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Research and News on the latest pest management techniques

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COMING UP THIS WEEK:

Who let the bugs out?
What's bugging you?
Botrytis, meet calcium
A killer winter for the bugs?

Ball Culture Guide
THE ENCYCLOPEDIA OF
SEED GERMINATION
By JIM NAU

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Who let the bugs out?

Hi, y'all! Welcome to the first installment of *PestTalks*!

My name's Juang-Horng Chong. People call me JC Chong. I'm a bug guy. I'm a lackey of Clemson University, running its Turf and Ornamentals Entomology research and extension program. I find new and better ways to kill bugs and answer the eternally perplexing question of, "What's good about a bug?" I teach a class on turf insects and diseases this semester; please pray for those poor undergrads.

The question of, "What good are they?" really started my life as an entomologist. Growing up on a farm in Malaysia, it's hard not to be a bug nerd. After having been nudged repeatedly toward medicine, I took my irate self across the Pacific Ocean to the University of Arizona, got a BS in Ecology and Evolutionary Biology, then an MS and PhD in Entomology at the University of Georgia. I worked for the University of Florida and USDA-APHIS in Miami for a couple of years, then started working for Clemson University in 2007.

I work with all segments of the green industry across the country. Occasionally, I also serve forest, hay, veggie and fruit growers in South Carolina. On my days off, I'm a fisherman, hunter, fixer-upper, tractor driver, bushwhacker, wood splitter, dog-belly scratcher and horse-poop scooper. I hope to be a jon boat captain one day if this newsletter runs long enough for me to score some money from Chris Beytes. I've worn lots of hats. To this day, my mom doesn't really know what I do (she loves me nonetheless).

This newsletter will reflect my many hats, covering news, insights, mysteries and rants about pest management in nurseries, greenhouses, and landscapes, and on woodies, herbaceous perennials, annuals, cutflowers, turf and everything in between. I'll bring you what I've see, hear or learn, and the shiniest new products and research.

This newsletter will cover not just insects and mites, but also diseases and weeds. At this very moment, plant pathologists and weed scientists all over the country are falling over sideways imagining how an entomologist might embarrass himself talking about diseases and weeds every other week in a newsletter published by respected the Ball Publishing. You have Matthew Chappell and Chris Beytes to

thank for that.

In my 20 years with the green industry and beyond, I've learned and seen much to make me dangerous. To quote my lovely wife, in her sweet southern drawl, "Why, ain't you just a well of (bleep) information!" And I can count on y'all. Send your teachable moments, feedback, suggestions and questions my way. Heck, I'll definitely showcase some of your most intriguing questions and mysteries in this newsletter. Do my wife a favor: Stump me and don't let my head get any bigger.

Let's get on with the news!



What's bugging you?

The IR4 Ornamental Horticulture Program has done it again. For those who aren't familiar with IR4, this organization is supported by federal and industry dollars to facilitate the expansion of pest management tools for specialty crops. If you're using a super-effective fungicide that was first introduced to the field crop market, thank IR4 for collecting the data needed to expand the label to include ornamentals, vegetables, fruits and sod.

IR4 surveys growers, landscapers and sod producers biennially on their hard-to-kill pests. Survey results guide decisions on research funding for the next two years. IR4 does most of its work through collaborative research. Full disclosure: I've received consistent yearly funding from IR4 to test insecticides and miticides. The money pays for part of my employee Shawn's salary. Before you call me an industry stooge, I invite you to tell Shawn that she can't have the money; I don't dare.

The top four pest groups are (drum roll, please ...) borers and beetles, mites and spider mites, thrips, and scale and mealybugs for entomology; leaf spots and anthracnose, crown and root rot, bacterial diseases, and powdery mildew for pathology; and summer annual broadleaf, winter annual broadleaf, perennial broadleaf and grasses for weed science. For the full survey results (fascinating read, trust me), go to ir4.rutgers.edu.

