

The Chickadee's Guide to Gardening

In Your Garden, Choose Plants That Help the Environment

By DOUGLAS W. TALLAMY
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OXFORD, Pa. — I GREW up thinking little of plants. I was interested in snakes and turtles, then insects and, eventually, birds. Now I like plants. But I still like the life they create even more.

Plants are as close to biological miracles as a scientist could dare admit. After all, they allow us, and nearly every other species, to eat sunlight, by creating the nourishment that drives food webs on this planet. As if that weren't enough, plants also produce oxygen, build topsoil and hold it in place, prevent floods, sequester carbon dioxide, buffer extreme weather and clean our water. Considering all this, you might think we gardeners would value plants for what they do. Instead, we value them for what they look like.



When we design our home landscapes, too many of us choose beautiful plants from all over the world, without considering their ability to support life within our local ecosystems.

Last summer I did a simple experiment at home to measure just how different the plants we use for landscaping can be in supporting local animals. I compared a young white oak in my yard with one of the Bradford pears in my neighbor's yard. Both trees are the same size, but Bradford pears are ornamentals from Asia, while white oaks are native to eastern North America. I walked around each tree and counted the caterpillars on their leaves at head height. I found 410 caterpillars on the white oak (comprising 19 different species), and only one caterpillar (an inchworm) on the Bradford pear.

Was this a fluke? Hardly. The next day I repeated my survey on a different white oak and Bradford pear. This time I found 233 caterpillars on the white oak (comprising 15 species) and, again, only one on the Bradford pear.

Why such huge differences? It's simple: Plants don't want to be eaten, so they have loaded their tissues with nasty chemicals that would kill most insects if eaten. Insects do eat plants, though, and they achieve this by adapting to the chemical defenses of just one or two plant lineages. So

some have evolved to eat oak trees without dying, while others have specialized in native cherries or ashes and so on.

But local insects have only just met Bradford pears, in an evolutionary sense, and have not had the time — millennia — required to adapt to their chemical defenses. And so Bradford pears stand virtually untouched in my neighbor's yard.

In the past, we thought this was a good thing. After all, Asian ornamentals were planted to look pretty, and we certainly didn't want insects eating them. We were happy with our perfect pears, burning bushes, Japanese barberries, porcelain berries, golden rain trees, crape myrtles, privets, bush honeysuckles and all the other foreign ornamentals.

But there are serious ecological consequences to such choices, and another exercise you can do at home makes them clear. This spring, if you live in North America, put up a chickadee nest box in your yard. If you are lucky, a pair of chickadees will move in and raise a family. While they are feeding their young, watch what the chickadees bring to the nest: mostly caterpillars. Both parents take turns feeding the chicks, enabling them to bring a caterpillar to the nest once every three minutes. And they do this from 6 a.m. until 8 p.m. for each of the 16 to 18 days it takes the chicks to fledge. That's a total of 350 to 570 caterpillars every day, depending on how many chicks they have. So, an incredible 6,000 to 9,000 caterpillars are required to make one clutch of chickadees.

And chickadees are tiny birds: just a third of an ounce. What if you wanted to support red-bellied woodpeckers in your yard, a bird that is about eight times heavier than a chickadee? How many caterpillars would that take?

What we plant in our landscapes determines what can live in our landscapes. Controlling what grows in our yards is like playing God. By favoring productive species, we can create life, and by using nonnative plants, we can prevent it.

An American yard dominated by Asian ornamentals does not produce nearly the quantity and diversity of insects needed for birds to reproduce. Some might argue that we should just let those birds breed "in nature." That worked in the past, but now there simply is not enough "nature" left. And it shows. Many bird species in North America have declined drastically in the past 40 years.

Fortunately, more and more gardeners are realizing that their yards offer one of the most empowering conservation options we have, and are sharing their properties with the nature around them.

By the way, you might assume that my oak was riddled with unsightly caterpillar holes, but not so. Since birds eat most of the caterpillars before they get very large, from 10 feet away the oak looked as perfect as a Bradford pear.

