BROAD MITES AND DAHLIAS

by Tony Evangelista

Possibly the worst dahlia pest I've ever had the misfortune to experience over the decades of dahlia culture was broad mites, which plagued my dahlias two years ago. It started when I noticed one deformed lateral shoot on one plant in July. Foolishly I did not examine the one inch abnormal shoot closely. I wrongly assumed it was probably just damage from a sucking insect when the shoot was smaller and just developing. The next time I observed the shoot it was about five inches long and severely deformed as shown in Figures 1 and 2.

This time I broke the lateral shoot off and examined it closely with a magnifying glass but couldn't see any evidence of insect predation. I then scraped the young leaves front and back and examined the debris under my microscope at 10X magnification. I was then able to see the mite shown in Figure 3.

Figure 1.

Figure 2.

Figure 3.

I remembered a discussion at a Midwest Conference Spring meeting about broad and cyclamen mites and the severity of the problem once they were established. I recalled Dave Knox from the Michigan Dahlia Association remarking that this is something you do not want to have to deal with. Sadly, he was correct in spades.

So what are broad mites? They are much smaller than the spider mites most dahlia growers are familiar with. They are truly microscopic being less than 0,2 mm in length. Broad mites inject a toxin from their saliva as they feed causing the distortion of growing tips and inward curling of the leaves. They also cause a very distinctive and characteristic "bronzing" of the undersides of leaves. They affect many plant species and not just dahlias. These susceptible plants include: New Guinea impatiens, gerbera, ivy, lantana, snapdragon, verbena, zinnia, peppers and other vegetable plants (1). Sadly, then, the mites can be introduced to your dahlias by other plants brought into your yard from outside sources.

When I diagnosed my problem, I discarded the entire plant hoping that I had interceded quickly enough to end the problem. Unfortunately, I had not. I started to see damaged foliage on new laterals of adjacent plants. Broad mites are believed to be dispersed to new plants through plant-to-plant contact or moved by larger insects like white-flies and aphids (1) So imagine a pest so small that it "hitchhikes" on the legs of insects as small as white-flies and aphids. Obviously, we can also disperse them when disbudding.

It is important to act quickly at the very first signs of broad mite damage. That's because they complete a life cycle in about one week with a range of 5-13 days according to the Tennessee State Extension Service (2). So I immediately began spraying with JMS Stylet Oil (a highly refined mineral oil) every 3-4 days in an attempt to break the life cycle paying particular attention to the underside of the leaves and new growth. I also continued to discard deformed foliage. Broad mites are destroyed at temperatures greater than 110 F. I would go through my garden and cull infected new growth and put it in a black garbage bag with a tie. After going through my entire garden and handling and discarding all deformed foliage, I would then wash my hands thoroughly before returning to work in my garden. This bag would them be left in direct sun all day to raise the temperature inside the bag to well over 110 F. This would kill all the mites. I then threw the bag in the trash. No composting! For small potted plants affected, the entire plant and pot could be submerged in 110 F water. I felt that I controlled the problem but did not eradicate it.

In summary, I would be especially cautious when bringing in stock of any new plant material to your yard. Remember the signs of broad mites are stunted terminal growth, curling inward of leaves and bronzing of the underside of leaves. This bronzing was the change in color of the underside of leaves from the usual light green color to a bronze shade. This symptom was marked in my garden. At the first signs, begin spraying with a horticultural oil or insecticidal soap. I don't advocate use of miticides although there are some labeled for this use. Remember to spray every 3-4 days to break the five day life cycle.

You could also consider biological control. As Rick Yates has stated about that approach, "There's conflicting information about the effectiveness of using predator mites to control broad mites so I reached out to Ronald Valentin, lead entomologist and biocontrol expert at Bioline Agrosciences, Inc. Ronald stressed that curative treatments aren't gong to successful although all of the Amblyseius mites will feed on broad mites. Best success will be achieved when high numbers of predator mites are present. An example would be the hundreds of predator mites released over four to six weeks when utilizing mini-sachets of A cucumeris to control thrips on

hanging baskets. During warm summertime conditions, A swirskii can be expected to outperform A cucumeris. A andersoni is the best choice in cooler conditions since it's active down to 43 F (6C). Last, but not least, A californicus shines under the lower relative humidity conditions that hinder the other Amblyseius mites" (3). Arbico Organics and A.M. Leonard are sources for all of the above mentioned predatory mite species.

I did not have a mite problem the following year in Ohio! We had a fairly cold winter—dahlias left in the ground did not over winter. Temperatures below 32 F dramatically decrease survival and reproduction of adult female broad mites. Median lethal times average 61.2 hours at 26 F and averaged 9.3 days at 35.6 F (4). So pray for cold weather after a daunting season with broad mites. Greenhouse users might consider allowing the greenhouse to get as cold as possible in the winter to kill the mites.

I would really like to hear from other dahlia growers regarding your experience with broad mites. I would love to report more personal experiences that other growers have had. I would also like to express my appreciation to the folks at the Ohio State University Extension Office for confirming my diagnosis from the photos and description I gave them (5).

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References:

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3. GrowerTalks 3/29/2017, "Their Size Fool You!" by Rick Yates.
4. Experimental and Applied Acarology, May, 2015, Vol. 66, Issue 1, "Cold Hardiness of the Broad Mite Polyphagotarsonemus latas" by Gil Luypaert, et al
5. Mike Hogan, Extension Educator & Associate Professor, Agriculture & Natural Resources at the Ohio State University and Master Gardener Freda H.