With the survey results in hand, IR4 staff, researchers and industry representatives selected the following national research priorities at the priority-setting meeting in mid-October 2017: borers and beetles, scales and mealybugs, and crop safety of new insecticides for entomology; botrytis, and non-oomycete root and crown rots for pathology; and pre- and post-emergent herbicide crop safety and efficacy for weed science.

Is your "favorite" pest on the list? Are you mad that snow flea, which has ground your gears for the past 15 years, is not on the list? Hate to tell ya: you have yourself to blame if you didn't fill out a survey.

The U.S. green industry had an economic impact of \$197 billion and supported 1.6 million jobs in 2013. But only 127 participated in the survey; that's less than 0.008% of growers, LCPs, ground managers, etc. in this country—56% of respondents were growers, 7% were landscape care professionals, and 28% were government, research and extension types. Most operations that responded were greenhouses, container nurseries and field nurseries, splitting the top spots at 22% to 24% each, followed by landscape operations at 16%.

You'll have to holler if you want attention to your pest of concern. The segment that has the greatest participation will likely have their concerns heard the loudest. If you want somebody to study snow fleas instead of botrytis, fill out a survey next year!

Speaking of botrytis ...

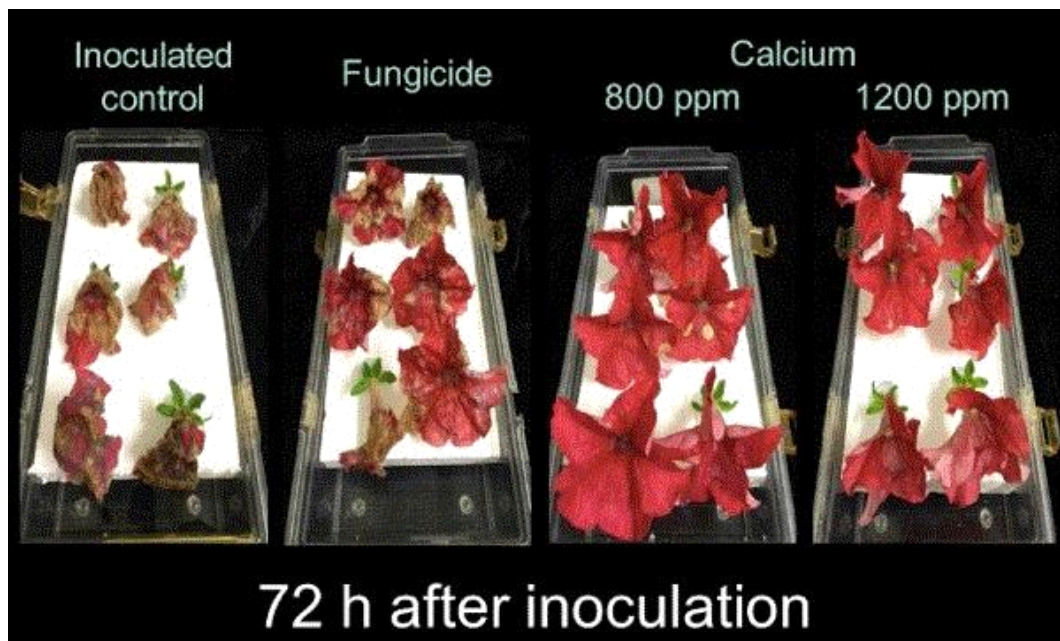


Botrytis, meet calcium

We pack our carts with the best crop of bedding plants ever, or our boxes with the best cut roses, only to receive a call from our customers rejecting the shipment because of gray mold. Botrytis meltdown is a huge problem during shipment because high humidity in sealed shipping carts or containers is just what botrytis needs to cause an outbreak.

With funding from the American Floral Endowment, Jim Faust and his graduate student Kathie Bennett (Clemson University) studied the potential of reducing botrytis meltdown on petunia flowers with pre-shipment sprays of calcium chloride. Kathie sprayed four concentrations of calcium chloride (at 0, 400, 800 and 1,200 ppm) over two weeks before the expected shipping date. She infected the flowers with a fludioxonil-resistant botrytis strain and kept the flowers in sealed boxes to simulate the high humidity of sealed shipping containers. She then compared the disease incidence score of these calcium-treated petunia flowers with those treated with one application of Palladium.

