

## EVALUATION OF MITICIDES FOR EFFECTIVE CONTROL OF SPRUCE SPIDER MITE<sup>1</sup>

The spruce spider mite, *Oligonychus ununguis* (Jacobi), can discolor, degrade or kill conifers and narrow-leaf evergreens of any age. It is considered to be the most destructive spider mite of conifers. Host range for the spruce spider mite (SSM) is quite extensive, including: *Abies*, true fir; *Chamaecyparis*, false cypress; *Juniperus*, juniper; *Picea*, spruce; *Pinus*, pine; *Pseudotsuga*, Douglas fir; *Sequoia*, redwood; *Thuja*, arborvitae; *Tsuga* hemlock

The adult SSM is very small and usually dark reddish in color, while the young larvae are a light pinkish to greenish color. Both the larvae and adults feed on leaves (needles) and young stems, destroying the plant cells. This results in yellow to brown spotting or mottling of the needles, referred to as "stippling".

**With severe infestations the needles soon fade to brown, drop prematurely, and a fine, silken webbing can cover the needles and small stems.**

It is important to monitor mite infestations because natural enemies and climatic conditions may keep the populations at low levels. Examine narrow-leaf evergreens in winter for overwintering eggs. This provides early detection of the mite, its distribution and overwintering population. Watch closely for egg hatch and continue to monitor the pest throughout the growing season and into the fall.

Miticides are used to control SSM and avoid aesthetic or economic damage. Two very important aspects of chemical control are timing of application and complete coverage sprays. With as many as seven overlapping generations in the Pacific Northwest, SSM should be controlled early to prevent excessive damage.

**SSM is more difficult to control once the newly emerged adults begin to lay eggs.**

The dark orange brown eggs begin to hatch around late March to early April in the Willamette Valley. Five to six weeks later, adults complete development and will start laying eggs. Population levels of adult SSM are the greatest in spring and fall.

**The lower northeast side of the host plant  
generally harbors the greatest number of mites.**

Miticides labelled for ornamental conifers in nurseries or Christmas tree plantations were evaluated for adult SSM efficacy. *Picea pungens* (Colorado blue spruce), *Picea glauca* 'Conica' (dwarf Alberta spruce), and *Pseudotsuga menziesii* (Douglas-fir) infested with SSM adults were treated late May to early June before new eggs were laid. Fair to excellent reduction in SSM adult populations were observed depending on the miticide used (Table 1).

**Table 1. Summary of miticides evaluated for adult SSM control.**

Treatment <sup>1</sup>	Formulation	Brand Name	Effectiveness <sup>2</sup>
dicofol	35 WP	Kelthane	good
dienochlor	4.0 FL	Pentac	fair
hexakis	50 WP	Vendex	good
propargite	30 CR	Omite-CR	excellent

<sup>1</sup> Spray treatments applied late May to early June, 1987-88, at the rate of 100 to 200 gallons per acre at 40 to 80 psi.

<sup>2</sup> Average relative effectiveness rated poor, fair, good, or excellent based on data collected on post-treatment adult mite and egg populations.

**Complete coverage sprays are crucial  
for miticides to be effective.**

The amount of spray solution applied per acre will depend upon the size of plant material, foliage density and type of sprayer used. Greater amounts of spray solution, up to 500 GPA, are needed with high pressure hydraulic sprayers, while an air-blast type sprayer will require somewhat less.

Aerial or mist blower applications are not as effective as high pressure applications. Another approach for managing SSM infestations is to use delayed dormant sprays that kill overwintering eggs. "Superior" horticultural oil and oxythioquinox (Morestan) applied to Douglas-fir in late March before bud break reduced initial SSM populations and the number of overwintering eggs the following season (Table 2). Use caution when applying oil sprays to prevent foliage phytotoxicity and follow label directions carefully.

Conifers and junipers with blue foliage often turn green after treatment with oil sprays. "Superior" oil sprays (1%, 2%, and 4%) affected the foliage color of *Pseudotsuga menziesii* (Douglas-fir), *Picea glauca* 'Conica' (dwarf Alberta spruce), *Juniperus chinensis* 'Mint Julep' (Mint Julep juniper), and *Thuja occidentalis* 'Pyramidalis' (pyramidal arborvitae). Plants lost their bluish color resulting in either a dark green or yellow green color. Foliage damage was observed at the 2% and 4% rate on dwarf Alberta spruce.

*Pesticides should be applied according to label directions on the pesticide container. The information in this article is provided with the understanding that no discrimination is intended and that listing of commercial products implies no endorsement or criticism by the author.*

**Table 2. Delayed dormant control of SSM in Douglas-fir with superior horticultural oil and Morestan**

Treatment Lb ai/A <sup>1</sup>	Motile Mites <sup>2</sup>		Overwintering eggs <sup>3</sup>
	16	28 days	
oxythioquinox 25 WP	0.50	0.0a	0.0a <sup>4</sup>
oxythioquinox 25 WP	0.25	0.0a	0.0a
horticultural oil	4.0%	1.2a	0.0a
horticultural oil	2%	0.1a	0.1a
horticultural oil	1.0%	0.5a	0 a
untreated		8.0b	8.5b
			7.4b

<sup>1</sup>Spray treatments applied on March 30, 1988. 150 GPA.

<sup>2</sup>Mean number of motile mites on previous season's growth per 12cm shoot sample 16 and 28 days after spray treatment.

<sup>3</sup>Mean number of overwintering eggs per 12cm shoot sample on February 8, 1989.

<sup>4</sup>Numbers within columns followed by the same letter are not significantly different at the 5% level of probability using DMR test with transformed data ( $Y + 0.5$ ).

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