What Are Those Spots?

Bill Steele — West Chester, Pennsylvania

July 1998: Three or four people asked if I knew what was causing the spots on azalea leaves. I didn't know. I didn't have the spots in my nursery, but I had no doubt that I could find a quick solution. Over a year later I still don't know.

The spots were irregularly and randomly spaced yellow dots from the size of a pinhead to 1/16 inch in diameter. They appeared near the end of June to the beginning of July on current new growth. It is interesting to note that later new growth, on the same branches, did not have the spots. They were not limited to azaleas, but also occurred on lepidotes (small-leaf rhododendrons), and elepidotes (large-leaf rhododendrons). The spots were not new. One person who had them recalled seeing them on a plant in Robert Gartrell's garden about 25 years ago. He made a remark about the nice variegated leaves. Bob Gartrell's response was, "Look closer. It's not a variegation."

Apparently whatever was causing the spots does not harm the plants. One person, who doesn't believe in spraying, has had the spots for at least ten years. The spots that appeared around the end of June had faded or disappeared by fall. The cycle is repeated again the following year, with no evidence of stress to the plants. Occasionally damage from other sources is confused with the spotting. In a few instances the plants that had spots have been in a state of decline. Upon further examination, the cause of the decline was found to be the result of azalea bark scale, spider mites, or something else not associated with the spots.

Undersides of foliage with cottony egg sacs. Photographs by author.

I am only aware of the spotting occurring in parts of Long Island, northern New Jersey, the mainline area of Philadelphia, and an isolated case on two adjacent plants in a garden in central New Jersey. It had just started to appear on azaleas in two arboretums in the Philadelphia area.

August 1998: A sample was sent to the Plant Disease Clinic at Penn State. They said it was not a disease. This has been confirmed by other sources. Samples were sent to Greg Hoover, Dept. of Entomology, Penn State; Barbara Bullock, Curator of Azaleas, US National Arboretum; and Bill Miller, The Azalea Works. None had seen this type damage before. Barbara sent her sample to Scott Aker at the National Arboretum. Bill Miller sent his sample to Dr. John Neal, a retired entomologist from the United States Dept. of Agriculture Station at Beltsville, Maryland. They had not seen this type of spotting before and could only conjecture as to its cause.

End of May 1999: Cottony masses, approximately 1/16-inch wide by 3/8-inch long began to appear on the undersides of the leaves of azaleas, lepidotes, elepidotes, and some trees. One person remarked that they were on everything except peonies. Some masses were even on the side of a building! I contacted everyone I knew who had leaf spotting in 1998, and they all had the cottony masses. Samples sent to Greg Hoover confirmed they were egg masses, each containing from 500 to 1000 lemon yellow eggs. Because there were no adult females present, he was unable to identify them any further than some type of soft scale.

End of June 1999: The egg sacs started to hatch, and the spotting began to occur on the leaves of the new growth. Again I contacted everyone I knew who had the egg sacs. The spotting was just beginning to appear on their plants also.

As the spots were forming, I sent samples to Greg Hoover, Barbara Bullock, and Bill Miller. Barbara sent her sample on to Ethel Dutky and John Davidson, Dept. of Entomology at University of Maryland. They said the crawlers and egg sacs were from a *Pulvinaria*-type scale (Cottony *Camellia* scale). They could find no evidence of insect damage causing the spotting. Because the sample they received had been sprayed with Cygon (a very potent insecticide, not usually recommended for azaleas), they suspected it was an injury resulting from this spraying.

Bill Miller sent his sample to Dr. John Neal. Dr. Neal theorized that the adult scales had left the host plant and laid eggs on azaleas and other plants. When the crawlers hatched, they attempted to feed, causing the spots, but they were unable to feed so they either died or found another suitable host plant. This seemed like the answer until I spoke with the person in central New Jersey. The egg sacs and the spotting were limited to the same two plants and didn't spread. For the past two years when the crawlers started to hatch, he sprayed with Malathion, and he feels this has helped to control the spreading.

Azalea foliage with mysterious spots.

