

Research News

Rust Mite Revisited

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An outbreak of rust mites (*Nalepella* spp.) in Fraser fir Christmas trees in western North Carolina in 1995 prompted me to write an article in the Winter 1995 issue of LIMBS & NEEDLES (Vol. 22, No. 5) spotlighting rust mites. As many of you know, we have had an even more serious outbreak in 1997. In the northern mountains, an estimated 10 to 15% of the Fraser fir Christmas tree fields required treatment for the rust mite in 1997 to avoid significant damage. I think its time we talked again about rust mites.

The crocuses of the insect world. That's right. Rust mites might be the first signs of spring! Rust mites like the same kind of spring weather we all like — warm, sunny days that don't get too hot. In 1997, we had a long spring. The weather was warmer than normal in January, February, and March followed by cooler than normal weather in April and May. Essentially, we had almost no winter and five months of spring. This allowed rust mites to become a serious problem in both the foothills and mountains.

Rust mites reproduce very quickly in response to favorable weather conditions. It doesn't take long for their numbers to build up. In one field in Ashe County monitored by Agricultural Pest Management, Inc., rust mite numbers increased from 4 mites per needle to more than 50 per needle in a couple of weeks. This pest can catch you unaware, if you're not regularly scouting.

Rust mites: Not a problem every year. We don't have problems with rust mites every year in Christmas trees. In hemlocks grown in the foothills, rust mites are a perennial problem because temperatures are milder at the lower elevations. In 1997, rust mite numbers were high enough in hemlocks in mid-February to warrant treatment. This is four to six weeks earlier than normal. Trends in the foothills can be indicators of potential problems in Christmas trees. County extension agents in the mountains are kept informed of developing problems each year to help you know when you need to start worrying.

However, just because your county agent may send out a rust mite pest alert, doesn't mean you should start spraying. It means you should start scouting. Rust mite numbers vary greatly from field to field because of differences in elevation, aspect, air drainage, pesticide use, and shading. Always assess each field before making the decision to apply a pesticide.

Finding the mite. Once you get used to looking for rust mites, they aren't hard to find. When the numbers are high, you can see them with your naked eye. Reaching that level of confidence in your ability to scout isn't easy, though. Rust mites are very small requiring magnification such as a hand lens (7X to 15X) or dissecting microscope (30X) to see them clearly. It helps to look at rust mites first through a dissecting scope before trying to find them with a hand lens. That way, you can get an idea of the size of pest you are looking for.

Rust mites have a wedge-shaped body with only four legs on one end. Other types of mites, such as spider mites and predatory mites, have eight legs at maturity. Rust mites can be cream-colored, tan-colored, or orange. They are similar in color and size to pollen.

Confusing rust mites with other problems. It's important to learn to find rust mites because there are other problems that can be confused with them. Nutrient deficiencies can also cause off-colored foliage and premature needle drop. Another problem common in the spring is sooty mold, a black colored fungus that lives on the surface of needles. Sooty mold grows on honey dew, the excrement of aphids. If balsam twig aphids or *Cinara aphids* are bad in trees, the foliage may look almost black with sooty mold. This can be confused with rust mite damage.

The way to distinguish between these problems is to find the rust mites on the foliage. In some cases, rust mites may have already died out. However, a trained scout can distinguish rust mite damage by examining the needles with a hand lens. Rust mite feeding makes the top of the needle look like someone had rubbed it with sand paper.

Rust mite damage. Actually, it takes quite a few rust mites to cause needle damage. Just one or two mites per needle is not enough to worry about.

The treatment threshold is reached when most of the trees have mites on them, and mite numbers on individual needles have reached a certain level. For a pesticide to be necessary, both of the following criteria need to be met. These numbers are determined by looking at a single shoot per tree. Using a hand counter and a scouting form can help you keep track of these numbers.

1. At least 80% of the shoots have mites on them. Usually, treatment is not necessary until most of the trees have a few mites on them. Calculate the percent incidence by dividing the number of shoots having mites by the total number of shoots examined.

2. At least 8 mites are present on a single needle. For the treatment threshold to be reached, only one shoot examined in a block has to meet this criterion. To reach this sum, add the number of mites on both the front and back of a given needle.

Rust mite control. Rust mites aren't difficult to control. Growers in Avery County achieved good results with air-blast, mist blowers or very light sprays with hydraulic sprayers and a hose. The materials that have given the best control in the past are dimethoate and Joust.

Predictions for 1998? It's impossible to predict if rust mites will be a problem this spring. We've had some mild weather in January, which is a good start to a rust mite outbreak. So, watch the weather, keep in touch with your county extension agent and if problems start to develop, start scouting!

For more information on rust mites in Christmas trees, see Christmas Tree Note #34 — RUST MITES IN CHRISTMAS TREES available at your county center of the North Carolina Cooperative Extension Service.

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