North Carolina Cooperative Extension Service

538 Scotts Creek Road, Suite 205
Sylva, N.C. 28779
828-586-4009
http://jackson.ces.ncsu.edu/

Christmas Tree Newsletter

July-September 2017

inside:

Important Cultural Practices in Fraser Fir

The following cultural practices will create an environment that will favor natural predators and not pests. Information about the pertinent cultural practices for each pest can be found at NCSU website *https://christmastrees.ces.ncsu.edu/pest-control* Important cultural practices include:

Site selection — Site selection is important for more than just *Phytophthora* root rot control. The site on which trees are located will determine rainfall, humidity, and temperature which affect both pest and predator development. Site selection can also impact what pests are prevalent. A windy ridge or south facing slope will have more problems with spider mites for instance. Elevation is a key determining factor in pest problem. A grower might not have a lot of control over where to grow Christmas trees, but knowledge about a difficult site can aid in scouting and pesticide selection.

Avoid interplanting — Interplanting young trees with older trees produces a mixed age stand that is difficult to manage for pests. Though not all growers can avoid interplanting because of land constraints, it should be avoided whenever possible.

Ground covers — Managing ground covers for a diversity of flowering weeds is the single most important tool in encouraging natural predators. Ground covers also increase the humidity and reduce soil temperatures which improve tree growth and lessen problems with spider mites. These same ground covers also provide habitat for wildlife and pollinators.

Fertility — Nitrogen especially will feed not only the tree but pests. Many growers have been able to reduce nitrogen use in younger trees because the clover in ground covers around trees are providing adequate nitrogen. Taking soil samples so that fertilizers are applied only when necessary is a good way not to make a pest problem such as elongate hemlock scale worse. A good fertility program also creates a stronger, faster growing tree that will reduce the rotation length (the number of years it takes to grow a tree to harvest size).

Culling — Fraser fir are grown from seed, and they vary greatly in their genetic make-up. Certain individuals are genetically more susceptible to pests such as mites and scales. By cutting and removing the most susceptible individuals, pesticide use becomes more effective and at times can even be avoided entirely.

Summer Pests: July - Early September

The following information was taken from the NCSU Christmas Tree Portal Website: http://www.ces.ncsu.edu/fletcher/programs/xmas/control/window/summer.html

Stages of pests. Most pests continue to be very active through the summer, though BTA and HRM are not.

- **RBM** — Mites are actively feeding and reproducing. Mites are residing in the newly formed rosette bud and will remain there until bud break of next year.
- **EHS** — All stages present. Another flush of white as the males pupate and emerge is seen in August.
- **BWA** — Adults laying eggs. All stages including eggs, crawlers, nymphs and adults present.
- **BTA** — Eggs.
- **Cinara aphids** — Cinara aphids may be active.
- **SSM** — All stages present including eggs, immatures, and adults.
- **HRM** — Typically inactive as it is too hot except for the highest elevation fields.
- **Predators** — Most predators are active and commonly found.

Advantages to applications during the summer. This is a good time to control EHS. Cinara aphid control for trees to be harvested can begin in August, so combing control of those two pests can occur then. Twig aphid control for the following year is better later in the summer as well.

Disadvantages to applications during the summer. It is hot, making it hard for the applicator to safely spray and wear the appropriate PPE. Predators and pollinators are both very active and can be impacted by pesticide applications.

Materials That Can Be Used During the Summer

Pesticides	RBM	EHS	BWA	BTA*	Cinara**	SSM	HRM
Bifenthrin products (Talstar, Sniper)	None	None	Excellent	Good to excellent for next year.	Excellent if applied in August or later.	Excellent	None but typically not needed.
Asana	None	May be some suppression but not long lasting control.	Excellent	Fair for next year.	Excellent if applied in August or later.	None.	None but typically not needed.
Dimethoate	None	May be some suppression but not long lasting control.	Poor	None	Excellent if applied in August or later.	Excellent control of active mites but eggs not controlled.	Good control if mites are active.
Asana + Dimethoate	None	Excellent	Excellent	Fair for next year.	Excellent if applied in August or later.	Excellent control of active mites but eggs not controlled.	Good control if mites are active
Safari	None	Excellent	Excellent	None	Good if applied in August or later.	None.	None.
Safari + Sniper (or other bifenthrin product)	None	Excellent	Excellent	Good to excellent for next year	Excellent if applied in August or later	Excellent	None but typically not needed.

