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THE OLD FARMER'S ALMANAC

# Garden Guide

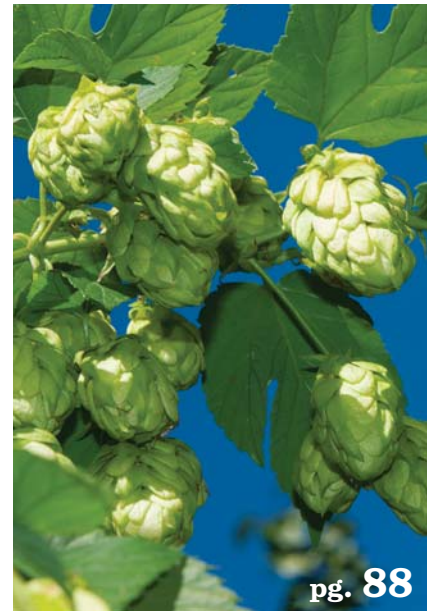
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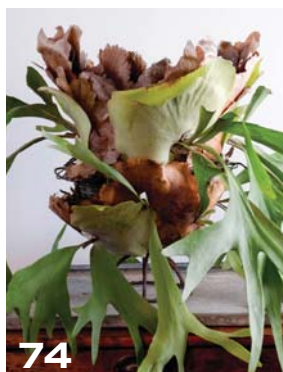
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SCAN TO LEARN MORE



# THE OLD FARMER'S ALMANAC

# Garden

## Guide

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*Thank you for buying this Garden Guide! We hope you find its garden wisdom useful and its pages entertaining. Thanks, too, to everyone who had a hand in its creation, including advertisers, distributors, printer, and sales and delivery people.*

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*The gardener doesn't mind the rain,  
The gardener doesn't mind the pain.  
And even when the weather's hot,  
She'd rather work outside than not.  
Even weeding has its pleasures,  
Making room for floral treasures.  
The gardener doesn't count time lost;  
She only minds an early frost.*

—ALMA RUTH, AMERICAN POET (B. 1928)

## WHY DO YOU GARDEN?

**W**elcome, friend, and thank you for picking up this year's *Garden Guide*. You must be a gardener—or want to be one. That's wonderful!

You're in good company: Folks who are interested in gardening have been increasing not only in number but also in diversity. One fun fact is that 54 percent of people ages 18 to 34 would rather go to a garden center than a nightclub! Likewise, the number of Millennials who intend to grow food is on the rise. And it turns out that younger and more urban social media garden influencers have more followers than their older, less citified counterparts!

Make no mistake about it: Gardening is for people of all ages and in all kinds of places—urban, suburban, rural; with pots or plots; indoors and outdoors.

The appeal of gardening today is surely that there

are just so many ways—and whys—to do it. One recent survey (page 11) suggests that we garden to relax, connect with nature, exercise, add property value, save money, and have good food. Another says that we do it to meet people, learn, and be creative. (Didn't anybody say that they garden for fun? *We do!*)

You'll find myriad ways to fulfill all of these whys and more on the pages of this *Guide*. Whatever your motivation, our goal is always to ensure that your gardening and growing experiences are the best that they can possibly be—and that the success of your garden becomes your well-earned reward for all of the work that you put into it.

Thank you again for joining us this year! We would love to hear your comments on this edition via [Almanac.com/Contact](http://Almanac.com/Contact). Why do *you* garden, and how can we help you to grow even better?

—Janice Stillman



# I have developed the world's best soil nutrient!

One of God's greatest gifts to me is a tremendous curiosity and love for the soil. My formal and informal education have taught me so much about soil types, structure, physics, chemistry, and biology. All life on this Earth comes from the soil, water, and sun. **Most disease comes from an imbalanced soil.** Since the advent of chemical fertilizers and genetic engineering (byproducts of the two World Wars), **industry has focused only on greater yields** and has neglected the most important part of our foods and feeds: **NUTRITIONAL CONTENT.**

**Our overuse of chemical fertilizers and pesticides has imbalanced our soils,** killed the micro life, and depleted what is most critical to life: minerals and trace minerals. My research has shown that **soils and plants need those missing nutrients to perform their best.** Soils respond to my product like a sick child responds to chicken soup, so I've named this product Chicken Soup for the Soil®. Now it is true that other companies have blended quality additives for the soil, amino acids, ancient seabed deposits, sea solids, soluble seaweed, organic acids like humic and fulvic, alfalfa, and other herbal extracts. However, the most important factor of our product is a discovery I made while blending these ingredients ...

**I made a serendipitous discovery** of how to react these individual ingredients into an homogenous product that **will not wash out of the soil.** We call the tiniest colloidal droplets of Chicken Soup "micro clusters." We don't call our product organic or natural, although it is carbon bound (which is the true definition of organic) and **all of our ingredients are naturally sourced.** We call it "biologically correct" because **our product stimulates the life in the soil and supplies all the nutrients commercial fertilizers neglect.**

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Jim Zamzow

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Verified Buyer

5.0 star rating

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**Plant happiness**

Plant happiness This stuff is great! Really improves my soil and plants are so healthy after I use it!



Review by Jeffrey B. on June 14, 2020  
**So much life in the Desert!** I live in the desert and it can be extremely challenging growing anything. I started using Dr. Jim's on my trees and garden and have noticed a profound difference in the growth rate and yields this year. My garden is happy and full of life even when it's scorching hot. I will cont. to use these products as I think they work wonders!

David G.

Verified Buyer

5.0 star rating

08/16/20

**Dr. JimZ Chicken Soup really helped my garden.** I'm glad I tried this. Even with very dry conditions for weeks I was able to get a nice harvest.

Ginnie Y.

Verified Buyer

5.0 star rating

08/07/20

**Love it!!**

I absolutely love this product! My plants looked so healthy and happy! Also a little goes a long way. I have used this year on my summer garden and still have enough for my winter garden.







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# LOTS TO SEE IN 2023!

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COMPILED BY STACEY KUSTERBECK



## WE ARE THE WORLD

“People are looking at their yard as an important piece of the local ecology,” observes Andrew Bunting, vice president of horticulture at Pennsylvania Horticultural Society.

Join in! Homegrown National Park calls on us to remove invasive plants and replace them with native plants in order to create new ecological networks. To gauge the group’s progress toward their goal of 20 million acres of native plantings (roughly half of the green lawns of private properties) or get your garden on the map, go to [Map.homegrownnationalpark.org](http://Map.homegrownnationalpark.org).



## SMALL VEGGIES WITH BIG IMPACT

“With the continued rise of food prices, saving money at the grocery store continues to be top-of-mind,” reports Jen McGuinness, author of *Micro Food Gardening* (Cool Springs Press, 2021). “People do not need traditional vegetable plots to tend their own food. Those with a patio, porch, or countertop can find ways to grow edibles creatively.”

Her favorite compact edibles . . .

- *micro tomatoes in 8-inch pots*: ‘Mohamed’, ‘Hahms Gelbe’
- *tomatoes in hanging baskets*: ‘Veranda Red’, **‘LITT’L BITES CHERRY’**
- *peppers in containers*: ‘Pot-a-peño’, **SHISHITO**
- *fingerling potatoes in window boxes*: ‘Red Thumb’, ‘Banana’

Another small wonder: “The **‘MICRO TOM’ TOMATO**, only 8 inches tall, will produce delicious tomatoes growing on a windowsill,” says Gary R. Bachman, Ph.D., extension/research professor of horticulture at Mississippi State University’s Coastal Research and Extension Center.

Learn more about “Pint-Size Produce” on page 64.



## MICRO-MANAGEMENT TIPS

Mini-veggies need the same basic care as full-size edibles: plenty of sun, good drainage, and (in containers) high-quality potting soil amended with organic compost as needed. If rain is scarce, give plants an inch of water per week. Diseases can break out in damp conditions, so water early in the morning to give the leaves time to dry before the Sun goes down. Be sure to mulch to help to retain moisture and prevent weeds.



**THE GLORY OF GARDENING: HANDS IN THE DIRT, HEAD IN THE SUN, HEART WITH NATURE. TO NURTURE A GARDEN IS TO FEED NOT JUST ON THE BODY, BUT THE SOUL.**

—ALFRED AUSTIN, ENGLISH POET (1835-1913)



## GOING WITH THE GRAIN

We're growing **WHEAT** and rice—for the novelty, for visual appeal, and as edible grain—alongside ornamental grasses. “This is a great addition to the edible landscape. I like to say that I’m growing biscuits,” says Bachman.



## ADD A LITTLE SPICE TO LIFE

“More North American gardeners are getting into exotic spices,” points out Tasha Greer, author of *Grow Your Own Spices* (Cool Springs Press, 2021). Flavor-seekers are growing vanilla and peppercorns indoors; starting **GINGER** and turmeric indoors and taking them outside in warm weather; and growing Sichuan pepper and saffron as edible ornamentals. *(continued)*

## PICK YOUR PLEASURE

Top reasons for gardening . . .

1. Relaxation
2. Connecting with nature
3. Provides exercise
4. Adds value to home
5. Saves money
6. To grow fresh, nutritious food

—2022 *National Gardening Survey*



## EDIBLES, FRONT AND CENTER

Veggies are stepping out into (often sunnier) front yards—in style. “While the move requires more attention to regular weeding and staking, many vegetables and herbs are attractive plants,” comments Peter Moe, director of the University of Minnesota Landscape Arboretum. Passersby feast their eyes on colorful peppers, yellow-flower summer squash, and blooming peas and beans on poles or trellises. Everbearing strawberries (in hanging baskets and window boxes) are also front-yard friendly.

It's not just annuals—perennial edibles are also going ornamental: “People are looking to add a sense of permanence and utility to their landscapes,” notes Lynsey Nielson, a horticulturist at Red Butte Garden in Salt Lake City, Utah.





**WE'RE BREAKING HABITS**

- “Native food forests and pollinator meadows are replacing lawns at a rapid pace,” says Cheney Creamer, chair of the Canadian Horticultural Therapy Association. Native plant gardens are easier to maintain in the long run, as the plants are suited to the local environment.
- Tapestry is taking over. “A patchwork of ground-hugging, pollinator-friendly plants like creeping thyme, clover, chamomile, and sedums is replacing turf, with no mowing required, to create colorful tapestry lawns,” reports Cynthia Sayre, curator of collections, VanDusen Botanical Garden in Vancouver, British Columbia.



**RESILIENCE RULES**

We still love ornamentals, especially those that can withstand weather extremes (droughts, floods, heat, humidity) without help. “People want plants that require less external input,” according to Bunting.

Breeders are developing annuals that need less water and vegetables that can take the heat and still produce, reports Diane Blazek, executive director of the National Garden Bureau. Some tough-as-nails plants . . .

- *for all kinds of weather:* **‘ENDURASCAPE’ VERBENA**
- *for “firescaping” to reduce wildfire threat:* ‘Blue Skies’ and ‘Lilac Sunday’ lilac shrubs

Plant breeders are also improving stem strength and flower quantity (so the plants produce more pollen and nectar) to make natives more appealing. “If you know your phlox won’t get disease or flop over from wind and rain, you might be more likely to plant it,” says Blazek.



**I ALWAYS  
THOUGHT A  
YARD WAS THREE  
FEET, THEN I  
STARTED MOWING  
THE LAWN.**

—C. E. COWMAN, AMERICAN  
EVANGELIST (1868-1924)

**WEATHER ALERT**

Why do some plants survive nature’s weather wrath while others succumb to it? Some answers . . .

- **WHY PLANTS FAIL IN FLOODS:** Waterlogged soil lacks oxygen; most plants die if flooded for more than a few days during the growing season. (Dormant plants require less oxygen and are more likely to survive a flood.) Thus, most plants require well-draining soil.
- **HOW PLANTS ENDURE DROUGHT:** Survivors have small leaves; waxy, hairy, or oil-coated leaves; gray-blue/silver foliage; wide-spreading or long roots; and, for evergreens, needles (vs. broad leaves) that tend to be more drought tolerant.
- **PLANT STRENGTHS AGAINST WIND:** Plant attributes useful for windy environments include strong or bendable trunks and stems, deep or wide root formation, and narrow or “wind-adaptable” leaves (e.g., feather- and fan-shape leaves on palms adapt by curving or folding up in high winds).
- **FACTORS ENABLING PLANTS TO RESIST FIRE:** No plant is fireproof, but some qualities make them more fire resistant—fleshy or moist leaves; open structure, with lowest branches high off the ground; thick bark; a top height of 2 feet or less; low levels of resin or oils; and a deep taproot.

*(continued)*





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**PLAN FOR POLLINATORS**

Plants with extended bloom times (from early spring to late fall), such as wild geranium, can help pollinators to survive and thrive. “Early-blooming plants provide a critical food source for pollinators during transition from winter into spring,” explains Elizabeth Fogel, senior horticulturist at Lewis Ginter Botanical Garden in Richmond, Virginia.

Read more about threatened plants on page 94.



**THE NO-MOW MONTH**

The #NoMowMay campaign, launched by Plantlife.org.uk, a British conservation charity that works to save threatened wild flowers, plants, and fungi, inspired people around the world to set aside their lawn mower to let the wild flowers—clover, dandelions, **DAISIES**, self-heal, and others—in their lawns bloom, providing a feast of nectar for hungry pollinators. This year, try joining the movement to let it go and let it grow!



**CUTTINGS FOR KEEPING**

“We want to fully experience all that our beautiful seasonal landscape offers and bring that inside to enjoy—whether it’s in a mason jar or large urn,” says Lucy Hunter, author of *The Flower Hunter* (Ryland Peters & Small, 2021).

The Pennsylvania Horticultural Society suggests that these classics make the cut: **COSMOS**, **DAHLIA**, poppy, and Shasta daisy.



**BOUQUET BEAUTY TIPS**

• Use a fluted vase for a loose and natural look. Plan to arrange the flowers to be about three times as tall and twice as wide as the vase. In your arrangement, use . . .

- 50% fillers: greens that provide textural interest, e.g., bells of Ireland, basil, scented geraniums
- 30% disks: round-head flowers (great for filling in holes in the bouquet), e.g., cosmos, small zinnias, black-eyed Susans
- 20% of the following, in combination:

**FOCAL BLOOMS**—the main flowers, these are typically large and showy, e.g., sunflowers, large zinnias, dahlias

**SPIKES**—colorful vertical flowers, e.g., snapdragons, gladioluses, foxgloves, hollyhocks

**AIRY ELEMENTS**—delicate flowers or foliage that add whimsy and movement, e.g., grasses, scabiosa, poppy pods, oregano

—Floret Flowers

**CLASSIC COMEBACKS**

“We’re seeing nostalgia bloom with shrubs like gardenia, nandina, and crape myrtle in bold new colors,” reports Kip McConnell, plant expert for Southern Living Plant Collection and Sunset Plant Collection. To turn back time (and turn heads), he suggests planting ‘Fool Proof’ gardenia, **‘OBSESSION’ NANDINA**, and ‘Light Pink Shi Shi’ camellia.



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- For long-lasting bouquets: ‘Angel Cheeks’ peony (continued)





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- USDA Zone 5–10



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### IT MAKES A VILLAGE

- “Gardeners become ‘hyperlocal’ when they support independent garden centers, use native plants for their area, and are committed to making an environmental difference in their communities,” comments C. L. Fornari, founder of Gardenlady.com.
- In Richmond, Virginia, Lewis Ginter Botanical Garden’s seed library allows people to “check out” seeds, grow plants, and then return seeds for others to use. “It’s an amazing opportunity to build a sense of community and spread joy,” says librarian Katarina Spears.
- In Illinois, volunteers involved with Plants of Concern collect data on rare plants (e.g., small white lady’s slipper). Learn more at [Plantsofconcern.org/get-involved](http://Plantsofconcern.org/get-involved).
- Founded in Moorhead, Minnesota, **THE LITTLE FREE GARDEN** initiative ([Littlefreegarden.com](http://Littlefreegarden.com)) promotes growing small raised beds of herbs, flowers, or vegetables for passersby to enjoy. “This encourages getting to know your neighbors better, helping folks to try a new herb that they might otherwise be hesitant about buying—and just being nice, which is something we need more of right now,” notes Bachman.

### YEARNING FOR LEARNING

“Gardeners are going beyond the vague notion of ‘good drainage,’” says Greer. “We’re moving deeper into the details of which garden practices are most beneficial for the things we plan to grow.”

We want more details on topics such as soil porosity, compost, soil health, and how different organic materials and microlife affect water retention—and to know, for example, that cool-season plants aren’t going to benefit from mycorrhizal inoculant as much as warm-season ones (because mycorrhiza are active mainly in warm soil).



### WE’RE BECOMING WATER-WISE

To reduce water use and cope with drought, gardeners are “hydro-zoning” by grouping plants together based on water needs. “People can make incremental changes by altering one particular area or bed at a time to incorporate plantings that require less water,” suggests Nielson.

### WATER SAVERS

Enduring drought? These plants thrive in dry conditions, once established . . .

- **DAISY-LIKE FLOWERS, DESCENDED FROM TOUGH PRAIRIE PLANTS:** black-eyed Susan, coneflower, coreopsis, feverfew, and tansy
- **HERBS,** including catmint, chives, creeping thyme, German chamomile, lavender, oregano, rosemary, Russian sage, and santolina
- **VEGETABLES,** including chickpeas, cowpeas, **EGGPLANT**, mustard greens, New Zealand spinach, okra, peppers (especially hot ones such as jalapeños), and pole and snap beans, plus some types of tomatoes (‘Early Girl’ and ‘Heatwave’), squashes, and zucchini



### PLANTS THAT MAKE A HOUSE A HOME

Gardeners are transforming their living space into botanical oases. “Cultivating a green space is not just for those with a large amount of outdoor space,” says Ashlie Thomas, known on social media as The Mocha Gardener.

Thomas’s picks . . .

- *For minimal light:* mother-in-law’s tongue (*Dracaena trifasciata*), prayer plant (*Maranta leuconeura*), ZZ plant (*Zamioculcas zamiifolia*)
- *For small spaces:* Chinese money plant (*Pilea peperomioides*), **JADE PLANT** (*Crassula ovata*), tillandsia

To learn about houseplants that help to remove toxins from the air, see page 68.





## FEATHERED FRIENDS' FAVORITES

“The eye-catching plants that we’re drawn to are often just as appealing to birds, bees, and butterflies,” observes McConnell. To enchant an array of birds from chickadees to hummingbirds, he likes . . .

- ‘Soft Caress’ mahonia
- ‘Ever Sapphire’ agapanthus
- ‘Picobella Rosa’ weigela

“Native shrubs and vines provide much-needed fruit for both migrating and resident birds,” notes Chris Earley, an interpretive biologist for The Arboretum at University of Guelph (Ontario) and author of *How to Feed Backyard Birds* (Firefly Books, 2022).

Earley’s picks:

- dogwoods, serviceberries, raspberries, wild grape, Virginia creeper, American bittersweet
- cup plant, which holds rainwater and provides seeds
- banks of conifers (white cedar or spruce) to provide nesting sites and shelter from winter winds

Finally, a tried-and-true method of giving birds a drink is making a comeback. “The iconic **BIRDBATH**, once a must in backyards, is finding its way back to our gardens,” points out Dave Forehand, vice president of gardens at Dallas Arboretum.

## WAYS THAT BIRDS BENEFIT

A proper array of plants will be the birds’ buffet, as long as you keep your hands off the pesticides. Shrubs will be crawling with delectable insects on their foliage and at their flowers. At night or in harsh weather, the plants become a bed-and-breakfast, offering **CARDINALS**, thrashers, native sparrows, and other songbirds a safe place to sleep or shelter with in the branches.

Shrubs are stepping-stones, too, which birds use to travel from place to place without exposing themselves to hawks and other dangers. Plus, songbirds find berries in perfectly bite-size servings simply irresistible. For these temptations, birds will come from far and wide to seek their share.



## DID YOU KNOW?

Legend has it that King Edward I of England was so fond of **GREEN PEAS** that he often kept half a dozen serfs at work shelling them. The serf who had the greenest thumb won a prize.



## THE WINNERS ARE . . .

For uniqueness, technological innovation, problem-solving, and appeal, a thumbs-up goes to . . .

- ‘Simply Scentsational’, a sweetshrub bush with deep maroon flowers and fragrant blooms
- Rock ’N Grow series ‘**BACK IN BLACK**’ sedum, a perennial with leaves that are nearly black and flowers with cream-color petals
- ‘Hummingbird Falls’ salvia, an annual with dark blue flowers
- ‘**CANDY CANE CHOCOLATE CHERRY**’, a colorfully striped mini bell pepper

–National Garden Bureau Green Thumb Awards  
(continued)



## HABITS OF HIGHLY SUCCESSFUL GARDENERS

- Entrepreneurs are selling cuttings of rare houseplants with in-demand features such as splashes of color or leaves with holes.
- “Florists are growing their own flowers or seeking out gardeners and other micro-growers in their community,” reports Debra Prinzing, founder of the Slow Flowers Society (Slowflowersociety.com).



### GARDEN JEWELS

Brighter colors are trending, with “more informal, naturalistic flower borders in eye-catching jewel tones that support pollinators and lift our moods,” says Sayre.

Purple salvias, pink cosmos, **RED CROCOSMIA**, and golden coneflowers deliver a pop of color while feeding butterflies, bees, hummingbirds, and songbirds.

## TWO- OR THREE-FOR-ONES

Plants with multiple attributes are in demand: “Why not get two-for-one with the proper plant selection?” asks Karl Gercens, the East Conservatory Manager at Longwood Gardens in Kennett Square, Pennsylvania. He recommends these double-duty plants:

- *Edible and variegated*—‘**DAUBENTON PANACHE**’ perennial kale (*Brassica oleracea* var. *ramosa*); ‘Pink Zebra’ corn (*Zea mays* var. *japonica*)—it’s not the typical “full-kernel” that we’re used to
- *Fragrant blossoms and golden foliage*—‘Gold Doubloon’ gardenia (*Gardenia jasminoides*)
- *Variegated foliage and fragrant*—**VARIEGATED MYRTLE** (*Myrtus communis* ‘Variegata’)

“Gardeners are choosing plants with two, if not three, special features or seasons of interest,” notes Julie Weisenhorn, extension horticulturalist at the Minnesota Landscape Arboretum.

Fast-growing Mexican sunflower, for example, boasts many red-orange flowers and is a bee and butterfly magnet. “Its impressive size and density make it a good screen plant during the growing season, too,” adds Weisenhorn.

One more: “Button bush is eye-catching in the landscape and provides seeds for birds and nectar for pollinators,” comments Fogel. *(continued)*







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**PEOPLE ARE TALKING ABOUT . . .**

- *Plant pride:* “I see a trend in what I call ‘boastable’ plants—specialized plants which are often hard to grow, and rare,” says Brian White, Ph.D., a member of the executive board of directors for Gardens British Columbia.
- *Bragging rights:* Gardeners are seeking bragging rights in social media posts and in person at garden shows. Coveted plants, according to White: **‘LIMELIGHT’ PANICLE HYDRANGEAS**, California lilac hybrids, ninebark (*Physocarpus opulifolius*), and *Lewisia longifolia*.

**WE’RE STANDING UP FOR TREES**

“People are caring for older, bigger trees rather than simply removing and replacing them,” reports Julie Janoski, plant clinic manager at The Morton Arboretum in Lisle, Illinois, who reports that today’s in-demand trees are . . .

- *useful:* serving as windbreaks, shade, or natural privacy screens
- *vertical, narrow, and compact* (to fit smaller residential lots); some upright versions of natives: Prairie Sentinel hackberry, **‘SLENDER SILHOUETTE’ SWEETGUM**, Lindsey’s Skyward Bald Cypress, Skinny Latte Kentucky coffee tree
- *in the native oak family:* “Entire ecosystems depend on oaks for their survival,” says Janoski.

Paul Manning, assistant professor of agriculture at Dalhousie University in Halifax, Nova Scotia, notes that being *beneficial to insects* is also a popular tree trait these days: “Oaks, maples, willows, cherries, and **POPLARS** are all excellent choices for feeding the neighborhood caterpillars.”



**WHAT DOES THE FUTURE HOLD?**

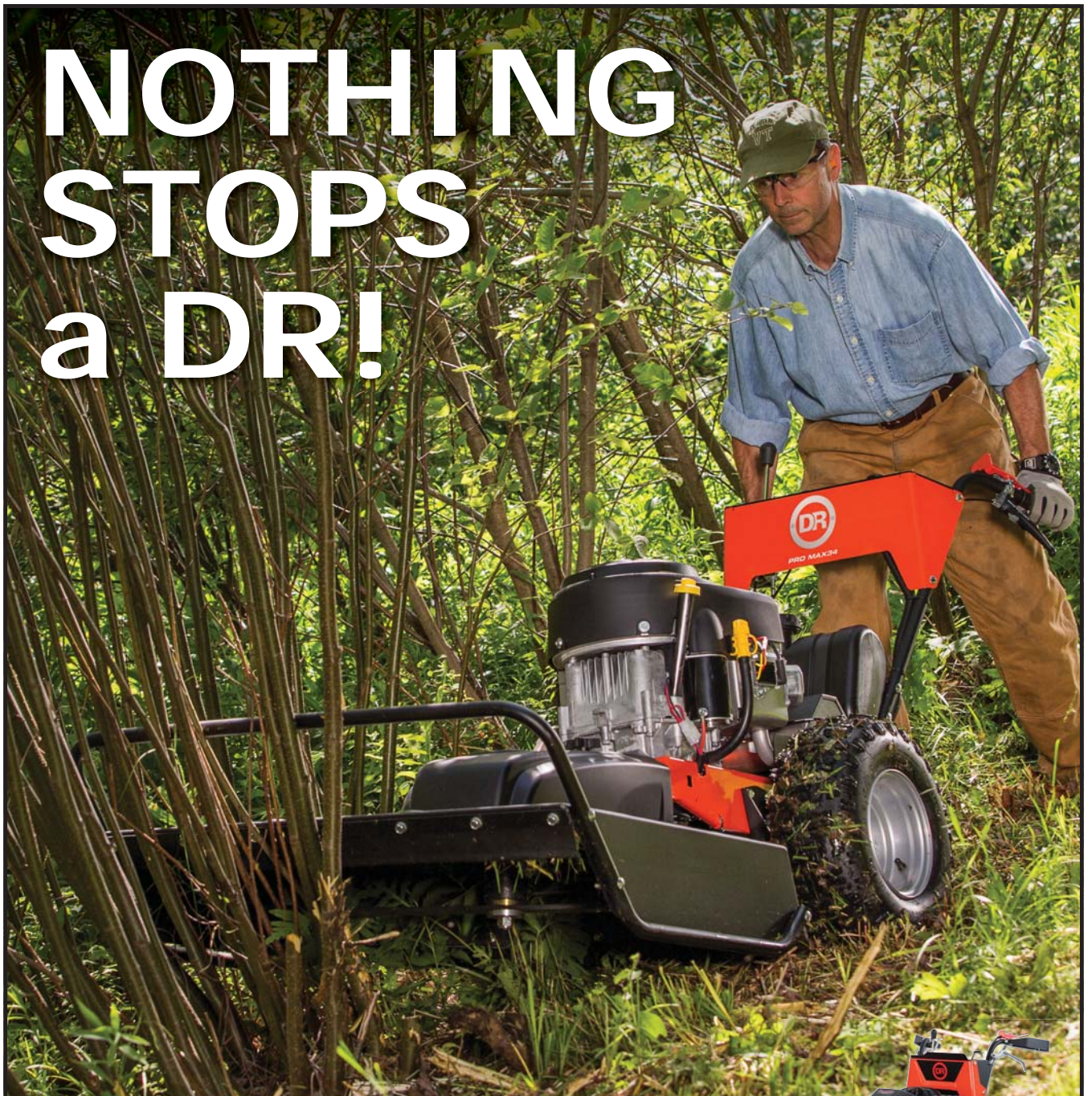
“With skyrocketing food prices, we will probably see an increase in food gardening above the already record-setting levels,” predicts Paul Cohen, research director at the National Gardening Association. Other findings from the 2022 National Gardening Survey . . .

