December 2022-Vol.8, No.12

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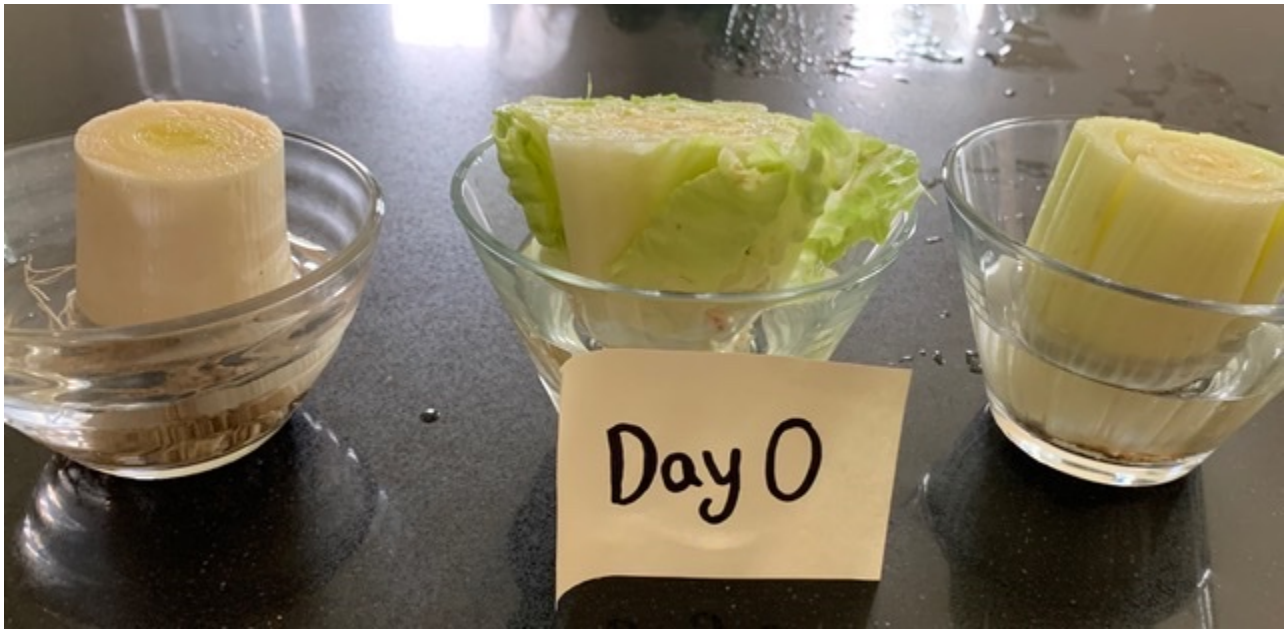
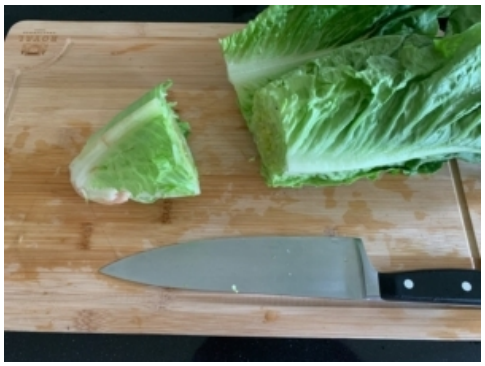
Growing Food from Food Scraps

By Meg Norling | December 2022-Vol.8, No.12





We used leek, celery, and romaine lettuce. Each was cut 2-3 inches above the base. Photo: Meg Norling

This *Garden Shed* children's activity is a fun way to recycle food scraps and "grow food from food." This can be done any time of year, but it's especially well-suited to cold winter months when there is less happening in the outdoor garden. Children grow food indoors using pieces of common vegetables, observe over time, and document the changes. This easy activity teaches children about growth cycles and promotes recycling (with a twist)! It is adaptable to a wide range of ages (see tips below).

Activity: Cultivate and observe new plant growth that emerges from food scraps.

Objective: Children learn about growth cycles and "recycle" food in an unusual way. Observation can include measurements, written notes, drawings, and/or photographs.

Materials Needed:

- Cutting board
- Knife (for adult use/supervision only)
- Vegetable(s) to cut and grow; we used leek, celery, and romaine lettuce in our experiment
- Small bowl(s) or container(s) to hold the cut pieces
- Water to pour into bowl(s); we used tap water from our well
- Sunny, warm location (such as south-facing window)

Place cut sections, flat side down, in small clear bowls of water. Photo: Meg Norling

Process:

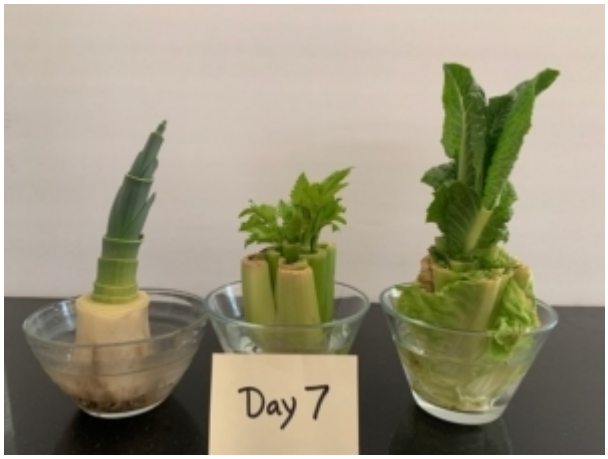
-Choose vegetable(s) you'd like to grow. There are many options; we selected those with a sturdy stem and base—**leeks, celery, and romaine lettuce.** The resources below provide other great ideas.

–Help the child cut a small piece of the vegetable, about 2-3 inches in length from the base of the plant.

-Place the vegetable cutting in a small bowl. Fill bowl about halfway with water.

-Place the bowl in a warm, sunny location, such as a south-facing window.

-Change the water every two days.



Our plants after 7 days in sunny windowsill. Photo: Meg Norling.

Daily observation:

1. Check to be sure the plant has enough water. Remember to change water every two days.
2. Talk with the child about changes you see, such as stem, leaf, or root emergence; plant growth (height/width); plant color, etc.
3. Depending on the child's age, keep an observation log to note daily or weekly changes. Record observations with measurements, notes, drawings, and/or photographs.

Our plants after 14 days in sunny windowsill. Photo: Meg Norling.

Tips:

- Food scraps can be grown in water or soil. We experimented using water and had success.
- Plants can be transplanted to soil (in pots or in ground) depending on time of year. We learned that transplanting to soil might be best at about 2-3 weeks, especially for the romaine which wilted at 3-4 weeks.

Root growth on the leek and celery at 28 days. Photo: Meg Norling.

- This activity can be tailored to a wide range of ages:
    - Younger children will enjoy the surprise of seeing “food grow from food.” Together, you can observe and discuss the growth you see. Help younger children measure and record observations.
    - Older children can learn more about **vegetative** growth (from leaves, stems, roots) vs. **reproductive** growth (from flowers, fruit, seeds). They can create their own observation logs using measurements, notes, drawings, and/or photographs.
- This activity can be expanded to include experiments that compare different methods of growth (such as water vs. soil or soil with and without compost).

Gardeners Mariah, 8 yrs., and Haley, 11 yrs. (with future gardener Savannah, 9 months) hold the new plants at 28 days. Photo: Meg Norling.

This “growing food from food scraps” activity helps children appreciate different ways that plants can start growing. It also helps children understand the importance of recycling. This project encourages observation, measurement, and documentation of plant growth. In addition, it was a lot of fun (for adults too)!

