

# Part 1: Troubles with Twig Aphids



*Jack Wiseman, Jr. with Dr. Kelly Ivors*

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This year there were a lot of changes in twig aphid control. Di-Syston 15 G was being sold almost solely in plastic jugs requiring the new handheld applicator. Some people were switching to mistblowing with other products such as Dimethoate rather than deal with the applicator. Others were experimenting with the applicator, trying to get the application rate to suit them. With the higher cost of Di-Syston the rate per acre has suddenly become an important issue.

It didn't look like twig aphids were going to be much of a problem this year. The number of eggs laid last year weren't extraordinarily high. And there was cold weather and plenty of rainfall the later half of April which would reduce the survival of the first stage of twig aphids – the stem mothers – and slow their ability to reproduce.

But it doesn't take much looking this summer to see that twig aphids made a come back in a big way in some fields. So what happened? Did they change Di-Syston so that it didn't work as well? Do the applicators not work? And how should people view twig aphid control next year?

The key to understanding how twig aphids damage trees is to understand the dynamics of twig aphid reproduction and tree growth. Let's start by reviewing twig aphid biology.

Twig aphids hatch from eggs from late March through mid April. Twig aphid hatch is governed by the temperature and something I follow every year to let people know when they can start applying Di-Syston. This year, twig aphid hatch was complete by April 18. In most years hatch is complete by tax day, April 15. The early part of April had seasonable temperatures that allowed for a normal hatch this spring.

The stage that hatches from the egg is the stem mother. They grow and molt four times which takes at least a couple of weeks before they are old enough to reproduce. They lay live young and so in typical years by bud break, there are a few large twig aphids (the stem mothers) and many little aphids on most tree buds. Those little aphids over the next couple of weeks continue to reproduce and will lay more live young.

This spring from April 15 to the end of April the weather stayed wet and cold. In Avery County for instance, during that time there were seven nights in the 30's and two in the 20's. This would slow the twig aphid growth and reproduction and in most years would reduce subsequent twig aphid damage.

But understanding twig aphid damage can't just take into account the bugs. You have to superimpose what the trees are doing. This year by late April most trees hadn't done much. In most years, trees break bud and are off and running any time through late April through early May. But this year, bud break and tree growth were slow because of the continued cool weather. At the Upper Mountain Research Station in Laurel Springs, the average temperature was 62 degrees in May of 2004 and only 55 degrees in May of 2005.

This significantly delayed budbreak, but perhaps more importantly it slowed down the shoot elongation the first 2-4 weeks after bud break. That gave time for twig aphids to catch up and with light rainfalls in May, they did. Those aphids that survived continued to grow and reproduce and all through May and into June, tree growth remained (was still) tender and vulnerable to BTA damage. As a result, a good but less than perfect treatment, which normally would have been good enough, often turned into significant damage this year.

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# Twig Aphids

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Trees aren't vulnerable to twig aphid damage all year long but only when they are breaking bud. All through April stem mothers are feeding on the old growth and they don't cause needle curl. If you go out most years in late May when the new growth is 3-4 inches long and the needles have spread apart, you can often find colonies of twig aphids feeding, but they no longer cause needle curl. It is only the early, most tender expanding growth that is vulnerable to needle curl when twig aphids feed.

This year, the trees were vulnerable for a long time. Those colonies of aphids in late May still had tender growth to feed on. You could have had a field with the same number of aphids in it the last week of May in 2004 and 2005 and ended up with damage this year and none last year.

The following field observations illustrate this. For instance, several fields Doug scouted that turned up just a few aphids after treatment eventually became serious damage, to the surprise of the grower and Doug. He scouted behind one Di-Syston treatment a few days after treatment (May 18th), and couldn't find any aphids, but by early June there was heavy twig aphid damage.

Doug observed that many mistblower applications were fairly successful. However mistblower applications made during the early days of the BTA treatment window didn't work quite as well as those applied the last days of the treatment window. Using a high pressure sprayer to control both balsam woolly adelgid and twig aphid gave the best BTA control this year. These treatments weren't dependent on the time of application because of the materials used. Treatments made the first week of April successfully controlled twig aphid. But these treatments should do a better job than using either a mistblower or Di-Syston because the coverage is more thorough and the woolly adelgid materials such as Thionex have such a long residual effect.

Hose spraying has always been the surest method of twig aphid control, though most people don't have the time or money to do this. Many growers, however, went with the hose this year because of the uncertainty and price of Di-syston. Fortunately it turned out to be an excellent year to make that decision due to the slow tree growth and resulting problems.

A similar problem occurred in 1997. That year we also had a very wet and cold April and early May, but twig aphid damage occurred later in May on the late breaking trees. Usually it is the early breakers that get the most damage.

The good news for growers is that in many areas of the mountains there has been enough rainfall that the trees have recovered from a lot of the needle curl. Hopefully this has reduced problems with twig aphid damage. This type of spring weather pattern appears to only occur only every 5 to 10 years so it is unlikely the same thing will happen next year.



*Jerry Moody with wood chips being used.*

So what has this year taught us about twig aphid control? Hose spray every year? I should hope not! What should a grower do next year? In Part II which will come out in the next issue of LIMBS & NEEDLES, we will discuss different methods of controlling twig aphids. What is the best way to use the new Di-Syston applicator? How can you get the most out of mistblowers? Hopefully that will help everyone be ready for twig aphid control in 2006. 🌲