At Plant-O-Rama in Brooklyn, the Message Was That Beauty Is No Longer Enough

In the Garden

By Anne Raver

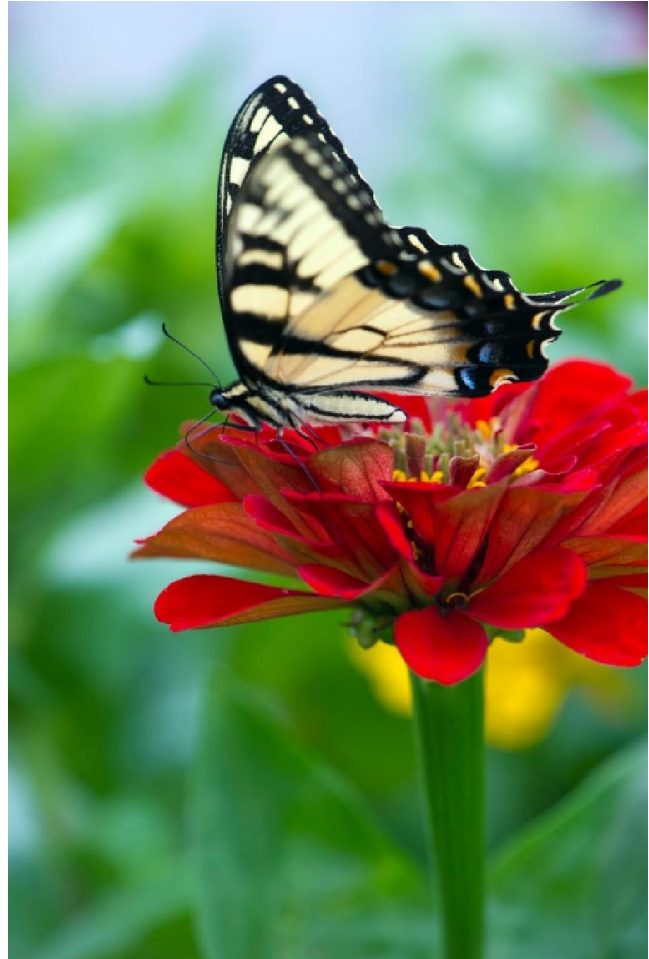
“I can’t believe I’ve been running this event for 19 years, but you seem to keep coming back,” Bob Hyland told the cheering crowd at the Brooklyn Botanic Garden’s auditorium last week. “A few growers from the North Fork are still digging out of 30 inches of snow. But they’re with us in spirit.”

The storm had postponed Plant-O-Rama for two days, but it hadn’t dampened the enthusiasm of the more than 1,000 plant lovers who are drawn to this symposium and horticultural trade show every year with an urgency akin to that of the swallows returning to Capistrano. (Mr. Hyland, a former vice president of horticulture at the Brooklyn garden, had flown in from his home in Portland, Ore.)

No matter that snow covered the witch hazels. Spring was on the way.

Plant-O-Rama has been a bellwether for trends in the garden world since its founding in 1997, by Mr. Hyland and other leaders of Metro Hort Group, a network of New York-based urban horticulturists. Exotic species as well as natives have ignited plant lust here, depending upon which rock star of the garden world extolled their virtues on the big screen in the darkened room. But always, the focus has been on aesthetics: what makes an attractive garden.

Last week, the keynote speaker, Douglas Tallamy, an ecologist, informed us that beauty is not enough.



Credit: Rob Cardillo for The New York Times

“We have to raise the bar on our landscapes,” said Mr. Tallamy, a professor and chairman of the department of entomology and wildlife ecology at the University of Delaware. “In the past, we have asked one thing of our gardens: that they be pretty. Now they have to support life, sequester carbon, feed pollinators and manage water.”

A daunting order, perhaps, but maybe it’s just a shifting of gears. Yards filled with beautiful natives that can provide all of these services don’t have to look unruly and formless. And they are key to survival, Mr. Tallamy argued. Pollinators, he reminded us, “pollinate 90 percent of all plants, not just crops.” And if the plants crash, so do the rest of the species, including us.

Landscape ecologists estimate that only 3 to 5 percent of the lower 48 states is undisturbed habitat for plants and animals. Farmland now covers more than half of the country. Most of the rest is taken up by suburban sprawl and about 40 million acres of lawns (“eight New Jerseys,” as Mr. Tallamy put it), along with highways, malls and growing cities. A world with half those lawns, he said, might have 20 million acres of habitat, or more than 13 national parks, including Yellowstone, Yosemite and the Adirondacks, if you added up the acreage.

Instead, thanks to vanishing habitats, Mr. Tallamy said, “We have 50 percent fewer birds than 40 years ago,” referring to results of yearly bird-banding studies that track those numbers. And some 230 species of North American birds are at risk of extinction, he added, citing the 2014 State of the Birds Report (stateofthebirds.org).