Resources:

https://stonepierpress.org/gardeningnews/growing-vegetable-scraps

https://edibleschoolyard.org/resource/growing-food-scraps

https://foodrevolution.org/blog/reduce-food-waste-regrow-from-scraps/

https://gardens.si.edu/learn/educational-resources/garbage-to-gardens/dont-pitch-it-plant-it/

https://carnegiesciencecenter.org/educators/early-learners/ (See *How to Grow Food from Scraps* activity)

The Ornamental Garden in December

By Patsy Chadwick | December 2022-Vol.8, No.12

With the onset of winter, leaves have long since fallen and you can easily observe the “bare bones” of the garden. This is the ideal time to walk around your landscape and note what changes or improvements you would like to make next season. And while you’re taking a critical look at your landscape, don’t forget to tackle any gardening chores that remain undone.

- **Look for areas in your landscape where water collects after long periods of rain or snow.** Water that collects on the surface of the soil during winter will freeze and can damage perennials. As a temporary solution to this drainage problem, dig shallow trenches to help drain excess water away from the planted area. In spring, consider improving drainage by aerating the soil or raising the beds by gradually adding soil as a top dressing. For more information, see this Northern Virginia Soil and Water Conservation district article on solving drainage problems.
- **Loosen or remove thick layers of matted leaves** from perennial beds that might prevent moisture from penetrating into the soil or, conversely, hold too much moisture in the soil.
- **Continue watering recently planted trees and shrubs.** This is particularly important because lack of moisture during long, dry periods in fall and winter can cause injury or death to plant root systems.
- **Look for cool-weather weeds in garden beds**. It may be December, but lots of weeds can be found growing in the garden at this time of year. Common chickweed, henbit, purple deadnettle, and other “winter weeds” sprout in mid to late fall. Weather permitting, pull the weeds now if you can reach them. A little effort now means less weeding needed in spring. As you weed, try to avoid stepping into flower beds because that can compact the soil.
- **Check to make sure mulch is not touching tree trunks**. If it is, pull the mulch away from the trunk to prevent moisture from being trapped against the bark. Otherwise, the prolonged moist conditions can decay the bark and, in time, eventually damage or kill the tree. For guidance on mulching, see the Virginia Cooperative Extension’s (VCE) publication on mulching for a healthy landscape.
- **Before the first winter storm occurs,** check to make sure you have a good supply of sand or sawdust on hand to put on icy walkways near plantings. Some plants are sensitive to de-icing salts, and sand or sawdust are better alternatives to use for this reason.
- **After the ground freezes, check for plants that have been displaced** due to soil heaving and replant them. This is a common occurrence with plants that were newly planted in fall and haven’t had sufficient time to anchor their roots into the soil. Make sure the roots are well covered with soil and mulch to protect them from freezing temperatures.
- If you didn’t remember to do this earlier in the fall, **drain all water hoses and store them** in a garage, garden shed, basement, or other suitable place out of the weather. Also, don’t forget to drain irrigation systems and non-frost-proof outdoor faucets.
- **Store concrete bird baths, planters, rain gauges and other outdoor ornaments** that might collect water and break in freezing temperatures.
- **Clean garden tools** with steel wool or a stiff wire brush, wipe with a damp cloth, dry, and apply an oil such as cooking oil, boiled linseed oil, tung oil, or WD 40.

PREPARING YOUR LANDSCAPE FOR SNOW

If a heavy snow or ice storm is predicted, take precautions to prevent damage to your evergreen landscape plants. Species with multiple leaders are susceptible to snow and ice damage. The branches of Leyland Cypresses, in particular, are bad about splaying under a heavy snow load and the damage is generally permanent. Other evergreens that might also be damaged include arborvitae, upright junipers, yews, magnolias, boxwoods, and some hollies. Minimize damage by loosely encircling the outside of the plant with jute twine, narrow rope, or strips of cloth so that individual branches can’t catch and hold much snow. Another technique is to tie the main leaders together, high up on the side of the shrub. The bindings may be

left in place once the snow melts or until new growth begins in spring.

Clemson Cooperative Extension's Publication on protecting evergreens from ice and snow damage recommends preventing storm problems in the first place by selecting evergreens with a single trunk or leader. Species with multiple leaders should be pruned to a single trunk or leader when the tree is young.

WINTER HOUSEPLANT CARE

Overwintering plants indoors needn't be all that challenging. It's simply a matter of understanding their requirements for water, humidity, temperature, and light. If you ignore these essentials, you'll find that it's quite easy to kill a houseplant. Let me count the ways:

- **Overwatering** (also known euphemistically as "killing with kindness") – This is perhaps the most effective way to kill a houseplant. Overly saturated soil prevents the plant from taking up oxygen at the root level. Symptoms of overwatering include wilting and yellowing of the foliage. The proper way to water a houseplant is to give it enough water so that it drains from the bottom of the pot. Otherwise, salts in the water may build up in the soil, which will eventually harm the plant. Unless your plant is one that prefers consistently moist soil, like an African violet, allow the soil to dry out somewhat between waterings.
- **Lack of humidity** – The flip side of overwatering is not having enough moisture in the air. Once we turn the heat on in our homes, the humidity in the air drops to well below 50%, which is the moisture level that most plants need to stay healthy. Browning of the leaf margins or tips generally indicates that the air is too dry. To remedy this problem, place the houseplant in a bathroom or kitchen where steam from showers or from boiling water will raise the humidity level in the room. Or, if you have a humidifier, try to position it near your houseplants. Another solution is to fill a pebble tray with water and set the pots on top of the pebbles so that they are not actually touching the water.
- **Exposure to direct heat** – Avoid placing houseplants near a vent or other source of direct heat. Hot air blowing on a plant can severely dehydrate it. An overheated plant will appear very limp.
- **Exposure to cold air** – If your house is not well insulated or sealed against cold drafts, your plant can suffer from exposure to the cold temperatures. You'll have the same problem if you place a tender tropical plant near a door that is opened frequently.
- **Direct contact with a window** – Although most houseplants need as much light as possible, don't let them have direct contact with a frosty window. Otherwise, the foliage touching the glass may freeze.
- **Not enough light** – Plants that aren't getting enough light will look pale rather than a healthy green color. New growth will look tall and leggy or spindly and the new leaves may appear smaller than normal. To solve the problem, move the plant to a brighter spot, preferably to a south or west-facing window. Give the plant a quarter turn once a week so that it grows evenly and doesn't lean or stretch toward the light.
- **Pest problems** – It may be wintry outside but that doesn't mean plant pests aren't an issue. Pests such as white fly, spider mites, aphids, mealy bugs, and scale can multiply very quickly on plants. Inspect your plants frequently for unwanted hitchhikers and deal with them promptly. For more information on houseplant pests, see Clemson Cooperative Extension's publication on common houseplant insects.

The holiday season is a great time to **share rooted cuttings from your houseplants** with friends and neighbors. Plants make wonderful "hostess" gifts and are a nice alternative to sugary sweets or scented candles. If your friends are (gasp) not "plant people," they'll appreciate your thoughtfulness if you include a few plant care instructions with your gift. As an aside, if you have never propagated a houseplant, then check out the University of Missouri Extension's article on home propagation of houseplants. It provides

straightforward instructions and excellent photos to illustrate the propagation process.

DECORATING FOR THE HOLIDAYS

Celebrating winter holidays in December generally means decorating the house with greenery.

- ***Cut Christmas Trees*** – If you plan on selecting a cut Christmas tree, check out Holiday Decorating with Fresh Greenery, which appeared in the December 2015 issue of *The Garden Shed*. The article includes a table comparing the four most popular Christmas trees – Fraser Fir, White Pine, Scotch Pine, and Norway Spruce. If you're not sure which is which, here's how to tell the difference:

Fir – If the branches bear their needles individually rather than in groups and if the needles feel flat to the touch, the tree is most likely a fir.

