

## **Spruce Spider Mite**

*Oligonychus ununguis* (Jacobi)

Acari: Tetranychidae

Sidebottom, J. R. 1995. The spruce spider mite in Fraser fir. Christmas Tree Notes. Raleigh, NC: *N.C. Agricultural Extension Service, North Carolina State University*; 4 p.

([http://www.ces.ncsu.edu/nreos/forest/xmas/ctn\\_029.html](http://www.ces.ncsu.edu/nreos/forest/xmas/ctn_029.html))

**Objective:** To provide a sequential sampling system for estimating *O. ununguis* densities and timing insecticide applications before significant damage occurs.

**Abstract:** The spruce spider mite, *Oligonychus ununguis* (Jacobi), can be a significant pest of Fraser fir, *Abies fraseri* L., Christmas trees in western North Carolina particularly on windy ridges, southern exposures, and during periods of drought. Infested needles become yellow-spotted and webbed together after which time they turn brown and fall prematurely from infested trees. Growers often depend on pre-budbreak insecticide applications for control of the balsam woolly adelgid, *Adelges picea* (Ratzeburg), to also provide season long *O. ununguis* control. However, mite populations rebound quickly following spring applications and subsequent treatments may be warranted.

A detailed sequential sampling system for estimating *O. ununguis* populations and damage was developed. This method was derived from previous sampling methods developed by McGraw and Hain (1979). The economic thresholds for control decision-making were based on the percentage of trees that have mites, and varied depending on tree value and cost of control. If trees are greater than 1 m tall and 40% are infested, then control was warranted. As trees approach marketability, economic thresholds decreased accordingly. If threshold levels are not reached, the author indicates when scouting should resume based on a detailed set of criteria.

**Sampling Procedure:** The rigid block scouting method is used for sampling *O. ununguis* populations. Enter the block two to four rows from one corner and record that location on the scouting form so that on your next visit you will be able to initiate surveys one to two rows above or below this point. Walk the full length of the row, scanning from side to side up to five rows in each direction depending on tree size and visual obstructions. When you encounter an off-color, symptomatic tree go to that location to sample, but return to your original row to continue sampling. When you reach the end of the row, step over 6 to 10 rows and continue this pattern until you have covered the entire block.

Scout all Fraser fir stands from the year after planting through harvest to determine if mite numbers are great enough to cause damage. The number of

times a field is scouted depends on tree size, mite prevalence, and prevailing weather conditions. For trees that do not receive a spring insecticide treatment for *A. picea* control, mite scouting should begin in mid-April. For trees that receive spring treatment, scouting efforts should begin in early June. Continue scouting until the first hard frost.

To examine for *O. ununguis*, pull a single shoot of the most current growth from the suspect tree and look for the presence of mites, mite eggs, or mite damage with a magnifying lens. Sample the majority of shoots from the bottom 61 cm of the tree, but also check a few shoots near the top of each tree. Look at small shoots from inside the tree canopy since this is where *O. ununguis* is most often found.

If any mites or eggs are found, then count the shoot as infested, and discontinue sampling as there is no need to count the number of mites or eggs. If no mites or eggs are found, count it as uninfested. Limit sampling to one shoot per tree. If you walk 15.5 m without seeing any trees that have symptomatic damage, pull a shoot from a tree at random and continue an additional 9 m before sampling another tree. Continue sampling at least one tree every 15-18 m and at least 37 shoots per hectare.

Calculate the percentage of infested shoots. The economic thresholds for *O. ununguis* are simply based on the percentage of trees that have mites, but vary depending on tree value and cost of control. The following thresholds are provided:

Size of the Tree	Economic threshold (ET)
1. Less than waist high	40%
2. Waist high to year before sale	20%
3. Year of sale	10%

If damage has not reached threshold levels, then scouting should resume according to the following criteria:

1. If no mites or eggs are found and no damage is seen, return in 6 to 8 weeks.
2. If less than 10% of the shoots have mites or eggs, or if new *O. ununguis* damage has occurred since the last sample, return in 4-5 weeks.
3. If greater than 10% of the shoots have mites or eggs, but it is less than the treatment threshold, return in 2 weeks.
4. If there are greater than 10 days of hot, dry weather, return in less than 2 weeks. Mite reproduction and life spans increase rapidly under these conditions.

5. If trees are marketable, scout at least once a month.

Hot spot scouting can be used during hot, dry periods to determine how the weather is affecting mite activity in problematic areas. The hot spot becomes a representation of the rest of the block, and is identified through previous scouting methods. If mite activity is increasing in these hot spots, then go back and resurvey the entire block using the rigid block scouting method.

A sample scouting form for all Fraser fir pests is available through your local county extension office. For more information on scouting for mites, see the video, *Detection and Control of the Spruce Spider Mite*, which is available for the North Carolina Agricultural Extension Service.

**Reference:**

McGraw, J. R.; Hain, F. P. 1979. Spruce spider mite sampling system. Forest Res. Note. Raleigh, NC: *N.C. Agricultural Extension Service, North Carolina State University*; 6 p.