- Food gardening is especially strong among younger households; there has been an uptick in gardening by younger consumers and in particular the Millennial generation.
- Gardening, overall, continues to become more diverse, with steady increases by gardeners of color.
- There were 16.8 million new gardeners in the U.S. in 2021.
- The social media garden influencers with the most followers are younger and more urban.
- There has been a surge in app-based and online gardening tools and content. ■

*Stacey Kusterbeck is a frequent contributor to Old Farmer’s Almanac publications.*



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## FRIENDS WITH BENEFITS

COMPANION PLANTING GIVES NEW MEANING TO "COMMUNITY GARDEN."

**C**ompanion planting is the practice of growing one plant to help another as part of a community. Fruit, vegetables, and herbs are simply—and noticeably—more resilient and productive when each member supports the next. The benefits can be one-way, such as when nectar-rich flowers planted around fruiting crops like tomatoes improve insect pollination, or reciprocal, as when the famous Three Sisters of corn, pole beans, and squash are grown together for their mutual benefit.

By growing communities of plants that are known to support each other, you can save a lot of time and potential heartache. This is nature's way of minimizing

pest damage, boosting soil fertility, reducing weed competition, and, ultimately, increasing yields. Productive gardens cultivated with companion planting in mind also tend to be better looking, too!

Knowing which plants grow well together isn't easy. Many of the recommendations that

we hear have become the stuff of garden folklore and legend. How much of it can we trust? What really works—and what is little more than hopeful thinking and good luck?

### SIMPLIFYING THE SCIENCE

The team behind our Garden Planner app has been working hard to

resolve companion planting challenges. They have exhaustively reviewed hundreds of scientific studies and the findings of experts across the country and beyond. In most cases, the results underscore confidence in beliefs that gardeners have always trusted, but there have been a few surprises. Plenty of traditional plant pairings remain untested, too. The proven results have been added to the Garden Planner so that you can use its Companion Planting function quickly and easily: Select a plant, then click a button and the plant's optimum companions are revealed. Learn more at [gardenplanner.Almanac.com](http://gardenplanner.Almanac.com).

What follows are just a few of the highlights and



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## ECO-GARDENING

what they mean for your productive garden.

### HOW COMPANIONS HELP TO CONTROL PESTS

One of the biggest challenges for any gardener is pests. Sure, you can spray pesticides, but these are very blunt tools that have serious repercussions for nontarget species, including beneficial bugs. It's better to plant companions.

Planting single crops in large blocks—which many of us do—makes it easier for them to be located and attacked by their main pests. However, overwhelming evidence supports the homesteader's hunch that intermingling crops makes for fewer nemeses. Not only does such diversity deny crop-specific pests the opportunity to move about freely, but also its more varied, favorable habitat attracts and supports a

greater number of the bugs that feed on pests.

Beneficial insect-attracting plants have received the thumbs-up from researchers across the board, validating the efforts of gardeners who plant “pollinator strips” (rows of pollinator-magnet plants) within the garden to encourage both pollinators and pest predators.

### HOW COMPANIONS REPEL AND DISGUISE

Many studies have put specific plant-insect relationships under the spotlight. For example, researchers at the University of Nebraska found that radishes planted with pumpkins appear to repel squash bugs. Similarly, it has been shown elsewhere that nasturtiums grown around fruit trees can deter pests such as codling moths. This is because nasturtiums secrete

water-soluble glucosinolates from their roots into the soil. These can then be taken up by the trees, which in turn take on the same defensive superpowers. Many brassica family plants, including mustards, horseradish, cabbage, and kale, also use glucosinolates to defend against pests.

Some companion combinations work because one plant hides the presence of another, such as that inseparable duo of tomato and basil. Analysis by the University of Nice Sophia Antipolis in France saw a reduction in tomato pests when basil was present—great news for gardeners looking to outwit thrips, a common carrier of tomato spotted wilt virus. Plus, while pest populations decreased, no increase in pest predators was detected as the cause, indicating that basil's strong scent disguised the tomatoes from pests.

Leaf shape can also do a great job of obscuring a target plant. Faced with a confusing array of different leaves, a pest may fail to recognize its host plant amidst the melee. This works with thyme, another tomato companion. Scientists at Iowa State saw a reduction in egg-laying by adult armyworms when tomatoes were interplanted with the herb. Used as a living mulch like this, thyme presented small leaves that did a great job of confusing the moths.

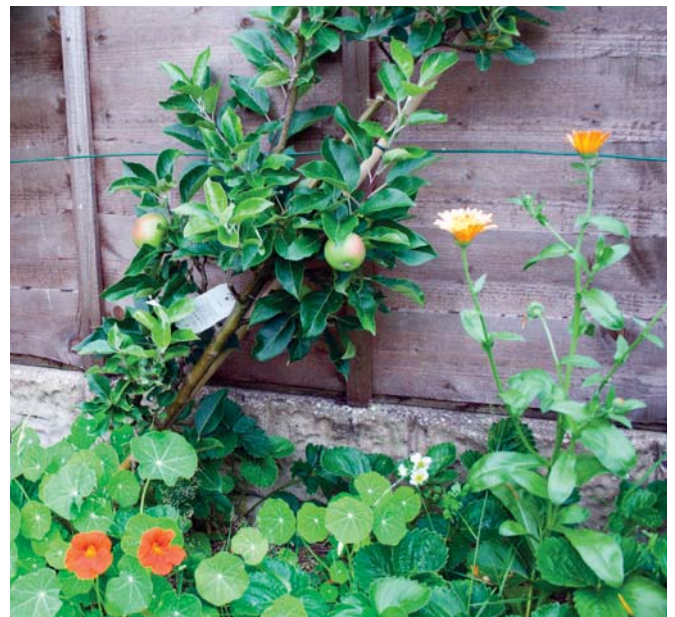
### HOW COMPANIONS PROTECT CROPS

Many flowers that are rich in nectar and irresistible to bees, butterflies, and other pollinators are also a big draw for insects that make a meal of garden pests. Hoverflies can't resist the sunny-side-up charms of poached egg plant (*Limnanthes douglasii*), and they happen to love a meal

## ONE OF THE BIGGEST CHALLENGES FOR ANY GARDENER IS PESTS.



CALENDULAS ATTRACT A VARIETY OF BENEFICIAL INSECTS, MAKING THEM A NATURAL COMPANION PLANTING CHOICE.



SOW NASTURTIUMS AROUND FRUIT TREES LIKE APPLES TO DETER PESTS SUCH AS CODLING MOTHS.



of juicy aphids, too. Pop poached egg plants near lettuces and guess what? Fewer aphids!

Another example is borage, which attracts tiny wasps that are the natural enemies of tomato hornworm caterpillars. Borage is also a well-known bee magnet, so with it you get a two-fer: boosted pollination, plus wasps laying parasitic eggs to purge notorious hornworm pests. The very best friend that any tomato could wish for!

A study published by the Kentucky Academy of Science in Louisville found that planting dwarf sunflowers around a field of corn attracted an army of pest-hungry ladybugs. Other research confirms the effectiveness of dill in attracting parasitic wasps to control cabbageworms and -loopers, while researchers at Rutgers University in New Jersey have showed that dill also happens to do a great job of luring enemies of the Colorado potato beetle. For these reasons, the Garden Planner recommends dill as a companion to crops such as broccoli, potato, and eggplant that are at risk from these pests.

**PUTTING COMPANIONS IN THEIR PLACE**

It's not just what you plant that matters—it's where you plant it. The traditional assumption has been that companions must be near each other to be effective. This is certainly true in most cases, but in some associations, a little distance is better.

**READY ACCESS TO NUTRIENTS MAKES THE JOB OF GROWING A LOT EASIER FOR CROPS.**



BEANS PLANTED WITH POTATOES WERE SHOWN TO INCREASE THE FINAL SIZE OF THE TUBERS.

Trap cropping, in which a plant is grown specifically because it is irresistible to pests, is one way to beat the bugs. Radishes are often grown to distract flea beetles from other prone crops. To be most effective, however, they should be planted around the edge of the protected crop to intercept beetles when they try to enter the field. This handy research by the University of Vermont could be applied on a smaller scale in the vegetable garden.

Another at-a-distance companion is bulb fennel, which emits natural chemicals that can suppress the growth of some neighboring plants. Locate it safely toward the edge of the garden, though, and it will attract and host aphid-hungry hoverflies, which will then spread out to feast on their nearby meals.

Growing potatoes? Plant

horseradish at the corners of your potato patch to guard against all manner of pests, including potato bugs, blister beetles, aphids, and many other soft-body insects (it's those wonderful glucosinolates at work again!).

Ready access to nutrients makes the job of growing a lot easier for our crops, and plants grown before or alongside others can make all the difference—a fact that our research backs up. For example, legumes such as beans and peas are often touted for their nitrogen-fixing ability, making them ideal for growing before heavier-feeding crops. In another experiment, beans planted with potatoes were shown to increase the final size of the tubers!

**LORE AND MORE**

Hard as they tried, the Garden Planner team failed to find any peer-reviewed

studies for quite a few commonly accepted associations. For example, there was no evidence to support the oft-touted recommendation that tomatoes repel diamondback moth larvae, a common pest of cabbage family crops.

Some studies did confirm a companion plant's effects but dispelled any hope of its real-life application. For instance, you may have heard that marigolds help to protect plants against tiny parasitic root-knot nematodes. This is true, somewhat, but only if the marigolds are first macerated before being applied to the soil. Marigolds will, however, fend off whiteflies.

Companion planting can indeed help gardeners to grow in step with nature, but what we know about this powerful tool is constantly evolving. Further research over the coming years will fill in the gaps and no doubt deliver a few more surprises along the way. In the meantime, the Garden Planner team's extensive research has helped to remove much of the guesswork around companion planting in order to save valuable time for today's busy gardeners. ■

—Benedict Vanheems

*Benedict Vanheems is a TV presenter, writer, and editor for GrowVeg, the developer of The Old Farmer's Almanac Garden Planner app. Enjoy and learn from his gardening videos on Almanac.com.*

Photo: GrowVeg.com





# THE SECRET LIVES OF SEEDS

WHAT REALLY GOES ON INSIDE AWAKENING SEEDS  
AND WHY YOU SHOULD START YOUR OWN SEEDLINGS INDOORS

**L**earning to grow your own seedlings is one of the most valuable gardening skills that you can acquire. By starting with seeds, you can choose from a huge selection of interesting varieties that are not available as seedlings. Growing your own seedlings also allows you to control the timing. You can kick-start spring by starting cool-season plants like broccoli and lettuce indoors in late winter. Then switch to starting tomatoes, peppers, and summer crops in midspring. Plan on another flurry of seed-starting activity in summer, as you get ready to stock your fall garden with spinach, kale, and kohlrabi. In addition to having the seedlings that you want when you want them, you will save a ton of money by growing your own.

**HOW SEEDS GERMINATE**  
Seeds are plants in a deep, dormant state. When triggered by moisture, temperature, and sometimes light, specialized cells inside the seeds wake up and start to grow. Stored nutrients are sent to the embryo, which holds the basic botanic structures for the roots, stem, and leaves. Fast-germinating vegetable seeds like those of cucumbers and tomatoes have well-developed embryos, but seeds of the carrot and onion families do not. Their tiny embryos must grow before the seeds can sprout, so they take longer to emerge.

Priming seeds by soaking them in water for a few hours and then drying them on paper towels before planting them often improves the germination of older seeds, but too much

water, for too long, can be deadly. Germination requires oxygen, because until leaves emerge to synthesize solar energy, seeds combine oxygen with their stored food reserves to grow new cells. When you force out soil oxygen with too much water, seeds struggle or rot.

## SPECIAL SOIL FOR STARTERS

As soon as they sprout, seedlings must defend themselves from fungi and bacteria, particularly those that live in soil. To prevent potential problems, buy a fresh bag of organic seed-starting mix every spring and keep it indoors, closed and dry between uses. Most seed-starting mixes are composed of peat moss, coconut coir, and vermiculite or perlite, materials that are hospitable to plant roots but not to soilborne diseases.

You can make your own seed-starting mix from rich, fluffy compost that has been placed in an oven-safe pan, tightly covered, and heated to 150°F in the oven for 30 minutes. Doing so will kill pathogens and weed seeds, but you should still add perlite or vermiculite to make the mixture porous. Made from naturally occurring minerals, vermiculite alone forms a moist, semisterile barrier when spread in a thin layer over germinating seeds.

## CHOOSING CONTAINERS

The most common seed-starting containers are plastic cell packs like those used for bedding plants. These clean up quickly in warm, soapy water; can be watered easily from the top or the bottom; and can be reused several times.

*(continued)*



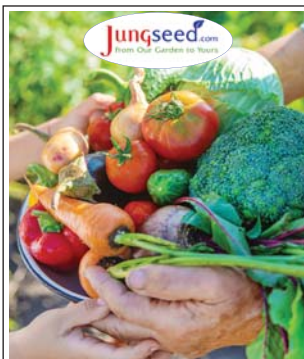
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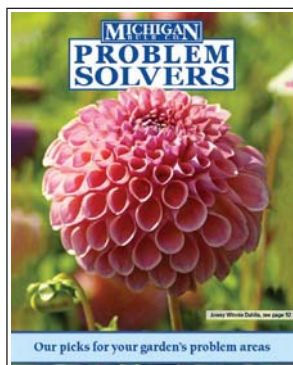


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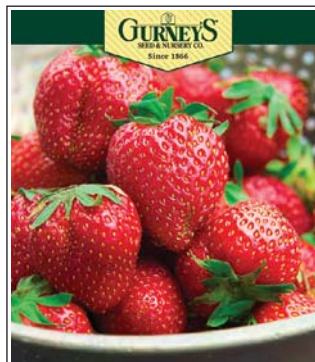
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## DO-IT-YOURSELF

Three-ounce paper cups with holes punched in the bottom also work well, with the added bonus that you can write the names of the varieties right on the cups themselves. Be careful with peat pellets, which hold too much water and not enough nutrients, or peat pots, which form a dry, acidic barrier that frustrates plant roots.

When you are ready to plant, fill containers halfway with moist seed-starting mix, dribble in a teaspoon or so of water, add enough mix to fill to the top, and water again. Tamp down the soil with your finger to eliminate air pockets. Plant seeds at their proper depth in the seed-starting mix, spray with water from a pump spray bottle, cover the tops with a thin layer of vermiculite, and spritz again.

Plastic domes are used to retain surface moisture until the seeds germinate, but a damp, folded newspaper, placed directly over the planted seedlings, works just as well. If you are starting only a few seeds, place the planted containers on a plate or in a baking pan loosely enclosed in a plastic produce bag. Remove the bag when the seedlings start to sprout.

### SIMULATING WARM SUN

Once seedlings are equipped with leaves, they switch to light as their primary energy source. To simulate sunshine, grow your veggie seedlings under bright light from a fluorescent or LED light

fixture. Inexpensive shop lights from a building supply store, suspended over seedlings, will meet this need. (There is little difference in seedlings' performance under fluorescent and LED lights. Super-efficient broad-spectrum LED plant lights that glow pink seem to have a comforting effect

or lower the lights, elevate or lower the containers by putting books or the like under them.)

Seeds germinate best when temperatures range between 65°F at night and 75°F during the day. When growing seedlings in a cool space like a basement, add modest bottom heat to your seedling setup with



### MAKE A HABIT OF LIFTING SEEDLING CONTAINERS TO JUDGE THEIR WEIGHT. VERY LIGHT CONTAINERS ARE LIKELY TOO DRY, WHILE HEAVY ONES ARE LOADED WITH WATER.

on stressed seedlings, yet seedlings also thrive under fluorescent fixtures, which give off a little heat—just like a gentle Sun.)

As soon as little sprouts appear, keep your seedlings under lights for 12 hours a day. Adjust the height of the lights as the seedlings grow. Fluorescent lights should be less than 2 inches from the tops of the plants, while LEDs should be at least 4 inches from the highest leaves. (If you can not raise

a seed-heating mat or an electric heating pad. Place microwave-safe plastic wrap over the pad and then lay a dish towel over it before placing seedlings on top. Set the heating pad to its lowest setting.

### THINNING AND FEEDING

A week or so after germination, seedlings develop their first true leaf, a sign that roots are also making good progress. This is the best time to

thin seedlings by nipping out the weakest ones with little scissors. Or, separate and replant the seedlings into containers filled with regular potting soil, a step which is called “pricking out.” To do this, remove the mass of seedlings from its container and place it on its side. Then use your fingers to lift individual seedlings, touching only their seedling leaves. Gently slip seedlings into their new containers, press lightly to firm soil around the roots, water well, and return the seedlings to the same position under lights where they were before. New growth should resume in a day or two.

As the seedlings grow and roots fill the containers, the plants use up soilborne nutrients. Keep them well nourished by using a water-soluble plant food mixed at half the rate recommended on the package every other time you water. Make a habit of lifting seedling containers to judge their weight. Very light containers are likely too dry, while heavy ones are loaded with water.

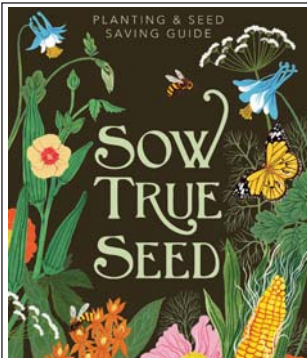
Learning to grow your own seedlings takes practice, but the life force locked away in every seed wants you to be successful. After all, only the luckiest seeds will get to be planted and cared for by you! ■

—Barbara Pleasant

*Barbara Pleasant is the author of many best-selling garden books, including Starter Vegetable Gardens (Storey Publishing, 2022).*



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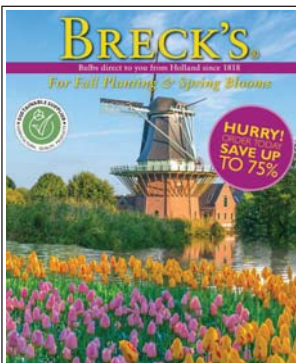
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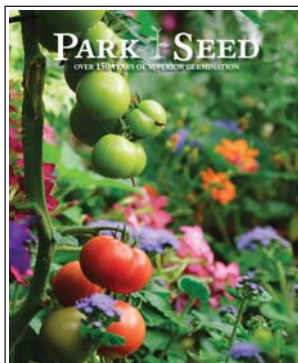


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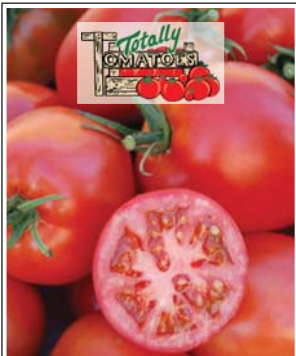
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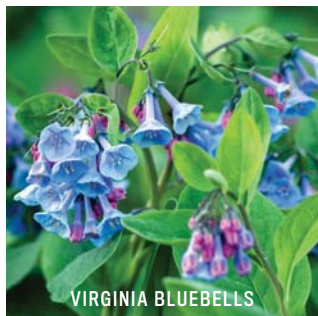


# MADE IN THE SHADE

**A**s a gardener, you can learn to love shade if you know how to create the conditions for plants to thrive in it. Once you determine what kind of shade you have and prepare your soil, you'll be ready for one of these designs featuring perennial plants.



ASTILBE



VIRGINIA BLUEBELLS

## WHAT KIND OF SHADE DO YOU HAVE?

There are many different interpretations of shade types. These definitions are generally accepted by gardeners everywhere.

- **Light shade** occurs in an area that is open to the sky and indirect light but is in permanent shade cast by the shadow of a building, wall, hedge, or tree. It offers the most opportunity for blooming plants that otherwise like the sun.

- **Partial shade** describes an area that receives up to 6 hours of direct sun, with 4 or more of these hours in the morning. The rest of the day, the area is in



WAKEROBIN



LIGULARIA



LUNGWORT

shadow. This type is most beneficial for a variety of plants. (Note that if 4 or more of the 6 hours of sun are in the afternoon, it is considered to be full sun.)

- **Dappled or filtered shade** is created by sunlight filtering through the canopy of open tree

branches or through latticework structures, with the pattern of light shifting all day. This is probably the most common shade in suburban backyards and



BUGLEWEED



HOSTA



BLEEDING HEART

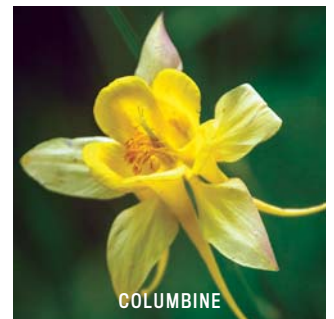
also the most common woodland shade-garden environment.

- **Deep or full shade** is dense and found under evergreens or closely spaced shrubs and trees that do not allow any direct light to penetrate. It takes effort to find plants that

will bloom here, but this kind of shade can be the most interesting because the plants suited to it tend to have the most interesting leaf structure.

## PREPARE THE SOIL

Shade-garden soil has special needs. Start by mixing a 2- to 3-inch-thick



COLUMBINE



FOAM FLOWER

layer of organic matter such as compost, composted manure, or shredded leaves into the soil. Do your best to scratch these amendments into the soil around the tree roots and leave a thin layer on top of the soil. After planting, add a 2- to 3-inch-thick layer of mulch to hold in moisture. A combination of compost, shredded leaves, and what is known in the landscape trade as “double-shredded bark” works well.

(continued)



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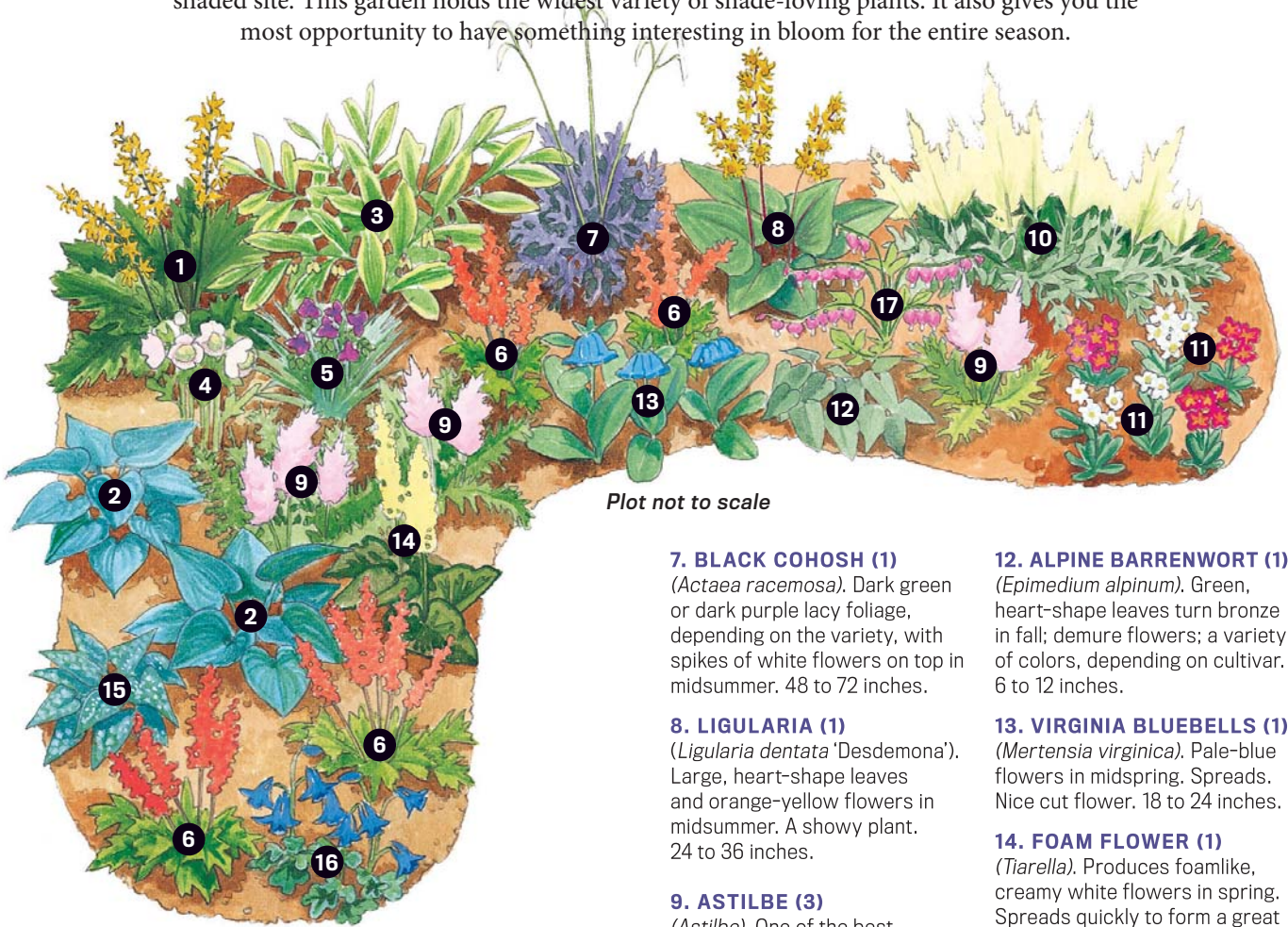
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## A LIGHT-SHADE GARDEN

Consider this plan for a good, all-season-long garden in an evenly moist, lightly shaded site. This garden holds the widest variety of shade-loving plants. It also gives you the most opportunity to have something interesting in bloom for the entire season.



Plot not to scale

Garden size: 15x10 feet

- 1. LIGULARIA (1 PLANT)** (*Ligularia stenocephala* 'The Rocket'). Large-lobed leaves, with spikes of yellow flowers in midsummer. 48 to 72 inches.
- 2. HOSTA, OR PLANTAIN LILY (2)** (*Hosta*). Glossy, open leaves in various shades of green and blue; also variegated forms. Thousands of varieties from which to choose. 'Serendipity' or 'September Sun' would be good here. 6 to 36 inches.
- 3. SOLOMON'S SEAL (1)** (*Polygonatum*). Arching stems lined with green or variegated leaves. White flowers in early spring. 24 to 36 inches.

- 4. LENTEN ROSE (1)** (*Helleborus orientalis*). Semi-evergreen leaves, with white, pink, purple, or green flowers in early spring. 12 to 18 inches.
- 5. SPIDERWORT (1)** (*Tradescantia x andersoniana*). Swordlike leaves topped with blue, white, or purple flowers in early summer. 18 to 24 inches.
- 6. CORAL BELLS (4)** (*Heuchera sanguinea*). More than 30 different varieties. Forms clumps of green or purple leaves topped with pink, red, or white spikes of flowers in early summer. 10 to 30 inches.

- 7. BLACK COHOSH (1)** (*Actaea racemosa*). Dark green or dark purple lacy foliage, depending on the variety, with spikes of white flowers on top in midsummer. 48 to 72 inches.
- 8. LIGULARIA (1)** (*Ligularia dentata* 'Desdemona'). Large, heart-shaped leaves and orange-yellow flowers in midsummer. A showy plant. 24 to 36 inches.

- 9. ASTILBE (3)** (*Astilbe*). One of the best summer-blooming shade plants. Fernlike clumps topped with spikes of white, pink, red, or purple flowers. 18 to 48 inches.
- 10. GOATSBARD (1)** (*Aruncus dioicus*). Lacy foliage topped with plumes of white flowers in midsummer. 24 to 72 inches.

- 11. PRIMROSE (6)** (*Primula*). Dainty-looking but sturdy, topped with yellow, white, blue, or red flowers. Flowers in spring. 6 to 24 inches.

- 12. ALPINE BARRENWORT (1)** (*Epimedium alpinum*). Green, heart-shaped leaves turn bronze in fall; demure flowers; a variety of colors, depending on cultivar. 6 to 12 inches.

- 13. VIRGINIA BLUEBELLS (1)** (*Mertensia virginica*). Pale-blue flowers in midspring. Spreads. Nice cut flower. 18 to 24 inches.
- 14. FOAM FLOWER (1)** (*Tiarella*). Produces foamlike, creamy white flowers in spring. Spreads quickly to form a great ground cover. 6 to 12 inches.