Pine – If the needles occur on the twigs in groups of two, three, or five, it's a pine. To further distinguish between white pines and Scotch pines, white pines have longer, softer looking needles than Scotch pines. Scotch pines have dark green needles and stiff branches that can hold heavy ornaments better than white pines.

Spruce – if the needles have four sides and roll easily between your fingers, it's a spruce.

- ***Live Christmas trees*** – If you buy a **live Christmas tree with the intention of planting it** in your landscape after the holidays, keep it out of doors until you're ready to decorate it. Make sure it stays well watered and doesn't dry out. Once you move the tree indoors, keep it in a cool room for a few days only. As soon as possible, move it back outside and continue to keep it well hydrated until it can be planted in a permanent spot in the landscape.
- ***Poinsettias –*** These cheery tropical plants are a colorful way to decorate for the holiday season. However, they can rapidly wilt if not properly cared for. To keep poinsettias looking their best, pay attention to their light, water, and room temperature requirements. They prefer bright filtered light, but will also thrive in a sunny, south-facing window. Water regularly but check to make sure the water drains away from the roots. They like evenly moist but not soggy soil. Prolong the display by keeping the indoor temperature at about 68°F during the day and cooler at night.
- ***Evergreen Wreaths*** – If you're planning to use a freshly cut or ready-made evergreen wreath, store it in a cool location until it is ready to be decorated. Soak it in warm water for several hours to keep it moist. Drain it well and then spray it with an anti-desiccant spray to seal in the moisture. After the sealer has set, finish decorating the wreath and hang it, preferably in a shady place that doesn't receive sun.
- ***Boxwood Decorations*** – If you purchase ready-made wreaths, swags, and other decorations that contain boxwood clippings, **inspect the clippings for symptoms of boxwood blight** (*Calonectria pseudonaviculata*). Symptoms include leaf spot, leaf drop, browning, or black streaks on stems. Although reputable suppliers of holiday greenery are taking precautions to avoid spreading this disease, it pays to be cautious. After working with boxwood decorations, sterilize garden tools with alcohol or a chlorine bleach solution. Once the holidays are over, bag the decorations for disposal in the trash. Do not compost them. The VCE publication on boxwood blight provides more information on this disease.
- ***Pets and holiday greenery*** **– Keep pets away from holiday plants such as poinsettias, mistletoe, and holly. Ingesting poinsettia foliage is not normally life threatening to pets, but the sap can cause mouth and stomach irritation as well as vomiting. Also, if the plant has been treated with a pesticide, the chemicals in the pesticide may cause**

more serious medical problems for a pet than ingestion of the sap. Mistletoe and holly berries are more toxic than poinsettias and can cause more serious health problems for pets.

INVASIVE PLANT CONTROL

Now that leaves have long since fallen, winter is an excellent time to identify invasive plant species. Many of them are evergreen and easy to spot. This is also a good time of year to treat invasives, particularly if you are using an herbicide. There's less risk of accidentally damaging native species that are dormant and protected by leaf litter. For more information on invasives, see the Blue Ridge Partnership for Regional Invasive Species Management's (PRISM) article on identification and control of invasive plants in winter. See also the Invasive Plant Control Calendar in the May 2022 issue of *The Garden Shed*.

Featured image of bird on feeders in December snow storm. Photo: Pat Chadwick

The Edible Garden in December

By Ralph Morini | December 2022-Vol.8, No.12

Congratulations to everyone who had a successful edible gardening year in 2022. I hope you enjoyed the gardening as well as the fruits of your hard work. If you have cleaned up your beds, planted cover crops or mulched them, and have protected cool weather vegetables that are still yielding, you have earned a break. In any case, now is the time to review this year's results and begin thinking about next year.

Reduce Chemicals, Build Soil, Add Diversity

Admittedly speaking as an advocate, I suggest using the winter to think about how to improve gardening techniques and be more ecologically responsible next year, through these practices:

- **Reducing chemical use through Integrated Pest Management (IPM)**. IPM is a process based on observing pest issues, understanding them, taking action only when the damage is significant and using chemicals as a last resort. It requires looking deeper into issues, which requires a time commitment. But given the environmental damage that is evident from pre-emptive chemical use, it is important. For information about how to implement IPM, check out the Garden Shed article Integrated Pest Management

- **Build your soil.** Healthy soil can reduce the need for chemical pesticides and fertilizers. Insights about productive ways to improve soil naturally are coming from the Regenerative Agriculture movement. It is a soil focused approach to growing crops that advocates:
    - Keeping the soil covered, with densely planted crops and employing cover crops or mulching in the off season
    - Minimizing soil disturbance. This means minimizing tilling, adding amendments on or near the surface, relying on soil organisms to carry them deeper, to preserve soil structure.
    - Keeping living roots in the soil to stabilize it while improving structure and adding carbon based nutrients.
    - Add diversity by varying and rotating crops, interplanting, and utilizing diverse cover crops.

These practices are growing, now followed by about 15% of commercial agriculture, and provide guidance to home gardeners that is ecologically and horticulturally healthy. *The Garden Shed* article It's All About the Soil explores it more deeply. The You Tube video Healing the Earth Through Regenerative Farming with Gabe Brown is also a convincing summary of the practice.

- **Create a diverse home landscape.** Creating a diverse home landscape, preferably of native trees, shrubs, and flowering perennials is critical for reducing the decline in insects and birds in recent decades. It also builds their populations to help manage garden pests naturally. This has worked wonders at limiting cabbage moths and Japanese beetles in my own garden. Get guidance on how to start with a pollinator friendly landscape from the *Garden Shed* article Plant A Pollinator Paradise. If you need some more convincing, watch the video Nature's Best Hope with Dr. Doug Tallamy, a leader in understanding and repairing native ecology.

Other helpful information, including video material, is available in the references at the end of this article and from the VA Cooperative Extension website.

As the interdependence of all aspects of our environment becomes increasingly clear, our need to integrate key ecological elements follows. Improving our practices in these three areas is a good start.

Other December Tasks

- As long as your soil isn't frozen, it is still okay to plant garlic and shallots in December. Mulch them well to moderate temperature and moisture.

Winter greens with open row cover. Photo: Barbara Gardino

- Placing row covers over winter hardy vegetables adds several degrees to the temperature under the cover and protects plants in the event of extreme cold while encouraging continued growth into the winter. Covering them during cold spells while giving access to sunlight on above-freezing days, maximizes growth. For tips on constructing simple hoop style row covers, consult *The Garden Shed* article Row Covers: A Season Extender with Benefits.

Leaf mulched herb bed. Photo: R Morini

- **Put Your Leaves to Good Use:**
  - Chopping or shredding them is a good idea to help speed decomposition while allowing water penetration when used as a mulch.
  - They can be used to set up new compost batches with winter-generated fruit and vegetable scraps added as they become available. When spring temperatures rise into the 50s, the batch's carbon-to-nitrogen ratio can be fine-tuned to stimulate decomposition. With good moisture and aeration management, you should have compost for use

prior to planting summer vegetables. Find guidance for home composting in the article Home Composting: A Guide for Home Gardeners, from the Penn State Extension.
    - Leaves left in place provide excellent cover for over-wintering beneficial insects that will help build a natural pest management system in your gardens next year.

