

Plant Lover's Almanac

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The maple sap is flowing. The witch hazels and filberts are doing their regular winter blooming. The silver maple buds are fattening. Spring has certainly not sprung, but Pawxatuney Phil notwithstanding, it does feel like it is on the horizon, though there are no guarantees. To paraphrase the Yogi, it's not here – 'till its here.

My botanizing buddies David Wiesenberg of the Wooster Book Company and art photographer Stephen Tomasko (exhibition right now at the Cuyahoga National Park) both tap maples and are collecting sap as we read this, David in 2 ½ gallon increments. If they see this, maybe this year will boil down to the reality of me receiving some of their finished product!



Witch hazel blooming in February at Naturealm (Stephen Tomasko)



Maple sap collection at Secrest Arboretum in Wooster (David Wiesenberg)

Though the winter blooming of Asian witch hazels, our winter-spring witch hazel (*Hamamelis vernalis*) and Asian-American hybrid witch hazels is not unusual on warmer winter days, the earlier blooming of plants come spring is something is truly happening. Climate change is real. It matters in many ways, including Plant Lover Almanac concerns. The following tale will be an example of one of my favorite Yogi Berra quotes: “*What gets us into trouble is not what we don't know. It's what we know for sure that just ain't so.*”



Maple sap collection at Secrest Arboretum in Wooster (David Wiesenberg)

This requires a little background. My colleague Dan Herms, an entomologist at Ohio State University's Ohio Agricultural Research and Development Center in Wooster, has mined the scientific literature and done climate change research on its effect on plants for decades now, and I asked him recently what got him interested, as an entomologist, in climate change.

In March of 1984, after earning his Master's Degree at OSU working with his advisors Dave Nielsen and Davis Sydnor, Dan headed north to Michigan. He graduated at OSU on a Saturday, and then on Monday he started as the entomologist at Dow Gardens in Midland Michigan. At Dow he was responsible for directing their pest management programs. Hello research, meet horticulture and entomology in practice.

In his spare time, from 1986-1991 Dan worked on and earned his PhD at MSU! At Dow, though, an element of his plant health care strategy involved phenology. Ever both the curious scientist and the practicing ecologist that all horticulturists are, Dan began charting insect emergence and flowering dates of woody plants at Dow. They are linked.

They are linked because both flowering and insect emergence are driven by heat units. This link between biological activity and environmental factors (in this case heat) is what phenology is all about. So, Dan became interested in the scientific backbone of phenology, starting with these observations and looking at the history of agriculture, which is strongly connected to phenological factors: when to plant wheat, etc. And there is a wealth



Black vine weevil on *Taxus* research. Gina Penny pictured (Dan Herms)

of long-term historical phenological observations, from dates of grape harvests for wine, Thoreau at Walden Pond, Aldo Leopold in Wisconsin, *ad infinitum*.

So, Dan began with these observations at Dow: first bloom (1 of 20 blossoms out), and full bloom (19 of 20 blossoms out) of selected woody plants, and egg hatch, larval instars, adult emergence for a range of insect pests. This greatly aided his pest management timing. The years went by at Dow, and then Dan returned in 1996 to OSU as the research and Extension entomologist for ornamentals. One thing that Dan had noticed with his phenology work, as did many professional and citizen scientists (usanpn.org: The National Phenology Network) was that plants were blooming earlier and insects were emerging earlier in the Spring.

Naturally, each Spring is different, depending on how warm it was in the new season and how many heat units had developed, but the overall trend was - warmer and earlier. Dan of course delved deeper into the science and developed models and equations for the phenological wave, the reliable sequential predictability of plant flowers and thus insect development – very important for insect control practices.

After Dan returned to Ohio one of his graduate students at OSU, Gina Penny, began work on a project in Lake County at Herman Losely and Son, Inc. nursery. One of the questions that arose was why the OSU recommendations for black vine weevil (BVW) control, developed by Dan's advisor Dave Nielsen decades before, did not seem to be working. The recommendation was to apply the first of three insecticides for black vine weevil control on or about June 21, an application to control BVW adults.



Black vine weevil life stages (Dave Nielsen)

This control was not as stellar as in the past. Why? Because, as it turns out, black vine weevil adult emergence was, by 2001, on average, around Memorial Day, 2-3 weeks earlier than when those general calendar date

recommendations were first made. Warming. What we had just known for sure about the best timing for black vine weevil control – just was not true anymore.

So, this was a major impetus for Dan to continue his interest in climate change. Check out “Herms Lab” on his website, for his latest power points on climate change and other research projects, deeply informed by science – defined by Merriam Webster as “*knowledge about or study of the natural world based on facts learned through experiments and observation.*”

Fast forward to now...Dan is continuing the applications of our climate change knowledge in a project with Davey Tree Expert Company in Kent. They are exploring how best the green industry can respond to climate change. Why is this important? My immediate thought about this was that it is important to arborists and others in the green industry to manage pests better with regard to warming temperatures...

...Think mountain pine beetles moving northward out west and southern pine beetles moving northward out east, about bagworm populations in Ohio increasing northward in Ohio. This “worming of Ohio” is something we have seen quite clearly in my time with OSU Extension, with bagworms 30 years ago being mostly of significance south of I-70 but now very prominent in northern Ohio, as more survive our generally milder winters.

Then as I listened to Greg Ina of Davey Tree and Dan Herms, many more issues become obvious for a green industry company, especially one that is regional and national and international. Climate change is resulting in more severe storm events – and if you have crews and equipment that respond to trees down around the country, more violent storms matter in terms of equipment fleets and scheduling. If heat wave events are more severe in southern states then worker safety protocols for heat stress need review. Drought stress models for tree health need review for plant selection, maintenance and pest control programs. Horticulture and the economics of the green industry – a perfect storm for academic and green industry cooperation and planning.

Let us heed the Yogi - Let us make this the year and decade and lifetime of improving our scientific literacy. Science is the rational method of true common sense. As Matt Damon’s character of Mark Watney said in *The Martian* when he endeavoured to survive, alone on Mars:

In the face of overwhelming odds, I am left with only one option. I am going to have to science the (well, you know what) out of this.”

To close: By the way, that quote that I was so sure came from Yogi Berra? That I have been using for years? Much to my embarrassment, it proves its own point. As I fact-checked this very article I learned that - the real author of...

...“What gets us into trouble is not what we don't know. It's what we know for sure that just ain't so.” is - Mark Twain!