- 15. LUNGWORT (1)** (*Pulmonaria*). Deep green leaves speckled with white or silver spots. Blooms in early spring with white, pink, purple, or blue flowers. 6 to 18 inches.

- 16. COLUMBINE (1)** (*Aquilegia*). Charming, old-fashioned-looking flowers from late spring to midsummer, in orange, red, blue, purple, or yellow. 12 to 36 inches.
- 17. BLEEDING HEART (1)** (*Lamprocapnos*, aka *Dicentra spectabilis*). Glorious plant of midspring, topped with pink and white, drooping, heart-shaped flowers on a large, fernlike plant. 24 to 36 inches.



## A DEEP-SHADE GARDEN

The most difficult environment in which to establish a garden may be the dry ground under a large tree.

Maple trees, in particular, put out surface-hugging roots that love to drink up all of the available moisture, making it difficult for many plants to thrive. Nonetheless, quite a few plants can take this scene and still look great. The secret to this garden is adding plenty of organic matter that holds in moisture.

**Garden size: 15x10 feet**

**1. BLEEDING HEART (2)**  
(*Lamprocapnos*, aka *Dicentra spectabilis*). Glorious plant of midspring, topped with pink and white, drooping, heart-shaped flowers on a large, fernlike plant. 24 to 36 inches.

**2. CORAL BELLS (2)**  
(*Heuchera sanguinea*). More than 30 different varieties. Forms clumps of green or purple leaves topped with pink, red, or white spires of flowers in early summer. 10 to 30 inches.

**3. CRANESBILL (2)**  
(*Geranium*). Lobed leaves with white, pink, purple, or blue flowers from early summer to early fall, depending on the variety. Choose all but compact, small species. 12 to 24 inches.

**4. HOSTA, OR PLANTAIN LILY (2)**  
(*Hosta*). Glossy, open leaves in various shades of green and blue; also variegated forms. Thousands of varieties from which to choose. 6 to 36 inches.

**5. ALPINE BARRENWORT (2)**  
(*Epimedium alpinum*). Green, heart-shaped leaves turn bronze in fall; demure flowers; a variety of colors, depending on cultivar. 6 to 12 inches.

**6. BUGLEWEED (4)**  
(*Ajuga*). Purple and green leaves on spreading, low-growing ground cover. Pretty blue, purple, or pink flowers in summer. *A. reptans* (carpet bugleweed) is invasive. 6 to 12 inches.

**7. SPOTTED DEADNETTLE (3)**  
(*Lamium maculatum*). Hardy ground cover; green leaves variegated with white. Purple flowers in late spring. May grow aggressively. 6 to 9 inches.

**8. SWEET WOODRUFF (1)**  
(*Galium odoratum*). Low-growing ground cover with tiny white flowers in late spring. 6 to 12 inches.

**9. WAKEROBIN (2)**  
(*Trillium*). Three-leaved, with white, golden, or maroon flowers in spring. 6 to 12 inches.

**10. WHITE WOOD ASTER (1)**  
(*Eurybia divaricata*, aka *Aster divaricatus*). Spreads all over the garden. Produces white flowers in late summer. 12 to 30 inches.

**11. LILY-OF-THE-VALLEY (2)**  
(*Convallaria majalis*). Low-growing and spreading, with tiny white bells in late spring that give off an unforgettable fragrance. 6 to 12 inches. ■

—Laurence Sombke

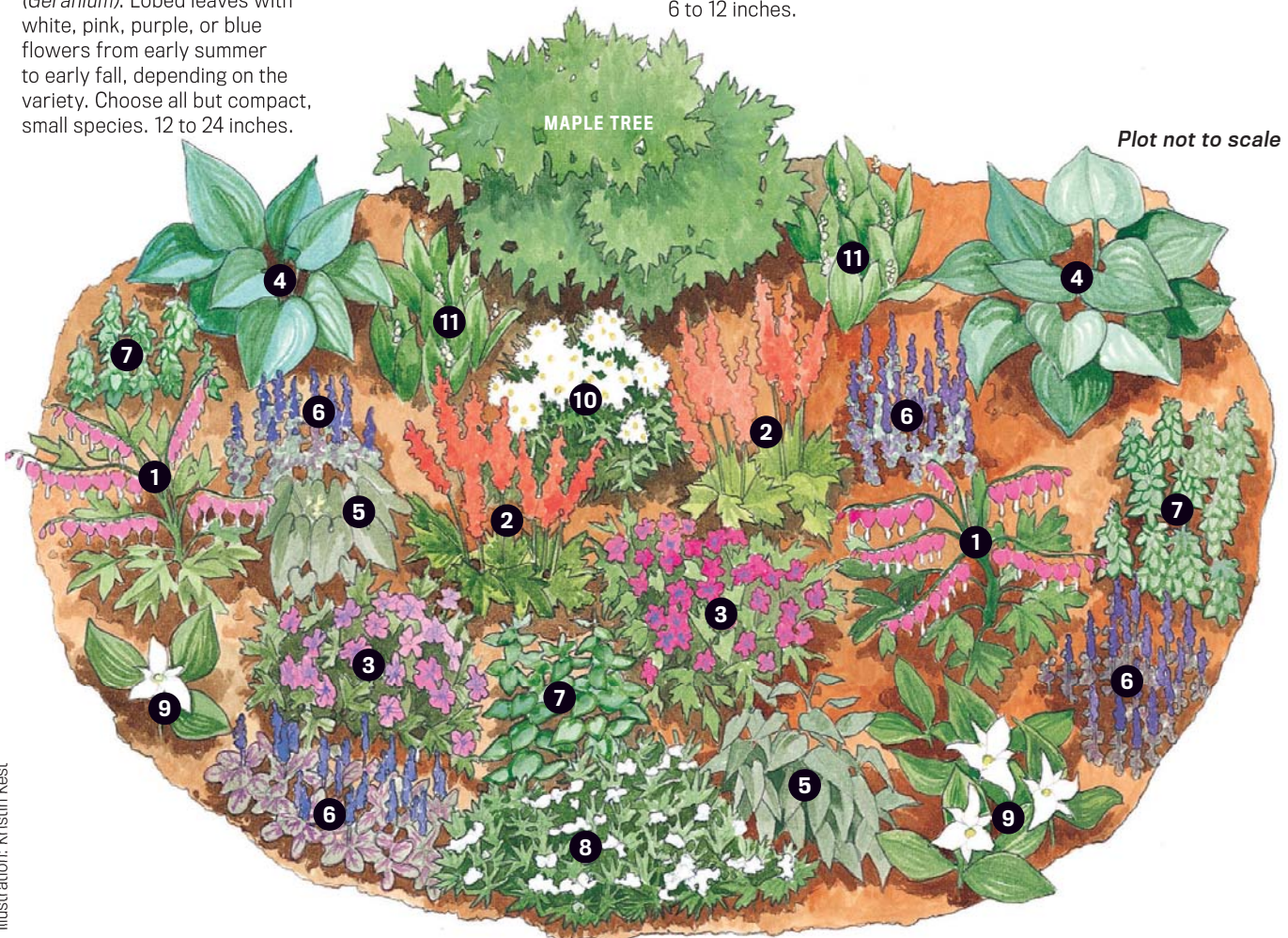


Illustration: Kristin Kest





# IS YOUR DREAM HOUSE A GREENHOUSE?

ADDING A LITTLE STRUCTURE TO YOUR LANDSCAPE IS A GREAT WAY TO EXTEND YOUR GROWING SEASON AND CHASE AWAY THOSE GRAY-DAY BLAHS.

**W**ith the Sun shining, your vegetables ripening, and your flowers blooming, a greenhouse may be the furthest thing from your mind. But now is a fine time to ponder the possibilities. If you've been gardening for a while, this is probably not the first time that you've given some thought to one. No other accessory offers the therapeutic potential of a home greenhouse—for both you and your plants. When it's cold outdoors, the greenhouse is warm and inviting. Plants grow with tropical lushness while the snow piles up outside, the sky turns a depressing shade of gray, and the wind sweeps its icy fingers through even

the heaviest clothing.

As a first step, consider the following questions as you think about adding a greenhouse and evaluate your needs.

## HOW WILL WEATHER COME INTO PLAY?

Every region of the country differs in its requirements for and benefits from a home greenhouse. Weather is a concern no matter what your location, but—with proper planning—it can also be an advantage. In the North, heating during the winter is a major concern, but a south-facing site can have many benefits. In the humid South, building a greenhouse that allows you to remove the side panels for cooling is often best. In

dry climates, evaporative cooling can make the summer greenhouse almost as much fun as it is in the winter. Even in the tropics of southern Florida, a greenhouse is helpful in letting you control the air movement, sun exposure, and amount of water that your plants receive.

## IN HOW MANY SEASONS WOULD A GREENHOUSE BE OF USE?

Many gardeners—certainly, some in all regions—find themselves greenhouse gardening throughout the year. For example, vegetable and bedding plants can be started from seed in early spring, saving the expense of buying commercial seedlings and eliminating the need for

plant lights indoors. (Heat-loving crops—tomatoes, cucumbers, peppers, and basil, for example—will thrive there in summer and never need to be transplanted to ground!) Plus, the controlled environment provides opportunities to experiment with growing plants that are not naturally suited to your zone, propagating cuttings to share, or increasing your plantings. As the days grow shorter and cool temperatures set in, it's ideal for extending the harvest with crops that do well in these conditions, such as radishes, lettuces, kale, and several herbs. You can also use the greenhouse to overwinter woody and hardy potted plants safely. In any

Photos: from left: Canopia by Palram; Aubrey Dawe/Sun Valley Greenhouses





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## LANDSCAPING

setting, accessories—from heating systems to fabric row covers—can help to optimize the unit’s production and your pleasure.

### HOW BIG SHOULD A GREENHOUSE BE?

Most sources recommend going bigger than you think you will need—or at least big enough to allow for expansion. A 16x24-foot greenhouse may seem large, but it will fill up fast. How many people will be in it at any one time? This number may help you to determine its size. Remember that you will need open areas for walking around and that all of your plants must be easy to reach. The small greenhouse that looks adequate in a brochure will resemble a phone booth full of college kids by the time you fill it with a few tropical plants.

### WHAT IS THE BEST COVERING FOR A GREENHOUSE?

There are a couple of ways to answer this question. One depends on how you plan to use the space. A clear covering that lets in full, direct sunlight is the best option if your goal is to start seedlings for transplanting outdoors later. Diffuse (or opaque) light is recommended for growing some plants to maturity because it provides even light for balanced growing. The compromise between these two is a semi-diffused covering, which is all-purpose: It allows adequate light for seed germination

as well as for growing crops to full term.

Cover materials raise practical as well as aesthetical questions. Glass is traditional. If you want that conservatory look, it’s the only way to go. If you live in an area where hail is



a problem, tempered glass is the best—albeit most expensive—option. Lighter, less fragile, and easier-to-handle polycarbonate and acrylic coverings look great when new and last a long time, but they may eventually discolor. These higher-rated coverings will cost almost as much as glass, but they are certainly more durable in a hailstorm. Fiberglass is less expensive. (Cheap fiberglass deteriorates rapidly.) If you choose fiberglass, be sure to use a clear greenhouse material. Don’t let someone talk you into using green fiberglass—it looks downright tacky. (The structure is called a greenhouse not because of its color but because of the

plants inside.) Polyethylene is much less expensive, but it deteriorates in sunlight. If you must use it, buy UV-resistant poly or it may not even last one season. The greenhouse grade of polyethylene should last up to 4 years.



### WHAT IS THE BEST LOCATION FOR A GREENHOUSE?

First, check your zoning or deed restrictions. It’s not uncommon for municipalities to require that you get a permit before adding a greenhouse to your property. Generally, an attached greenhouse (often

called a “lean-to”) that blends with the architecture of your home may be the easiest to get approved.

Maximum sun exposure is a primary consideration. Track the Sun’s path across your property during a growing season—a year, if time allows. Orienting the greenhouse with the roof ridges running east to west is usually best.

An attached structure on the south side of the house or garage or another structure gives you the most winter sun exposure. Freestanding (unattached) greenhouses can be located in the open to maximize exposure to sunlight. On any site, trees and other structures can limit the amount of sunlight that reaches the greenhouse. Remember that trees that are small now will mature to potentially block the sunlight. Still, there may be days or even periods of the year when you want some relief from the sun. Dappled shade from trees in leaf might seem like a solution, but remember: You can’t add light, but you can add shade cloth.

### WHAT ELSE SHOULD I CONSIDER?

You want a level site on firm ground. A slight grade can be modified, but a steep slope could present problems, including uneven settling on firm ground. A level site will minimize heat loss and/or cold seepage at the foundation level, as well as invasion by animal or insect pests. Common foundation materials include wood (rot-resistant



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## LANDSCAPING

cedar or redwood is recommended) and concrete, which takes many forms. A concrete patio is often ideal—if it provides good drainage. (Drainage refers to both interior and exterior runoff and will vary, depending on the size and scale of your structure.)

You may seek protection from damaging weather, such as strong or even hurricane winds. Locating your greenhouse on the side of the house or near a fence may provide some shelter. As you research your options, consider the quality and weight of the materials used in the construction of your greenhouse as weather assets or liabilities.

### WHAT ARE THE PROS AND CONS OF AN ATTACHED GREENHOUSE?

Access to electricity, plumbing, and other utilities is easy with an attached greenhouse. You can even get emergency heating from the house in the winter, although you probably won't want to try cooling it in the summer. Being attached also makes the greenhouse easier to access: You won't have to get dressed or dash through the snow to be with your prize begonia. The biggest drawback is the wall of shade that you get from the house, which is why it is best to locate an attached structure on the south side to get maximum sunlight. A tightly fitted sliding glass door and good ventilation will help to keep moisture in the greenhouse and mold out of the house.



### CAN I BUILD A GREENHOUSE MYSELF?

It's possible for do-it-yourselfers to build a home greenhouse from a variety of materials. Hobby greenhouses can be put together with old window frames, sliding-door panels, and other recyclable construction materials. Some companies sell ready-to-assemble kits that don't require much engineering skill. You can also find plans for small greenhouses built with PVC (polyvinyl chloride) electrical conduit and polyethylene plastic. If you're not a builder, you can find greenhouse construction firms that will build one for you. Check out the Hobby

Greenhouse Association at [Hobbygreenhouse.org](http://Hobbygreenhouse.org). For a membership fee, you'll get a wealth of information on hobby greenhouses.

### WHAT DOES A GREENHOUSE COST?

Although you'll see advertised prices of less than \$500 for greenhouse kits, most people will spend up to a few thousand dollars on a hobby greenhouse setup. If you can design and build your own, then the bottom line can be much less. If you want a turnkey job done by professionals, figure on a bill of \$10,000 to \$20,000 or more.

There will be many additional expenses, including a heater, fans, floor

material, and benches. Buy heaters designed especially for greenhouses. If you use a gas heater, be sure that it is properly vented; ethylene produced during combustion can damage plants, especially flowers.

### WHERE CAN I GET MORE INFORMATION?

The Internet is an obvious choice. Start with [Hobbygreenhouse.org](http://Hobbygreenhouse.org). Also try searching for "hobby greenhouse" and "home greenhouse." Order brochures from as many suppliers as possible and carefully check and compare materials, sizes, and extra costs involved. Gardening magazines are a good source for greenhouse ads, and vendors often set up booths at garden shows specifically to meet and talk with potential customers. Contact your local Cooperative Extension, which might have a hobby greenhouse plan that is free or available for a nominal charge and/or staff that has greenhouse experience or knows someone in your area who does. The Extension's Master Gardener volunteer program is a great way to learn how to use your new greenhouse. For more about Cooperative Extensions and to locate yours, go to [Almanac.com/cooperative-extension-services](http://Almanac.com/cooperative-extension-services). ■

—William D. Adams

*William D. Adams, a retired agent with the Texas A&M AgriLife Extension Service, has authored several books, including The Texas Tomato Lover's Handbook (Texas A&M University Press, 2011).*



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# THE CANNA CHRONICLES

In Summer 2017, two-and-a-half years into my gardening journey, a colleague gave me several garbage bags full of different plants from her outdoor oasis. I'd started my garden on a tight budget, working mainly with sweet potato ivy, purple queen, and elephant ears that I'd found in the discount section of the garden store or been given, so I accepted her gift with excitement and gratitude. The cannas that she included were of particular interest to me, and she'd separated them by the color of the flowers: red, orange, and yellow. One bag of stalks with dark leaves contained special variegated bulbs—not that I knew what this meant at the time.

As grateful as I was for her kind and bountiful gift, I was exhausted by work and didn't have the time or energy to fully think through the process of planting the bulbs. Instead, I imagined how the vibrant colors of the flowers would look together in bloom and planted bulbs wherever I saw space for them. The idea of blooming canna lilies energized and inspired me, and I found myself looking out my windows for signs of progress whenever I had the chance.

Fortunately, I didn't have to wait long. These

bulbs loved my garden, and growth appeared within a few weeks! The cannas erupted into bright green stalks, and their oval leaves unfurled from tight spirals, giving the plants dimension and volume. With the number of bulbs that I'd planted, my garden transformed and my spirit sang. The new additions contributed to the beauty of my garden, and it became my solace and sanctuary.

## I DUG OUT THE CANNAS AND DISCOVERED THAT THEIR ROOTS HAD STRANGLERED THE ROOTS OF MY ELEPHANT EARS.

### GROWTH BLOOMS AND PROBLEMS DEVELOP

Unfortunately, my job demanded more of my time, and I couldn't enjoy the garden as much as I would have liked. I yearned for the energy that the garden gave me, so I took every opportunity to get outside. With my limited time, the most that I could do was to enjoy what I'd cultivated; I couldn't do any work, add anything new, or take care of issues.

A year later, the cannas stood 2 to 4 feet tall, and red, orange, and yellow flowers bloomed atop the stalks. They were strong, resilient, and beautiful. I was pleased because they had not required much effort, and my garden

seemed as healthy as ever. As a self-taught, experiment-driven gardener, I did not realize that plants can take time to reveal signs of decline, which often begins in the soil. Problems often develop where we can't see them and wait to reveal themselves, especially if we don't know to look for them. I saw cannas growing all over my garden but did not know that they were

multiplying in the ground.

Fast-forward another year: I noticed that some plants had stopped growing and others appeared stunted. Had a garden pest invaded while I focused on work? Did a problem develop in my soil? Did a neighbor use a toxic herbicide that seeped into my garden?

I stood in my garden and surveyed my favored space, looking for signs of the culprit. Despite the decline of some plants, tall green stalks and oval leaves were everywhere. Suddenly, it struck me: My canna lilies looked unaffected and unbothered. Where other plants showed signs of struggle, these were thriving, with bright

foliage, strong forms, and blooming flowers. I looked at my yard and soon realized that there were far more canna lilies in my garden than I'd originally planted. A wave of horror washed over me: Could the cannas be the culprit? Could the gift that I'd come to love be thriving at the expense of my other plants? My busy schedule prevented me from investigating further, but the suspicion remained.

In Fall 2020, I noticed that the elephant ears in one of the beds had failed to grow to their typical size, so I tried an experiment: I dug out the cannas that I'd planted there a couple of years before and discovered that the canna roots had spread farther than I'd anticipated, produced more bulbs, and strangled the roots of my elephant ears! I reluctantly accepted the idea that the cannas were hurting my garden and I had many hours of work ahead of me. My plan was to remove all of the canna bulbs, so I resolved to do a little bit every time I went out to the garden.

### TRAGEDY STRIKES: THE TEXAS FROST

Before I could lift all of the cannas, the Texas Frost of 2021 decimated my cherished garden. What had been a colorful and lively









**WE CAN BRING BEAUTY AND JOY TO OUR COMMUNITIES AS WELL AS PROBLEMS AND CHAOS—POTENTIALLY AT THE SAME TIME.**

landscape became a dreary scene of decay in a matter of days. The snow melted, leaving few signs of life in its wake. I was heartbroken, but such is the life of a gardener. Over the next couple of weeks, I forced myself not to work in my garden and let nature run its course. Thankfully, it was not long before my hardiest plants emerged above the soil. Purple queen was the first to return. Cannas were next, and with fewer plants to compete with in the soil, they grew quickly and plentifully.

Within months, color, shape, and texture had returned to my garden, mainly as purple tubes and bright green canna stalks.

My elephant ears recovered more slowly, and some other plants did not come back at all. As I planned for “Project Rebuild My Garden,” the depth of the issue began to truly sink in. Cannas had multiplied and sprouted everywhere! There were over five times more cannas growing than had been originally planted. This confirmed to me that cannas were hindering other plants from rebounding. I needed to lift all of the cannas out of the ground as soon as possible and plant them into pots from which they couldn’t spread their roots and multiply. This job was likely to take hours and sap most of my energy.

**LEARNING FROM CANNAS**

I got to work with my shovel, pressing it into the ground with my foot and fishing out clusters of bulbs. I gave the cannas new homes in planters of varying sizes that lined my fence and fit into every free space. Just as my canna garden began as a gift, so I shared these bulbs freely with friends and family—along with a warning that, if planted in the ground, the bulbs were likely to propagate and take over.

As I reflected on this 4-year process, I thought of a parallel between canna lilies and people. The bulbs transformed my yard in ways that I’d not anticipated; in the same way, just like

cannas, we affect our own communities. We can bring beauty and joy as well as problems and chaos—potentially at the same time. We differ from canna lilies in that we can use observation and awareness to ensure that we contribute to the betterment of our environment and those around us.

By moving my canna lilies to pots, I helped them to do what they couldn’t do alone: relocate. This reminds me of the power of community and that we don’t need to operate alone. When we’re struggling, we can reach out for help so that our problems don’t spread and affect the community.

Now, years later, I still haven’t completely eliminated cannas from the soil. They rooted deeply and still pop up. Thankfully, the remaining plants are easy to spot and remove. I’ve brought balance back to my garden and learned how amazing and versatile canna bulbs can be. I’ve also learned what can happen when we introduce new plants to each other: They don’t always work together, but they still have a place in the garden community. ■

—Marcus Bridgewater

*Marcus Bridgewater, also known as Garden Marcus, is the CEO and founder of Choice Forward and author of How to Grow: Nurture Your Garden, Nurture Yourself (HarperOne, 2022). Assisted in everything by his wife and creative partner, Dana, he is working hard to create a better future.*

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# SURVIVAL STRATEGIES

HOW PLANTS MANAGE THE SHIFT FROM WINTER TO SPRING

**W**eather in late winter and early spring across the northern United States and Canada can feel like a roller coaster. Climate change has made warm periods in December, January, and February more common than they were in the past. Warming has also reduced the stability of the jet stream, making intense cold waves with blasts of Arctic air more common in late March and April.

How do plants survive these extremes? I study how climate affects the timing of seasonal events in the life cycles of plants, birds, and insects in the northeastern United States. What I have found is that although species here have evolved to handle our region's famously changeable weather, a warming climate is disrupting weather patterns and testing the abilities of many species to adapt.

## TOLERATING COLD

On brutal winter days when temperatures are far below freezing, animals hibernate underground or huddle in protected spots. Trees and shrubs must sit and take it. The tissues in their trunks, branches, and roots are alive. How do they survive the freezing cold?

In autumn, woody plants



IN AUTUMN, WOODY PLANTS IN MANY PARTS OF NORTH AMERICA START PREPARING FOR WINTER. WHEN THEIR LEAVES CHANGE COLOR AND FALL, THEIR TWIGS, BRANCHES, AND TRUNKS START TO LOSE WATER.



TREES IN COLD CLIMATES HAVE EVOLVED PROTECTIONS AGAINST ICE AND SNOW. THEY HAVE THE ABILITY TO SURVIVE MONTHS OF COLD AND SNOWY WEATHER.

in many parts of North America start preparing for winter. When their leaves change color and fall, their twigs, branches, and trunks start to lose water. As a result, their cells contain higher concentrations of

sugars, salts, and organic compounds.

This lowers the freezing point of the cells and tissues and allows them to survive temperatures far below the normal freezing point of water. This trick has its limits, though, so extreme

cold can still kill certain plants. For example, orange trees can not tolerate as much cold weather as apple trees.

Below ground, the situation is somewhat different. Like aboveground tissues (think stems and

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## WEATHER WISDOM

branches), the belowground roots of trees and shrubs remain largely inactive during winter. They rely on insulation from snow, fallen leaves, and soil to keep from freezing.

### THE DANGER OF SPRING FROSTS

As if winter cold were not enough, early spring brings new dangers. Plants need to leaf out as early as they can in spring to take full advantage of the growing season. However, to leaf out, they must pump water into their developing leaves, reducing the concentration of sugars, salts, and organic compounds in their tissues and removing their protection from cold.

Each species has a characteristic leaf-out time. Early-leafing species such as blueberries, apples, and willows are the gamblers of the plant kingdom. They risk frost damage to take advantage of longer growing seasons. Later species like oaks and pines are cautious and conservative. They avoid frosts but have shorter growing seasons.

Flowers and young leaves are vulnerable to frosts because they contain lots of water. If the flowers of fruit trees like peaches and pears are killed by frost, the trees won't produce fruit later in the summer. Late frosts also can cause disappointingly short flowering seasons for early-flowering ornamental plants such as forsythias, flowering cherries, and magnolias.



EARLY-LEAFING SPECIES SUCH AS BLUEBERRIES (ABOVE) RISK FROST DAMAGE TO TAKE ADVANTAGE OF LONGER GROWING SEASONS. LATER SPECIES LIKE OAKS (BELOW) AND RED MAPLES (BOTTOM) ARE MORE CAUTIOUS.

### CUES TO GET GROWING

To guard against frost and still take advantage of the full growing season, trees and shrubs have developed three ways to know when it is time to start growing in the spring.

**First**, plants can sense winter cold. Each winter, they stay dormant until they have experienced a certain number of cold winter days. This allows them to avoid the mistake of leafing out on abnormally warm days in



January and February.

**Second**, plants sense spring warmth. After they experience a certain number of warm days each spring, they grow and leaf and flower.

**Third**, plants also sense day length or photoperiod. As days get longer in the spring, trees get itchy to leaf out and are quick to grow in response to warm weather.

Interestingly, North American trees such as red maple and black birch



Photos: from top: Clara Nila/Getty Images; Richard B. Primack; Ruth Peterkin/Getty Images



are more cautious and conservative than their risk-tolerant relatives in Europe and East Asia, where the more predictable climate (at least in the past) allowed trees to evolve bolder strategies to leaf a few weeks earlier than their counterparts in eastern North America, where the weather is more variable and leaf-out is deferred a bit for the purpose of avoiding late spring frosts.

**SCRAMBLING THE SIGNALS**

Plants are highly attuned to temperature signals, so warming driven by climate change is making it harder for many species to detect how to avoid or handle winter cold and spring frosts. Warmer temperatures can fool trees such as apples and pears into leafing out and flowering several weeks earlier than normal, increasing their vulnerability to late frosts.

Such late frosts are becoming more common because climate change is destabilizing the jet stream, leading it to dip much farther south and allow bursts of unusually cold weather to descend.

In 2007, an exceptionally warm period in March triggered trees to leaf out across the eastern and central United States. A hard frost in April then killed the young leaves and flowers of oaks, hickories, and other species. The trees were able to produce a second crop of leaves but could not fully replace the

leaves that they had lost, which stunted their growth for that year.

Warmer winters are now leaving the ground bare and snow-free for more of the winter. Cold snaps that occur with no insulating layer of snow can freeze the soil and kill the roots. Tree and shrub branches then

adelgids and emerald ash borers. As winters become milder, more of these insects survive, extend their range to the north, and damage more trees.

**SPECIES REPLACEMENTS**

In coming decades, many cold-loving evergreen tree species, such as spruces

south such as oaks and hickories. Across North America, risk-tolerant nonnative species such as Norway maple and European buckthorn are already taking advantage of climate-driven disruptions to disperse into forests from roadsides and neighborhoods.