- **Small Fruits**
    - Blueberry bushes can be pruned any time from leaf drop to the start of growth in spring. During the first 3 years, just remove the low growing canes. After fruit production starts, prune out one of every six of the oldest canes, as close to the ground as possible. For canes aged 1-5 years old, aim for 10-15 canes, 2 or 3 each of the 1-5 year old growth.
    - Strawberries should be protected from the cold; 6-8 inches of straw or leaf mulch works well. Plants growing in barrels or pyramids benefit from having the mulch covered with burlap as well.
    - Additional detail about caring for these and other small fruits is offered in the publication Small Fruit in the Home Garden from VCE.
- Be sure to **drain your hoses**. Disconnect them from faucets and lay them out on the ground, both ends open, to let them drain. Then roll them up for winter storage.
- **Drain rain barrels** and redirect downspouts to ground, rather than refilling the barrels during the cold months.
- Review your journal entries and think about improvements for next year in plant selection, location, and techniques.
- Use your learning as you review the first new **catalogs and communication from seed suppliers** for next season's supplies. It is fun to browse them, looking for new items to grow and assessing different varieties that may help avoid disease problems that affected last year's garden. Pay attention to "time to harvest" and "disease resistance" data. For help interpreting seed catalog and seed pack information, check out *Garden Shed* article Using Seed Pack Information to Help Your Garden Grow.
- Make a first pass at **laying out your crop arrangement for next year**. Remember to rotate specific plant families to different parts of the garden, preferably on a 3-4 year cycle. The benefits are disease and pest reduction and soil enrichment through plant diversity.
- **Care for your tools**. Winter is the time to clean, disinfect, sharpen, and generally prepare them for the work ahead. Also a good time to **clean pots and flats** if you have a warm enough place to do the wet work. Come spring, you'll be happy you did it.

"Indoor Herb Garden" by ReeseCLloyd is licensed under CC BY-NC-SA 2.0

- An enjoyable way to keep your hands in the soil during winter is to **grow herbs indoors**. You need a sunny window, preferably with a southern exposure. Use a premium potting soil and add nutrient as recommended. It is best to use clean plastic or glazed containers to reduce watering Be sure the container has drainage holes and use a non-porous dish to catch excess water. Keep the soil surface moist between planting and germination. Herbs do best with temperatures above 65 degrees, the warmer the better. Basil likes temperatures above 70 degrees, so doesn't want to be too close to the window during cold weather. Check out Garden Shed article "Be Inspired With Indoor Herb Gardening" for great information on growing herbs indoors this winter.

In any case, enjoy your December gardening, happy holidays, and I hope to see you next month at *The Garden Shed*.

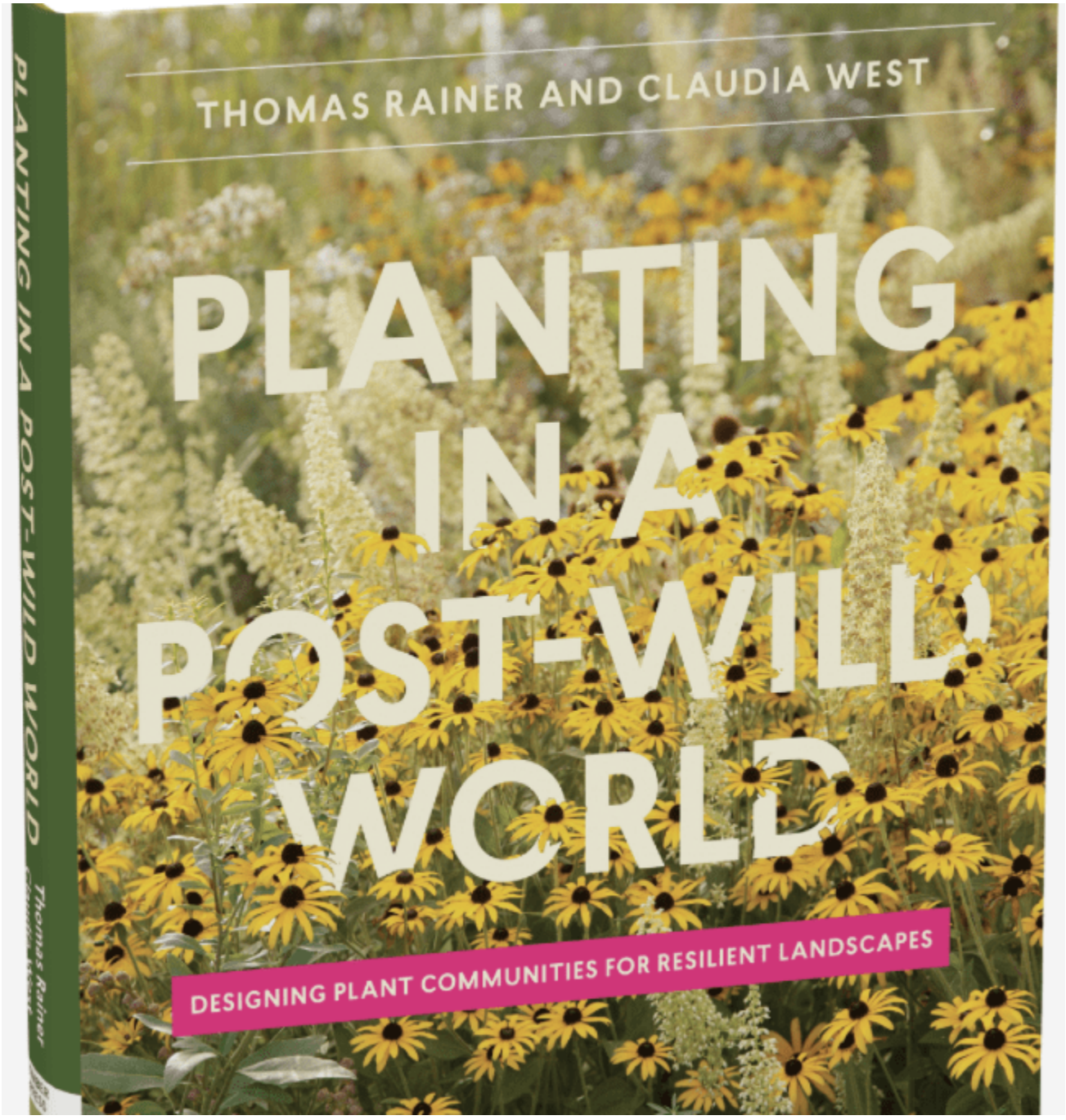
References:

Cool Season Planting Chart for Companion, Interplanting and Square Foot Gardening, Washington State University Extension:
https://s3.wp.wsu.edu/uploads/sites/2056/2018/10/Cool-Season-Planting-Chart-for-Companion.pdf

Virginia Native Plant Society website: Resources for Creating Native Plant Habitats: https://vnps.org/

Book Review: Planting in a Post-Wild World

By Cathy Caldwell | December 2022-Vol.8, No.12



The authors of *Planting in a Post-Wild World: Designing Plant Communities for Resilient Landscapes* propose a new paradigm for garden design, one which modifies and adapts the "plant communities" concepts in ways that are sustainable and beautiful in a world changed by urbanization, species invasion, and climate change. This book addresses the big issues that percolate around gardening, but it also provides a blueprint for creating viable plant communities in our yards and public spaces.

From the very first pages, I got a definite feeling that I was in the hands of designers, as opposed to plantspersons. This is far from a bad thing; it's just different. There's a definite focus on how we as humans

respond to a garden, plus there are many lush photos. Authors Thomas Rainer and Claudia West are indeed garden design professionals. Rainer is a landscape architect in Washington, D.C., who has designed public gardens for the U.S. Capitol grounds, the Martin Luther King, Jr. Memorial, and the New York Botanical Garden — as well as for private homes. West grew up working in her family's nursery and landscape design business, and is now a garden designer and consultant. By the time I finished the book, it was clear that its intended audience is primarily professional designers, but there's lots to learn and think about for us home gardeners.

