

# Phenology gardens track ties between weather, nature

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How strange has this spring been?

Denise Ellsworth can tell you exactly.

Ellsworth is one of the coordinators of the Ohio Phenology Garden Network, a patchwork of gardens that helps scientists track the timing of natural occurrences. The gardens supply data on when plants bloom, allowing researchers to show how that timing is affected by weather.

Looking at the data, it's easy to see just how much farther ahead nature is this year than normal. Late last week, for example, plants were blooming in Akron, Ohio, that bloomed in mid-May a year ago.

That sort of information can guide home gardeners as well as university researchers, said Ellsworth, who coordinates the garden network with Dan Herms, her colleague in the entomology department of the Ohio Agricultural Research and Development Center in Wooster Township. By paying attention to when things happen and in what order, gardeners can treat pests more effectively, provide a steady diet for wildlife and plan a garden where there's always something in bloom, she said.

The idea for the network blossomed in 2003, when Ellsworth and Herms were helping to lead a program on insects for master gardeners from throughout Ohio. As Ellsworth recalls it, a fellow educator at that program remarked that it would be interesting to have gardens where people could track the emergence of plants and insects each year.

"Dan (Herms) and I looked at each other, and we were like, yeah, let's do this," she said.

The idea behind phenology is that some natural events always occur in the same sequence, year after year. But exactly when those events happen, or how fast the sequence unfolds, can vary greatly depending on the [air temperature](#), Ellsworth said.

Scientists have long known about that sequence and its relationship to weather, she said, but the phenology gardens have enabled them to track the sequence and to show it holds true across a state or region.

The network started with about two dozen gardens and has since grown to 45. They're in places such as parks and arboretums, school grounds and college campuses. Summit County has two, at Seiberling Nature Realm in Akron and Adell Durbin Park in Stow.

All the gardens across the state contain the same collections of trees and shrubs. Some also have perennials, an identical set in each garden.

The gardens are tended and monitored by volunteers, who include master gardeners, public garden employees and Ohio State University Extension staff members.

The volunteers visit the gardens regularly - maybe two or three times a week, or less often when the temperature cools and plant development slows. They note the date each plant first blooms and, in some cases, the date it reaches full bloom. They also note the degree days, which is a cumulative measure of how much warmth the area has experienced up to that point in the year.

That information is logged into a statewide phenology calendar, which shows the sequence of natural events and the date each event happened

in a particular area. The calendar also includes insect activity, such as when a particular insect's eggs hatch or when adult insects emerge.

Monitors also keep an eye out for certain problematic pests, such as the viburnum leaf beetle that moved into Ohio in 2002 and has been killing viburnum shrubs, said Chris Donohoo, a master gardener from Cuyahoga Falls who oversees the monitoring of the phenology garden in Stow. That information is passed on to researchers and helps with efforts to track and fight invasive [pests](#).

At Seiberling Nature Realm's phenology garden, the first flowers on the Coral Burst crab apple tree had just opened one day last week, an event volunteer Lori Nelson dutifully noted. Nelson, of Bath Township, is among eight master gardeners who take turns monitoring the garden in one-week shifts, and last week was her week.

Volunteer Mary June Starts of Cuyahoga Falls looked over the swelling buds on a Miss Kim lilac shrub. "That's going to pop. Not too long," she said with a smile.

The group feels a pride of ownership over the plot, Starts said. Even though its primary function is research, the volunteers work to make it beautiful for the hikers who pass on an adjacent trail. And they get plenty of help from Woody Stover, the Nature Realm's gardener, and Laura Esposito, its grounds and facilities manager, they said.

The volunteers also welcome the chance to talk with the visitors who ask about the garden, said Carolyn Dunlavy, a West Akron resident who coordinates the volunteer schedule for the Nature Realm garden.

"Now's our opportunity to educate the community on what this is all about," she said.

Because of the unusually warm spring, the work of monitoring the gardens sneaked up weeks early this year, Donohoo said. The first plant the monitors check each year is Lenten rose, which took Donohoo by surprise when she noticed it was already blooming in her yard by March 1. She hadn't thought to check the phenology garden yet, she said.

That's not an uncommon kind of glitch. The system is based on observation, Ellsworth said, and if a monitor misses an event by a day or two, the data aren't compromised significantly.

"It's our best effort at data collection," she said. "It's not the perfect system."

Nor can the calendar predict every event. For example, seed germination depends on soil temperature, but the phenology calendar doesn't track that factor.

Still, Ellsworth said the data can go a long way toward helping people garden more knowledgeably and effectively.

By consulting the phenology calendar, she said, a gardener could time an insect treatment to when the pest is most vulnerable. In many cases, that enables a gardener to choose the least environmentally harmful approach.

Or the gardener could choose plants that would provide a succession of color throughout the season or a sequence of blooms to attract bees, hummingbirds or other wildlife, she said.

The calendar helps a gardener tune into nature's timing instead of relying on less exact references, Ellsworth said.

And nature's timing is the only one that's always right.

## WHAT IS PHENOLOGY?

No, phenology is not the study of bumps on people's heads. That's phrenology.

Phenology is the study of recurring biological phenomena and their relationship to weather. Examples of those phenomena are bird migration, the emergence of insects and the blooming of trees and wildflowers.

Research shows that those things happen in the same sequence every year. Silver maples bloom before red maples, for example, and gypsy moths hatch when the Eastern redbuds start to bloom.

But exactly when those things happen depends on the weather, particularly the temperature. During a warm spring like this year's, nature presses the gas pedal and accelerates the schedule.

Phenology can help [home gardeners](#) and professional landscapers alike by giving them a visible way to tell when certain garden tasks should be done. For example, if you know a pesky insect emerges at the same time the crab apple tree in your yard starts to bloom, you can watch for the blossoms as a sign that it's time to do battle with the bug. By timing a treatment correctly, you'll have the most success with the least effort and environmental harm.

Ohio's phenology calendar is online at [www.oardc.ohio-state.edu/gdd](http://www.oardc.ohio-state.edu/gdd). To see what's happening in your area, just type in your ZIP code. You can also see when things happened in previous years by entering a date from the past.

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