Similar shifts are happening in many places as climate change alters the signals on which plants rely to mark the changing seasons. In the western United States, plants are facing greater challenges associated with higher temperatures and increased drought and fires.

Homeowners are also having to change the plants that they grow. For creative and adaptable gardeners, these might be exciting times when they can replace more northern hemlocks, dwarf spruces, and firs with more southern camellias, crepe myrtles, and magnolias. For gardeners in cold climates, maybe this is the time to try peaches, nectarines, figs, and pawpaws and other plants from farther south. Eventually, as the climate warms, oranges and other citrus trees, pomegranates, and other warm-loving fruit will be growing farther north. ■

—Richard B. Primack



AS WINTERS BECOME Milder in northern climates, insects such as hemlock woolly adelgids (above) and emerald ash borers survive and damage more trees (below).



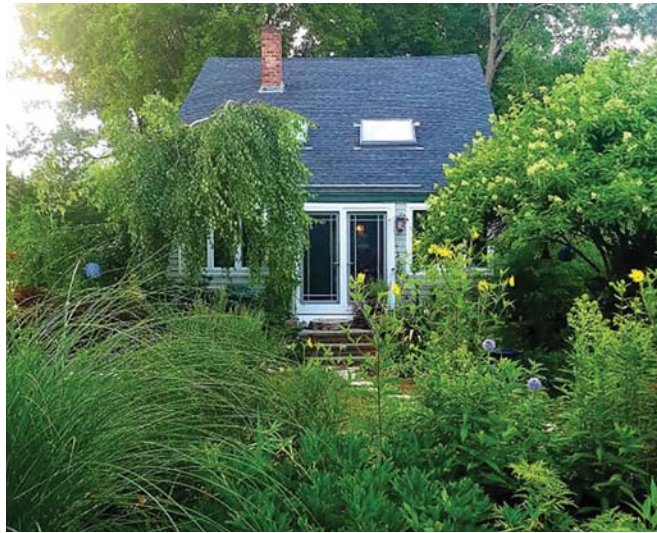
die back because damaged roots can not supply enough water and nutrients. In extreme cases, plants die.

As if managing shifting climate and timing were not enough, trees are having to deal with new problems like insect pests. In northern climates, harsh winter weather holds in check many insect species, such as hemlock woolly

and firs in the northern United States and Canada, will become less abundant when these new challenges become too much for them to bear, and they will be replaced by deciduous species such as maples and beeches. In turn, forests currently dominated by maple and beech trees will be gradually occupied by native species from farther

Photos: from top: Robert Winkler/Getty Images; ziggy7/Getty Images





## THE INFLUENCE OF ANCESTORS

*Essential wisdom accumulates in the community much as fertility builds in the soil.*

—WENDELL BERRY, AMERICAN WRITER AND ENVIRONMENTALIST (B. 1934)

**A**s a child, I was fascinated by the natural world. I was drawn in by evidence of people and plants that had left a mark on the landscapes I saw before me. Worn woodland paths, old cellar holes outlined with daylily or periwinkle, and stone walls running through the forest suggested that life was not as it had been before. An ancient Roxbury russet apple tree near my

home stood as a witness to history and the last remnant of an orchard that grew on the landing above a shipyard abandoned centuries earlier.

My feet and my imagination ran wild in the evolving suburban landscape, where I foraged from a blackberry bramble and frolicked after monarchs and fireflies visiting milkweed meadows. Between that field and the woods, I made

my fort beneath a craggy old weeping mulberry tree, wondering who had planted it beside the poet's narcissus that (like me) peeked out from under the curtain of branches each spring.

Visits to my immigrant grandparents' urban gardens taught me more about vegetable cultivation and heirloom seed-saving that connected ancestral seeds to our family's kitchen table. When they came to visit

my parents' riverside homestead for Sunday supper, my grandfather would sneak tomato and eggplant seedlings into beds of peonies and hostas. They seemed to be incompatible based in what I saw happening in other American gardens of the day, but each harvest season would bring tomato-and-basil sandwiches, caponata, and bodacious bouquets that helped me to appreciate

Photos: John Forti





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that good gardens could come in many forms.

Looking back, I wonder if perhaps the fireflies' Morse code inspired me to become a garden historian and whether the flavor of basil and fragrance of the poet's narcissus influenced my decision to become an heirloom gardener.

As an adult, I have restored, re-created, and rehabilitated numerous gardens, ranging from native habitat plantings to landscapes designed by Frederick Law Olmsted to World War II victory gardens. Each landscape I have worked has broadened and shifted the way that I garden.

As a young horticulturist for Plimoth Plantation Museum—now known as Plimoth Patuxet Museums—in Plymouth, Massachusetts (in the 1990s), I fell in love with many of the heirloom plants that were common

### I STILL CULTIVATE FOOD CROPS AND LANDSCAPE PLANTS THAT MEMBERS OF THE WAMPAOAG TRIBE GREW.

in 17th-century gardens. To this day, I still cultivate food crops and landscape plants that members of the Wampanoag tribe grew. These plantings provide food and forage for wildlife, as well as a framework that brings a sense of place to any regional landscape I design.

The colonial belief that any useful plant is an herb led me to look upon all plants as part of a formula for environmental as well as personal well-being. I now grow native medicinal and culinary plants—Joe Pye weed, pleurisy root, bee balm, milkweed, fiddleheads, elderberry, sunchokes, staghorn sumac, saskatoon berry, and disease-resistant hybrid American chestnut trees among them—for habitat

enrichment. Similarly, I keep a place in my gardens for the colonial kitchen garden herbs and nutritional greens that I came to love, such as angelica, lemon balm, lavender, lovage, rosemary, violets, dianthus, sage, sorrel, kale, and hops.

Later, as curator of historic landscapes at Strawberry Banke Museum in Portsmouth, New Hampshire, I gained a new appreciation for exploring change over time on a site that examined the evolution of gardens across four centuries. Layered atop colonial kitchen gardens onsite, the museum's 18th-century dooryard gardens (that period's form of curb appeal) broadened my plant palate to include more

small-yard fruits, woody ornamentals, and trees such as gooseberry, currants, quince, lilac, smoke bush, rose, sugar maple, pear, and apple. Here, I also fell in love with the dooryard garden's storied pass-along perennials—iris, daylily, peony, and Solomon's Seal among them. The elegant spiraling trellises, seated arbors, formal pathways, and ornamental fencing styles found in these period gardens further fueled my passion for creating interconnected outdoor rooms in my own landscapes.

It was at the same museum that I also developed a new appreciation for Victorian-era plants that I had previously dismissed as garish (alyssum, artemisia, coleus, dahlia, four o'clock, and zinnia). When massing them in the carpet beds for the governor's mansion, I came to see how they

Photos: John Forti



could harmonize to create beautiful patterns in the landscape. Similarly, the heirloom vegetables that had been introduced to the neighborhood by 19th-century immigrants (white eggplant, broccoli rabe, oxheart tomatoes from Ukraine, Romano beans, and turban squash) found their way into my garden, kitchen, and heart.

While restoring the property's 20th-century gardens and landscapes, I learned to love the nostalgic, colonial-revival era (1880s to mid-20th century) style that had evolved in response to industrialization and a nation's reminiscences about its first 100 years. These gardens helped to reintroduce native plants (aster, goldenrod, phlox, foxglove, lavender, hollyhocks) and classic colonial garden layouts in romanticized landscapes that helped to inspire the preservation

movement, which continues to inform my thinking and practices more than a century later.

More recently, 20th-century Victory gardens, school gardens, community gardens, and children's gardens taught me that movements that bring families and nations together around education, nutrition, and well-being can be even more important than appearances and aesthetics alone.

Heirloom gardens have ensured that we pass down the best of our plants and horticultural practices through the generations. In addition to beauty and a sense of place, horticultural history offers models of adaptation for a changing world. Everyone past and

present has moved through trying times and struggled to keep well, yet each spring we continue on in an annual conversation between what has been and new potential.

Gardening is like this every spring—our next best chance to grow. So, each spring, I head back out and I work old muscles. I prune my fruit trees, mend garden beds, spread compost, and wait for new blossoms, harvests, and vistas. I cultivate my habitat with meaningful seeds, artful fragments, and elements of my life experience. And, year after year, my gardens help meld the fruits of my labor—joyful memories and meaningful stewardship together in my own backyard. Songbirds

and sustenance—the best way I know to contribute to a more hopeful future.

At a time when it can feel difficult to effect meaningful change, we can take comfort in knowing that the gardens that we plant connect past and present to our own health and happiness. Landscapes woven together by generations of oak and acorn, fireflies and monarchs, chickadees and bumblebees, grandparents and great-grandchildren, can help us to learn from the past and thus create a more sustainable future. This is what makes me a passionate gardener! ■

—John Forti

Garden historian and ethnobotanist **John Forti** is the author of *The Heirloom Gardener: Traditional Plants and Skills for the Modern World* (Timber Press, 2021). For more, visit [JForti.com](http://JForti.com).

**HEIRLOOM GARDENS HAVE ENSURED THAT WE PASS DOWN THE BEST OF OUR PLANTS THROUGH THE GENERATIONS.**



Photos: John Forti



# Will Cities Feed the

**In 2007, for the first time in history, half the world's people were living in cities. By mid-century, two-thirds of the world's population—as many as 7 billion people, including 90 percent of Americans—will live in densely populated areas. Population growth, losses of agricultural land, and the ongoing ravages of climate change have led researchers to project that by 2050, feeding people around the world will require expanding global food-production capacity by as much as 70 percent. Given these sobering predictions, experts anticipate that we'll be growing more food—especially perishable crops—in and around cities, bringing food production closer to where most people live and eat.**

## A LOOK BACK AND FORTH

**U**rban agriculture isn't new. It isn't radical. People have been growing food in cities since we've had cities," says Dr. Laura Lawson, executive dean of agriculture and natural resources at Rutgers University's School of Environmental and Biological Sciences.

Among numerous examples, she cites the market gardeners of Paris, who from the 12th through early 20th centuries provided vegetables and fruit year-round to the entire city, eventually even exporting them to Britain. These *marâchers* pioneered a special labor- and space-intensive system that used intercropping, succession planting, and glass coverings to protect plants against the cold, employing then-abundant horse manure for maintaining a stable soil temperature and helping with soil fertility.



Tomorrow's urban food producers will grow food not only in the ground but also on rooftops and in an astonishing variety of indoor locations.

Experts say that they can't generalize about the future of urban agriculture because each city's food system will evolve in response to its unique characteristics.

Still, they do predict that urban food production is and will become increasingly multifunctional, co-generating economic and social benefits such as energy generation, waste reduction, water conservation, stormwater management, improved air quality, heat reduction, increased biodiversity, agritourism, crime reduction, community connections, and—most important of all—human health.

*(continued)*



COMMUNITY GARDEN, CHICAGO

# Future?

BY MARGARET BOYLES







COMMUNITY GARDEN, CONEY ISLAND, NEW YORK CITY

**THE TREND**

**Community Connections**

City-dwellers throughout North America will continue to grow food in places such as backyards, patios, and community gardens (located in parks, vacant lots, and school- and churchyards and on unbuildable land and prison and hospital grounds), as well as on for-profit and nonprofit commercial farms. “Nobody really knows how many urban community gardens there are across the U.S., but it’s a huge wave, especially among young people—it seems that everybody is trying to join or start a community garden,” reports Cathy Walker, president of the American Community Gardening Association, which offers many kinds of help to community gardeners.

Surveys in both the United States and Canada showed substantial increases in home and community gardening during the pandemic, especially by people working from home. In addition to being motivated by their desire for increased food security, people said that they had started or continued to garden for mental well-being, exercise, and family activity. But no one knows whether this trend will grow or decrease as life returns to a “new normal.”



COMMUNITY GARDEN, SAN FRANCISCO

**GROWING: DOWN IN THE DIRT**

**C**elebrating its 50-year anniversary in 2023, Seattle’s P-Patch Program—one of the nation’s most successful community-gardening efforts—has grown to incorporate nearly 34 acres of gardens of varying size scattered throughout the city, mostly on city-owned land. (The “P” honors the Picardo family, who allowed the first community gardeners to use a corner of their truck farm and then later sold their land to the city.)

Today, 3,700 gardeners tend plots in the city’s 90 P-Patch gardens, according to Kenya Freddie, who supervises the program for the Seattle Department of Neighborhoods. She notes that there are more than 4,000 people on the waiting list. The program gives priority to residents from minority and low-income groups.

“Green spaces are so important in densely populated urban areas,” Freddie observes. “They meet many social and educational needs. They provide gathering spaces. They may recycle food waste and building materials.”

Each P-Patch has a unique character. Some offer large gathering spaces, elaborate artwork, or raised beds that accommodate gardeners with disabilities. Sixty P-Patches have gleaning programs or “giving gardens” that donate to food banks and hot-meal programs. One garden allows growers to sell produce at a small farmstand to supplement their incomes.

The most important product of a community garden? “Connection!” responds Sandy Pernitz, coordinator of 16 P-Patches, including the 7-acre Beacon Food Forest—“a permanent food garden that mimics the structure of a multilayered natural forest.”

“Connection to nature, to food,



to each other,” she explains. “People learn about each other, learn to work together, organize, deliberate, resolve conflicts, make decisions, grow things, and cook.”

These vital connections also extend to urban for-profit and nonprofit farms, according to Lawson: “There’s an important social-justice component here. Nonprofit groups, community gardeners, and urban farmers know the needs and food insecurities in their communities that fly under the radar.”

Noting that fierce competition and rising prices for urban real estate often threaten to eradicate community-based food production spaces, she adds, “Cities must find ways to honor these investments of blood, sweat, and tears. The value must remain with urban farmers and community gardeners, especially in terms of ensuring long-term land tenure.”



3,700 GARDENERS TEND PLOTS IN SEATTLE'S 90 P-PATCH GARDENS.



AGRIVOLTAIC FARM NEAR BOULDER, COLORADO



IOWA'S FIRST AGRIFOOD



AGRITECTURE CONCEPT PROPOSAL FOR CHELSEA AREA, NEW YORK CITY

**THE TRENDS**

**Agrihoods, Agritecture, and Agrivoltaics**

Urban housing developments and office parks have begun to include food-producing spaces in their landscaping and construction plans.

Some will follow new models of development called “agrihoods,” planned developments that focus on food production for residents’ direct use and/or for sale outside the development.

A new discipline called “agritecture,” or “building-integrated architecture,” focuses on designing or retrofitting residential and commercial buildings to integrate indoor or outdoor food-producing spaces.

“Agrivoltaics” is the practice of co-locating food crops under solar arrays for mutual benefit.

*(continued)*





ROOFTOP COMMUNITY GARDEN ATOP CONDOS, VANCOUVER, BRITISH COLUMBIA

### GROWING: UP ON THE ROOF

**F**armers and gardeners around the world have begun making use of otherwise unused urban rooftops to produce a wide variety of food crops.

“What drew me to green roofs was how they push plants to grow under the most stressful conditions and still get a lot of production,” says Dr. Jennifer Boussetol, an assistant professor of urban horticulture at Colorado State University, who has been researching and advocating for this form of urban agriculture since studying green roofs in 2003 atop an EPA building in Denver. The project simultaneously launched her into the nascent field of rooftop agrivoltaics.

Most agrivoltaic projects are located in farm fields, but Boussetol

has observed that when “a solar array is located at the edge of a green roof, the plants growing under it do so much better.” She continues: “Plants under solar panels grow bigger and use half the water because they remain cooler, protected from harsh winds and excess solar radiation.”

This arrangement “also improves the efficiency of solar generation by cooling the panels,” she adds. “In turn, an agrivoltaic system insulates the roof, lessening the costs of heating and cooling the building.”

As part of her research, Boussetol has identified 5,000 acres of rooftops in Denver with the potential for food production. “I don’t see green roofs replacing traditional field crops,” she states, “but they’ll help to build

resilience into local agriculture and contribute to food security.”

Boussetol foresees rooftop farms evolving into systems of “neighborhood-supported agriculture, or NSAs,” similar to community-supported-agriculture projects (CSAs) in which consumers share the costs, risks, and benefits with growers.

The biggest impediments to increasing rooftop food production? “Space and high start-up costs,” she says. “Developers are slow to adopt the concept because most of the benefits are societal. They don’t go to the developer.”

As might be expected, Boussetol is ever optimistic: “We’re still in the Dark Ages of rooftop agriculture, but it will grow.”



## THE TREND

### Growing Up and Down

Controlled environment agriculture (CEA), also called “vertical agriculture,” relies on soilless growing systems (in which plant roots are bathed in or sprayed with a nutrient solution) and computer-controlled indoor climates.

In a promotional video, Nate Storey, co-founder and chief science officer of vertical farming company Plenty, notes that in CEA, “Humanity becomes fully untethered from the environment.” Further, as the film’s narrator points out, “Every place in the world would be able to grow the same crops as those grown in California and Tuscany.”

Innovative components of urban agriculture include a wide variety of indoor growing systems that conquer traditional environmental and space constraints by moving indoors, often rising way up and sometimes going deep down.

CEA operations have sprouted as rooftop greenhouses that take advantage of some natural sunlight and as windowless indoor farms in warehouses, factories, multistory buildings, repurposed shipping containers, and underground bunkers or beneath the foundations of new urban structures.

Commercial CEA crops typically grow in floor-to-ceiling layers of horizontal trays or cascading vertical walls or pillars. Large indoor CEA farms are called “plant factories.”



INDOOR FARM, DAVIS, CALIFORNIA



VERTICAL FARM, CLEBURNE, TEXAS

## GROWING: IN HOMES AND PLANT FACTORIES

Two University of Florida researchers, Drs. Celina Gómez, a CEA expert, and Catherine Campbell, with expertise in public health, have teamed up to explore the prospect of using household-scale CEA growth chambers to encourage low-resource urban families to grow some of their own vegetables. Their twin goals: finding the best compact vegetable varieties to ensure success and demonstrating that growing some of their own will spur inner-city urbanites to add more vegetables to their diets.

Proponents cite many advantages of urban CEA, among them:

- Growers can establish a system almost anywhere.
- High-density planting and year-round cropping allow many times the annual production of field-based farms.
- It could lessen food insecurity in inner-city areas.
- It greatly reduces or eliminates the need for pesticides and requires up to 98 percent less water.
- Operators can manipulate lighting and other factors to increase desirable nutrients, alter textures, and improve flavor.

Nonetheless, the nascent industry has been criticized for overhyping and sometimes greenwashing CEA’s potential, as well as for failing to adequately collect and share hard data.

Researchers say that the capital-intensive industry is also burdened by high energy and labor costs, lack of a well-trained workforce, outdated regulations, and the ongoing need to educate potential investors and city officials who lack understanding of both food production and CEA technologies. Many farmers





LUFA FARMS HOSTED CANADIAN PRIME MINISTER JUSTIN TRUDEAU.

## Growing Pains in Canada

**Montreal, Quebec, is home to Lufa Farms, the world's largest rooftop CEA greenhouse operation. Lufa is especially notable for its marketing model—a complete online supermarket with a CSA feel. Members (“Lufavores”) order weekly baskets of fresh produce from the greenhouses in addition to products from hundreds of local partners: field-based farms selling eggs, dairy, meats, poultry, fish, and vegan alternatives, as well artisanal pastas, baked goods, coffees, personal care products, and more.**

**Yet Canadian agricultural economists have expressed concern that growth of the CEA industry in Canada lags behind its pace in other advanced economies.**

**Researchers behind a Canadian study titled “Growing pains: Small-scale farmer responses to an urban rooftop farming and online marketplace enterprise in Montréal, Canada” conducted interviews with local traditional farmers, who voiced concerns about the disruptive effects of high-capital, high-production, supermarket-scale CEA facilities like Lufa Farms. Small land-based farms lack the access to funding for capital and operating expenses, as well as for developing an online marketing presence. The study also noted that rising prices and increased demand for local produce may exclude marginalized urban populations from the promised benefits of high-tech production operations.**

question whether artificial growing systems (“constructed ecosystems”) can ever replicate the nutrient density and health benefits of soil-based agriculture.

However, anticipated technological improvements, the development of skills-based curricula and credentialing programs for the CEA labor force, more automated labor, financing schemes targeted for vertical farms, and the introduction of more fruiting crops into the CEA mix have all made market-watchers enthusiastic about the long-term growth of CEA.

For now, “CEA can’t compete on price with produce grown on traditional farms,” says Lawson. “Currently, most CEA farms are cultivating either cannabis or leafy greens for high-end specialty stores and restaurants.

“But CEA is an important and evolving piece of urban agriculture. It captures students’ imaginations. It offers exciting new job possibilities. It can bring fresh produce into inner cities.”

## SO, WHAT'S THE PLAN?

**W**hat’s the potential contribution of urban agriculture to the overall food needs of a given city? What new technologies will arise? Can planners ensure that urban farms and gardens remain sustainable? Will they meaningfully help to alleviate food insecurity and prevent gentrification? How will it all come together?

“We just don’t know,” says Lawson. “There are so many threads to urban agriculture. We don’t have the answers for how to integrate them.

“But we do have a lot of expertise—in agriculture, public health, urban planning, land use, energy, food security, food justice, sustainability, and engineering. Cities need to hire directors of food-systems planning to bring these people together.” ■

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*Rural New Hampshire’s Margaret Boyles has long been interested in how human health relates to agriculture, horticulture, and the environment.*





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# THE BARTENDER'S GARDEN



## GARDEN DELIGHTS FOR DRINKS

Edible flowers such as borage blossoms, lilac florets, calendula petals, violets, and honeysuckle are colorful additions to beverages, along with any of your culinary herb flowers. Use them fresh in season or freeze them in ice cubes to use all year long.

Vegetables—including cucumbers, snap peas, and cherry tomatoes—will bring your botanical cocktails to a new level, whether they are muddled into the drink or used as garnish.

Experiment with cooking homegrown fruit and berries with equal parts sugar and water to make your own flavored syrups.

Toast with the taste and cachet of homegrown herbs!

BY ROBIN SWEETSER

**W**e all know that when preparing a meal, fresh is

best—and that growing your own veggies and accompanying herbs makes for an especially appetizing experience.

Having grown up among the many farmers and gardeners of Pennsylvania's Amish country, Jefferson Brechbühl, co-owner of the Colby Hill Inn and Grazing Room in Henniker, New Hampshire, recognized this.

Consequently, when he and partner Bruce Barnes opened their establishment in 2016, Brechbühl took on the

job of growing most of the herbs for use in what would turn out to be their award-winning farm-to-table meals.

When guests requested afternoon and after-dinner cocktails, Brechbühl—who was not much of a drinker himself—had to learn fast. Despite having no bartending experience, he began experimenting with culinary herbs in beverages—their flavorful oils and delightful aromas adding another dimension to his libations. Before long, his innovative craft cocktails became so popular that he eventually moved the herbs that he used most often

to a sunny spot right in front of the inn—his bartender's garden.

Brechbühl advises starting small and growing the herbs that you're most likely to use. A few of his favorites for craft cocktails and booze-free mocktails are thyme, spearmint, chocolate mint, basil, and lavender. (He shares three of his recipes here.)

Whether perennial or annual, most herbs are easy to grow and share the same need for full sun, well-draining soil, neutral pH, and little, if any, fertilizer, except as noted.

Consider growing the following herbs for happy-hour inspirations.

*(continued)*





## CHOCOLATE MINT MOJITO

- 10 fresh chocolate mint leaves
- ½ lime, cut into four wedges or slices
- 2 tablespoons sugar, or to taste
- 1 cup ice cubes
- 2 ounces white rum
- carbonated water or club soda
- chocolate mint sprig

Place mint leaves and one lime wedge into a sturdy glass. Use a muddler to crush the mint and lime to release the mint's oils and lime's juice. Add two more lime wedges and sugar. Muddle again to release the lime juice. Do not strain the mixture. Fill the glass almost to the top with ice. Pour rum over the ice, then fill the glass with carbonated water. Stir, taste, and add more sugar, if desired. Garnish with remaining lime wedge and mint sprig.



**HONEY GRAPEFRUIT MARTINI**

Add two thyme sprigs and the juice from a half lime to a cocktail shaker and then muddle.

Add to the shaker . . .

1 ounce Krupnik Spiced Honey Liqueur (Brechtbühl uses Djinn Spirits from New Hampshire)

2 ounces gin

3 ounces grapefruit juice

½ ounce honey

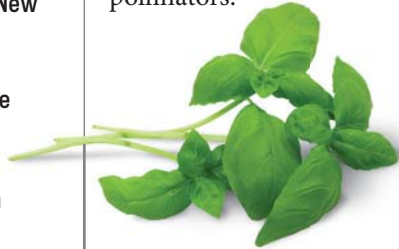
1 scoop ice

thyme sprig, for garnish

Shake and pour into a martini glass. Garnish with a thyme sprig and a slice of citrus.



**ANISE HYSSOP** has a minty, licorice flavor and aroma and acts as a subtle stand-in for anise-flavored liqueurs. A hardy perennial in Zones 4 to 8, this plant is loved by bees and other pollinators.



**BASIL** varieties offer a range of flavor profiles, from sweet to citrusy lemon and lime to spicy cinnamon to anise-like Thai; the dark purple variety bears a mild clove flavor but is usually chosen for the color that it lends to drinks. Basils pair well with gin, vodka, or rum. Brechtbühl suggests using lime basil in your next gimlet. A tender annual, basil is easy to grow from seed.



**CILANTRO** infuses fruity drinks with south-of-the-border zing. Good with vodka, gin, tequila, or

rum, it's a great candidate for your next mojito or margarita. Plant new seeds of this annual every few weeks to keep a fresh supply growing.



**FENNEL** is another licorice taste-alike whose leaves, flowers, and seeds can be used to add a note of anise. Good for the digestion, fennel is perfect for use in after-dinner drinks, acting as an herbal Sambuca. Sow seeds directly in the garden, as the plants do not like to have their roots disturbed.



**LAVENDER** adds a floral sweetness. Use it sparingly, though: It can be overpowering and even bitter, if overdone. These petals make a delicious lemonade that can be enjoyed as is or enhanced with light spirits such as vodka or gin. It is also tasty with a splash of tequila or rum. Perennial to Zone 5,

lavender likes slightly alkaline soil, so add lime or wood ashes if necessary to raise your pH to between 6.5 and 8.



**LEMON BALM** has a sweet, citrus flavor and is good for calming stress and anxiety—it's aromatherapy in a glass. Muddle with watermelon and shake with tequila, ice, and agave for a summery margarita. A perennial hardy to Zone 4, lemon balm is easy to grow from seeds or plants. Being in the mint family, it needs containing to be kept from spreading throughout your garden.



**LEMON VERBENA** adds lemony zip to any drink—with only a few leaves! It combines well with bourbon or rye: Try a whiskey sour or make a lemondrop martini with vodka and triple sec. It's hardy only to Zone 8, so



in colder areas, a new plant will be needed every spring.



**MINTS** are many, and all are interesting. For drinks, chocolate mint, spearmint, and apple mint are the best. Peppermint can be too sharp and intensely menthol. If you love mojitos or mint juleps, mints are must-haves in the garden. Be sure to plant these perennials in a pot or otherwise contain them to prevent them from running rampant.



**PINEAPPLE SAGE**, like the tropical fruit, has a sweet flavor and perfume that will impart a tiki bar touch to your rum- or vodka-based drinks. Its beautiful red flowers appear late in the season and make a colorful garnish. A perennial native to Mexico, it is hardy only to Zone 8, so in colder areas replace it with a new plant after the danger of frost has passed each spring.



**ROSEMARY** adds an invigorating piney essence to your drinks. Try it in a G&T (gin and tonic) for a Mediterranean vibe. A perennial hardy only to 30°F, it should be grown in a pot in order to later winter-over indoors on a cool, sunny windowsill.



**SORREL** adds a lemony flavor. Try it muddled with gin and a citrus juice, such as lemon, lime, orange, or grapefruit. Add a splash of simple syrup to lessen the pucker power. A perennial in Zone 4, it pops up early in spring and starts to blossom when hot weather hits. Cut the whole plant to the ground to encourage new leaf growth. Pretty, red-veined sorrel does double duty as a garnish.