The authors' goal is to provide "a guide for designing resilient plant communities" that can succeed in today's landscapes, which "no longer resemble historically natural conditions." Due to the much-altered environmental conditions we face today, the authors urge us to give up the notion of creating an exact replica of nature in our yards, parks, and other public spaces. Instead, Rainer and West developed the concept of "**designed plant communities"** that **resemble** and **function like** those in the wild. They also urge us to avoid treating plants as "individual objects placed in the garden for decoration," but instead, taking our cues from nature, "to arrange plants to interact with other plants and the site." Employing research on **how plants interact in "wild" communities, the authors have derived certain principles that "can help designers better select, arrange, and manage horticultural plantings."**

The **guiding principles of the authors' designed plant communities** are:

1. Related populations, not isolated individuals
2. Stress is an asset (to the plants, not the gardener!)
3. Cover the ground densely by vertically layering plants
4. Make it attractive and "legible" (i.e., it should be "readable" as a pleasant landscape by humans)
5. Management, not maintenance (manage the entire plant community, not individual plants)

These basic principles are developed fully in the early chapters of the book, which then shifts to a step-by-step guide to plant choices, design, installation, and maintenance, all accompanied by helpful charts, drawings, and photos.

Principle # 1 is the essential feature of a plant community: the plants "coexist and interact." Principle #2 — stress — is based on the fact that plants have varying **competitive strategies** to deal with limited sun, water, and nutrients; they may have roots that can move away from competitors or they may have the ability to take up excess nutrients. The authors believe we must consider these varying capacities and strategies in order to create a successful plant community. This is one reason plants in naturally-occurring communities tend to occupy every inch of available ground, which is Principle # 3. A fundamental layer, for the authors, is the ground cover layer. The authors note that some desirable ground covers — grasses, sedges, and leafy perennials — have limited commercial availability. Principle # 4 — legibility — may seem puzzling, but it seems to be based on some deep thinking about, and maybe even some scientific analysis of, human beings and their propensities.

The legibility principle underlies the idea that a designed plant community is a "**stylized version**" **of a naturally occurring plant community.** Why a "stylized version" of nature? First, it might be necessary to use only a few of the most adaptive species in a natural community or to supplement a native community due to availability issues. Second, a stylized version may be preferable due to the cultural conditioning of humans. According to Rainer and West, a **highly mixed planting** such as might be found in nature tends to remind us of "abandoned fields or derelict industrial sites." Thus, the designer's task is to **distill the essence of familiar landscapes** — which the authors refer to as **archetypes.** A bit of Googling revealed that the term **archetype** is used fairly extensively in the field of landscape architecture to identify patterns. The book focuses on **three major archetypal landscapes**:

— forests

—grasslands,

—woodlands and shrublands

The authors believe that humans relate to these three archetypes in essential, emotional ways; thus, a design that adheres to one of these basic patterns will be "**legible"** — i.e., humans will recognize it immediately — and positively.

If you're wondering how to "distill the essence" of these archetypal landscapes, the authors provide very specific guidance. And for each major archetypal landscape, there's in-depth discussion, plus a helpful list of problems to avoid. One of those really grabbed my attention: in a meadow-type garden, avoid plants that are taller than eye level; apparently, this kind of height is a turnoff for most folks. Since I'm in the midst of developing a new garden right now, this advice was timely.

The authors' philosophy is strongly focused on the site; the idea is to choose plants that are **naturally adapted to the site;** i.e., that can all survive in the site's environmental conditions, including its stresses. **Native plant communities** are "battle-tested" and aesthetically familiar, so they are the **ideal starting point.** By choosing familiar native plant communities, we can make the task much simpler. Here or there we may have to substitute an exotic — a non-invasive one that's adapted to the conditions of our site. The authors eschew the "troublesome divide" between those who dogmatically insist upon a natives-only regime versus those who will use exotics. Nevertheless, they clearly endorse native plant communities:

> *We firmly believe that designing with native plants still matters. In fact, it matters more than ever. But in order to be successful in establishing native communities in tough sites, both a new expression of nature and a deeper understanding of the dynamics of plant communities is required. It is our challenge to reimagine a new expression of nature — one that survives within our built landscapes, and at the same time performs vital ecosystem functions needed to ensure life. . . . The building blocks of this new nature are resilient and native plants — and yes, even exotic species — that are naturally adapted to environments similar to our man-made landscapes. The question is not what grew there in the past but what will grow there in the future."*

It's well worth noting that this book has received the seal of approval of Doug Tallamy, author of *Bringing Nature Home*: "This is the universal how-to guide to sustainable landscaping we have all been waiting for. A masterful accomplishment."

As indicated above, this book contains a wealth of detailed guidance, and you'll soon be learning about things like the root morphologies that allow different species to grow right next to each other with little or no direct competition, thus making room for even more plants that support pollinators and other wildlife. That ability to grow cheek-by-jowl is a key concept reaped from the study of plant behavior in the wild. You'll soon learn and be able to apply the authors' defined terms, such as

- structural layers
- seasonal theme layers
- dynamic filler layers
- visual essence species

You'll be able to make use of the Landscape Selection Key to **identify the archetype best suited to your site**. You'll be urged to draw your site as a way of knowing it in new ways. And you'll be introduced to major influencers from the fields of ecology and landscape design:

- Plant habitat-focused system of Richard Hansen and Friedrich Stahl
- Plant survival strategies research of John Philip Grime and his C-S-R system for developing plant communities
- Norbert Kühn's blend of these two systems into Kühn's 8 Plant Types

Back cover of Planting in a Post-Wild World.

It has been noted that this book could be viewed as a continuation of the work of Richard Hansen and Friedrich Stahl, authors of *Perennials and Their Garden Habitats*. (1993). Frankly, I knew nothing about that or any of the other books discussed and listed in the bibliography, and I'm hoping to remedy that situation soon.

Initially, I found a few elements of the book somewhat off-putting — such as the use of unfamiliar defined terms. Some of the suggestions about cutting back on the use of mulch and of soil amendments struck me as problematic, especially in our challenging changing climates. Despite these concerns, I learned plenty. I was particularly intrigued by the authors' philosophy of management, especially the insistence that we recognize that our gardens will change over time — no matter how we maintain them. I will no doubt return to this section of the book, which helpfully posits various change scenarios and the variety of responses available to the gardener.

One very useful feature of this book is that all concepts and recommendations are accompanied by lists of example species (using their scientific names) along with a wealth of photos of these species, both singly and in plant communities created by well-known designers.

To say that the book is inspiring is a major understatement. I draw like a kindergartener, but thanks to this book, I'm feeling confident and ready to head out to draw my site!

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Upcoming Lectures by Thomas Rainer/Piedmont Landscape Association/2/2/23

Thomas Rainer's Grounded Design Blog

Marigold: More Than a Pretty Face

By Charles D'Aniello | December 2022-Vol.8, No.12

Marigolds are among the happiest of flowers. Beautiful and resilient, they have literally colonized the globe. There is a long and rich history of human engagement with them, and this engagement extends well beyond their just having a pretty face. Some social and cultural history and some practical horticultural guidance follows.

A Flower of the Aztec Empire

Tenochtitlan, capital city of the Aztec Empire imagined. "Mitos y Fantasias de los aztecas foto 7.png." Guillermo Marin and Gumr51, Wikimedia Commons. CC BY-SA 3.0.