The picture tells the tale: Flowers in the inoculated control (i.e. infected with the pathogen, but not treated) and the fungicide treatment didn't fare well. Flowers treated with 800 and 1,200 ppm calcium chloride looked good, although they had some blemishes.



Petunia flowers treated with calcium at 800 and 1,200 ppm suffered from less botrytis meltdown than untreated and fungicide-treated inoculated control. (Photo credit: Kathie Bennet, Clemson University)

Pre-shipment sprays of calcium chloride at 800 or 1,200 ppm can reduce botrytis meltdown during shipment, even against fungicide-resistant strains. Some of us are already using calcium spray to prevent calcium deficiency or bract edge burn in poinsettia. As shown in this study, calcium spray can also help with botrytis suppression, reducing fungicide application frequency and cost.

It's still very important to practice good cultural and sanitation practices, e.g., remove and properly discard plant debris before and during production, provide proper plant spacing, lower air temperature, and reduce humidity level. Aaron Palmateer of Bayer wrote [a piece on botrytis management in the October issue of *GrowerTalks*](#).

Jim and Kathie are conducting follow-up studies to select the most efficacious calcium source. I look

forward to updating you on the results.



A killer winter for the bugs?

I'm writing this newsletter from the comfort of my couch with my (wife's) dog by my feet. I'm working from home because my office is covered in 3 in. of snow and closed. Y'all need to understand, unlike Chris Beytes who zips along snow-covered streets of Chicago at 80 mph in his Maserati Ghibli, we South Carolinians (or Deep Southerners, in general) are paralyzed by any amount of snow and ice. Milk and bread are gone; government services suspended; anarchy reigns.

I bet I'll receive this question in the next few days, "Since it was cold enough to freeze the (bleep) off a brass monkey, will I have less _____ (enter your favorite insect or disease) this year?" I always answer, "It is hard to say." I'm not being coy. The fact is, I really don't know.

Some will be affected. Cliff Sadof (Purdue University) described beautifully on *Ornaent* (a list-serve of ornamentals entomologists and pathologists) how bagworms might have a hard time in Indiana after the temperature in West Lafayette dropped to a high of -3F on January 1 (Yikes!). The survival of bagworm eggs is a function of the weight of the egg mass and the maximum daily temperature. Knowing the weights of egg masses and temperatures on January 1 in different parts of Indiana, Cliff was able to predict that most bagworm eggs in West Lafayette will be killed, many in Indianapolis spared, and all in Evansville doing just fine.

Examples of known tolerances for low temperatures, such as with bagworms, are rare. Low-temperature tolerance is species-specific and we don't know that information for most species. We therefore cannot predict pest status for most species.

In fact, most pests will likely shrug off the arctic blast. Insects overwinter; weeds and pathogens become dormant or produce surviving structures as winter approaches. To better survive the winter, most of these overwintering insects and dormant pathogens are hiding in the ground, plant tissues or litters, which give them additional insulation. Winter temperature, however bitter, doesn't reduce survival of these overwintering or dormant creatures by an amount necessary to make a difference for a year. They'll be active when they thaw out, as if nothing ever happened at all.

Watch for temperature and moisture in the spring. If temperatures are higher than normal, that might allow insects to develop faster and complete more generations. If the temperature and moisture are right, some diseases will also reach an outbreak level on susceptible plants.

So, I do not expect ambrosia beetles (which overwinter as adults in wood) to be less problematic in the coming spring. They may be worse since plants were cold-stressed or injured and became more susceptible to attacks. Alas, trying to predict outbreak levels is no more successful than winning the jackpot.

By the way, what good is three gallons of milk when the power goes out for a few days?

Anyway, I'll go catch myself some snow fleas now.

See y'all next time!



JC Chong

Associate Professor of Entomology at Clemson University

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