Flowers, Fungus, Bugs, and Worms

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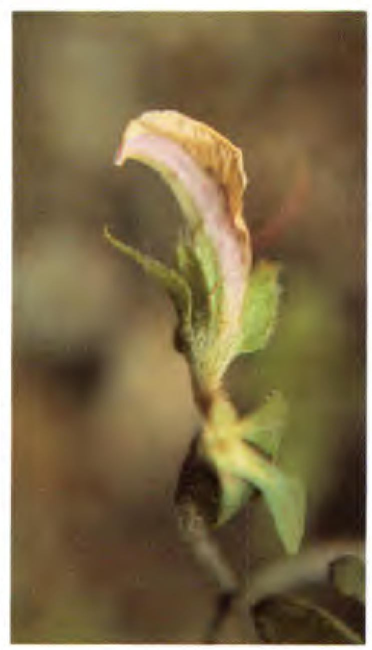
Each season brings with it a raft of opportunities. Every year is a little different, and each year provides us with an opportunity to improve our understanding of azalea behavior. If we take the time to notice, we may be able to make sense out of our observations. For example, why does the flower color of some cultivars seem more vivid some years? Is there some relationship between winter temperatures and color pigment production? Why are some semi-double cultivars more double some years? Could the transmutability of stamen into petal-like structures be affected by the amount or timing of rainfall? Why do previously stable cultivars throw multiple sports some years? These are all good questions, and I am sure that we have all noted similar situations.

The winter of 1993-1994 was pretty rough—cold temperatures, snow, and ice. Those of us who were involved with flower shows in 1994 experienced more anxiety than usual. We knew there was damage, and as you might expect, there was no way to anticipate the extent of the loss until the last minute. Picture, for a moment, holding a formal, competitive, flower show with few if any entries. Fortunately, the Brookside show (April 28-May 1, 1994) was its usual success, and the public was oblivious to the anxious anticipation. In retrospect, the later blooming varieties like the Satsukis and the Robin Hills bloomed poorly or failed to bloom at all. In my yard, camellias, *Nandina*, and *Aucuba* were companion plants that were hit particularly hard in 1994.

A severe winter also provides opportunities of a more positive nature. Hybridizers benefit by being able to evaluate seedlings for cold hardiness. In my own situation, tender seedlings succumbed, marginally hardy seedlings became obvious, and those seedlings which performed well were identified and will continue in the evaluation process perhaps to be introduced some day.

Steinernema carpocapsae, *a biorational option for controlling many pest insects. About one-half millimeter (approximately 0.02 inches) in length, this round worm is yet another weapon in the Integrated Pest Management arsenal. Thanks to Dr. Mike Raupp of the University of Maryland for helping me locate this slide.* ***Photo credit: Randy Gaugler, Ecogon, Inc.***

For years, the Glenn Dale 'Morning Star' had bloomed as a self-colored flower (described as Rose with a yellow undertone by (Lee) or deep purplish pink with a yellow undertone (Galle) with no suggestion of sporting. In 1988, 'Morning Star' produced two distinctly different sports. In retrospect, this does not seem so remarkable given what we have learned to expect from anything derived from 'Vittata Fortunei', but was there an environmental trigger?



Two examples of peculiar azalea behavior. RIGHT: *One sepal is elongated and carries a pigmented stripe the color of the corolla, as if the flower momentarily considered becoming hose-in-hose but changed its mind.* ***LEFT:*** *While most azalea flowers commonly carry five and sometimes six petals, a comparatively rare, but proportionally perfect, eight petal flower was produced.*

Similarly, the hard winter of 1993-1994 provided us with an opportunity to test a question that a colleague had previously posed regarding petal blight. Would a severe winter have any impact on petal blight? As far as I could tell, *Ovulinia azaleae* Weiss, the causative fungal agent, was unfazed. At about the time that 'Martha Hitchcock' bloomed, petal blight made its unwelcome appearance.

A mixed positive note, I recorded the return of *Rhinocapsus vanduzeei* Uhler, the little red bug with the painful bite that I discovered in my yard in 1993 [1]. I was not sure whether it would be able to withstand a bad winter. Despite the fact that it is a plant eater, no appreciable damage was noticed on the azaleas; lace bug which it also eats did not seem to be much of a factor; and I was bitten several times while minding my own business.

For several years, I have been watching two populations of *Callirhopalus bifasciatus* Roelofs (two-banded Japanese weevil) in my yard [2]. With weevil adults notching the leaves and larvae feeding on roots, I knew that this pest really should not be ignored, and I decided to do something about it last year. Always on the lookout for a better (safer, cheaper) way to deal with problems of this type, I noticed in the catalogs that entomopathogenic ("causing disease in insects") nematodes were recommended for the control of Japanese beetle grubs, cutworms, cabbage root maggots, and *Otiorhynchus sulcatus* Fabricius (black vine weevil), a similar root weevil pest. Not to be confused with other nematodes that attack plants and are pests, these beneficial microscopic roundworms, averaging about one-half millimeter in length, enter their host's body and release a bacterium (*Xenorhabdus* sp.) which kills the host in several days. This had real possibilities, since this approach afforded me an opportunity to learn more about predacious nematodes while evaluating a "biorational" alternative to Orthene® for weevil control. In the beginning, the plan was to treat one group of plants with the nematodes and the other group of plants with Orthene®. The basis for comparison would be the amount of leaf notching that resulted post treatment. However, it occurred to me that the proposed experimental design might have some shortcomings. For example, what if the winter killed both populations of weevils? That would give the false positive appearance that both methods are highly effective. I decided not to use the Orthene®, so it would be a comparison between no treatment and treatment with nematodes.

Currently, the most widely used nematodes are *Steinernema carpocapsae* and *Heterorhabditis bacteriophora* or Strain Sc and Strain Hb respectively. The supplier offered both, so I chose the Hb strain, which was described as being more aggressive in seeking its prey. A $34.00 order for 25 million Hb nematodes was placed in early April. Several weeks later, a padded mailer containing instructions and three individually packaged sponges arrived. As the soil temperature had to be at least 50° F, I waited several weeks to apply the nematodes. As instructed, I thoroughly watered the area around the plants that I was planning to treat, extracted the nematodes from the sponge carriers by repeatedly squeezing the sponge carriers in a bowl of lukewarm water, and poured the resulting solution into the soil surrounding the plants. The instructions called for using a garden syringe or a sprayer to permit a measured and even application of nematodes, but I was more interested in ensuring that I applied nematodes in excess of what would be necessary. I had no means of gauging stock viability, and allowing for as little as 50% viability, twelve million nematodes should still have been adequate for my purposes.

I periodically monitored both sites and observed leaf notching on the non-treated plants first. This was anticipated and resolved my concern about the severe winter wiping out the weevils. Unfortunately, I later detected leaf notching on the treated plants and subsequently observed adults at both sites. What conclusions could I draw from my results? Perhaps the Hb strain is not appreciably effective as a means of treatment for this particular weevil under the conditions that I provided, or perhaps there was a problem with my shipment of nematodes (dead stock). Even though my results were not what I expected, I succeeded in learning more about what may yet prove to be a useful weapon in the Integrated Pest Management arsenal.

REFERENCES

(1) Miller III, W.C. Rhinocapsus vanduzeei Uhler, *A Little Known Pest of Azaleas.* **THE AZALEAN**, September 1993, 15 (3), 58-59.

(2) Smith, D.C. and M.J. Raupp. *Leaf Notching Weevils.* **THE AZALEAN**, June 1985, 7 (2), 30-31.

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