**STEVIA** adds sweetness without sugar. Heat

releases the flavor, so steep  $\frac{1}{3}$  cup of leaves in 1 cup of hot, not boiling, water for 12 hours to use as simple syrup. A tender perennial, it is not winter-hardy in climes colder than Zone 9; replace each spring.



**THYME** offers many flavor profiles, depending on the type you choose—lemon, orange, caraway, coconut, nutmeg, rose petal, or culinary thyme. Each is perennial and most types are hardy from Zones 5 to 7. Grow them from seed, cuttings, or transplants. Thyme marries well with vodka or gin; try it with bourbon for a thyme old-fashioned.

Bottoms up! *Santé!*  
*Cin-cin* [chin chin]!  
*Salud! Proost! Kanpai*  
[gahn-pie]! Cheers!  
However you say it, when enjoying your unique botanical cocktails with friends, be sure to toast to good health—and herbs! ■

*Robin Sweetser, garden columnist for New Hampshire HOME magazine, writes a gardening blog for Almanac.com. She lives and gardens in Hillsborough, New Hampshire.*

## STRAWBERRY LAVENDER MARGARITA

*Make a lavender simple syrup:* Combine 1 cup water and 1 cup sugar in a pan. Add five lavender sprigs. Cook over medium heat until sugar is completely dissolved. Set aside to cool and steep overnight for full flavor.

Add to a cocktail shaker . . .

- 2 strawberries, chopped
- 1 sprig lavender
- 1 ounce lavender simple syrup
- 2 ounces fresh lime juice
- 4 ounces tequila (Brechtbühl uses Don Félix Silver)
- 1 scoop ice
- lime slice or strawberry wedge, for garnish

Muddle strawberries, lavender, and simple syrup. Add lime juice, tequila, and ice. Shake well, then pour through a cocktail strainer into a plain or salt-rimmed glass. Garnish with a lime slice or strawberry wedge.





# PINT-SIZE PRODUCE

BY ROBIN SWEETSER

Once grown as novelties, mini vegetable plants—with their proportionally small-scale but disproportionately delicious produce—are now embraced by plant breeders and gardeners alike. These compact plants suit numerous situations: They are a practical choice for small households and small-space gardeners, an ideal option for anyone growing in containers, a fun way to get kids involved in growing food, and (in a nod to their early appeal) a novel way to interest nongrowers in trying something new. Every year, it seems, breeders bring out new varieties from which to choose. Here are some of our favorites.

## BEETS

Any beet can be harvested while small, but ‘Babybeat’ and ‘Robin’ will give you 1- to 2-inch-round mini beets only 40 days from seed. Beet lovers should plan to sow seeds every few weeks to keep them coming all season. Don’t forget to eat the greens, the most nutritious part of the plant! Seeds for both varieties are widely available.



‘BABYBEAT’



‘PICK-A-BUSHEL’

## CUCUMBERS

Cukes are so crunchy and refreshing that a summer salad is not complete without them! If you are tired of dealing with a tangled mess of vines, look for some of these bush-type cukes to eliminate the problem. Because the fruit are small, they are classified as picklers, but they make excellent slicers for a single salad. ‘Pick-A-Bushel’ is an All-America Selections (AAS) cuke with disease-resistant vines that spread only 2 feet wide. Start harvesting after just 50 days, when the dainty fruit are 3 to 5 inches long. ‘Iznik’ is a seedless, 3- to 4-inch-long, cocktail cuke from Germany that is so thin-skinned that it needs no peeling. Producing only female flowers, it doesn’t need pollination to set fruit, so it can be grown under a row cover for protection from bugs. ‘Bush Crop’ is an heirloom pickler that grows on well-behaved, 2-foot-long vines bearing in 55 days. These three are all available from Seeds ‘n Such and Jung Seed. Remember, too: Cucumber vines have clinging tendrils that will grab and climb up a mesh fence or trellis to save even more space.



## CARROTS

Carrots don't take up a lot of room, and the shorter ones are made for growing in containers where they don't have to push through heavy soil or bump into rocks. Look for tender baby varieties like 'Minicore' or 'Bambino' from Pinetree Garden Seeds. A gourmet treat raw or cooked, they are ready to pick in about 60 days or when they reach 4 inches long. Plant a few every 2 weeks to keep a steady supply coming. Take note: For straight carrots, go easy on the nitrogen-rich fertilizer. Too much encourages forking.



## BOK CHOY

Chinese cabbage (aka pak choy) fans will fall in love with 'Asian Delight'. It forms 5- to 7-inch heads that are immediately recognizable as single servings. Planted in spring, it is very slow to bolt when the hot weather sets in; planted again in late summer, it stands up well to cooler fall nights. An AAS winner ("tested nationally and proven locally"), it is excellent for container growing or as a border plant in sun or partial shade. Harvest the whole head 30 to 50 days from seed. Find the seeds at Johnny's Selected Seeds and Park Seed. Keep in mind that cabbage moths and flea beetles can be deterred with floating row cover.

## PEAS

The name 'Snak Hero' says it all! This AAS-winning snap pea bears 4-inch-long pods on 18- to 24-inch-long vines, with or without support. Very versatile, it grows great in the ground, a 12-inch container, or a hanging basket. Taking 65 days from seed to edible-size pods, this hero thrives in cool spring weather, so you can plant early (once the soil has warmed to above 45°F) and this will be one of the first vegetables that you harvest. Kids will eat the crunchy, sweet pods right off the plant! Seeds are available from Seeds 'n Such and Territorial Seed Company.



## CONTAINER CROP TIPS

1. Don't crowd the plants! They need room for healthy root growth.
2. Fertilize! Containers have a limited amount of soil from which to draw nutrients. Mix a slow-release fertilizer into the soil at planting time and water with liquid fertilizer every 7 to 14 days.
3. Water evenly and often! Don't let pots dry out completely, which stresses the plants, reduces productivity, and causes problems like blossom end rot. *(continued)*





**PEPPERS**

Trendy snack-size peppers are here to stay. Delicious raw or cooked, these fruit are sweet and fruity. Look for ‘Mini Belle Mix’ if you want a blend of colors ripening from green to yellow, orange, or red in just 65 days. Only 1½ inches long and wide, these bite-size treats grow on 24-inch-tall plants. For a slightly larger pepper that is even earlier, check out ‘Candy Cane Red’. Its 3- to 4-inch-long bells ripen from green with yellow stripes to red in only 55 days; its compact plants grow to be 18 to 24 inches tall and have the bonus of attractive variegated foliage. Find seeds for both at Pinetree and Seeds ’n Such. Try this: Pinch the first set of flowers off your pepper seedlings before transplanting; this will direct plant energy into roots and promote strong growth. You’ll get twice as many peppers!

Some like it hot! Spicy 3- to 4-inch-long jalapeños cascade from the bushy ‘Pot-a-Peño’ pepper plant, which fits perfectly into a 10- to 12-inch-wide hanging basket. Start seeds 6 to 7 weeks before your last frost date to have plants ready for the garden. The fruit are ready to pick green 45 to 50 days from transplanting but leave them alone: If they stay on the plant another 2 weeks or so, they’ll turn red and even more flavorful. A recent AAS winner, the seeds are available from Park, Seeds ’n Such, and Territorial.

**CAULIFLOWER**

Cauliflower has become increasingly popular lately, substituting for oven-roasted steak, fried rice, mashed potatoes, hash browns, pizza crust, and even buffalo wings. Single-serving-size ‘Baby’ cauliflower—the whole head is only 3 to 4 inches across!—was bred for container culture, so it won’t take up much space, even in your garden. Maturing super fast, they are ready to pick in 40 days. Kids will love these miniature cuties! Available from many seed companies.



**MELONS**

Yes, melons can be miniature! Sure, they can be challenging to grow and tend to take up a lot of room in the garden, but softball-size mini-melons weigh-in at only 1 to 2 pounds when mature—light enough to grow on a trellis without needing additional support. Northern gardeners should look for 70-day heirloom ‘Minnesota Midget’ muskmelon (often misnamed cantaloupe), which grows on compact, 3-foot-long vines and is open-pollinated, so seeds are widely available. For increased disease resistance, try 80-day ‘Sugar Cube’ muskmelon from Burpee, Gurney’s Seed & Nursery Co., Renee’s Garden, and many others. When shopping for melon seeds, look for a high brix percentage. This refers to sugar content (sweetness) in the ripe flesh. Both ‘Minnesota Midget’ and ‘Sugar Cube’ have high brix contents at 11 to 14 percent.

‘Mini Love’ watermelon is a personal-size (5- to 9-pound) variety ready to challenge the classic ‘Bush Sugar Baby’. Growing on 3- to 4-foot-long vines, it is disease resistant, matures a little earlier, and has fewer seeds—but is just as sweet and juicy as our old favorite. The seeds of this AAS winner are available at Jung, Park, and elsewhere. The juiciest melons need rich soil and plenty of moisture, but once the fruit has started to ripen, cut back on watering to concentrate the sugars for a sweeter melon. Too much water late in the season can split the fruit.





## SQUASHES

Squash vines are notorious for taking over the garden. Varieties that bear mini-fruit on compact plants have shorter vines: 3 to 4 feet long. Here are a few . . .

**ACORNS:** 'Reno' is an acorn squash from Territorial that tips the scale at about 1½ pounds and is about 5 inches across. When halved and baked, one squash will serve two. The single-stem, bushy but well-behaved plants mature in 70 to 75 days.

If powdery mildew is a problem in your garden, give 'Sweet REBA' a try. Developed at Cornell University and available at Fedco Seeds, "REBA" stands for Resistant Early Bush Acorn. Just one or two plants will give you plenty of small and sweet acorns to keep over winter. Here's a tip: According to the late Dr. Brent Loy of the University of New Hampshire, acorn squashes should not be harvested until they develop an orange ground spot; these stand a better chance at reaching full sweetness.

**BUTTERNUTS:** Weighing in at 1 to 2 pounds, 'Butterbaby' and 'Butterscotch' will give you the smallest butternut squashes. Although the plants are considered semi-bush, they produce 3- to 4-foot-long vines that can be trained to climb up a trellis or hang over the edge of a large container. According to the folks at Cornell, they grow best in-ground, if given 6 square feet of space; alternatively, plant one in a half barrel. You can find seeds for both of these at Johnny's.

**SUMMER SQUASHES:** You've probably seen round zucchini such as 'Eight Ball' and 'Ronde de Nice', but how about a round yellow squash? Like its green cousins, yellow 'Lemon' is best harvested when baseball-size. All of these squashes grow on bushy plants that don't take up too much space in the garden and actually do well when planted singly in half-barrel containers. Dinner for two? They are delicious cut in half, stuffed, and baked. Seeds for all three varieties are widely available.

## CABBAGE

If a standard-size head of cabbage keeps coleslaw on your menu for a month, grow small. 'Katarina' is an early-maturing mini cabbage that produces 4-inch heads only 45 days from transplant or 55 days from seed. Space the compact plants 6 to 8 inches apart in the ground or grow in a container. An AAS winner, 'Katarina' is available from Jung, Territorial, Park, and other seed companies.



## TOMATOES

Nothing beats the flavor of a fully ripe, homegrown tomato fresh off the vine. The Dwarf Tomato Project has crossed determinate dwarfs with indeterminate heirlooms, combining the best of both worlds. The results are plants that are naturally small in stature but have a long fruiting season and keep their delicious flavor profiles. Check out [Dwarftomatoproject.net](http://Dwarftomatoproject.net) for descriptions of compact, easy-to-maintain plants. For even more dwarf tomato varieties, visit [Heritageseedmarket.com](http://Heritageseedmarket.com). A virtual marketplace, it offers seeds from the Dwarf Tomato Project as well as about 100 other dwarf varieties ranging in size from micro-dwarf cherries (standing only 6 to 12 inches tall) to dwarf and compact plants reaching 2 to 4 feet tall. Growers in steamy southern states may be interested in seeds developed from tomato varieties in India, Hawaii, and Africa that are said to beat the heat. Northern growers will appreciate the short-season varieties that hail from northern Europe. ■





**ARECA PALM**

Dr. Wolverton rates this palm as the very best air-purifying houseplant, taking into consideration how easy it is to grow and how well it humidifies the air (a tall areca palm will add a quart of water a day to your home's humidity). It is an especially good remover of toluene and xylene.



# HOUSEPLANTS TO THE RESCUE

If you're gasping for  
fresh air in your home or office,  
houseplants can help!

BY ANDREA CURRY

**T**oday, Americans spend up to 90 percent of their time indoors, often in places with little or no ventilation. The air inside our super-insulated modern homes and offices is often unhealthy due to harmful chemicals called “volatile organic compounds” (VOCs), which can cause short- and long-term medical problems.

Plants, on the other hand, can absorb these airborne chemicals through their foliage, break them down in their root systems, and turn them into sugars, amino acids, and other useful “building blocks” of life.

According to Dr. B. C. Wolverton, head of Wolverton Environmental Services in Picayune, Mississippi, the 10 houseplants highlighted here are among the best performers in removing from the air some of the most common and harmful VOCs (see “Toxins and Their Origins” on page 71) in our homes and offices.

*(continued)*



## HOUSEPLANTS

### PROOF THAT PLANTS WORK

Some scientists believe that many common, chronic health complaints may be caused by poor indoor air quality. Studies have suggested that plants can clean the air that we breathe:

■ In the 1980s, Wolverton, then a NASA scientist, was involved in reducing astronauts' exposure to airborne chemicals from synthetic materials that they would bring into space. He discovered that specific houseplants were efficient at absorbing contaminants.

■ In 1996, some Norwegian office workers coughed 37 percent less after plants were introduced into their workspace.

■ A study in India (2008) showed that workers in plant-filled office buildings had 24 percent fewer headaches, 52 percent less eye irritation, 34 percent fewer respiratory conditions, and a 12 percent higher lung capacity than workers in plantless environments.

■ An Australian study (2010) showed that 'Janet Craig' dracaena and the peace lily reduced negative moods (e.g., anger, anxiety, depression, stress) in office workers by 40 to 60 percent over 3 months.



#### CORN PLANT (A TYPE OF DRACAENA)

This is an excellent overall air purifier with variegated green foliage. The mature plant will display fragrant white flower stalks.

#### 'JANET CRAIG' DRACAENA

Especially good at removing trichloroethylene, this is easy to grow and tolerates neglect; buy one for your office and keep one next to your computer desk at home.



#### ENGLISH IVY

A very effective air purifier that can take on benzene as well as other compounds, English ivy tolerates fairly low light (although varieties with variegated leaves will lose their markings in too much shade).



**PEACE LILY**

This stunning plant, which sends up elegant white spathes above its foliage, is very good for disposing of acetone, benzene, methyl alcohol, and formaldehyde.



**COLORFUL AIR-CONDITIONERS**

These seasonal flowering plants are not only lovely to look at but also help to purify indoor air. Enjoy them whenever they're in bloom:

- Chrysanthemum
- Dwarf azalea
- Gerbera daisy
- Tulip



**BOSTON FERN**

One of the most common ferns in homes, it removes formaldehyde more effectively than any other plant.

**TOXINS AND THEIR ORIGINS**

Here are some common substances and the toxins that they can produce.

**Substance:** cigarette smoke, nail polish, nail polish remover, paints, plastics. **Toxin:** acetone

**Substance:** adhesives, ceiling tiles, floor coverings, paints, particleboard. **Toxin:** benzene

**Substance:** cleaning products, fiberboard, particleboard, plywood, upholstery.

**Toxin:** formaldehyde

**Substance:** adhesives, cosmetics, dyes, resins, varnishes. **Toxin:** methyl alcohol (methanol)

**Substance:** gasoline, heating oil, kerosene, lacquers, paints. **Toxin:** toluene

**Substance:** inks, paints, photocopiers, printers, varnishes.

**Toxin:** trichloroethylene

**Substance:** cigarette smoke, gasoline, paint, paint thinners, products treated with rust preventative. **Toxin:** xylene

*(continued)*

**'KIMBERLY QUEEN' FERN**

This attractive fern tolerates dry indoor air a little better than the Boston fern and is also a great overall air purifier.





## HOUSEPLANTS

### CARING TIPS

Species that thrive as houseplants are often native to the lower, shady levels of tropical rain forests. Think “rain forest floor” as you care for your plants.

**Soil:** Although all of these plants can be grown in ordinary potting soil, the ferns will do better in a soilless mix. The palms prefer potting soil amended with sand.

**Light:** These plants do well with lots of bright but indirect light, and none likes more than a few hours a day of direct sunlight. Place the two dracaenas (‘Janet Craig’ and the corn plant) in a spot where they will receive no direct sunlight.

**Moisture:** These plants benefit from frequent light misting. Water lightly but often for a constant, low level of moisture at the roots.

### READ MORE

Dr. B. C. Wolverton has written much about plant air purifiers. His books include *How to Grow Fresh Air: 50 Houseplants That Purify Your Home and Office* (Penguin Books, 1996) and *Plants: Why You Can't Live Without Them* (Roli Books, 2010), coauthored with Kozaburo Takenaka. ■

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*A frequent contributor to Almanac publications, Andrea Curry has written on a variety of topics.*



### BAMBOO PALM

An excellent all-around air purifier that will cleanse your home or office of benzene, formaldehyde, and trichloroethylene, this palm is very easy to maintain.

### DWARF DATE PALM

The dwarf date palm is a strong overall purifier, second only to the areca palm in the capacity to remove toluene and xylene from the air.



### RUBBER PLANT

This plant is especially good at removing formaldehyde, the most common toxin in the home. It grows slowly and tops out at about 10 feet tall indoors.





**“I never had pain-free feet – UNTIL NOW!”**

# Pain Doctor Recommends Circulation-Boosting ‘Miracle Socks’ for Diabetes and Foot Pain Sufferers!

**Breakthrough design improves blood flow, swelling, boost oxygen flow, and eliminate foot fatigue – naturally in as little as 5 minutes!**

**W**hat part of your tired, swollen, sweaty or achy feet would you like to see go-away?

If you suffer from poor circulation, swelling or any condition that makes your feet feel fatigued and sore, then read on to discover the solution that could change your life.

Good news comes in the form of a pain-reducing, circulation-boosting sock design from DailyNergy.

### Better Blood Flow

This ‘miracle sock’ is made from proprietary blend of nylon and poly materials, which are optimally constructed to make a DailyNergy sock.

DailyNergy socks feature graduated compression which exerts the greatest degree of compression at the ankle, and the level of compression gradually decreases up the socks. This forces the blood to move upwards, where there is more space.

Wearing DailyNergy graduated compression socks is the most convenient, quick way of combating muscle soreness and fatigue. By applying the right pressure in the right places, DailyNergy socks help increase blood flow. When you increase the blood flow, your broken down soft tissue can repair itself more quickly.

“Have been wearing only DailyNergy stockings for a while now. After my 12 hr shifts as a nurse they do wonders for my legs, no soreness, no pain. I swear by them. Best investment ever. Thank you!” -Maryia S.

### Doctor recommended:

“Pain, swelling, muscle soreness - these are just a few common symptoms not only in athletes but also in people doing normal day-to-day activities, especially those who suffer from varicose veins.

By utilizing graduated compression technology, which creates more pressure near the ankle and gets looser when moving up the leg, DailyNergy is designed to promote

improved blood circulation within the legs. A medical grade compression level used by DailyNergy socks may help ease foot fatigue, pain, muscle cramps, and improve blood flow, thus promoting heart health.”

-Dr. Denys Tsveiuk

“Quality compression sock with an emphasis on compression. These socks maintain their compression for the duration on wear and aren’t too tight/constricting. Perfect for my bike rides to help with circulation.”-LB

Scott Adams, VP of Product Development for DailyNergy

says, “Our socks are ideal for diabetics and those suffering from neuropathy or injury from repetitive use. DailyNergy socks can also bring comfort to tired legs within minutes of putting them on, energizing individuals who spend long hours on their feet.”

### Goodbye to Pain and Fatigue

“I recently bought a few pairs of DailyNergy socks because I have never wore them before so I wanted to try them. And let me say they helped my feet so much. They were so comfortable to walk around in. And so comfortable to go running in also.”-Maritza N

### BENEFITS:

- Increased blood flow and oxygen
- Reduced swelling and pain



- Wicks away moisture
- Increased range of motion

### IDEAL FOR:

- Neuropathy
- Cramping
- Cold Feet
- A variety of vascular conditions

**Socks come in either black or white colors!**

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SHOE SIZE	5-7	6.5-8.5	8-10	9.5-12	+12

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# Go *Rare* With *Flair*

TIRED OF HO-HUM HOUSEPLANTS? SET YOUR SIGHTS ON A FEW EXOTICS.

by Tovah Martin



**M**aybe you were among the masses who jumped on board the houseplant trend during the pandemic and now have amassed an array of common specimens. Or perhaps you've been nurturing botanical roommates for years and need a novelty that's not "garden variety." Whether you're a new plant tender, a wanna-be "greens keeper," or a longtime houseplant parent, we've got some ideas to bring pizzazz to your place.

The plants here were once considered weird; today, we look upon them as wonders of nature. Being unfussy about their care, they're not boring or demanding. You may have to search to find them (rarities don't lurk in every big-box garden department), but you can conduct your "strange safari" at your own pace in garden centers throughout the land. Enjoy the search, celebrate your discoveries, and think of the stories that you'll tell! *(continued)*







## BRIGHT IDEAS

You'll want to match your new potted pal with the right growing conditions. The marvels mentioned here want the brightest location that you can muster. No need for a greenhouse: Any unobstructed south-facing window will do. Placement is key, so harness available sunbeams by positioning these plants close to the panes. Rotate them often (half a spin once a week) to balance their growth.

In the right spot, these sun-worshippers will adapt happily in the glow of your hospitality.



### **MOTHER OF THOUSANDS** *Kalanchoe daigremontiana*

If you find fecundity fascinating, you're going to love this plant. Talk about being fruitful and multiplying! Mother of thousands carries hundreds of little plantlets on the rim of each succulent leaf. Some might say that she overdoes the whole procreation process, but the physical presentation of tiny rosettes lining each chalky blue-green leaf is totally intriguing. Plus, this kalanchoe is a cinch to grow. For best results, give her good light and don't overwater. And when friends shower you with compliments on your mother load, just snip off a rosette or two and send them to their new home.

### **SMALL STARFISH FLOWER**

*Stapelia scitula*

If flowers make your heart race, we've got a mini plant with a rather strange blossom to give you a cardiovascular workout. Starfish flower prefers confinement in a super-small container, so everybody has room on their windowsill for this compact performer. If you forget to water this little number occasionally, that's okay. Give it bright light to encourage its mighty but a tad macabre flower moment. We're talking puffy, star-within-star blossoms the color of coagulated blood and teeming with wavy hairs. Sci-fi aficionados, this one's for you!







**CORAL CACTUS** *Euphorbia lactea* 'Cristata'

This Frankenplant looks like it was born in the basement of a mad professor. A result of grafting two euphorbias, this weird presentation doesn't really grow perceptibly but sits around making a statement. The kinky, crested, paddle-like top attached to the poker-straight *E. neriifolia* base has fanning, undulating accordion pleats that would be the envy of any dilophosaurus (the dinosaur with the double-crested headgear). To keep your little monster happy, give it gritty soil and confine it to a tight container. You might want to anchor the base in a heavy pot for ballast to prevent the top-heavy crown from toppling. Water only when the plant is very dry and keep water away from the base. And be careful: When bruised, all euphorbias "bleed" a toxic milky latex that can cause skin or eye irritation. Wear gloves.



**ORCHID CACTUS** *Epiphyllum guatemalense* 'Monstrose'

Windowsills full? Here's a plant that dangles. You can host it in a hanging pot or a tall cylinder; either way, this nontraditional cactus will send its Medusa-like mass of plump, twisted leaves draping down. Beyond its banana-curl hairdo, you might ultimately see bright pink fruit. With or without fruit, though, the plant is extraordinary and not difficult to please. Let it go dry between waterings, but if you begin to see browning edges and tips, amp up the water slightly. Remember that more light will make for longer curls.

(continued)

**CLIMBING ONION** *Bowiea volubilis*

Any plant with an exposed and swollen bulb at its base is going to thrill a certain crowd. During summer, this nonconformist sits around looking strange enough, but in late autumn it goes into action mode, spouting chains of lacy growth climbing all over the place (it has no aerial roots—it just winds). Ultimately, tiny, green and white, starlike flowers appear on a vine that athletically adds an inch or more daily. Like most bulbs, the climbing onion does not like to be overwatered and prefers to sit in a slightly tight container.





## SHADY CHARACTERS

Lack light? No need to lack luster. Plenty of options remain on the table for botanical oddballs that thrive in an east- or west-facing window. Again, closer to the panes is better for making the most of incoming sunbeams. Avoid window treatments that reduce light and open those curtains—early in the morning (on the east side) or in late afternoon (on the west)—for maximum effect. Water plants growing in lower light conditions only when the soil is dry to the touch. Also, don't overpot; tight is about right. Check the root system of these plants before giving your resident green eccentrics bigger digs. Then, prepare to be amazed.



**POLKA-DOT BEGONIA** *Begonia maculata* var. *wightii*  
Many begonias have intriguing foliage and flowers, but this version is particularly well endowed with swag. In the angel-wing group, this scene-stealing specimen has dramatic, sharply pointed, batwing-like leaves with red undersides. On top of their noteworthy shape, the dark leaves look like someone went crazy splattering them with luminous white paint. (The polka dots are natural, not a result of hybridization; this one is native to the rain forests of Brazil.) All begonias prefer to be watered only when their soil is dry, and they do best in situations with ample humidity.

### STAG- OR ELKHORN FERN

*Platycerium bifurcatum*

This fern is amazingly easy to grow, although it looks outrageously complicated. As you might imagine, antler-shaped fronds play a part, emerging from shieldlike fronds (aka the back plates) that protect the root crown. The fronds are all covered in what looks like white felting, which helps the plant to conserve moisture. Because staghorn ferns are epiphytes and prefer to be anchored in a mossy base rather than soil, they are often wired to plaque-like frames on a wall. The easiest way to water this thirsty rain forest native is to do so in a sink or bathtub every 3 days or so. (We said that this would be a strange safari!)




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*Tovah Martin's New England home is alive with 200+ houseplants that take advantage of every windowsill and 7 acres of gardens. The ambiance has inspired several books, including The Unexpected Houseplant (Timber Press, 2012), as well as lectures presented throughout the country. For more information, go to [TovahMartin.com](http://TovahMartin.com).*





### MOON VALLEY PILEA

*Pilea mollis* 'Moon Valley'

Botanical nonconformity can take on a textural spin. If you're the type who likes to reach out and touch your plants, *P. mollis* is going to bring this encounter to a whole different tactile level. The bronze and forest green leaf surface of Moon Valley pileas is seriously otherworldly. Walk your fingers over it and sandpaper or a cat's tongue comes to mind. Equally cratering are the foliage spikes and pits on a visual level. Although Moon Valley resembles the lunar surface, it can not survive its namesake's aridity, so care is not a giant leap: Serve with frequent drinks.



### STRING OF TURTLES *Peperomia prostrata*

### ERECT PEPEROMIA *Peperomia columnaris*

Green roommates that form strings of leaves—that look like, for example, dolphins, pearls, hearts, fish hooks—are the rage. To these thrilling spillings, you can add string of turtles, whose tiny leaves resemble a cascade of patterned carapaces. In autumn and early winter, you should see flowers—look for upright “needles”—but don't be disappointed. The leaves are the show and a snap to grow: Give this terrapin type indirect light and water it sparingly—that's all you need to know.

Want an upright cousin in the same easy-does-it family? Try *P. columnaris*, which sends up stacks of graphic, funky, cuticle-like leaves. Take note that peperomias are nicknamed “radiator plants”: They tolerate the low humidity, dry conditions, and so forth that an imperfect home can hand out.



