

Yellow spruce needle rust looks bad, but usually not fatal

by Ed Berg



Spruce tree with rust needles. Credit U.S. Forest Service

I have been seeing lots of bright yellow foliage on spruce trees this summer. The yellow color is due to spores of the spruce needle rust (*Chrysomyxa ledicola*), a fungus which infects spruce needles. We have outbreaks of this showy fungus every few years.

In the spring this fungus sets up shop in pustules on spruce needles, which release the yellow spores in mid-summer. The fungus infects only the current crop of new needles, so it is concentrated at the tips of branches where new needles are produced.

Like many rusts, the spruce needle rust has a two-host life cycle, where the rust goes back and forth between alternate hosts. The alternate host in this case is Labrador tea (*Ledum*), which is a common shrub in wet areas. Hence most of the spruce needle rust occurs in more or less wet areas, with plenty of Labrador tea.

The yellow spores on spruce needles cannot spread and infect additional spruce needles; they can only in-

fect Labrador tea leaves, so there is no point in cutting off yellow branches to save other trees. The yellow spores can however produce rusty patches on Labrador tea leaves. The rust overwinters on Labrador tea, and in the spring the rust produce a second kind of spore which cycles back to infect the tender young needles on spruce trees.

All species of spruce in this area—black, white, Lutz, and Sitka spruce—can have spruce needle rust. There are about 30 species of this kind of rust (*Chrysomyxa*) worldwide, affecting a wide variety of conifer trees, with alternative hosts in the heath shrub family (*Ericaceae*).

I remember the first time that I saw this yellow fungus back in the 1970s growing on Sitka spruce in my front yard. It was pretty alarming, sort of like seeing a small fire starting in your forest. How far will it go? Will it kill all my trees? As I recall, I contacted the Co-op extension and was told not to panic. The rust only occurred on a few branches. It was gone the next year and never reappeared, and the trees suffered no permanent damage.

A few weeks ago I was flying over an island in Naknek Lake in Katmai National Park, and could see that many acres of trees were bright yellow with the rust. On the Kenai this summer I have seen the rust from the Soldotna-Kenai area, south to Kachemak Bay, but never in great abundance.

As always with this kind of outbreak, I wonder what prevents it from simply running to completion, and affecting every possible host, every year, until the supply of hosts is simply exhausted. There are some reports in the literature that needle rust outbreaks follow a cool damp spring, which would promote the spread the spread of spores from Labrador tea to spruce needles. April and May were basically warmer than average, and not especially wet, according to data from the Kenai and Homer airports, so the cool damp spring theory doesn't seem to apply, at least for this year. Here's yet another unsolved mystery for the forest detective!

There is a nice article and photos by Forest Service plant pathologist Paul Hennon on the Web at: <http://www.fs.fed.us/r10/spf/fhp/leaflets/Sprneerus.htm>

Ed Berg has been the ecologist at the Kenai National Wildlife Refuge since 1993. Ed will teach his one-credit Cycles of Nature course at the Kenai Peninsula College in Soldotna and Homer, beginning Septem-

ber 11 and 13, respectively. Previous Refuge Previous Refuge Notebook columns can be viewed on the Web at <http://www.fws.gov/refuge/kenai/>.