On November 8, 1519 about 400 Spaniards under Hernán Cortés (1485-1547), with about 1,000 native allies, entered Tenochtitlán, the as many as 300,000 person capital of the Aztec Empire. Present-day Mexico City is built on its ruins. Recent scholarship contends that Moctezuma II (1466-1520) (aka Montezuma) invited them to enter out of curiosity and, perhaps, an intention to ultimately destroy them. They were awed by a dazzling city in the center of a lake: beautifully painted, clean, organized, and resplendent with flowers. Many of the flowers were what we call today marigolds. The Aztecs called them *cempoalxóchitl* (in Nahuatl); the Spanish later called them *cempasúchil*. The Aztecs used the term to encompass several *Tagetes* species; but most directly *Tagetes erecta*. They bred the flower for size and depth of color. The literal translation of *cempoalxóchitl* means "flower of twenty petals." They were called in Spanish "Clavel de Indias," the "Carnation of the Indies."

Aztec pottery incense burner. Templo Mayor Museum. Mexico City. Photo: Gary Todd, Wikimedia Commons. CC 0 1.0.

Marigolds were cultivated on the *chinampas*, floating agricultural islands, which surrounded Tenochtitlán. The Spaniards also found imposing and beautiful temples in which human sacrifice was practiced. Blood sacrifice had long been a component of Mesoamerican religions and marigolds had long had a role in other Mesoamerican cultures, notably the Maya. Research shows that Mesoamerican cultures used the flower to adorn idols, priests, and sacrificial victims long before the Aztecs. Marigolds were used in healing, but were also sacred, playing a role in a diversity of ceremonies.

Naturalists and scholars of the 16th century had wide interests, and, not long after the conquest, there was some careful and assiduous work to describe and preserve knowledge of the cultures and environments of what was now New Spain. There were several important efforts. In addition to Sahagún's anthropological work (mentioned below), of central importance is the 1552 work compiled by the young Aztec physician baptized as Martin de la Cruz, which was originally in Nuahatl and then translated into Latin as *Libellus de Medicinalis Indorum Herbis*. You can read it in English as the inexpensive paperback *An Aztec Herbal*. Its history is succinctly, but thoroughly related in the scholarly article authored by Chavarria and Espinosa cited under Sources. The late 16th century *Historia de las plantas de Nueva España* compiled by Francisco Hernández (1514-1578), which also had a complicated publication history, is also invaluable (see the entry *cempoalxóchitl* in the 1942 edited volume ii, book iv, chapter CLXXIX, pp, 644-652). For a survey of *Tagetes* uses not only in Mexico, but worldwide, see Robert Trostle Neher's 1968 article "The Ethnobotany of Tagetes." The medical indications are not recommendations for use, but an indication of use. For a general

dive into Aztec pharmacology, with examples from the above primary sources, begin with the Mexicolore websites *Four Hundred Flowers: The Aztec Herbal Pharmacopoeia, Part 1. Yauhtli and Cempoalxóchitl, Cempoalxóchitl,* and *How to cure stiffening of the serpent: herbal medicine, Aztec style.* For full citations to the works mentioned above consult the list of Sources.

Tagetes has been an international genus for a long time and a search of the Web retrieves many scientific articles published around the world, written for scientists, exploring chemical composition, uses or possible uses, and suggesting efficacy. Modern scientific study suggests that *Tagetes* extracts may be valuable in contemporary medicine and support claims of efficacy in traditional medical applications. For a deep dive into this literature, try PubMed.

Returning to the Aztecs, what we call *Tagetes lucida* and *Tagetes erecta* were burned along with copal (aromatic resin from the copal tree) in the incense burners associated with the imposing *Templo Mayor* in Tenochtitlán. The musky scent was believed by the Aztecs to carry messages and prayers to the gods. In short, marigolds had an ancient and highly developed role in pharmacology, theology, and artistic expression and symbology.

Sculpture of the deity Coyolxuahqui with a marigold headdress. Museo Nacional de Antropologia [National Museum of Anthropology], Mexico City. Photo: Carlos yo, Wikimedia Commons. CC BY-SA 4.0.

The *cempoalxóchitl* was used by the Aztecs in human sacrifice rituals and to honor the dead. *The Florentine Codex*, the *Historia general de las Cosas de Nueva España* (*General History of the Things of New Spain*), an encyclopedic work compiled by Fray Bernardino Sahagún (1499-1590) to describe Aztec culture, explains that dried and pulverized Yauhtil (*Tagetes lucida*) was blown into the faces of sacrificial victims with the intent of lessening their pain (see Mexiciolore, *Four Hundred Flowers*). There is a scientific literature regarding the hallucinogenic and narcotic properties and uses of the marigold species *Tagetes lucida* in particular. And it is thought that marigold was added to chocolate and tobacco with the intent of enhancing their enjoyment and presumed medical benefits.

The Day of the Dead

Day of the Dead altar, Mexico. Photo: Steve Bridger. Flickr, Wikimedia Commons. CC BY 2.0.

The marigold's "sacred" role continues today in *Día de los Muertos* or Day of the Dead celebrations, which are held November 1-2. *Día de los Muertos* is an enormously popular celebration in Mexico in particular and is celebrated among many Americans of Hispanic heritage. The Day of the Dead celebrates life by creating a special occasion for remembering and honoring deceased loved ones. The celebration is even recognized with an American postage stamp on which – just coincidentall

Day of the Dead, Mexico. Photo: Darvin Santos. Pixabay.

y — marigolds are prominent.

The observance is living history. It has long been interpreted as an amalgamation or blending of indigenous and Christian religious belief and practice in conquered Mexico, which ultimately resulted in a holiday that fits Aztec custom and belief (see Mexicolore's *The Art of Aztec Mourning*) and complements in some ways the Roman Catholic All Saints Day and All Souls Day. Some scholars argue, however, that it more closely reflects and resembles the festivals of medieval Spain. (For this, see the Wikipedia article for a quick introduction.) It can mean different things to different people and be mystical or symbolic, but at its core, it celebrates life, honors the deceased, and is a time to experience the life-infusing power of love and memory.

For those observing the holiday, spirits are summoned back to life either mystically or symbolically. The marigold, a symbol of life's brevity, serves as a lure and a guide. Yellow and orange marigolds (*Tagetes erecta*) – in Spanish, in this context, *Flor de Muertos* – call and guide the dead "home" with their odor and color. Various rich food and drink offerings on family altars, *altares de muertos* or *ofrendas*, do the same. Marigold petals are sometimes symbolically strewn as a path to guide returning souls and bundles of marigolds are lovingly placed on graves.

For a thoroughly enjoyable introduction to the holiday's essential meaning and symbols, consider watching Disney Pixar's *Coco* (2017). The film is rich in orange marigolds, including a marigold bridge connecting the lands of the living and the dead. It won numerous awards including the 2017 New York Film Critics Circle Award for Best Animated Film and 2018 Academy Award for Best Animated Feature. For a response to the film's critics, see Smithsonian folklorist Cynthia Vidaurri's *Did Disney Pixar Get the Day of the Dead Celebrations Right in Its Film 'Coco'?* For a different perspective entirely, consider watching the documentary and concert film *Flor de Muertos* (2011), which features the music of the band Calexico. Rest easy, there are marigolds! It begins with *Día de los Muertos* in Mexico and ends with an All Souls Day procession in Tucson.

Examples of the Columbian Exchange

After the conquest, the Mexican marigold made a series of its own conquests. It became a beautiful part of the Columbian Exchange: the exchange between the New and Old Worlds of plants, animals, diseases, metals, technology, culture, ideas, and people. Exchange occurred within continents and hemispheres as well. The marigold was accompanied on its journey by petunias, poinsettias, sunflowers, and zinnias. It was not uncommon to find marigolds in the United States shortly after the Revolution. A related species, c*alendula*, had been grown in English colonial gardens.