***BTA** control is for the following spring.

****Cinara aphid** control is for harvest of that year.

Focus on Spruce Spider Mite

Factors Affecting the Spruce Spider Mite - With such high reproductive capabilities, spider mites would overwhelm all Christmas trees if there weren't factors keeping them in check. The most important factor reducing mite numbers are natural predators, especially predatory mites. Other predators include hover fly larvae, lacewing larvae, dusty wings, and lady beetles. Predatory mites require high humidity to survive. That is one reason that the spider mite numbers rise during hot, dry weather.

Moisture also affects the spider mite itself. Rainfall keeps mite eggs from hatching, washes mites off of the tree, and allows a fungal parasite to kill both eggs and mites. In years with plenty of rainfall, spider mites are seldom a problem.

Temperature is the third important consideration. The spruce spider mite can live and function at low temperatures - even below freezing. However, the warmer the temperature, the faster it is going to be able to feed, mature and reproduce.

Field location and production practices influence mite activity. Growers can change their management practices to reduce problems with spider mites. Growers interested in producing organically grown Fraser fir for Christmas trees should be especially careful of field locations which can create more problems with mites. Important factors are listed below:

- **Elevation.** In the mountains of western North Carolina, spider mites are more of a problem at lower elevations. Fields below 3,000 feet will almost always have spider mites every year. The warmer temperatures at lower elevations allow the mites to reproduce more quickly.
- **Aspect.** Fields facing south and west have more problems with spider mites than those facing north and east. Aspect affects both the temperature and the humidity at the site.
- **Rainfall.** Rainfall averages in western North Carolina range from less than 50 inches a year to over 100 inches. Some counties such as Ashe and Alleghany tend to have more problems with spider mites than counties such as Avery or Transylvania that receive more rainfall. In some years, though, problems with SSM are region-wide because of drought. Keeping track of rainfall in a field with a rain gauge can help determine when mites are more likely to be a problem. Fields receiving an inch of rain a week should have few problems with spider mites unless some other factor is creating a problem.
- **Air movement.** Trees grown on windy ridges typically have more SSM damage than those surrounded by woods which reduce air movement and foliage drying. In these protected fields, the SSM is almost always present, but even during dry periods do not cause economic damage. That is because these habitats are best for predatory mites.
- **Dust.** Trees grown along dusty roads are most often the first to be damaged by the SSM. It is believed that the dust on the needles scratches the more active predatory mites, causing them to desiccate and die which in turn allows the more sedentary spider mite to reproduce unchecked.
- **Pesticide use.** Some pesticides such as Sevin, and Asana are broad spectrum and last a long time in the environment. These will kill off natural predators, allowing spider mite numbers to build. To avoid this problem, only use a pesticide against a pest when scouting results indicate that there is a problem. Use the least-toxic material available at the lowest effective rate. Control the balsam woolly adelgid from November through March when predators aren't present. Also during this time, materials such as horticultural oil, which are easier on the predators, can be used effectively. If fields are treated for woolly adelgid during the growing season, scout for spider mites more often, even into the following year.
- **Ground cover management.** Predators feed on insects and other mites, as well as pollen produced by flowers in the ground covers in the absence of pests. When ground covers are killed out, natural predators have lost an important habitat and they may not be present in high enough numbers to give control if spider mites should become active.

Focus on Spruce Spider Mites Cont.

Scouting for the Spruce Spider Mite
Even with a good location for Fraser fir production, judicious use of pesticides and proper groundcover management, spider mites can still be a problem. Many people depend on pre-budbreak pesticide applications for the control of the balsam twig aphid to give season-long SSM control. However, mite numbers can quickly increase with hot, dry weather even with effective spring controls. The only way to know if chemical controls are necessary and to avoid economic damage is by scouting.

When to Scout
Scout all Fraser fir fields from the year after planting through harvest to determine if mite numbers are great enough to damage trees. The number of times a field is scouted for mites depends on the size of the trees, the prevalence of SSM and the weather throughout the growing season. For trees that do not receive a balsam twig aphid or balsam woolly adelgid treatment in the spring, start scouting in early April. For trees that are treated in the spring, scouting can be delayed until early June. Continue scouting until spider mites die out in the fall. This may take several hard freezes.

Target areas of the field where mites are more likely to develop first such as windy ridges, south-facing slopes, or near dusty roads. If mites aren't found in these areas, it's unlikely that they will be elsewhere in the field. Some trees are genetically more prone to mite activity and mite damage than others. Mark these trees if they are identified so they can be examined first. Checking these 'mother' trees is an easy way to assess how weather conditions are affecting mite numbers. For more information go to: https://content.ces.ncsu.edu/spruce-spider-mite-on-fraser-fir

Sincerely,

Christy Bredenkamp, Extension Agent

Agriculture-Horticulture

Jackson County Center
538 Scotts Creek Road, Suite 205
Sylva, NC 28779