

offered new technology, was worth a try, and did work without injuring seedlings.

As you consider the type of frost protection to rely on next year, weigh the strengths of the treatment with your resources and comfort as a risk-taker:

- Do you have an adequate temperature monitoring system to turn irrigation on soon enough? Do you know when your seedling beds approach 32 degrees F, or do you rely on the TV weatherman or Ray's Weather predictions of regional freezing temperatures?
- For irrigation to be effective, it must be turned on before temperatures drop below freezing and be kept on until the ice melts. Do you have enough water to maintain coverage all night, several nights in a row?
- Is Phytophthora root rot a real concern in your nursery beds such that additional water from irrigation in late spring is problematic?
- Do you have the time, labor, and ability to be on-site frequently enough to open and close poly-spun fabric covers daily?
- Are you willing to risk a relatively new and risky treatment such as ice blankets?
Can you afford to grow seedlings or transplants without some form of frost protection?



Part 2: Troubles with Twig Aphids

Precision Twig Aphid Control

By Jill R. Sidebottom and Doug Hundley

In the first article on the 2005 balsam twig aphid control season, Doug Hundley and I discussed causes for the severe twig aphid damage experienced by many growers this past spring. The cool spring weather slowed bud break and shoot elongation, allowing the new growth to be vulnerable to aphid feeding longer. Twig aphid treatments that would have usually been judged as successful ended up failing. Unfortunately this year many growers were experimenting with new methods of controlling twig aphids.

So what are the best ways to control twig aphids? In this article, Doug and I will be reviewing the three main methods of twig aphid control— spraying with a high-pressure sprayer, spraying with a mistblower, and using granular Di-Syston. In the year 2000 according to the 2001 Pest Management Survey, 16% of growers reported controlling twig aphids with a high-pressure sprayer, 8% with a mistblower, and 67% with Di-Syston.

No matter what method of control you are using, you should check for rust mites and spider mites before treating. That might change the materials you use. Also, if there are a lot of cones in the trees, remove them before treatment. Twig aphids hide in cones and are shielded from pesticide applications.

High-pressure sprayers. As we stated last time, spraying with a high-pressure sprayer is the surest way to guarantee twig aphid control. It is also the most labor intensive and therefore costly. If you need to treat for balsam woolly adelgid also, then using the high-pressure sprayer is truly justified. Wait until March or early April and you will control both adelgids and aphids. Remember, if you are looking at treating for both twig aphids and woollies using the synthetic pyrethroids Asana, Astro and Talstar, that is a good choice as they are effective, BUT they may also create problems with hemlock rust mites the following spring. A treatment with Thionex controls both pests and has lead to far fewer problems with rust mites. This is however, a more toxic product and should be used with care. Remember you cannot apply Thionex within 300 feet of water.

Hopefully you are scouting for rust mites before deciding what to use for twig aphid control. If you find rust mites then spraying for two pests helps justify the use of the high-pressure sprayer. Using the high-pressure sprayer for twig aphids alone is hard to justify but often that's all a grower has if Di-Syston is not the appropriate choice for a given field. The bottom line is that treating with a high pressure sprayer will only be "cost appropriate" when necessary and on limited acreage.

Beware of the damage high pressure spraying dimethoate and other materials can cause on new growth. We are confident you can use a high-pressure sprayer application with dimethoate to control twig aphids for a couple of weeks after bud break begins. However, we see damage every year even from dimethoate alone applied with a high-pressure sprayer on tender growth in late May and even early June. To reduce the risk of damage spray on cloudy cool days or early in the morning before midday and temperatures reach into the 70's or 80's.

Mistblowers. More and more growers are depending on tractor-driven airblast mistblowers to apply pesticides. In 2005, several of us worked closely with growers to calibrate their mistblowers and evaluate coverage. Many applications of low rates of Roundup were followed to evaluate effectiveness and tree damage. Doug also followed several applications with dimethoate for twig aphid control, some of which worked and some didn't.

The following are some suggestions if you are planning on using a mistblower to control twig aphids:

Be sure that you can go completely around the field and treat it from opposite directions.

Don't try to reach too far with your mistblower. How many rows you can cover depends on many factors including row spacing, the terrain, the size of the mistblower and the power of the tractor. If you aren't sure you are getting coverage, fill the sprayer with water and place water sensitive cards in your trees to learn just where the spray is reaching. Give your county agent a call for help on how to do this. In general, mistblowers can cover a 15-20 row field well when treating from opposite directions.