The flower arrived in India with Portuguese merchants in the 16th century and took the subcontinent by storm. From weddings, to family, religious and civic events, to funerals to Diwali (the symbolic celebration of the victory of good over evil, light over darkness, and knowledge over ignorance), *Tagetes* became the preeminent celebratory flower, replacing all others. The conquest was the same as the New World chili's replacement of India's native *pippali* or long pepper. The flowers are used to adorn people and the doors and windows of homes and as offerings to Hindu gods. The marigold is a symbol of goodness and happiness. In other traditions, it is identified as a symbol of "inner light," but also as a symbol of embarrassment and grief. Across time and place, different species can have diverse meanings; for instance, *Tagetes patula* can symbolize creativity and passion, but also jealousy, grief, and uneasiness (see Dani Rhys' *Marigold Flowers Meaning and Symbolism* for an introduction).

Marigold garlands. Photo taken in Kolkata (Calcutta) on Mahalaya Day. Photo: Biswarup Ganguly. Wikimedia Commons. GFDL, CC BY 3.0.

Tagetes erecta are raised to meet the huge demand for marigold garlands in India. Those unable to acquire real flowers resort to paper and plastic representations. The marigold has become a national symbol of India and the happiness it evokes finds a home in many cultural expressions, including India-focused popular movies in the West: *Marigold* (2007), *The Best Exotic Marigold Hotel* (2012) and *The Second Best Marigold Hotel* (2015). Some may also remember the marigold-consumption in *Monsoon Wedding* (2001).

Curiously, there was an effort to make the marigold our national flower, but it was defeated by the rose in 1986. In our current moment, it's worth noting that *Tagetes tennuifolia*, *patula,* and *erecta* are recognized as national symbols of Ukraine; but the sunflower, a marigold relative, is Ukraine's national flower.

Will the Real Marigold Please Stand Up

Calendula officinalis. Photo: Pixabay.

Long before the New World marigold (*Tagetes*) was discovered, there was another plant with the same name living on the other side of the world. Here is where confusion begins. Europe already had a marigold. Its properties, uses, and folklore were well established. But the English applied the same name to the New World flower. Vernacular names can lead to confusion. The system developed by Carl Linneaus (1707-1778), however, makes the difference clear. The Old World marigold we know as *Calendula officinalis* and the New World marigolds as *Tagetes*. Both are members of the Asteraceae family (among the many plants included are lettuce, daisies, sunflowers, chrysanthemums, asters, dahlias, and zinnias), and while they are similar, there are differences. For useful overviews of the plant's characteristics, visit the Wisconsin and North Carolina extension *Calendula* websites. It can get confusing; for instance, Shakespeare liked marigolds (and flowers in general), but he was responding to *Calendula officinalis,* or maybe, at least sometimes, *Glebionis segetum*. And, of course, the symbolic association of the marigold with the Virgin Mary developed around *Calendula officinalis*.

Even within the *Tagetes* genus there is confusion, since the French marigold did not originate in France, and the African marigold did not originate in Africa. All the *Tagetes* species originated in the New World, with

representatives in southwestern America, tropical America, and South America. *Tagetes erecta* and *Tagetes patula* are native to present day Mexico and Guatemala. In addition, *Tagetes* species have been able to reproduce and spread worldwide and establish populations in areas in which they are not native, a process called naturalization. The genus name *Tagetes* is aptly derived from the name of an Etruscan prophet said to have founded the Etruscan religion, and, after emerging from a plowed furrow, addressing the Etruscans.

Widely Known Marigolds

Tagetes erecta. Photo: Kurt Stueber. Wikimedia Commons. GFDL, CC BY-SA 3.0.

Tagetes erecta Commonly known as the African marigold, Aztec marigold, American marigold, Mexican marigold, *cempoalxóchitl*, and *cempasúchitl*. The African designation has nothing to do with its origin, only with the probable route it traveled to reach Europe or the place of its early spread.

Tagetes patula. Photo: Charles D'Aniello.

Tagetes patula Commonly known as the French marigold. Once again, the geographic designation has nothing to do with its origin.

Tagetes lucida Commonly known as the Mexican marigold, Mexican mint marigold, Mexican tarragon, sweet mace, Texas tarragon, and *pericón*. Perennial.

Tagetes lucida. Photo: manfred.sause@volloeko.de. Wikimedia Commons. GFDL, CC BY-SA 3.0.

Tagetes lemmonii. Photo: Emmanuel Douzery. Wikimedia Commons. CC BY-SA 4.0.

Tagetes lemmonii Commonly known as Copper Canyon daisy, Lemmon's marigold, mountain marigold, and Mexican marigold. Perennial.

Tagetes minuta. Photo: Vinayaraj. Wikimedia Commons. CC BY-SA 4.0.

Tagetes tenuifolia. Photo: Pixabay.

Tagetes minuta Commonly know as black mint, Muster John Henry, wild marigold, and Stinking John Henry.

Tagetes tenuifolia Commonly know as signet marigold, golden marigold, and lemon marigold.

Propagating and Planting

Marigolds are remarkably easy to grow. They can easily be started from seeds, cuttings, sowed directly after danger of frost has passed, started in small pots, milk or water jugs, water, or purchased as seedlings. There are many types of marigold, and within the same species, for example *Tagetes erecta*, you will find a great variety — many cultivars — distinguished by color, blossom, habit, and height. If marigolds become your passion, you will be compelled to sow seeds. This will result in time enjoyably spent scanning catalogs and websites.

Again, starting seeds in jugs and containers indoors or outside will enable you to save a little money and to sprint into the growing season. Provide drainage by drilling holes in the bottom of containers and water the growing medium and then the seedlings with a mister. Whenever seeds are planted, if the soil is warm and moist, germination can occur in less than a week and blooms appear in about one and half months. Once seedlings break the surface — and are large enough to handle — thin them to spacing appropriate to their anticipated size at maturity. If seeds are planted too deeply, germination will be retarded or simply fail to occur. Plant at a depth of one-quarter inch or follow seed packet directions. Young plants and plants of all ages transplant without drama so long as moist, warm soil conditions prevail. In fact, if you allow flowers to go to seed, you may see self-sowing throughout the growing season. Some crosses between *Tagetes erecta* and *Tagetes patula* — the 'Zenith™' series, for example — are popular hybrids; however, if you're a seed saver, remember that while seeds from hybrids may germinate, you may not get exactly the plant you're

hoping for. This is succinctly explained in a Toronto Master Gardener piece, *Growing Marigolds from Seed and Cross Pollination*.

Flower breeders hoped to give Mother Nature a nudge into variations in the 1920s and 1930s by irradiating seeds. The International Atomic Energy Commission Agency explains Mutation Breeding. *The Effect of Gamma Rays on Man-in-the-Moon Marigolds, a* play, which won the Pulitzer Prize for Drama in 1971 and its film adaptation, which debuted in 1971, explores this effort. David Burpee (1893-1980), son of the founder of the W, Atlee Burpee Seed Company, was a championship marigold breeder. In this regard, he is remembered, for his patient and ultimately successful effort to encourage the development of a white marigold. To accomplish this, he sponsored a contest with a $10,000 prize, offered in 1954, but not achieved and rewarded until 1975. Apparently, development was through progressive seed selection targeted at this characteristic.

More on Planting and Nurturing

Marigolds require well-draining soil and lots of sun to reach a full and healthy adulthood. Too much heat though and they can look scorched; however, they are drought-resistant. Water plants when about the top inch of soil is dry. Drench the soil, watering the base of the plant. Keep an eye on containers, which may require more frequent watering. Marigolds are hardy; a little neglect is unlikely to result in death, although the appearance of the plant may be affected.