Greg Hoover said that scale does not travel very far. When the crawlers hatch,

they must feed in 48 hours or they will die. He could classify them no further than a *Pulvinaria*-type scale.

Bud Gehnrich, past president of the American Rhododendron Society and a resident of Long Island, New York, had also been trying to find the cause of the spotting. He contacted Jim Thornton, past president of the Azalea Society of America, who lives in Georgia. He had not seen thern before and could only surmise what had caused them.

Bud also sent spotted leaves to Margery Daughtrey and Daniel Gilrein of the Cornell Cooperative Extension on Long Island, and Jim Stimmel, Pennsylvania Dept. of Agriculture. They found some scale crawlers on the leaves, but the positions of spots and crawlers did not coincide in all cases, so the scale could not be ruled the perpetrator.

Dan Gilrein and Margery Daughtrey speculated that it might be *Exobasidium burtii*, a relative of the fungus that causes the gall on azaleas. However, according to the *Compendium of Rhododendron and Azalea Diseases*, "as they age, the spots become covered by a white fungus growth and eventually turn brown from the center out." These spots do not turn brown. In the fall they actually turn a pale green as if they were attempting to take on chlorophyll.

Dan Gilrein felt it is conceivable that the spotting may be a reaction to scale feeding, but this is by no means certain. He also said, "Scale insects probably find new host plants a number of ways. We found newly hatched cottony maple scale crawlers blown from a Norway maple onto roses and herbaceous perennials about a hundred feet away. The crawlers can also move onto new plants via 'bridges' where plant parts overlap. Animals can play a role: hemlock woolly adelgid crawlers are known to be transported incidentally by birds. Infested plants can also be introduced to landscapes and be the source of problems in new areas. Adding to the situation is the fact that locally (on Long Island) we have had unusually high populations of scale infestations on landscape plants over the last several years all around Long Island, raising awareness and interest (and perhaps increasing observable symptoms of infestation or injury) related to scale problems."

Margery Daughtrey remarked that people have been asking her about the spotting for 20 years, but lately these questions are becoming more frequent.

Barbara Bullock wondered if it could be a virus and suggested that I contact the Agdia Laboratory in Indiana. I contacted Dr. Henn at the Agdia Laboratory. After I had described the spotting to him, he said it is probably not a virus because a virus would continue, and not allow later new growth to be unaffected. He suggested I contact Dr. Gary Simone at the University of Florida. Dr. Simone said it did not sound like a virus. I sent him a sample. Dr. Simone's response typified the response from most experts: "No pathogens could be observed on or recovered from symptomatic tissue. Observed symptoms must be attributed to either environmental or cultural stress. No evidence of disease. Spots are not consistently associated with insects, nor is there evidence of feeding wounds. I have not seen this malady before and have no explanation for it based upon the sample and phone conversation."

Steve Schroeder, a member of the board of directors of the Azalea Society of America, and also proprietor of Holly Hills Nursery in Indiana, felt it might be ozone damage. When I sent him a sample, he said he had not seen it before, and it was not ozone damage.

At this time we have eliminated: jettisoned jet fuel, solvent from roofing compounds, ozone damage, pollutants from a local industry, a reaction to an insecticide or fungicide, a disease, a virus, feeding of adult lace bugs, and white fly damage.

Even though entomologists have not found any insect damage connected with the spotting, we feel there is some connection between the egg sacs that appeared on the undersides of the leaves at the end of May and the crawlers that hatched at the end of June.

I would like to express my heartfelt gratitude to the lady who has allowed me to come into her garden and take branches from her plants to send to almost everyone I know within the eastern United States. Entomologists have difficulty isolating what is causing a problem when the sample has lace bugs, red spider mites, white flies, mealy bugs, azalea bark scale, predatory thrips, and probably a host of other insects. After each sample was analyzed, I would tell this beleaguered lady they hadn't found the cause of the spotting yet, but you should spray for... I think she has worn out at least three sprayers. She sprayed in March with horticultural dormant oil, in early May with Decathelon, and in late May hired a professional. HE SPRAYED WITH CYGON. Apparently there is a form or concentrate that may be used on azaleas, and this was what he used. There was no damage to the plants. She was devastated when the egg sacs appeared at the end of May to early June, three to five egg sacs on the undersides of the leaves of as many plants. She didn't give up. After the eggs hatched, she got her trusty sprayer out again and sprayed the crawlers and her spotted azaleas with Orthene and a miticide. At the present time her plants look beautiful, there is no sign of insects, and I think the spots make a nice contrast.

