

MANAGING SPIDER MITES ON

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The most important thing to understand about spider mites is that populations are always kept under control by natural predators, until we spray insecticides. Spider mite populations decline rapidly on abandoned trees, as soon as the pesticide residue breaks down and predators move back. Farms where no insecticides are used do not have problems with mites. Unfortunately, there may be other pests causing an unacceptable amount of damage, pushing growers to apply insecticides. Spider mites have a short generation time, 7–14 days, depending on daily temperatures. With each female laying 30–40 eggs, populations of spruce spider mite can increase rapidly once the predators are gone. That is what happens when an insecticide is sprayed. Spider mites in fruit orchards and Christmas tree farms are notorious for having developed resistance to pyrethroid insecticides, the neonicotinoid insecticides, carbaryl, and many other insecticides. They are not affected by these insecticides, and without predators, populations explode, and growers begin to see damage to Christmas trees.



Figure 1. Ward Strong, BC Ministry of Forests, Bugwood.org



Figure 2. Petr Kapitola, Central Institute for Supervising and Testing in Agriculture, Bugwood.org

The spider mite most found on spruce, fir and pine Christmas trees is the spruce spider mite. All species of spider mites found on Christmas trees have a similar biology and are managed in the same way. Female spruce spider mites, at their largest life stage, are only 0.5 mm-long. Six to twelve of them can stand shoulder to shoulder on a spruce needle and not span the width of the needle. They usually have dark green bodies and light-yellow legs (Fig. 1). Spherical eggs are about $\frac{1}{4}$ the length of females, and vary from light orange to red. Hatched eggs are clear shells of the same shape. Spruce spider mites molt several times when developing from egg to adult, leaving many shed skins on the surface of needles (Fig. 2). As the infestation builds, Christmas tree needles may appear ‘rusty’ or off-color, due to the many little specks of feeding damage that eventually coalesce (Fig. 3). When viewed from a few feet away, infested branches will appear gray to brown (Fig. 4).

CHRISTMAS TREE FARMS

One of the most important tools for successful spider mite management is frequent scouting. It is the only way to catch infestations early, before the damage is unacceptable, and to know if populations are building, or if a miticide application has worked. Looking for spider damage is the quickest way to detect outbreaks. The inner portion of branches tend to show injury first. Spider mite damage remains the rest of the season after it happens, so it is important to check for live mites when scouting. This is easily done by sharply rapping a branch over a white piece of cardboard. Dislodged mites are about the smallest objects you can see with your eyes, but if alive, they will be moving and easy to see. A hand lens is helpful but not necessary, once you are familiar with them.

The most desirable management approach is to avoid using carbaryl, pyrethroid and neonicotinoid insecticides. Once you stop using insecticides it may take a year or longer to re-establish predator populations. During this time a selective miticide, like Savey, can be used. However, spider mites can develop resistance to Savey, and it may even be likely, if you have used Savey for several years. Another option is to use selective insecticides, unlikely to cause outbreaks of spider mites, like Bt or Dimilin, for caterpillars. If you are already using broad-spectrum insecticides, and you need to control an outbreak of spider mites, a list of miticides labeled for use on Christmas trees is available in the 'Michigan Christmas Tree Pest

Management Guide 2021'. Please note that in the guide, all products labeled for spider mite control are listed, including synthetic pyrethroids, which may not work due to spider mite resistance. In the guide, you will see some of the miticides listed as 'selective', designated by an 'S' following the

product name. These products tend to be more toxic to spider mites than predator mites. This means that they will not cause spider mite outbreaks. However, spider mites can become resistant to them. Scouting before and after miticide applications is important to see how well they work, so you can switch to a different product if necessary. ▲



Figure 4. Eric R. Day, Virginia Polytechnic Institute and State University, Bugwood.org



Figure 3. Petr Kapitola, Central Institute for Supervising and Testing in Agriculture, Bugwood.org