the alternate



Generalized life-cycle of needle rust fungi.

hosts. These wind-borne spores complete the disease cycle by initiating new infections in pine needles in the late summer and fall. These infections remain undetected during the winter, only becoming evident when the aecial pustules are produced the following spring. Needle rust is extremely variable, both with respect to location of occurrence, and severity, during any given year. Needle rust incidence may remain low and nearly undetectable for many years, then suddenly appear one year at widespread and alarming levels. Factors which may account for this variability include rainfall/temperature/humidity patterns, populations of alternate hosts, and genetic diversity within the pine population.

CONTROL

Control of needle rusts is seldom necessary or cost-effective. If the situation does warrant control, fungicidal protection of susceptible pine needles with an appropriate fungicide in late summer and fall may be useful. Eradication of the alternate host(s) growing near susceptible pines, and location of pine plantings away from heavy populations of the alternate host(s) are also prudent control practices.

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