Calibrate the sprayer so you know how many gallons per acre you are using. Then use the full labeled rate of whatever product you are using. For instance, many people use dimethoate which has a rate of 1 1/2 pints (24 ounces) per acre. If you apply 25 gallons per acre and have a 100 gallon tank, you would add 6 pints to the mistblower.

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If a product has a per 100 gallon rate you should attempt to apply the same amount of insecticide per acre that you would if you were using a high pressure sprayer. Estimate how much water you think you would use per acre to get good coverage with a high-pressure sprayer. For instance, if you would normally use 250 gallons per acre with a high-pressure sprayer and Product X is labeled at 2 oz. per 100 gallons, then you would normally apply 5oz. of Product X per acre. If your mistblower is applying 25 gallons of water per acre, then add 20 oz. of Product X per 100 gallons to your mistblower. Be sure to read the label to make sure mistblower applications are not prohibited. If you use a range of gallons per acre, go with the higher rates to give better coverage.

Consider using an adjuvant such as VITAL to increase droplet size and increase coverage. Use such products at the labeled rates. This has been demonstrated to not only reduce drift but increase coverage and make coverage more uniform between the rows.

Make applications during calm conditions and avoid the heat of the sun when spray may rise or fail to reach targeted trees. Optimum coverage is essential.

Always scout 3-5 days after application to evaluate control. Do this by beating the foliage of 10-15 trees on a sheet of paper to see if live aphids fall out. Use a handlens when you look as young aphids are very small. Look at trees across the block including the center of the block where it is hardest for the spray to reach.

In trees that you are cutting out of, it never hurts to go back and scout again a few days after the trees break bud to evaluate if the twig aphid numbers are increasing. For a couple of weeks into bud break you can still gain control by spraying dimethoate with a high-pressure sprayer.

Be sure to scout for rust mites and spider mites before treating for twig aphids. Choose one or more products that will control all the pests you have at the time.

Di-Syston. Granular Di-Syston has been the material of choice for growers for many years because of the quickness of application and excellent spider mite as well as twig aphid control. Still, Di-Syston has never worked perfectly.

Now people are trying new methods of application to reduce worker exposure to the product. I don't think we have worked out the best way to apply Di-Syston with the new applicators, but here are some suggestions.

Di-Syston works best when applied on still days when there is moisture available. Late evening applications have become very popular and effective. The nighttime calm conditions and resulting dew that follows the application time provides excellent conditions for successful results.

Di-Syston works best in fields with solid stands of trees that haven't been cut-over.

Di-Syston works best in trees less than 8 feet tall.

Wait to apply Di-Syston until twig aphids have all hatched out. This information is found at the Fletcher Christmas tree web site at: <http://ces.ncsu.edu/fletcher/programs/xmas>

Di-Syston needs to be applied at 20-30 pounds per acre. The stainless steel applicators made by Select-A-Feed are designed to apply the product at this range in most fields. But of course this will depend on tree spacing and the number of trees per acre. Using this applicator as designed with a full trigger pull per tree resulted in good control in 2005 in most fields where all conditions were right.

In summary, don't treat on days the weather is not cooperating with you. If you use Di-Syston don't apply it until twig aphid hatch is complete but don't use it after bud break has begun. After bud break only dimethoate with a high-pressure sprayer will give you decent twig aphid control and then for only two weeks. Scout after you treat so if you need to re-treat you will know it as soon as possible.

Timing is everything with twig aphids. Cutting corners with poor coverage or late treatments will often come back to bite you, as it most definitely did in spring of 2005. If you have any questions, feel free to call us or your County Extension Agent. For more information on twig aphids, see <http://www.ces.ncsu.edu/fletcher/programs/xmas/ctnotes/ctn019.html>.

Recommendations for the use of chemicals are included in this publication as a convenience to the reader. The use of brand names and any mention of commercial products or services in this publication do not imply endorsement by the North Carolina Cooperative Extension Service nor discrimination against similar products or services not mentioned. Individuals who use chemicals are responsible for ensuring that the intended use complies with current regulations and conforms to the product label. Be sure to obtain current information about usage and examine a current product label before applying any chemical. For assistance, contact an agent of the North Carolina Cooperative Extension Service in your county.