### TWISTED LIPSTICK PLANT

*Aeschynanthus radicans* 'Rasta'

If you like plants that are considerably off-kilter, this curly-leaf version of the lipstick plant is your twisted sister. A different flat-leaf variety may bloom more easily (producing lipstick-like flowers up “tubes,” as if they are lip gloss), but this wonder's whorls of ropelike leaves hold endless fascination. Just steer clear of sunlight or risk scorching the foliage. Give it a shady window and water from below (although not to excess) to prevent leaf mottling. This is the perfect low-maintenance, offbeat companion for anyone who wants to impress neighbors. ■



ORNAMENTALS



# SPLENDOR IN

OFFERING COLOR, FORM, TEXTURE, HEIGHT, AND EASE OF CARE, ORNAMENTAL








# THE GRASSES

GRASSES INTRODUCE NEW DIMENSIONS TO TODAY'S GARDENS. **BY STEVE BENDER**



CLOCKWISE, FROM TOP  
LEFT: 'BLUE ZINGER' BLUE  
SEDE, 'AUREOLA' JAPANESE  
FOREST, 'PURPLE MAJESTY'  
ORNAMENTAL MILLET, PAMPAS,  
PINK MUHLY, MAIDEN,  
MONDO, MEXICAN FEATHER





THIS BEAUTIFUL PRAIRIE GARDEN MINGLES SWITCHGRASSES AND FEATHER REED GRASSES WITH A VARIETY OF PERENNIALS.

**T**HERE WAS A TIME when the first word associated with “grasses” was “lawns.” Lawns flowed like featureless green ponds from one house to the next, bringing neighbors together every Saturday morning for a beloved ritual called “mowing,” followed by group hugs and the drinking of beer. Then, in the 1970s and ’80s, pioneering garden designers such as Baltimore–Washington’s Wolfgang Oehme and James van Sweden pulled

back the suburban curtain to show homeowners a new way to see.

Grasses need not exist in a boring horizontal plane. Now they could spear the skyline; form cascades, mounds, and drifts; blend wonderfully with annuals, perennials, and shrubs; and sway in the breeze. Observes Charlotte, North Carolina, garden designer Jay Sifford, “I love the kinetic quality of grasses as they flirt with the prevailing wind. A great garden nestles into and

responds to the natural environment. Movement shows that.”

Unlike fussed-over lawns frequently derided as ecological deserts, ornamental grasses benefit wildlife. “Birds nibble on the seed heads,” says Sifford. “I’ve even seen hummingbirds swarm around the pink blooms of ‘Karley Rose’ pennisetum [*Pennisetum orientale* ‘Karley Rose’]. Grasses also provide shelter for small birds and beneficial insects.”

New York author and







garden designer Jan Johnsen backs him up. “My favorite grass is our native prairie dropseed [*Sporobolus heterolepis*],” she reports. “In late summer, its brown-tinted,

of butterfly larvae dine on its foliage, and birds eat its seeds.

Sifford believes that “texture”—the interplay of varying shapes and sizes—is a vital asset

color—far from it. Grass foliage can be blue, yellow, burgundy, striped, or variegated. Long-lasting blooms range from white to buff to copper, pink, and purple.

*selloana*), northern sea oats (*Chasmanthium latifolium*), ruby grass (*Melinis nerviglumis*), palm grass (*Setaria palmifolia*), and Chinese silver grass (*Miscanthus*

**“I LOVE THE KINETIC QUALITY OF GRASSES AS THEY FLIRT WITH THE PREVAILING WIND.”**

misty flowers on slender stems seem to float above the foliage. The birds love its seeds.” She extols native blue grama grass (*Bouteloua gracilis*) as well. More than 10 species

that grasses bring to the garden that is often overlooked by the public in favor of bold splashes of color from bedding plants. This doesn’t mean that grasses lack

However, grasses come with a caveat. Although most behave themselves, others spread aggressively by seed or running roots, depending on location. Pampas grass (*Cortaderia*

*sinensis*) epitomize the former. Blue lyme grass (*Leymus arenarius*), variegated ribbon grass (*Phalaris arundinacea* ‘Picta’), and giant reed (*Arundo donax*) exemplify



PURPLE FOUNTAIN AND JAPANESE BLOOD GRASSES SWAY IN THE BREEZE.





**GRASSES SLOW THE WATER IN HEAVY RAIN  
AND REDUCE EROSION. MOISTURE-TOLERANT  
GRASSES ARE MAINSTAYS FOR RAIN GARDENS.**

the latter. This doesn't mean to not plant them; just be sure to consider their appropriateness for the site and watch for and control escapees.

**FRIENDS FOR GRASSES**

Perennials, especially those found in natural or planted meadows, make boon companions for grasses. Popular choices include such butterfly magnets as black-eyed Susans (*Rudbeckia hirta*; *R. fulgida*), purple coneflowers (*Echinacea purpurea* and hybrids), asters (*Symphyotrichum* spp.), butterfly weed (*Asclepias tuberosa*), daisies (*Leucanthemum* spp.), Joe Pye weed (*Eutrochium purpureum*),

spike blazing star (*Liatris spicata*), and threadleaf coreopsis (*Coreopsis verticillata*).

Of course, every garden-er has a favorite combination. Johnsen underplants vase-shape 'Morning Light' miscanthus with 'Walker's Low' catmint (*Nepeta x faassenii* 'Walker's Low') and 'Caradonna' violet sage (*Salvia nemorosa* 'Caradonna'). "This grass's slender, variegated foliage contrasts beautifully with the blue flowers of the others," she notes.

Sifford extols the marriage of red-leaf 'Shenandoah' switch-grass (*Panicum virgatum* 'Shenandoah'), the deep-pink blooms of 'Magnus' purple coneflower, and the orange and burgundy

foliage of 'Ginger Wine' ninebark (*Physocarpus opulifolius* 'Ginger Wine'). "Add a bit of 'Blue Dune' lyme grass, and you've created perfection," he states.

In California, Santa Barbara landscape architect and writer Billy Goodnick touts small meadows mingling 'Blue Zinger' blue sedge (*Carex flacca* 'Blue Zinger'), snow-in-summer (*Cerastium tomentosum*), ruby grass, Majorcan teucrium (*Teucrium cossonii*), and catmint.

**PLANTS OF OPPORTUNITY**

In addition to adorning mixed borders and meadows, ornamental grasses solve common problems. They slow the water in

heavy rain and reduce erosion, an important consideration for sloping sites. Tall grasses screen unpleasant views and add privacy. Moisture-tolerant grasses are mainstays for rain gardens.

Graceful foliage and flowers of grasses also offer exciting opportunities in design. They bend and flutter with the wind and thus are well placed near bodies of water. Upright grasses such as feather reed grass (*Calamagrostis x acutiflora*) serve as superb vertical accents. Smaller grasses are perfect for pots. Arching grasses like Chinese pennisetum (*Pennisetum alopecuroides*) soften retaining walls and other hardscaping. Moreover,





A STUNNING RAIN GARDEN CONTAINS UMBRELLA AND DWARF EGYPTIAN PAPYRUSES, FIBER OPTIC GRASS, CALADIUMS, AND HOSTAS.

the aspect of grasses changes with the seasons. “In the fall, when the Sun is lower in the sky, tawny grasses seem to positively glow,” discerns Johnsen. “It is such a magical effect.”

### GROWING CONCERNS

Ornamental grasses are easy to grow even for beginners and thrive from Canada to southern California and Florida. In general, they suffer few pests, don't fret about the soil, and tolerate heat, cold, and drought. Most prefer sun, but others accept shade. Check hardiness zones to ensure that a grass you like is adapted to your area, remembering that variations in rainfall and humidity can make growing conditions vastly different from east to west, even if you're in the same zone.

Pruning is an annual requirement. When to do it depends on the grass. Cool-season grasses, as their name implies, grow in cool weather and go dormant in summer. Trim them in late winter and earliest spring. Warm-season grasses grow fast in summer and go dormant in fall and winter. Cut them to the ground when the foliage browns. This is particularly important in fire-prone areas, as brown, dry grasses ignite like Roman candles.

### NOW IT'S YOUR TURN

Certain that I've opened *beaucoup* sets of eyes, I've grouped grasses that fit various categories to help you with your selection. Banish your mower and get thee to a garden center! Let the planting begin!

*Note:* Hardiness zones

in this list are estimates. Growing conditions vary with each location. Check with your local garden center or Cooperative Extension to ensure a grass's adaptability.

*\*Not true grasses but look and function like them*

*†Considered invasive in some areas*

### GRASSES FOR YELLOW FOLIAGE

'Aureola' Japanese forest grass (*Hakonechloa macra* 'Aureola'), Zones 5 to 8

\*'Everillo' Japanese sedge (*Carex oshimensis* 'Everillo'), Zones 5 to 9

\*'Ogon' Japanese sweet flag (*Acorus gramineus* 'Ogon'), Zones 5 to 9

### GRASSES FOR BLUE FOLIAGE

Blue fescue (*Festuca glauca*), Zones 3 to 9

†Blue lyme grass (*Leymus arenarius*), Zones 3 to 10

Blue oat grass (*Helictotrichon sempervirens*), Zones 3 to 8  
 \*†'Blue Zinger' blue sedge (*Carex flacca* 'Blue Zinger'), Zones 3 to 9  
 'The Blues' little bluestem (*Schizachyrium scoparium* 'The Blues'), Zones 3 to 9

### GRASSES FOR BURGUNDY/ RED FOLIAGE

†Purple fountain grass (*Pennisetum setaceum* 'Rubrum'), Zones 9 to 11

'Purple Majesty' ornamental millet (*Pennisetum glaucum* 'Purple Majesty'), all zones (annual)

'Shenandoah' switchgrass (*Panicum virgatum* 'Shenandoah'), Zones 4 to 9

### TALL GRASSES FOR SCREENING

†Giant reed (*Arundo donax*), Zones 6 to 10

Giant silver grass (*Miscanthus x giganteus*),





\*MORNING LIGHT' MISCANTHUS IS PAIRED WITH BLUE SUMMER SNAPDRAGON, PINK GLOBE AMARANTH, AND SWEET POTATO VINE.

**ORNAMENTAL GRASSES ARE EASY TO GROW  
EVEN FOR BEGINNERS AND THRIVE FROM CANADA  
TO SOUTHERN CALIFORNIA AND FLORIDA.**

Zones 5 to 9  
 †Maiden grass  
 (*Miscanthus sinensis*  
 'Gracillimus'), Zones 4 to 9  
 †Pampas grass  
 (*Cortaderia selloana*),  
 Zones 6 to 11  
 †Ravenna grass  
 (*Saccharum ravennae*),  
 Zones 5 to 9

**GRASSES FOR CONTAINERS**

Blue fescue (*Festuca  
 glauca*), Zones 3 to 9  
 \*Japanese sedge (*Carex  
 oshimensis*), Zones 5 to 9  
 \*Japanese sweet flag  
 (*Acorus gramineus*),  
 Zones 5 to 9  
 'Little Bunny' Chinese  
 pennisetum (*Pennisetum  
 alopecuroides* 'Little

Bunny'), Zones 4 to 9  
 Mexican feather grass  
 (*Nassella tenuissima*),  
 Zones 6 to 10  
 Prairie dropseed  
 (*Sporobolus heterolepis*),  
 Zones 3 to 9  
 †Purple fountain grass  
 (*Pennisetum setaceum*  
 'Rubrum'), Zones 9 to 11  
 Ruby grass (*Melinis  
 nerviglumis*), Zones 8 to 10

**GRASSES FOR SHADE**

Japanese forest grass  
 (*Hakonechloa macra*),  
 Zones 5 to 8  
 \*Japanese sedge (*Carex  
 oshimensis*), Zones 5 to 9  
 \*Japanese sweet flag  
 (*Acorus gramineus*),  
 Zones 5 to 9

\*†Mondo grass  
 (*Ophiopogon japonicus*),  
 Zones 6 to 11  
 †Northern sea oats  
 (*Chasmanthium  
 latifolium*), Zones 4 to 9

**GRASSES FOR WET SOIL**

\*Japanese sedge (*Carex  
 oshimensis*), Zones 5 to 9  
 \*Japanese sweet flag  
 (*Acorus gramineus*),  
 Zones 5 to 9  
 †Maiden grass  
 (*Miscanthus sinensis*  
 'Gracillimus'), Zones  
 4 to 9  
 †Northern sea oats  
 (*Chasmanthium  
 latifolium*), Zones 4 to 9  
 Switchgrass (*Panicum  
 virgatum*), Zones 4 to 9

**GRASSES FOR DRY SOIL**

Blue fescue (*Festuca  
 glauca*), Zones 3 to 9  
 Blue grama grass  
 (*Bouteloua gracilis*), Zones  
 3 to 10  
 Blue oat grass  
 (*Helictotrichon  
 sempervirens*), Zones 3 to 8  
 Mexican feather grass  
 (*Nassella tenuissima*),  
 Zones 6 to 10  
 Pink muhly grass  
 (*Muhlenbergia capillaris*),  
 Zones 5 to 11  
 Ruby grass (*Melinis  
 nerviglumis*), Zones 8–10 ■

Author of *The Grumpy Gardener* (Southern Living, 2017), 40-year garden writer **Steve Bender** lives in Hoover, Alabama.





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# VERY VINE





BY TOVAH MARTIN



**V**ines are botanical camouflage. Have a seen-better-days shed that you'd like to conceal? That's where a vine comes in handy. Does a porch need privacy screening? Depend on a vine for discretion. Is your mailbox begging for your stamp of approval? A vine is a first-class option.

Vines are the problem-solvers in your landscape, serving all sorts of functions, from providing cover-ups to defining spaces.

Matching one of these aerial acrobats with the right situation and support structure requires a little know-how. In their constant pursuit of upward mobility, vines muster several methods for getting a leg up, and knowing their moves helps to make the right pairing. One of the most common ways in which vines travel aloft is by twining around a prop—think morning glories and most annual vines. Generally, they'll need something wiry to expedite their journey. Other vines like to lean on something, weaving their way to greater heights.

Knowing your collaborator is critical when working with a vine. Use its vigor to your advantage, and you've got a co-conspirator in a creative cover-up. To help you pair the right aerial artist with your situation, we've come up with some suggestions of job descriptions and vining solutions that work to your advantage.

*(continued)*

# SOLUTIONS

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## BUILDING INVISIBILITY



### PERENNIAL: HOPS

Is there a shed or other less-than-favorite outbuilding or structure in your garden space that you wish would simply—well—disappear? Soften its lines with a graceful living wall: Put up some wire as a brace for hops and let this energetic upstart do double duty for your home brewery. Hops are ultra-energetic. After a slow initial year, they quickly gain momentum. This delayed energy is not a trait unique to hops: Most perennial vines follow this pattern, inspiring an oft-repeated quip that in the first year, vines sleep; in the second, they creep; and finally, they leap. In the case of hops, whatever a hop vine is wired to climb on will become totally shrouded in oak-shape leaves and conelike flowers. If you don't want your structure to ultimately vanish completely from sight, think again.

Most **PERENNIAL VINES** follow a pattern that inspired an oft-repeated quip: In the first year, vines **SLEEP**; in the second, they **CREEP**; and finally, they **LEAP**.

### ANNUAL: MORNING GLORY

Originally planted to disguise privies, morning glories quickly and efficiently engulf a building in heart-shaped leaves. If growth-per-day were a race, they'd win. Late in the season, they form numerous buds that swell into impressive trumpets to greet the dawn and then flag with the noon sun. Morning glories can be a blessing or a curse, depending upon which cultivar you select. The mainstay 'Heavenly Blue' rarely seeds itself in. Not so for many other versions. They can become a nuisance if allowed to set seed. In fact, morning glories are listed as invasive in some states. One method of control in areas where they are not restricted is to cut the vine down before seed matures. Or weed a lot.





## CREATING A PORCH PRIVACY SCREEN

Non-invasive native honeysuckles will add **HUMMINGBIRD** visits and **HOUSE FINCH** nests to the evening's entertainment.

### PERENNIAL: HONEYSUCKLE

If exchanging hot gossip on the front porch rockers is one of your favorite high summer pastimes, a privacy vine might come in handy. Non-invasive native honeysuckles (*Lonicera sempervirens* cvs.) are an option that will add hummingbird visits and house finch nests to the evening's entertainment. Sending up roaming arms and legs that will eventually become woody, this vine can easily support and hide a bird's nest. Clusters of red, orange, or yellow trumpet-shaped flowers form in spring and keep on coming throughout summer. Using a combination of leaning and twining to ascend, honeysuckles demand a strong support. Pruning will keep them in check (just be sure to wait until your feathered friends become empty nesters).



### ANNUAL: HYACINTH BEAN

Everything about hyacinth beans (*Lablab purpureus*) is handsome, from their purple-tinged, three-sector leaves to the spires of purple/pink flowers that linger long and brandish wands overhead followed by shiny burgundy seedpods that remain until frost. Although hyacinth beans form sufficient foliage on their twining vines to keep your porch conferences confidential, the whole shebang isn't weighty. Wire is sufficient to make your meetings clandestine. *(continued)*



## DOUBLE DUTY FOR A DEER FENCE

Take care to plant your **BERRY CANES** where the vine does not obstruct sunbeams from nurturing the incumbent **VEGETABLES**.

### PERENNIAL: THORNLESS BLACKBERRY

If you're growing edibles, consider harnessing your deer fence with semi-erect or trailing forms of thornless blackberries to further feed the family. Although deer might nibble on any leaves that they can reach, they mercifully tend to leave the fruit alone. Ditto for birds, who find the plump, juicy berries to be too much of a mouthful. Blackberries are leaners, so you will want to tie-in the vine with sturdy supports. Pruning keeps ultra-energetic thornless versions such as 'Chester' in check. Take care to plant your berry canes where the vine does not obstruct sunbeams from nurturing the incumbent vegetables that you are protecting with the fence.



### ANNUAL: SCARLET RUNNER BEAN

A loose, lacy vine is exactly what you need to couple with your family's source of salads. Enlist a scarlet runner bean, and you have beauty and edibility in a single package. With sparsely foliated stems that ascend by winding around wire, scarlet runner beans rapidly swing into the first stage of their glory with a vigorous crop of orange/red pea-like flowers that delight both pollinators and your eyes. Then come the long pods in profusion. The whole kit is perfect for your kitchen garden—as long as your fence is sufficiently sturdy to support what can be a tall and bountiful vine.



## MAILBOX MASK-UP



### PERENNIAL: JASMINE

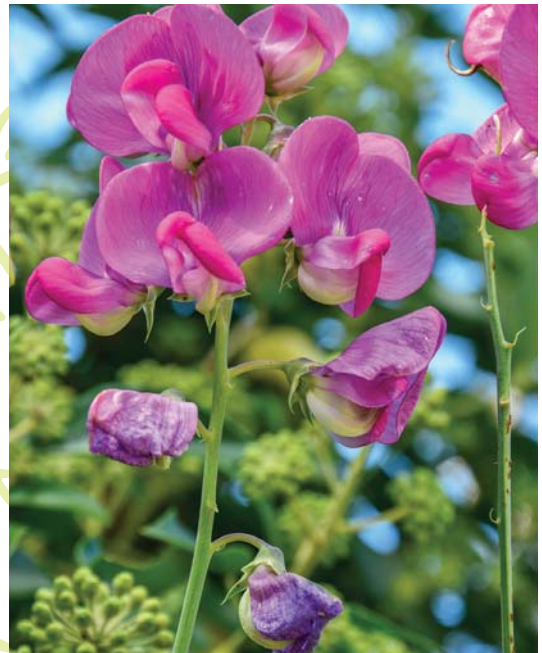
You don't want to go too crazy with the mailbox. After all, the mailman isn't going to love wrestling a vine to deliver those much-awaited bills. But something loose and lacy might be just the ticket to doll up the post supporting your postbox. Surround it with some wire, and a jasmine could gain a foothold. Pink jasmine (*Jasminum polyanthum*) is a good candidate if you live where temperatures are moderate during the winter. Tolerant of sun or light shade, it has foliage that is good-looking even without its late winter/early spring, ultra-fragrant white umbels of flowers.

Something **LOOSE AND LACY** might be just the ticket to doll up the post supporting your **POSTBOX**.

### ANNUAL: SWEET PEA

Sweet peas are legendary among vines—and for good reason. There is no aroma equal to that of perfume floating from the wands of flowers that adorn this tendril climber, and its color range is incredibly broad. Plus, you'll be making the postman's duty delightful! Just a note, however: Sweet peas are toxic and should not be eaten. Like most other peas, they prefer cool temperatures to pump out their blossoms and will cease to flower during heat waves. Consider coupling your sweet peas with a clock vine (*Thunbergia alata* 'Blushing Susie') to extend the show. 'Blushing Susie' will pick up the slack with open-faced colorful flowers in midsummer when the sweet peas are on pause. Both would love some sort of wire cage around the mailbox's post to get a leg up.

For more of Tovah Martin's takes on using vines in the landscape, see "Working With Social Climbers" in the 2022 Old Farmer's Almanac Garden Guide. ■



*Tovah Martin tends 7 acres that she calls "Furthermore," where vines mount every fence and trellis that they can find. She has authored several books, including most recently The Garden in Every Sense and Season (Timber Press, 2021). For more information, go to TovahMartin.com.*



# DISAPPEARING ACTS

Forty percent of the world's plants are in danger of extinction. Here's why—and what you can do to help save them.

BY JANET MARINELLI



THE FRANKLIN TREE

In October 1765, botanist John Bartram and his son William came across what they described as some “very curious” shrubs growing along the banks of the Altamaha River in what was then a British colony and is now the U.S. state of Georgia. Eight years later, William returned to the same location and brought seeds back home to Philadelphia. It was not until 1781, though, after his father’s death, that he was able to coax a tree germinated from this seed to produce the species’ snowy white, orange-scented, camellia-like blooms. He named the plant in honor of his late father’s friend, Benjamin Franklin. It was soon available in the nursery trade.

Just a few decades after it was spotted by the Bartrams, however, the Franklin tree could no longer be found in its native habitat. Today, it is one of a growing group of plants that are extinct in the wild and live on only in cultivation. At last count (a 1999 census), nearly 2,000 Franklin trees, each one traceable to the seeds collected by William Bartram, were found thriving at botanic gardens, private homes, parks, and even cemeteries in the United States, Canada, and around the world.

Most imperiled plants have not been so fortunate.



## THE NUMBERS

In a global analysis published in 2019, scientists from Royal Botanic Gardens, Kew, in the United Kingdom and Stockholm University in Sweden calculated that almost 600 plant species had been wiped out in the previous two-and-a-half centuries, although the true number is likely to be much higher. Many more are on the knife-edge of extinction.

Endangered plants don't make headlines in the way that charismatic animals such as pandas and polar bears do, so most people don't know that 40 percent of the world's plant species are at risk of disappearing, according to a 2020 international report. In the United States, 944 plants are on the federal endangered species list, and many more have been waiting in

### GARDENERS CAN PLAY A CRITICAL ROLE IN PROTECTING IMPERILED PLANT SPECIES.

a long line to be considered for listing or are not afforded protection due to a lack of information on their numbers and the threats that they face. In Canada, according to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), 236 vascular plants and mosses are at risk of extinction.

## THE THREATS

The most common threat to plants is the continuing destruction of the places where they live to make way for farms, cities, suburbs, roads, and other development. To make matters worse, we have degraded their remaining habitats by suppressing the wildfires that maintain the necessary growing conditions, by introducing invasive non-native weeds and pests, and by cutting timber, extracting minerals, and carelessly using recreational vehicles. According to the USDA Forest Service, for example, invasive species introduced from abroad have contributed to the decline of nearly half of the plants listed as endangered or threatened under the



FLORIDA SEMAPHORE CACTUS



## BIODIVERSITY

U.S. Endangered Species Act. Theft is another factor. Populations of cacti, carnivorous plants, and other prized species have been decimated by unscrupulous plant collectors who steal them from the wild. All of these threats are exacerbated by rapid climate change and the lack of continuous migration corridors that would allow plant species to seek more suitable habitats.

Yet plant conservation has not generated nearly the same sense of urgency or funding that animal conservation has. Plants are safeguarded only on federal lands—unlike animals, which are protected on both public and private lands.

### THE SOLUTIONS

**G**iven the paucity of safeguards and funding for the cause, gardeners can play a critical role in protecting imperiled plant species and ensuring that others do not suffer the same fate. For example, by donating funds or volunteering time—or both—you can provide much-needed support for botanical gardens and conservation groups working to save plants in their native habitats.

Just as important, you can engage in plant conservation in your own backyard: Avoid planting the non-native invasive species that are degrading plant habitats. Plant scientists advise against attempting to grow imperiled species—unless varieties are already commonly available in the nursery trade—because populations of imperiled species are fragile and vulnerable to poaching.

Grow native plants that are not of conservation concern; this has multiple benefits. These plants provide food and shelter for birds and other wildlife. What's more, a 2019 report by German scientists noted that most of the 355 plant species that they had surveyed in the northeastern region of that country had suffered “significant losses” during the previous two decades. Surprisingly, it was the plants that they deemed “moderately common” that had experienced the greatest declines. By gardening with plants that are native to your area, you can prevent declining common species from suffering the same fate as those clinging precariously to life.



EASTERN PRAIRIE FRINGED ORCHID



PINK COREOPSIS





WESTERN LILY



LAKE LOUISE ARNICA

**HELP WANTED**

**F**eatured on these pages are just a few of the plants across the United States and Canada that plant scientists are working to save from extinction.

**FLORIDA SEMAPHORE CACTUS**

*(Consolea corallicola)*

This tree-like cactus with branches held out at angles was named after the semaphore signaling system that uses flags and arms held in various positions to send messages. Cactus hobbyists were thought to have extirpated the critically imperiled species native to the Florida Keys by the late 1970s. It was rediscovered several years later but today just two populations survive. Sadly, the remaining plants are all male, so the species can not reproduce sexually. It is also under attack by a non-native cactus moth that arrived in Florida in 1989. Perhaps the most serious threat to the remaining plants is sea level rise caused by climate disruption.

**VOLUNTEERS HAVE BEEN HAND-POLLINATING THE ORCHID FOR THE PAST 30 YEARS TO SAVE IT FROM EXTINCTION.**

**EASTERN PRAIRIE FRINGED ORCHID**

*(Platanthera leucophaea)*

The fringed white petals of this exquisite native orchid once carpeted moist prairies in the eastern United States and Canada during late June and early July like a wayward blanket of snow. The plant's intoxicating, jasmine-like fragrance lured its only pollinators, night-flying hawkmoths.

Today, when less than 4 percent of the continent's tallgrass prairie remains—the rest destroyed by bulldozers and plows—the orchid hangs on primarily in small, isolated habitat fragments. Because hawkmoths can no longer find them, human volunteers have been hand-pollinating the orchid for the past 30 years to save it from extinction.

**PINK COREOPSIS** *(Coreopsis rosea)*

New varieties of this showy, long-blooming perennial are splashed on the pages of many nursery catalogs, but in its native habitat the species is anything but common. Pink





SMOOTH CONEFLOWER

coreopsis is extremely rare along pond shores and in swales and boggy depressions scattered on the Atlantic coastal plain in the United States. In Canada, where it is restricted to the shores of three lakes in southern Nova Scotia, it is threatened by water pollution caused by expanded mink farming and shoreline development and has been deemed endangered by COSEWIC.

**WESTERN LILY (*Lilium occidentale*)**

The United States and Canada have a wealth of spectacular native lilies, some of which are now exceedingly rare.

Hummingbirds love the western lily’s striking flowers with red petals that curve strongly backward and spotted greenish yellow centers. So do lily growers, who have dug up the plant from the wild for commercial trade since at least the 1930s. Found only within a narrow, 200-mile stretch of Pacific coastline between southern Oregon and northern California, this endangered wildflower is declining rapidly due to continued poaching as well as cranberry farming and the draining of wetlands.