Although the spots have not caused any visible damage to the plants, we should find the cause and control before it spreads further. This is not a good article for a nurseryman who specializes in azaleas and lepidotes to write. It could scare off a lot of customers, but I don't have these spots, yet. My goal is to find the cause and the cure before I get them, and before a lot of other people get them.

Next year's plans include sending samples beginning the second week of May, on a weekly basis, to Greg Hoover and all other interested entomologists. This will hopefully result in a positive identification of the scale that is laying the eggs in the cottony masses. I find it difficult to imagine that there is not a trap available for this purpose. The lady who has been kind enough to open her garden for me may find flypaper stuck to the undersides of a lot of leaves next May.

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Donations to the Society

Bob Stelloh – Hendersonville, North Carolina

The table below shows the gifts made to the Society by our members during the past few months. Please accept our public "Thank you!" These gifts are vital for us to maintain our current dues level without compromising the high quality of **THE AZALEAN** and other membership benefits. The $2,000 gift from Brookside Gardens Chapter is particularly welcome, as we believe the website will become a very important tool for attracting new members in this electronic age.

In addition, the following 41 members contributed $1,305 since the last issue of **THE AZALEAN**. The total donations to the Society in the period were $3,305.

L. Malcolm Clark, Gen. & Mrs. Bryghte D. Godbold, William B. McIntosh, Joseph E. Schild, Jr., Mr. & Mrs. William F. Bode, Mr. & Mrs. Robert H. Craft, Jr., Margarette L. Erdman, Mrs. Arthur Frazer, William & Eleanor Gural, Mr. & Mrs. Lloyd Hahn, Joseph C. Kinney, William T. Lloyd, Joan Lunney, Dick Marshall, Dr. & Mrs. Donald E. Moreland, W. T. Norris, Jr., MD, Franklin B. Pelurie, Pope's Azalea Farm, Ken & Dorothy Reese, Dr. & Mrs. A. Chandler Schmal, Swarthmore College, Bruce Seal & Liz Rachun, John & Lynette Richbourg, Barbara S. Stump, Bill & Linda Summers, Mr. Frederick L. Thane, Maarten van der Giessen, Peter van der Giessen, Mr. & Mrs. Art Vance, Margaret Vogel, Donald H. Voss

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Unanswered Questions: Where does the scale that lays the egg masses come from? What does it eat? Why is there no visible damage to any other living plant in the area? Where does it go? What causes those spots?

Any help or information that anyone can supply will be greatly appreciated. Please send information to Bill Steele, Steele's Nursery, 1055 E. Niel's Lane, West Chester, PA 19382.

Bill Steele and his wife Ellen are retired schoolteachers who have a small nursery specializing in azalea and lepidote liners. They currently grow 2600 varieties of azaleas, with sales limited to three weekends a year: the last weekend of April and the first two weekends of May.

Reference

Coyier, Duane L. and Martha K. Roane. Eds. 1986. *Compendium of Rhododendron and Azalea Diseases.* St. Paul, Minnesota: The American Phytopathological Society.

Society and Azalea Information Online

For the benefit of anyone with Internet access who is not a member of the ASA, membership information is available at four sites:

1. www.azaleas.org (the ASA's website, where you may join).

2. www.plantweb.com/azaleasociety (the Louisiana chapter's website).

3. www.theazaleaworks.com/asa.htm (Bill Miller's website with information about the ASA).

4. www2.azaleas.org (the Society's developmental website for information and renewing membership)

Encourage your computer-literate friends to join the Azalea Society of America online, or just give any friend an application form.

Finally, to share information with, or ask questions of, azalea enthusiasts online, join our (free) ASA e-mail discussion forum for azaleas. To join this forum, send an empty e-mail to: azaleas-subscribe@azaleas.org