“But we can do something about this,” he said. “We can bring nature back to our yards.”

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Plant-O-Rama’s theme this year was Living Landscapes, a nod to Mr. Tallamy’s latest book, “The Living Landscape: Designing for Beauty and Biodiversity in the Home Garden,” written with Rick Darke, a horticulturist and photographer whose own native garden in Newark, Del., is strikingly beautiful.

The book, published last year by Timber Press, comes seven years after Mr. Tallamy’s best seller, “Bringing Nature Home,” which described the lifeline that native plants provide to native fauna, particularly insects and birds. But his first book didn’t show how native plants could be layered, with winding paths in between, to make a garden as lovely to people as it is to its other inhabitants.

As Mr. Tallamy admitted, “I’m not a designer.” But Mr. Darke does have a gift for design, and the new book shows how a garden can function as an ecosystem and still have a powerful form.

Trees, of course, are carbon sinks. A large native sugar maple sequesters 450 pounds of carbon a year; a white oak, 513 pounds. Millions of such trees planted in American yards, Mr. Tallamy said, could help reduce global warming. Yet landscape contractors and designers often discourage clients from planting oaks and sugar maples.

“They say, ‘You won’t live long enough to enjoy an oak tree,’” Mr. Tallamy said. “But it doesn’t have to be 300 years old.”

He flashed an image of a white oak seedling on the screen, planted by a blue jay in his yard in Oxford, Pa. Fourteen years later, the tree is 20 feet tall and 13 feet wide. It’s a handsome tree, for sure. But so is a zelkova, or Japanese elm, you might argue, and that sequesters carbon, too. The difference is that native oaks support 557 species of caterpillars. The zelkova, none.

Gardeners worry that all those caterpillars will defoliate their nice shade trees, Mr. Tallamy said, and then pointed to his white oak: “I counted 410 caterpillars, of 19 different species, just walking around this oak for half an hour one July day last summer. It wasn’t defoliated. You couldn’t see the holes.” (And even if you can, don’t think of those holes as damage, he said. Think of them as evidence that you’re feeding your friends.)

He counted the caterpillars on one of his black cherry trees: 239 in 14 species. In contrast, a Bradford pear in his neighbor’s yard had just one species, an inchworm.

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Mr. Tallamy is relentless with his facts: 90 percent of native insects have developed specialized relationships with native plants. The blue flowers of Phlox divaricata, a native ground cover, for example, have too narrow a corolla for [bees](#) to reach the pollen. Only native hummingbird moths and a few other insects have a proboscis long and narrow enough to reach the pollen and nectar.

And another thing: Most plants defend themselves with toxic compounds. But certain native insects with the right enzymes have evolved alongside specific plants to break down the plant’s particular chemicals.

“Eastern red cedar has been around for millions of years, but very few insects, except the Juniper hairstreak, can eat its tissues without dying,” Mr. Tallamy said. “The downside is, that’s the only thing it eats. So if we don’t include cedars in our yards, we lose the hairstreak.”

And the only host for the great fritillary butterfly is the native violet. “When violets are mowed down,” he said, “we lose the fritillaries.”

And if we lose the insects, including spiders and moths, we lose amphibians, bats, rodents.

“Even the fox eats insects — 25 percent of his diet is insects,” Mr. Tallamy said.

So it goes throughout the food web. Though nonnative plants may provide nectar for butterflies, their leaves are unpalatable to caterpillars. Images of weirdly gorgeous worms flashed before our eyes. Caterpillars with little curvy tails or blue neon bumps or fuzzy mops of brown hair, chomping leaves of willow, black cherry, oak and other native species. “Streak dagger moths, Cecropia moths, spiny oak caterpillars,” he said, reeling off a dozen other names.

These caterpillars aren’t just entertaining to look at: 96 percent of all terrestrial birds in North America eat insects. And their young can’t survive without them.

Mr. Tallamy flashed images of bluebirds, catbirds and warblers, their beaks full of caterpillars, stuffing them down the throats of their voracious young. “Chickadees need 6,000 to 9,000 caterpillars to feed one clutch,” he said.

Mr. Tallamy had watched a pair feeding their young in a nesting box suspended from his white oak tree. The birds delivered 17 species of live caterpillars to their babies in three hours, sometimes carrying two or three at a time, every three minutes. No coffee breaks for these parents. They hunted worms from 6 a.m. to 8 p.m. for 16 days, until the nestlings fledged.