DWARF LAKE IRIS

**LAKE LOUISE ARNICA (*Arnica louseana*)**

This dainty member of the sunflower family is one of 109 plants that grow in Canada and nowhere else in the world. Although it may look delicate, the petite perennial wildflower with nodding bright yellow blooms endures the frigid temperatures and fierce winds of its native habitat—high-elevation alpine meadows and rocky slopes in the Canadian Rockies along the border between Alberta and British Columbia. However, like many so-called endemic species with small populations and very restricted ranges, Lake Louise arnica is vulnerable to extinction by a variety of causes, including climate change.

**IN JULY 2022 THE SMOOTH CONEFLOWER WAS “UPGRADED” TO “THREATENED.”**

**SMOOTH CONEFLOWER (*Echinacea laevigata*)**

The sunny forest openings with calcium- and magnesium-rich soils preferred by this close relative of the familiar purple coneflower that graces countless gardens were once scattered throughout the southeastern United States.



Wildfires and large grazers like bison prevented trees from colonizing these sunny habitats. But agriculture, development, and fire suppression have destroyed many of its former haunts, and collectors attracted by the cone-flower's elegantly drooping pale pink or lavender petals have depleted remaining populations. After 30 years on the U.S. endangered species list, in July 2022 the smooth cone-flower was "upgraded" to "threatened." Today, it survives precariously in utility rights-of-way and along sunny roadsides.

#### DWARF LAKE IRIS (*Iris lacustris*)

This close relative of the native crested iris more familiar to gardeners is found only in the Great Lakes region. Within this restricted geographical range, it grows in the cool, moist, lakeshore air, hugging the coasts of Lake Huron and Lake Michigan on both sides of the U.S.–Canada border.

The striking white, deep purple, and orange markings on the outer petals of this lovely low grower guide bees to the center of the flower for pollination. Increasingly rare, the dwarf lake iris is threatened largely by habitat loss caused by shoreline development.

#### THE VENUS FLYTRAP SUPPLEMENTS ITS DIET BY EATING MEAT.

#### VENUS FLYTRAP (*Dionaea muscipula*)

Like pitcher plants and other species that live in nutrient-poor habitats, the Venus flytrap supplements its diet by eating meat. When hapless insects land, they stimulate hairlike projections called trichomes that cause the plant's traps to snap shut. Digestion takes 5 to 12 days. The Venus flytrap has a very restricted range in coastal North and South Carolina. Over the years, populations of this carnivorous plant have been decimated by poachers. Today, it is also imperiled by development and fire suppression, which enable trees and shrubs to invade and degrade its habitat. ■

*Janet Marinelli* was director of scientific and popular publications at Brooklyn Botanic Garden for 16 years. She has written and edited several books on imperiled species and the efforts to save them.





WE MAY THINK THAT WE ARE NURTURING  
OUR GARDEN, BUT OF COURSE IT'S OUR  
GARDEN THAT IS REALLY NURTURING US.

*—Jenny Uglow, English biographer (b. 1947)*





# REJUVENATE YOUR MIND AND BODY

WITH HAND-BLENDED REMEDIES USING  
HERBS FROM YOUR GARDEN

BY SUE GOETZ

Is yours a fast-paced life? Do you yearn for a respite from time to time? Have you ever wished that you could hit “Pause” on the day and take a few minutes to relax?

You can—in the garden!

A garden is a sanctuary, a retreat from life’s routines. Think of the peace that comes from being among plants, present to insect life, birdcalls, and light winds (instead of fast traffic, phone calls, and emails). Imagine yourself in a hammock or comfortable chair, surrounded by the fragrance and colors of flowers, herbs, and foliage. Then imagine yourself working in the garden, digging in the dirt, weeding, and planting.

For centuries, people have recognized that gardening is therapeutic on many levels—in the moment, it can bring spiritual renewal; as a lifelong practice, it can help to keep us fit. Its bounty can nourish the body, inside and out.

An ideal combination of a garden as both sanctuary and therapy can be a bed of select herbs. The care taken to nurture these plants, the steps taken to harvest and preserve them, and, finally, the preparations undertaken to produce from them soothing remedies can be re-energizing, rewarding, and ultimately rejuvenating.

You may know these five common herbs; here we take a deeper look at their qualities and discover how to luxuriate with them. *(continued)*





### CALENDULA

*Calendula officinalis*, also known as pot marigold, is an easy-to-grow annual. Its bright flowers bring vivid color to beds and containers, and it is simple to start from seed. Follow the planting directions on a seed packet and direct-seed in full sun. Harvest the flowers when they are fully open but before their color begins to fade. The flower petals can be used fresh or dried. For fresh use, gently pull them away from the center of the flower. To dry, spread the whole flower heads on a flat screen in a warm, dry area. When completely dry, store them in a glass jar. When ready to use, pull the petals off the flower base.

The most common use for calendula is to infuse the petals into healing oils and salves. The healing quality of the petals calms redness and irritation on the skin.

### CALENDULA HEALING OIL

Use as a healing lotion on skin for scrapes, bug bites, and sunburn. You can also apply a drop or two to lips to soothe dryness.

**½ cup organic dried whole calendula petals**

**½ cup sweet almond oil (see note at Rosemary Foot Scrub)**

Add the petals to a cleaned and sterilized canning jar. Pour the oil over the petals until they are completely submerged. Seal the jar with the lid and shake gently. Store in a warm place or sunny window. Shake the jar every few days; after about 4 weeks, strain the petals out of the oil by pouring it over a cheesecloth and into a cleaned and sterilized glass jar. Seal tight and store in a dark cabinet. Use within 6 months.



### MAKERS, MIND THESE TIPS

When making your own remedies:

- Always grow and use organic plant materials.
- Learn the correct part of the plant that you need to use—flowers or foliage.
- Fresh, homemade remedies look and feel different from those on store shelves. The natural state of herbs infused into liquids or waxes may be grainy, may take on earthy shades of beige or brown, and/or may contain plant sediment. Oils and waters tend to separate; shake well before use. Waxes and oils may solidify at lower temperatures; to soften, place the container in a sunny window or warm it in a pan of simmering water before use.
- These recipes do not contain preservatives. Herbs added to water begin to break down quickly; a mixture can go bad within days because bacteria and fungi grow in water. Store them in the refrigerator for longer shelf life.





## LAVENDER

Lavenders (*Lavandula* spp.) are herbaceous to semi-evergreen perennials; most varieties are hardy in Zones 5 to 9. Lavender loves full sun and prefers well-draining soil. Use English varieties such as ‘Munstead’ or ‘Hidcote’ for their sweet fragrance or choose the hybrid cross *intermedia* varieties such as ‘Grosso’ and ‘Provence’ for heavy flower production. Harvest stems just as the flower buds are in full color but not open-petaled.

Lavender can be used fresh or dried. Strip the buds

from the stems for fresh use or dry entire stems with the flowers attached. Hang bundles of stems in a warm, dry place away from the sun or a direct heat source. When completely dry, strip off the lavender buds and store them in a glass jar.

This plant is used for the treatment of burns, wounds, and irritated skin and has long been recognized as a cleansing herb. Its name is derived from the Latin *lavare* (“to wash”).

### LAVENDER SPA SALT GLOW

*Use this aromatic mix to cleanse the skin of impurities and revive it.*

**3 tablespoons fresh or dried lavender buds**

**1 cup coconut oil**

**1 cup coarse gray sea salt**

**10 drops lavender essential oil, if desired**

Combine the lavender and coconut oil and mix well; crush the lavender slightly to release its essential oil. Add sea salt and lavender essential oil, if using, and stir well. Store in a cleaned and sterilized wide-mouth glass jar.

*To use:* Dampen skin. Take a generous amount of the mixture and massage it onto the skin with a gentle circular motion. Use caution around scratched or irritated areas of skin. Rinse off with warm water.

*(continued)*







## ROSE

Roses (*Rosa* spp.), considered herbal shrubs, prefer full sun, rich soil, and good drainage and are generally hardy in Zones 2 to 7. Choose varieties with highly fragrant flowers; the more aromatic the petals, the more essential oil is present. The best varieties for skincare are Old Rose *R.* 'Frau Dagmar Hastrup'; *R.* 'Rose du Roi'; *R. rugosa* 'Hansa'; damask rose (*R. x damascena*) varieties 'Madame Hardy' and 'Rose de Rescht'; and Apothecary's rose (*R. gallica* 'Officinalis').

Use petals from organically grown roses. Pick them when they are just beginning to open up and are not over-aged. Roses are excellent for their humectant (moisture-retaining) quality; they preserve moisture on the skin without introducing other oily ingredients. Highly fragrant rose petals are popular for use in bath blends, spray mists, and lotions.



### ROSE WATER

- 1 cup fresh-picked, clean rose petals**
- 2 cups distilled water (see note at Chamomile Toner)**
- 3 tablespoons vodka (used as a preservative)**

Place rose petals in a cleaned and sterilized glass jar. Add water and vodka to cover completely. Gently crush petals with a wooden spoon to help to release the natural oils into the liquid. Cover and place in a warm area or on a sunny windowsill. Allow to infuse for 2 weeks. Strain the petals from the water and discard or add to the compost bin. Store water in a cleaned and sterilized glass jar and use within 3 to 6 months.

### ROSEWATER CREAM

*A classic lotion for fragrant skincare. Skin will glow and be moisturized with this simple cream that won't clog pores.*

- 2 tablespoons sweet almond oil (see note at Rosemary Foot Scrub)**
- $\frac{3}{4}$  tablespoon grated beeswax**

**1 tablespoon rose water (purchased or homemade; see recipe at left)**

In a small pot or pan, combine oil and beeswax. Heat just until the beeswax melts. Remove from the heat and allow to cool. Stir in the rose water and mix well to combine. Store in a cleaned and sterilized glass bottle in a dark cabinet.

*To use:* Apply as a scented lotion to soften dry skin and chapped lips.





## CHAMOMILE

*Chamaemelum nobile* is a low-growing, carpetlike perennial that grows up to 12 inches tall and spreads through creeping rhizomes. It thrives in sun to partial shade in well-draining soil. The small, daisylike flowers are the healing part of the plant. Harvest them just as they fully open.

Use whole flower heads fresh or dry them first on flat drying screens. Many people are familiar with the calming effects of chamomile flower tea. This same calming effect happens when chamomile flowers are ingredients in remedies for skincare. When used in facial treatments, the flowers provide gentle cleansing and can calm irritation and puffiness. Other common chamomile healing and beauty concoctions include hair rinses, skin lotions, and bath blends.

## CHAMOMILE TONER

Use this herbal facial toner to remove any last traces of dirt, grime, and impurities after washing your face.

**2 cups distilled water\***

**½ cup dried chamomile flowers**

**¼ cup organic apple cider vinegar or true witch hazel extract  
(if the smell of vinegar is bothersome)**

**\*Distilled water is preferred for use in skincare recipes because nearly all impurities and/or chemicals that irritate the skin have been removed. Distilled water also tends to have a neutral pH (acid/alkaline level), which is better for use in skincare. If the pH is too high, skin will feel dry; if too low, skin tends to be oily. Water with a neutral (or near-neutral) pH eliminates the risk of dryness or oiliness and enables the skin to better absorb the herbal healing ingredients. Distilled water can be purchased at many supermarkets and pharmacies.**

Heat water to hot (but not to the boiling point) and add the chamomile. Remove from heat and allow to steep for 15 minutes. Add vinegar and mix well. Strain out the flowers and discard them. Store the liquid in a cleaned and sterilized glass jar. The toner will keep for up to 6 months. *(continued)*

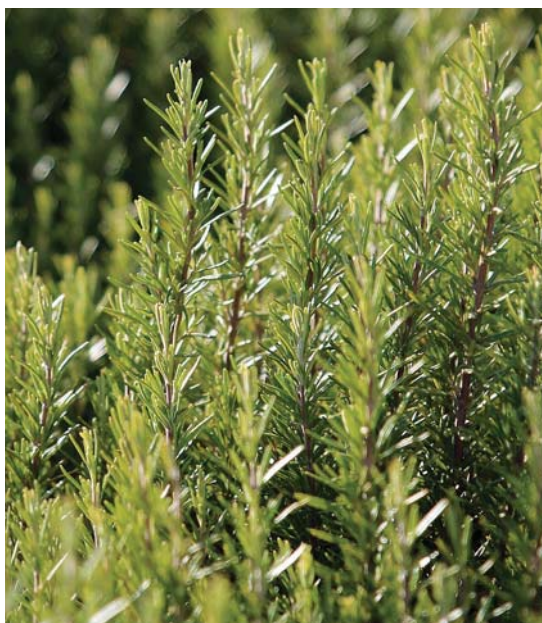




## DO-IT-YOURSELF

### ROSEMARY

*Rosmarinus officinalis* is a tender perennial typically treated as an annual in colder climates (north of Zone 5). Rosemary thrives in full sun and well-draining soil. It can be harvested at any time but is best when the stems are without flowers. Remove stems and strip off leaves for fresh use. Rosemary is an invigorating “wake-up” herb because of its intense, enchanting fragrance. Steep the leaves in distilled water for stimulating bath blends, hair rinses, and cleansing balms.



### DISCLAIMER

Recipes and herbal information for health or skincare are for educational purposes only and not intended to diagnose, treat, or prevent any disease. All herbal information is regarded as safe. Not all health claims made are approved or advised for use by the FDA. Even if an ingredient is in its raw, natural state, always use it with caution on sensitive and/or allergy-prone individuals, babies, and persons with medical conditions.



### ROSEMARY FOOT SCRUB

*Use to cleanse skin of dead cells, then soften and heal.*

**1 cup distilled water (see note at Chamomile Toner)**

**¼ cup plus 1 tablespoon fresh rosemary leaves, divided**

**¾ cup organic cornmeal**

**1 tablespoon sweet almond oil\***

**\*Sweet almond oil, made from almonds, is popular as a base oil in skincare recipes because of its skin-softening effect and the numerous nutrients that it contains. It has little to no fragrance; it will not overpower the aroma of your herbs. Use unrefined or virgin almond oil, which retain more of the beneficial nutrients.**

*Brew a rosemary infusion:* Bring distilled water to a boil in a glass saucepan. Remove the pan from heat and add ¼ cup of fresh rosemary leaves. Cover and allow to steep for 15 minutes. Remove leaves from the water by filtering through a cheesecloth. Discard leaves or add them to a compost pile.

In a small, nonmetallic bowl, combine cornmeal and almond oil. Pour ¼ cup of the rosemary infusion over the cornmeal and mix until it is the texture of a smooth paste. Add the remaining fresh rosemary leaves and stir until well mixed.

*To use:* Massage feet immediately, rubbing in a circular motion, then rinse clean. This scrub does not store well. ■

*Sue Goetz is an award-winning garden designer, writer, and speaker. Her books include Complete Container Herb Gardening (Cool Springs Press, 2020) and The Herb Lover's Spa Book (St. Lynn's Press, 2015). For more information, visit SueGoetz.com.*





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# THE 2022 PEACH RECIPE CONTEST WINNERS

STYLING AND PHOTOGRAPHY:  
SAMANTHA JONES/QUINN BREIN COMMUNICATIONS

**FIRST PRIZE: \$250**

## **BLACKENED SHRIMP WITH SPICY PEACH MANGO SALSA**

### **SALSA:**

2 peaches, peeled, pitted, and diced  
1 mango, peeled, pitted, and diced  
1 jalapeño, seeded and finely diced  
1/4 cup finely diced red onion  
1 to 2 tablespoons olive oil  
juice of 1 lime  
pinch of cayenne pepper

### **SHRIMP:**

1 pound large shrimp, peeled and deveined  
2 tablespoons blackening seasoning  
1/8 teaspoon cayenne pepper  
2 tablespoons peach preserves  
1 tablespoon grapeseed or canola oil  
chopped fresh cilantro and lime slices,  
for garnish

**FOR SALSA:** In a bowl, combine peaches, mango, jalapeño, and onions. Add oil, lime juice, and cayenne and stir to incorporate. Cover and refrigerate.

**FOR SHRIMP:** Place shrimp in a bowl. Add blackening seasoning and cayenne and stir to coat. Add peach preserves and mix to incorporate. Let sit for 15 minutes.

Place an enameled skillet or flat grilling pan over medium-high heat. Warm oil, then add shrimp. Without moving them, allow shrimp to cook for 2 to 3 minutes, or until a slight caramelization develops. Flip and repeat until fully cooked.

Serve over rice or in taco shells. Garnish with cilantro and lime slices.

**Makes 4 servings.**

*-Julie Love, Port St. Lucie, Florida*



**SECOND PRIZE: \$150**  
**FRENCH PEACHES**

**3 cups peeled and coarsely chopped fresh peaches**

**1/4 cup all-purpose flour**

**2 cups French vanilla ice cream, melted**

**3 eggs, lightly beaten**

**1/2 cup finely crumbled granola**

Preheat oven to 350°F. Grease or coat eight 6-ounce custard cups or ramekins; place on a baking sheet.

Divide peaches evenly among cups.

Put flour into a bowl. Slowly add melted ice cream, beating well until smooth.

Add eggs and continue to beat mixture until evenly combined. Pour over peaches in cups. Evenly sprinkle granola into each cup.

Bake for 25 minutes, or until set in center when gently shaken. Cool before serving.

**Makes 8 servings.**

*-Candy Barnhart, Makawao, Hawaii*  
*(continued)*



**THIRD PRIZE: \$100**  
**SUMMER PEACH AND**  
**GORGONZOLA PIZZA**

pizza dough for 1 pizza  
6 ounces gorgonzola cheese  
2 tablespoons olive oil  
3 peaches, peeled, pitted, and sliced  
2 tablespoons balsamic vinegar  
3 tablespoons honey  
1/2 cup chopped walnuts

Preheat oven to 425°F.

Spread pizza dough on a baking sheet or preheated pizza stone and prebake for 10 minutes. Remove pizza from oven and sprinkle with gorgonzola.

In a nonstick skillet over medium heat, warm oil. Add peaches, balsamic vinegar, and honey. Cook, stirring frequently, for 2 minutes. Spread peach mixture over gorgonzola. Sprinkle walnuts over peaches.

Bake for 10 to 12 minutes, or until edges of crust are golden. Serve hot or at room temperature.

Makes 3 or 4 servings.

-Lisa Hall, Johnson City, Tennessee

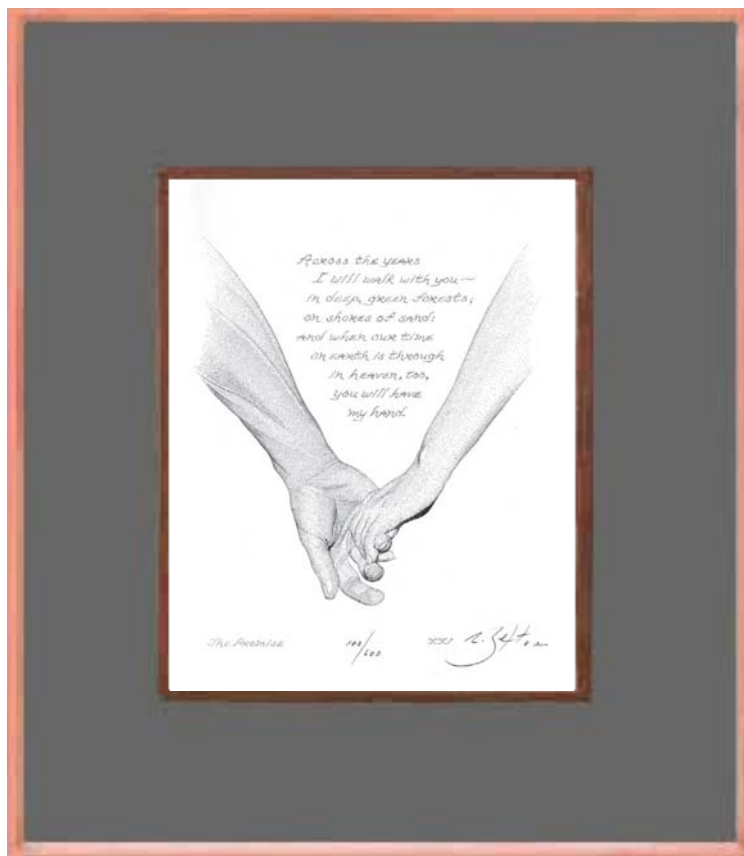
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# The Promise

*A Most Unusual Gift of Love*



THE POEM READS:

*“Across the years I will walk with you—  
in deep, green forests; on shores of sand;  
and when our time on earth is through,  
in heaven, too, you will have my hand.”*

Dear Reader,

The drawing you see above is called *The Promise*. It is completely composed of dots of ink. After writing the poem, I worked with a quill pen and placed thousands of these dots, one at a time, to create this gift in honor of my youngest brother and his wife.

Now, I have decided to offer *The Promise* to those who share and value its sentiment. Each litho is numbered and signed by hand and precisely captures the detail of the drawing. As a wedding, anniversary or Valentine's gift or simply as a standard for your own home, I believe you will find it most appropriate.

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## A DEEP DRINK

You may have tried the age-old trick of setting a container with holes in it into the ground and then filling it regularly with water to act as a reservoir for watering vegetables and other relatively shallow-rooted plants. Good idea, but we know of no jug big enough to quench the thirst of trees and other deep-rooted landscape plants—only the **ROOT QUENCHER** has suitable depth and capacity.

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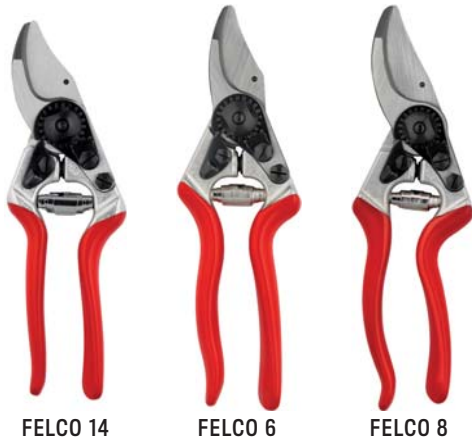


### BATHING BEAUTIES

Want to treat the birds in your backyard to a stylish splash-splash? Here are two ways to do it:

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### CUT TO SIZE

When pruning, well begun is half done, especially with the proper tool. Your pruner should make precise, clean cuts; feel comfortable—not unwieldy—to hold; and be reliably ready whenever you are.

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### FACING FORWARD

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# ADAPTING TO CHANGE

WHEN LIFE THROWS YOU CHALLENGES, JUST FIND WORK-AROUNDS.



I inherited a lot of wonderful things from my Italian mother, but her bad back was not such a gift. Over the years, I've endured many painful episodes. At the end of one January—rose-pruning season in California—the pain persisted for several weeks and I could not get up off the sofa, let alone bend over to prune.

Being energetic, I was frustrated and feeling sorry for myself. I wondered if I could adapt so that I could tend to my garden. Over the next few weeks of healing, I researched “adaptive gardening,” looking for ways to get past my pain and garden despite my physical weaknesses.

The more I researched,

the more I realized that I was not alone and that if what I had learned had worked for me, perhaps it might be helpful for others, too. So, I started spreading the news.

## “WHAT IF . . . ?”

Have *you* ever wondered: What if I can no longer garden without pain? What if I need to use a walker or a wheelchair? How would I navigate and tend to my garden safely?

When faced with physical ailments and limitations, some gardeners might consider giving up their favorite pastime. I say, “Never give up!” When life hands you a challenge, whatever it may be (e.g., you can not bend over to

embed a plant or reach to distribute mulch), find a different way to get it done—because there is always another way.

None of us is getting any younger and it can be frustrating to observe our bodies changing, but that's life, right? And this is not about just aging: Even 20- or 30-somethings can have mobility issues that hold them back from gardening with gusto.

So, accept “what is.” If you can not change your situation, accept it and change. This is the key to being resilient.

What does it mean to be resilient? It means that you have the ability to adapt well and recover quickly after setbacks, loss, trauma,

or tragedy. According to the Mayo Clinic, “If you're less resilient, you're more likely to dwell on problems, feel overwhelmed, use unhealthy coping tactics to handle stress, and develop anxiety and depression.”

Learning how to be resilient will not make your challenges go away, but it can help you to see past them, find joy in life, and handle setbacks when they strike. Here's some help on how to do that.

## KNOW YOUR LIMITS

Listen to your body. No matter your age, your body is changing. Many of us have a 35-year-old brain that whispers “It's OK, I'll just do a little bit more” to our significantly older body.

It is so important not to push yourself if your body is telling you to stop. My mom used to say to me, “*Basta!*,” which means “Enough!” Make that your mantra, and maybe it will make you smile.

## CONTROL WHAT YOU CAN: ADAPT

Identify the movements and circumstances that put you at risk or cause pain when you garden. Is your balance off? Clear away clutter from your pathways and other areas. Look closely at your hardscape and, if possible, replace all potential tripping hazards,



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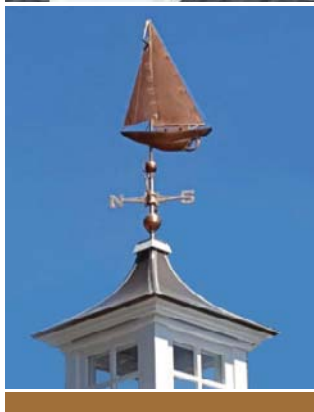
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## DO-IT-YOURSELF

such as flagstone paths if there are gaps between the slate slabs. The goals are to make all walking surfaces solid ones (think concrete or interlocking pavers) and to make paths smooth, level, and at least 4 feet wide, so that, when necessary, a friend can walk by your side. If you are at risk of falling due to balance, do not get on a ladder. If you're tempted to tackle those tall hedges, replace your ladder with a sturdy step stool that has a grab bar at the top.

Does decreased muscle strength or arthritis in your hands make it uncomfortable to hold and easy to drop pruners or other tools? Adapt them to fit your hand. Push a bike grip onto the handle or cut a length of spongy pipe insulation to fit the handle on your tools. These will increase the size and cushiness of the tool handle.

If decreased hand strength makes opening bags of compost or mulch difficult, keep scissors close by or rip into the bag with a soil scoop that has serrated edges. Instead of trying to lug a heavy bag to where you want to spread its contents, transfer portions to a lightweight tub and carry it to the site. Or, pull the tub to the site in a wagon. Here's a tip to avoid bending into the bag to get the contents out: Place the bag on a second step or platform, tilt it toward a lightweight tub or even your garden bed, and then scoop out the contents.

If eyesight is a challenge,

add color to tool handles by wrapping them with red or yellow tape or try a spray product called Plasti Dip, available in an array of colors. This gives your tool handles a rubberized coating that makes them easier to see—and less likely to end up in a debris pile.

If your knees are not what they used to

operate while standing up! It grabs, removes, and holds the weed until you press the release mechanism and effortlessly toss the vegetation into your debris can—all without bending over.

Many gardeners with back pain will do anything to avoid bending over. If this is you, create a planter that you can

seeds with soil.

We tend to experience pain with repetitive movement over an extended period. Whatever the task—raking, mowing, or sweeping—do it for no longer than 20 minutes, then switch it up by doing another chore—like watering, fertilizing, or pruning—that utilizes different muscles.

### FIND YOUR WAY FORWARD

Finally, go easy on yourself. Some of us tend to make things harder than they need to be, working and reworking our gardens. Try to get to a place of “done is better than perfect.” It can be liberating to take a stand and declare what truly matters most.

If you love to garden and want to keep gardening throughout your lifetime, start thinking about how to change, adapt, and modify. Share ideas. Ask friends who have demonstrated resilience how they were able to get past their physical issues. Then you will be able to see your garden with an eye for comfort, safety, and ease, as well as lower maintenance—all of which will bring you joy and peace. ■

—Toni Gattone



### CLEAR AWAY CLUTTER FROM YOUR PATHWAYS AND OTHER AREAS AND MAKE ALL WALKING SURFACES SOLID ONES.

be, look around your yard for vertical garden opportunities. Even in raised beds, trellises put tending and harvesting at eye level. Pergolas and arbors allow you to garden upward with beautiful vines. Containers elevate plants so that you can have a chair or kneeler bench next to them. Other ideas are wall planters, railing planters, and window boxes, all of which add visual interest and are easier on your body.

Hate stooping, bending, or kneeling to weed? Get a weeder tool that you can

use while standing up. For seed planting, cut a 1-inch-diameter piece of lightweight PVC long enough to be waist high. If you use a wheelchair or prefer doing this in a seated position, cut it at a shorter, more comfortable length. Make a furrow in your bed by dragging the pipe through the soil in a straight line at the proper depth. Drop a seed through the pipe. Move it the appropriate distance interval and drop another seed. When your planting is complete, use the pipe to carefully cover your new

*Toni Gattone, a passionate gardener, enthusiastic speaker, and author of The Lifelong Gardener: Garden with Ease & Joy at Any Age (Timber Press, 2019), overcame debilitating back pain to keep doing what she so loves to do.*



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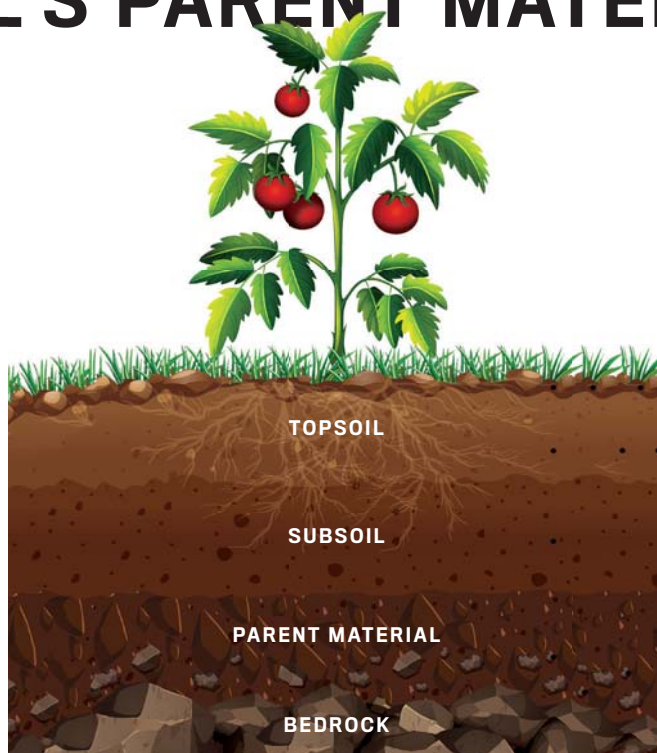


# SOIL'S PARENT MATERIAL

**S**oil is complex. Even soil scientists don't fully understand it, so, as a gardener, you may sometimes feel overwhelmed with information on soil care. But think of it this way: Soil's source ingredients, or genetics, determine its ability to help plants thrive. These ingredients are called "parent material" and are the backbone of your garden soil.

## WHAT IS PARENT MATERIAL?

The parent material of soil defines its potential health problems as well as its natural strengths. Around the world, soil scientists have mapped soil's parent material to better understand ecosystems. Here in North America, for example, our biggest ecosystem is the Great Plains, which extend from the Canadian prairies (as far north as Edmonton) south to Texas. Within that region, there are several soil parents. For example, Glacio-Lacustrine soils, whose parent materials include sediments deposited by meltwater from ancient glacial lakes, are high in clay. Aeolian soil sediments consist mainly of sand- or silt-size particles from ancient sand dunes or old inland ocean beaches. One of the most predominant



parent materials in North America is glacial till. This soil consists of clay, sand, silt—even boulders—and is high in micronutrients such as calcium, magnesium, and iron.

All soils have a parent material. If we understand what this is, then we can better manage the soil. So, whether you are buying gardening soil or establishing an in-ground garden, you should always ask, What is the origin of this soil material?

## WHY PARENT MATERIAL MATTERS

All soils have three main attributes:

- **“Chemistry”** refers to the soil’s “battery”—its ability to retain and release nutrients; soil chemistry involves pH.

- **“Physics”** refers to the soil’s structure—its ability to form aggregates and allow for water infiltration or compaction levels, as well as its water-holding capacity

- **“Biology”** refers to the soil’s ability to support life—how it helps with nutrient cycling, disease, and pest management.

The combination of attributes in any soil yields its character and natural tendencies, and these are based on the soil’s parent material.

As gardeners, we know that some soils naturally have better physical structure than others: For example, clay soils naturally tend to be compacted. Sandy soil naturally tends to be void of nutrients. Rich, loamy soil has ideal physical structure:

If you take a shovelful from the ground, it sticks together, or aggregates around organic matter and allows for roots, water, and macro fauna (worms, beetles, etc.) to move freely through it—to thrive. Knowing these characteristics helps you to determine how to amend and enrich your soil for food and flower production.

The nature of soil’s parent material can not be changed. However, we can nurture all three of these attributes to “make” productive soil.

## RECHARGING MOTHER NATURE’S BATTERY

Soil pH plays an important role in a plant’s ability to absorb nutrients. Soil nutrients are stored in our soil in the same way that energy is stored in a car battery. The “battery” can be replenished, or topped up, over time with organic or inorganic fertilizers. Soil pH is essentially the power controller: A different pH yields a different volume of energy. If your soil pH is too low, then less nitrogen can be released from the battery. If the soil pH is too high, too many micronutrients are released, ultimately causing a toxic environment. (See the table “pH Preferences of Trees, Shrubs, Flowers, and Vegetables” on page 126.)

You can test your soil





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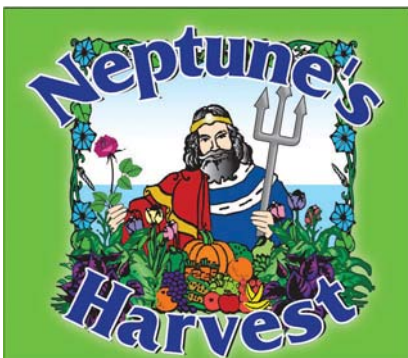
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for its pH level in several ways. Depending on what you want to grow, you may need to move the pH up or down. The amendments used to do this are elemental sulfur and lime powder. If your soil pH is too acidic (lower than 5.0), you will want lime to sweeten it. If you want more acidic soil because you are growing acid-loving plants, you'll want elemental sulfur. The rule of thumb is that 4 to 6 pounds are enough for 10 square feet (1 square meter). Then test again, amending until you achieve the desired pH range.

#### HOW TO MANAGE CLAY-HEAVY PARENT MATERIAL

Clay or clay loam soil is common for anyone gardening in continental North America (except in deserts and dunes); its parents include ancient lake bottoms and residue from glacial grinding. This soil consists of the smallest soil particles on Earth, and it has some unique features. For example, children find its cohesive nature to be perfect for mud pies. For gardeners, though, this is the problem. Clay soil's physical nature (tiny particles that stick together) results in poor water infiltration, poor root development, and low microbial activity. But once the physical structure of clay soil is corrected, its chemistry and biology improve.

To change the physics of clay soil, you need to manipulate its profile;

### REGARDLESS OF YOUR SOIL'S PARENT MATERIAL, NURTURING THE SOIL THAT YOU HAVE WILL ALWAYS RESULT IN A MORE PRODUCTIVE GARDEN.

specifically, you need to introduce the missing elements—different, less “sticky” amendments. These include a variety of composts, leaf molds, and pine barks that have been decomposing for at least a year. (Fresh pine bark or recently shredded leaves will take much-needed nitrogen from your soil to aid in decomposition.) Cover the garden with 3 to 4 inches of only these combined amendments (not 3 to 4 inches of each).

Next, test the pH of your soil, then amend it by spreading the proper ingredient on top of your compost layer.

The final, one-time, *mandatory* step is to incorporate the layer of decomposed material into the clay soil to a depth of 5 to 15 inches. This runs contrary to the mainstream idea of no-dig gardening (the popular practice of not tilling or turning soil under), but remember that clay soils tend to be depleted of much-needed organic material, which is the cause of their compaction.

If you prefer not to dig-in your amendments, you can

try aeration. Borrow or rent a lawn aerator to poke holes into your garden. Then, use a rake to spread the compost and elemental sulfur or lime into the holes and across the surface.

After this, your yearly maintenance would include adding an inch of compost to the garden, testing the pH, and spreading 4 pounds of elemental sulfur or lime (depending on what you plan to grow) per 10 square feet. Water it in, ideally before planting, and retest the soil.

#### HOW TO MANAGE SANDY PARENT MATERIAL

Sandy soil is generally found in coastal regions. It is less than ideal for gardening and can be difficult to amend. (This is why we don't farm on sand dunes.) A shovelful of sandy soil separates into individual grains; it can be improved with biology and chemistry reclamation—with the addition of carbon. This boosts its “battery” capacity (which, incidentally, is naturally very high in clay soils).

The amendment process is similar to that for

clay soil reclamation—a one-time dump of compost incorporated into the top 5 to 15 inches of the soil. However, in this case, you'll want a top layer of 5 to 6 inches of different composts, plus 9 to 10 inches of coconut coir and/or leaf mold. Then, top-dress with and incorporate 2.2 gallons of biochar for every 10 square feet (1 square meter) of garden. Every year thereafter, spread and mix in another inch of compost.

Sandy soil also benefits from the addition of mycorrhizal fungi. When transplanting seedlings, simply place an inoculant into the newly dug hole. After the initial incorporation year, plan to practice the no-dig garden method for five growing seasons. Then test the soil pH to see what is needed.

With clay soil, plant nutrients are rarely a cause for concern. Clay soil is the best type for supplying, holding, and capturing plant nutrients. However, sandy soil tends to leach out plant nutrients quickly. Therefore, the addition of nutrient-holding amendments in the form of organic material, plus achieving proper pH, is critical to soil fertility.

Regardless of your soil's parent material, nurturing the soil that you have will always result in a more productive garden, all other factors being equal. ■

—Ashley Esakin

#### HOW LOW SHOULD YOU GO?

The depth that you dig when incorporating amendments depends on the soil type and how much sand it contains. Sandy soil (determined by a bulk density or soil test) should be amended to 5 inches. A sandy loam should be amended up to 15 inches.

Canadian agronomist **Ashley Esakin** has had a passion for plants since she was a child.

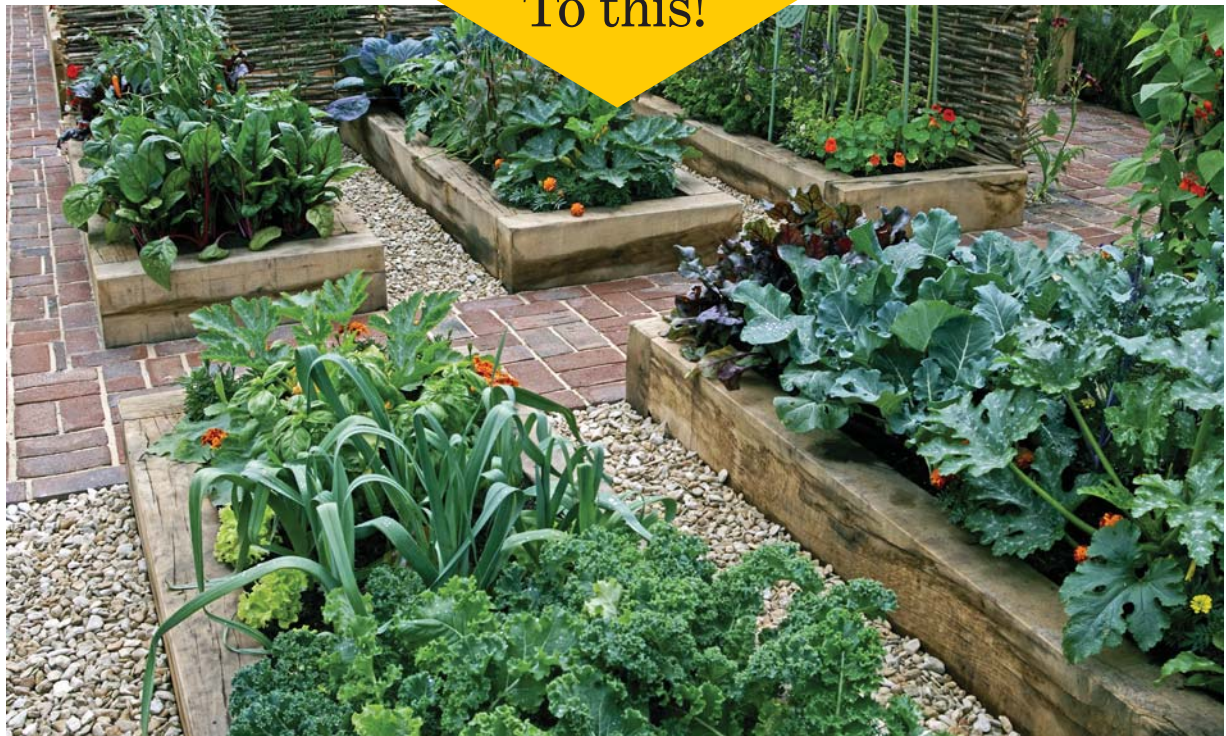


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## PLAN AND DESIGN

Sketch an overhead view of your property on graph paper or list the types of planting areas in your yard. Note compass direction and areas of sun and shade.

Locate and consider your microclimates: Are there dry spots where only drought-tolerant plants should be used? Do you have shaded areas where the soil is usually moist? Got any wetter places that might never need irrigation? Do existing trees

or buildings shelter plants from drying winds and intense sun? Could a steep slope become a terraced bed to catch rainwater runoff?

## IMPROVE YOUR SOIL

Well-aerated soil, rich in organic matter, stores water well yet drains adequately

enough to not become soggy. It encourages earthworms and beneficial microorganisms. Plants are able to establish deep roots and become more resistant to drought and disease. Just about any soil can benefit from compost; it increases the water-holding capacity of sandy soil and loosens heavy clay soil to improve drainage. Compost is also a storehouse of plant nutrients that are slowly released into the soil to feed the plants over a long period of time.

Spread 3 to 4 inches of compost (or well-rotted or bagged manure) over the top of the soil, then turn it in as deeply as you can.

*(continued)*

## XERIC PLANT COMBOS

For a foundation planting, try colorful groupings of water-thrifty ‘Blue Star’ juniper, deep maroon ‘Diabolo’ ninebark, purple smoke bush, and a rainbow mix of summer azaleas.

For a perennial border that brings late-summer bloom and needs minimal watering, try a mix of ‘Autumn Joy’ sedum, silvery cat mint with spiky blue flowers, magenta flower poppy mallow, and several varieties of asters.

Other options: Most rock garden plants, many ornamental grasses, and numerous herbs can add interest without requiring a lot of work.





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## ALMANAC ADVICE

### PLANT SELECTIVELY

Use plants that will thrive with the normal rainfall for your area (e.g., cacti in the Southwest; forsythia, daylilies, and Japanese tree lilacs in the Northeast).

Also, seek native plants growing wild in your area; chances are that they survive on only the water that Mother Nature gives them. In addition, they provide habitat for songbirds and other wildlife.

Depending on your location, natives such as beach plum, green ash, mountain laurel, and witch hazel could all be great plants. (Here's news: Pruning can be all but eliminated if plants are selected based on their ultimate size.) Explore local native nurseries for more.

### BE SURE TO MULCH

A thick layer of organic mulch conserves soil moisture and protects plant roots from extreme temperature fluctuations while smothering weed growth and preventing soil erosion. As the mulch breaks down, it releases nutrients into the soil, providing natural fertilization. Compost and finely shredded bark are excellent mulch choices. Apply a 2- to 3-inch layer throughout the planting bed and replenish as needed.

### RE-EVALUATE GROUND COVERS

Turf grass takes more irrigation, fertilization, pest control, mowing, and water than any other part of the landscape. If you walk on



### HOW SOME PLANTS FIGHT BACK

Often the qualities that make plants heat- and drought-resistant are the very same ones that make them attractive and/or interesting.

- The silver foliage of dusty miller and silver mound artemisia and grayish leaves of lavender reflect sunlight and thus resist withering.
- Sedums, hens and chicks, and other succulents store water in their thick, fleshy roots and stems.
- Junipers, white spruce, and other evergreens with small needles leave little surface area exposed to the sun and hence are less likely to succumb to its drying effects.
- Plants such as bayberry and vinca have waxy leaf surfaces that resist drying winds.

the grass only to mow it, consider an alternative.

Ground covers are low plants that grow together to form living mulch that crowds out weeds, prevents erosion, and never needs mowing. Like a lawn, a ground cover unites different landscape areas.

Sun-loving ground covers such as blue rug junipers, bearberry, bugleweed, and creeping phlox are perfect for steep slopes and open areas. For shade, choose pachysandra, wild ginger, and sweet woodruff. Or, install stone pavers. Leave gaps between them for low plants such as thyme or Irish moss.

### WATER LESS

Xeriscaping means having not a waterless landscape but a “water less” one. Use efficient drip irrigation or soaker hoses under mulch to apply water directly to the root zones of plants with similar water needs. If you are using overhead sprinklers, water in the evening or early morning to minimize evaporation and wind drift.

In times of increasing drought and restrictions on water use, Xeriscaping is a responsible, low-cost way to garden that makes traditional methods of landscaping seem all wet.

### COLD-ZONE CONSIDERATIONS

Xeriscaping in colder climates is an option as well. You don't need to live in a hot and dry location to enjoy its benefits. Hardy plants for Xeriscaping in northern zones (2, 3, or 4) include:

### PERENNIALS

- Daylily (*Hemerocallis*), Zones 2 and 3
- Delphinium (*Delphinium*), Zone 3
- Purple coneflower (*Echinacea purpurea*), Zone 3

### TREES

- Ash-leaved maple/box elder (*Acer negundo*), Zone 2
- Eastern white pine (*Pinus strobus*), Zone 3
- European bird cherry (*Prunus padus*), Zone 3

### SHRUBS

- Common lilac (*Syringa vulgaris*), Zone 3
- Smooth sumac (*Rhus glabra*), Zone 2
- Siberian pea tree (*Caragana arborescens*), Zone 2

### GROUND COVERS

- Bugleweed (*Ajuga*), Zone 3
- Common bearberry (*Arctostaphylos uva-ursi*), Zone 2
- Lily-of-the-valley (*Convallaria majalis*), Zone 2

*Note:* Some of the plants listed above are considered invasive in certain areas. Before planting them, it's best to consult your local Cooperative Extension or garden center to determine their suitability. ■

—Almanac editors



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# pH PREFERENCES OF TREES, SHRUBS, FLOWERS, AND VEGETABLES

**A**n accurate soil test will indicate your soil pH and will specify the amount of lime or sulfur that is needed to bring it

up or down to the appropriate level. A pH of 6.5 is just about right for most home gardens, since most plants thrive in the 6.0 to 7.0 (slightly acidic to neutral)

range. Some plants (azaleas, blueberries) prefer more strongly acidic soil in the 4.0 to 6.0 range, while a few (asparagus, plums) do best in soil that is neutral to slightly

alkaline. Acidic, or sour, soil (below 7.0) is counteracted by applying finely ground limestone, and alkaline, or sweet, soil (above 7.0) is treated with ground sulfur.

COMMON NAME	OPTIMUM pH RANGE	COMMON NAME	OPTIMUM pH RANGE	COMMON NAME	OPTIMUM pH RANGE
<b>TREES AND SHRUBS</b>					
Apple	5.0–6.5	Black-eyed Susan	5.5–7.0	Snapdragon	5.5–7.0
Azalea	4.5–6.0	Bleeding heart	6.0–7.5	Sunflower	6.0–7.5
Beautybush	6.0–7.5	Canna	6.0–8.0	Tulip	6.0–7.0
Birch	5.0–6.5	Carnation	6.0–7.0	Zinnia	5.5–7.0
Blackberry	5.0–6.0	Chrysanthemum	6.0–7.5		
Blueberry	4.0–5.0	Clematis	5.5–7.0	<b>VEGETABLES</b>	
Boxwood	6.0–7.5	Coleus	6.0–7.0	Asparagus	6.0–8.0
Cherry, sour	6.0–7.0	Coneflower, purple	5.0–7.5	Bean	6.0–7.5
Crab apple	6.0–7.5	Coreopsis	5.0–6.0	Beet	6.0–7.5
Dogwood	5.0–7.0	Cosmos	5.0–8.0	Broccoli	6.0–7.0
Fir, balsam	5.0–6.0	Crocus	6.0–8.0	Brussels sprout	6.0–7.5
Hemlock	5.0–6.0	Daffodil	6.0–6.5	Cabbage	6.0–7.5
Hydrangea, blue-flowered	4.5–5.5	Dahlia	6.0–7.5	Carrot	5.5–7.0
Hydrangea, pink-flowered	6.0–7.0	Daisy, Shasta	6.0–8.0	Cauliflower	5.5–7.5
Juniper	5.0–6.0	Daylily	6.0–8.0	Celery	5.8–7.0
Laurel, mountain	4.5–6.0	Delphinium	6.0–7.5	Chive	6.0–7.0
Lemon	6.0–7.5	Foxglove	6.0–7.5	Collard	6.5–7.5
Lilac	6.0–7.0	Geranium	5.5–6.5	Corn	5.5–7.0
Maple, sugar	6.0–7.5	Gladiolus	5.0–7.0	Cucumber	5.5–7.0
Oak, white	5.0–6.5	Hibiscus	6.0–8.0	Eggplant	6.0–7.0
Orange	6.0–7.5	Hollyhock	6.0–8.0	Garlic	5.5–8.0
Peach	6.0–7.0	Hyacinth	6.5–7.5	Kale	6.0–7.5
Pear	6.0–7.5	Iris, blue flag	5.0–7.5	Leek	6.0–8.0
Pecan	6.4–8.0	Lily-of-the-valley	4.5–6.0	Lettuce	6.0–7.0
Plum	6.0–8.0	Lupine	5.0–6.5	Okra	6.0–7.0
Raspberry, red	5.5–7.0	Marigold	5.5–7.5	Onion	6.0–7.0
Rhododendron	4.5–6.0	Morning glory	6.0–7.5	Pea	6.0–7.5
Willow	6.0–8.0	Narcissus, trumpet	5.5–6.5	Pepper, sweet	5.5–7.0
		Nasturtium	5.5–7.5	Potato	4.8–6.5
<b>FLOWERS</b>		Pansy	5.5–6.5	Pumpkin	5.5–7.5
Alyssum	6.0–7.5	Peony	6.0–7.5	Radish	6.0–7.0
Aster, New England	6.0–8.0	Petunia	6.0–7.5	Spinach	6.0–7.5
Azalea	4.5–6.0	Phlox, summer	6.0–8.0	Squash, crookneck	6.0–7.5
Baby's breath	6.0–7.0	Poppy, oriental	6.0–7.5	Squash, Hubbard	5.5–7.0
Bachelor's button	6.0–7.5	Rose, hybrid tea	5.5–7.0	Swiss chard	6.0–7.0
Bee balm	6.0–7.5	Rose, rugosa	6.0–7.0	Tomato	5.5–7.5
Begonia	5.5–7.0	Salvia	5.5–6.5	Watermelon	5.5–6.5



# FROSTS & GROWING SEASONS

**D**ates given are normal averages for a light freeze (29° to 32°F, or -2° to 0°C); local weather and topography may cause considerable variations. The possibility of frost occurring after the spring dates and before the fall dates is 30 percent for the U.S. and 33 percent for Canada. The classification of freeze temperatures is usually based on their effect on plants. A light freeze kills only tender plants, with little destructive effect on other vegetation.

## UNITED STATES (alphabetical by state abbrev.)

CITY	GROWING SEASON (DAYS)	LAST SPRING FROST	FIRST FALL FROST
Juneau, AK	171	Apr. 26	Oct. 15
Pine Bluff, AR	230	Mar. 22	Nov. 8
Denver, CO	154	May 4	Oct. 6
Hartford, CT	165	Apr. 27	Oct. 10
Wilmington, DE	199	Apr. 13	Oct. 30
Athens, GA	217	Mar. 31	Nov. 4
Cedar Rapids, IA	155	May 4	Oct. 7
Boise, ID	166	Apr. 30	Oct. 14
Chicago, IL	193	Apr. 17	Oct. 28
Indianapolis, IN	172	Apr. 26	Oct. 16
Topeka, KS	182	Apr. 19	Oct. 19
Lexington, KY	185	Apr. 20	Oct. 23
Worcester, MA	167	Apr. 29	Oct. 14
Baltimore, MD	192	Apr. 16	Oct. 26
Portland, ME	160	May 1	Oct. 9
Lansing, MI	151	May 7	Oct. 6
Willmar, MN	149	May 4	Oct. 1
Jefferson City, MO	193	Apr. 14	Oct. 25
Helena, MT	132	May 15	Sept. 25
Bismarck, ND	126	May 19	Sept. 23
North Platte, NE	131	May 16	Sept. 25
Concord, NH	136	May 15	Sept. 29
Newark, NJ	211	Apr. 6	Nov. 4
Albany, NY	159	May 2	Oct. 9
Cincinnati, OH	179	Apr. 23	Oct. 20
Tulsa, OK	207	Apr. 5	Oct. 30
Portland, OR	260	Mar. 6	Nov. 22
Williamsport, PA	167	May 1	Oct. 16
Kingston, RI	148	May 8	Oct. 4
Rapid City, SD	144	May 9	Oct. 1
Memphis, TN	229	Mar. 24	Nov. 9
Amarillo, TX	184	Apr. 20	Oct. 22
Cedar City, UT	119	May 31	Sept. 28
Richmond, VA	204	Apr. 9	Oct. 31
Burlington, VT	158	May 3	Oct. 9
Seattle, WA	246	Mar. 12	Nov. 14
Parkersburg, WV	186	Apr. 20	Oct. 24
Casper, WY	105	June 1	Sept. 15

## CANADA (alphabetical by province abbrev.)

CITY	GROWING SEASON (DAYS)	LAST SPRING FROST	FIRST FALL FROST
Calgary, AB	99	May 29	Sept. 6
Edmonton, AB	123	May 15	Sept. 16
Red Deer, AB	108	May 24	Sept. 10
Dawson Creek, BC	76	June 8	Aug. 24
Kelowna, BC	150	May 8	Oct. 6
Prince George, BC	120	May 20	Sept. 18
Vancouver, BC	180	Apr. 21	Oct. 19
Victoria, BC	208	Apr. 14	Nov. 9
Brandon, MB	92	June 6	Sept. 7
Lynn Lake, MB	87	June 10	Sept. 6
Thompson, MB	58	June 18	Aug. 16
Winnipeg, MB	116	May 21	Sept. 15
Fredericton, NB	125	May 22	Sept. 25
Saint John, NB	165	Apr. 30	Oct. 13
Gander, NL	115	June 6	Sept. 30
St. John's, NL	117	June 11	Oct. 7
Halifax, NS	164	May 8	Oct. 20
Sydney, NS	135	May 27	Oct. 10
Truro, NS	103	June 7	Sept. 19
Fort Simpson, NT	81	May 31	Aug. 21
Yellowknife, NT	102	May 31	Sept. 11
Kapuskasing, ON	75	June 18	Sept. 2
Kingston, ON	161	Apr. 28	Oct. 7
Ottawa, ON	135	May 13	Sept. 26
Sudbury, ON	124	May 21	Sept. 23
Timmins, ON	86	June 13	Sept. 8
Toronto, ON	161	May 4	Oct. 13
Charlottetown, PE	142	May 20	Oct. 10
Summerside, PE	154	May 13	Oct. 15
Montréal, QC	168	Apr. 25	Oct. 11
Québec, QC	129	May 17	Sept. 24
Roberval, QC	117	May 25	Sept. 20
Trois-Rivières, QC	128	May 19	Sept. 25
Prince Albert, SK	88	June 7	Sept. 4
Regina, SK	91	June 1	Sept. 1
Yorkton, SK	106	May 26	Sept. 10
Watson Lake, YT	83	June 6	Aug. 29
Whitehorse, YT	72	June 12	Aug. 24



LAST LOOK

**WEEDS ARE FLOWERS, TOO,  
ONCE YOU GET TO KNOW THEM.**

-EYORE, CHARACTER IN *WINNIE THE POOH*  
BY A. A. MILNE, ENGLISH WRITER (1882-1956)





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