Watching these kinds of interactions is more engaging than watching the grass grow (and mowing it). And it can create a sense of place.

“At our house, spring comes when the woodcock returns,” Mr. Tallamy said. “We know it’s fall when the juncos show up.”

Of course, not all of us are about to give up our beloved lilacs and tree peonies. And many are still married to those garish Japanese azaleas that Mr. Tallamy loathes.

“But are they ruining the landscape?” he asked. “No, they’re just taking up room that a native plant could occupy.”

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Ruth Rogers Clausen, an English-born perennials expert who has gardened in this country for a half-century, followed Mr. Tallamy with a talk about her own favorite native plants. And it must be noted that her latest book, “Essential Perennials: The Complete Reference to 2,700 Perennials for the Home Garden,” written with Thomas Christopher and recently

published by Timber Press, is as enthusiastic about a Japanese tree peony as a native prairie flower.

“As far as our book is concerned, we didn’t push one way or another,” said Ms. Clausen, 76, who gardens in Easton, Md. “Putting in an Asian plant doesn’t make you a bad person.”

But environmental consciousness has raised the bar, she allowed. “I came to the first Plant-O-Rama, and almost every one since,” Ms. Clausen said. “People used to not ask where a particular plant came from. Now they want to know, especially the young people.”

In her own garden, she said, she strives for at least “a minimum of 50 percent natives, just to make sure that I’m looking after wildlife.”

Ms. Clausen, who grew up in South Wales, recalled that many plants in her mother and grandmother’s garden were American natives. “We had a hedge of New England asters that bloomed every fall.”

She suggested all kinds of lovely combinations.

Bloodroot, the ivory woodland flower that blooms so early and fleetingly, could be tucked beneath a deciduous tree to flower while its branches are still bare. “But don’t plant the double one, if you want wildlife,” she said. (Many varieties of species, gussied up by hybridizers, lose their value for wildlife.)

Mix bloodroot with trilliums (if you don’t have deer), columbine and native gingers, which have shiny evergreen leaves.

Virginia bluebells are striking mixed with celandine poppies, though the poppy “is a generous seeder,” she said, and can be invasive in some gardens. In the wild, native bluebells flourish with ostrich ferns.

Ms. Clausen mentioned sun-loving zizia, or golden alexander, as one of the best plants for the black swallowtail butterfly, and noted that spigelia, with its upright stems of deep red flowers, draws the hummingbirds.

Amsonia, a native mounding perennial, covers itself with blue stars in spring and turns a golden orange in fall, she said, and “it looks gorgeous en masse.”

Both she and Mr. Tallamy encouraged gardeners to visit Mt. Cuba Center (mtcubacenter.org), a botanical garden near Wilmington, Del., and a former du Pont estate, which demonstrates, in hundreds of acres, how natives can be artfully combined. Ms.

Clausen loves the fields of native coreopsis and rudbeckias encouraged along the roads near Easton.

“I stood on the brakes on Route 50 for this field of *Coreopsis grandiflora*,” she said. And a field of *Rudbeckia hirta*, black-eyed Susans, caused her to hit the brakes on Route 301.

She loves to put such natives in her garden, but the popular variety, Goldsturm, leaves her cold. “It looks like plastic,” she said. “It’s very flat.”

Many other favorites of hers may be found in “Essential Perennials,” along with her favorite exotics, like the epimediums she has nestled beneath the old native beech tree in her backyard. (“Don’t tell Doug,” she said.)

If the natives get 50 percent of her garden, perhaps the rest goes to nonnative plants that bring back memories of home, or dear friends. “I love the Welsh poppy, because I come from Wales,” she said. “I love the old-fashioned fragrant dianthus that my grandmother grew.”

But the specialized relationships between the native species fascinate her: “The whole thing is an enormous jigsaw puzzle, and when you find a piece, it’s exciting.”

In “A Living Landscape,” Mr. Tallamy tells the story of the Atala butterfly, a native of South Florida that once thrived on its sole host plant, *Zamia pumila*, or coontie, a slow-growing native cycad. The butterfly disappeared as the coontie was harvested to the point of extinction, to make starch out of its roots.

But in the mid-1970s, landscape designers rediscovered coontie as a valuable evergreen that could take drought and heat. And as coonties began to fill South Florida yards, the Atala butterfly returned.

“Maybe it had been harbored in the Everglades or somewhere,” he said, but “adding that single plant brought the butterfly back.”