Marigolds come in a variety of heights and spreads. Tall varieties can collapse, and benefit from pinching back (especially when young), staking, and sometimes replanting at a slightly greater depth. If you want to keep large plants small, the negative consequences of planting too close may be somewhat positive for you. They respond to fertilizer (try a 12-6-6 balanced fertilizer) — do not overdo it — but generally they do not need it. They respond enthusiastically to deadheading, but will seemingly thrive without it. To encourage a bushy habit in any marigold, pinch back young plants. The best pH for soil is a neutral 6.0-7.0/8.0.

Essentially, the only significance of hardiness zones relates to the start and end of their growing season. It's easy to see why marigolds have found homes around the world. For specific guidance, read the directions on seed packets (if planting from seeds) and/or refer to the species-specific guides, for the most common species, prepared by North Carolina State Extension: *Tagetes*, *erecta*, *lucida*, *patula,* and *tenuifolia*. See also Clemson Cooperative Extension's excellent guide.

Garden and Landscape Design

Purposefully designing with marigolds has a history, with examples in their use as diverse as Thomas Jefferson (1743-1826) (*Tagetes erecta* and *Tagetes patula*) and William Robinson's (1838-1935) influential *The English Flower Garden* (3rd ed. 1893). The latter suggests marigolds for use in beds as well as borders, notable for colorful blooms with which a picture can be painted. The practice continues today. Even earlier, marigolds appear in Joseph Breck's (1794-1873) 1851 *The Flower Garden*, which has brief discussions of *Tagetes erecta* and *Tagetes patula*.

Spring Catalogue of Seeds, Bulbs and Plants for 1897. John Lewis Childs, Henry G. Gilbert Nursery and Seed Trade Catalog Collection 1897. Photo: Internet Archive Book Images. U.S. Dept. of Agriculture, National Agricultural Library. Wikimedia Commons.

Marigolds also do very well in containers and can be especially attractive on decks, porches, and patios; use dwarf varieties. You have to not mind their smell, though many contemporary marigolds are said to have a far less

pronounced odor than their predecessors. Since they thrive in the same conditions, combine members of the genus *Tagetes* and the genus *Calendula.* Marigolds also do well as cut flowers. Removing leaves will reduce odor.

Different *Tagetes* species and cultivars may work better than other species and cultivars in different garden environments. Combining French marigolds (*Tagetes patula*) with signet marigolds (*Tagetes tenuifolia*) can make an attractive border. French marigolds (*Tagetes patula)* work well alone as a border. Because of their size, African marigolds (*Tagetes erecta*) work best as background. Since there are so many colors – not to mention sizes to choose from — give attention to arrangement and theories of complementary colors. This applies to other marigolds as well as the other plants, objects, and garden backdrop. Marigolds can add vibrant and massed color to any garden, so the extended period of time over which they will bloom should be considered. They are a very economical annual plant, because they grow so readily from seeds. Photographs in garden books and on the Web may serve as a source of aspiration and inspiration. For some good advice and a beautiful image, visit Gary R, Bachman's *Marigolds supply lasting color, help tomatoes*. The featured image will give you an excellent sense of size and color.

The Repelling and Attracting Power of Marigolds

Visiting a marigold bud. Although less effective than bees, butterflies are useful pollinators. Photo: Pixabay.

Deer and rabbits find the aroma of marigolds offensive. The jury is out though as to whether marigolds repel insect pests. In fact, the USDA identifies 15 pests that assault them; among them: aphids, Japanese beetles, and spider mites. And they are also susceptible to viral infections. Marigolds can attract insects, though, that attack insect pests! In addition, marigolds can be a powerful

An Ailanthus webworm moth (Atteva aurea) on a French marigold (Tagetes patula). The moth is a good pollinator. Photo: Charles D'Aniello.

tool with which to control nematodes, the pesky tiny worms that feed on plants by piercing their roots. Marigold roots emit a toxic chemical that inhibits the hatching of nematode eggs. For this to work though, marigolds must be planted at least two months prior to the planting of vegetables and at the same location where the vegetable crop is to be planted. Not all species or varieties will be effective. A study does show that French marigolds may deter whiteflies from attacking tomatoes. For a thorough review of this topic, see *The Garden Shed* article *Magical Repelling Powers of Marigolds – Myth or Fact?*

Some pollinators love marigolds, and they are an excellent food source for Lepidoptera caterpillars, which transform into butterflies and moths. To encourage pollinators, plant varieties with open centers; among these are the *Tagetes patula* varieties. In fact, the Latin word *patula* means “wide spreading habit.” To attract a diversity of pollinators, and for aesthetic impact, consider artfully mixing flowers with different

shaped heads.

Eating Marigolds

There are over 50 species of marigolds (*Tagetes*). At least some marigold blossoms and even greenery are definitely edible; but edible does not necessarily mean tasty. Some cooperative extension websites that reference the edibility of marigolds are: Colorado State University Extension's *Edible Flowers* (*Calendula*, *Tagetes erecta*, and *Tagetes tenuifolia*), University of Minnesota Extension's *Marigolds* (*Tagetes tenuifolia*), and Master Gardeners of Northern Virginia's *Edible Flowers in the Vegetable Garden* (recommending '*Lemon Gem*' *and* '*Tangerine Gem*' and '*French Vanilla*'). Under its marigold entry *The Oxford Companion to Food* briefly discusses *Tagetes minuta*, *Tagetes lucida*, and *Tagetes lemmonii*. The pot marigold, *Calendula officinalis* (a different genus), sometimes called the poor man's saffron, but more commonly the pot marigold, has a long history of consumption in the Old World. Of *Tagetes*, the French marigold (*Tagetes patula*), the African marigold (*Tagetes erecta)*, the Mexican mint marigold (*Tagetes lucida*), and the lemon marigold (*Tagetes tenuifolia*) are identified as edible in a MasterClass sponsored piece. Flower petals may readily be used in salads. Avoid a bitter taste by trimming off the white or pale green heel at the petal's base. Marigolds have been consumed in various ways for a very long time, from herbal medicines, to garnishes, to food coloring, to teas, to seasonings and condiments, and as ingredients.

Readers with a more scientific interest in marigold edibility may wish to consider such research pieces as "Edible Flowers with the Common Name 'Marigold': Their Therapeutic Values and Processing," which is cited fully under Sources. There is a history of *Tagetes* being identified as mildly toxic and especially mildly toxic to cats and dogs, with cats indicated as being most affected. The sap of *Tagetes* is indicated as an irritant. If a pet has a reaction, as always, consult a veterinarian. Quantity of exposure is likely to determine the extent of a reaction, if any.

For an introduction to this culinary delight, consider Leona Woodring Smith's *The Forgotten Art of Flower Cookery* (Pelican Publishing Company, Inc., 1985, c1973). On edible flowers in general, consider Rosalind Creasy's *The Edible Flower Garden* (Periplus Editions, 1999) and the wise advice offered in Dixie Sandborn's *Edible flowers: Adding color, flavor and fun to your dinner plate*. Before consuming, be certain there are absolutely no chemicals present of any form or type, proceed after exercising your own "due diligence," sample a small amount, and only then let your taste buds be your guide.

In Conclusion

I hope you will explore the sources below as well as the truly large body of marigold information on the Web, the size of which is testimony to the enduring popularity of this plant. Marigolds, including *Calendula officinalis* or pot marigold, have been widely used by humans across time and place, as well as subject to our manipulations. After reading this article, perhaps you'll never look at marigolds quite the same way again and your interest will be sparked to learn more.

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How to support tomato plants

By Chris Stroupe | December 2022-Vol.8, No.12

It’s never too early to think about summer tomatoes. Seed-starting is several weeks away, so now is the time for some planning. What varieties will you grow? Where will you plant them? And how will you support your tomato plants to keep them off the ground?

Why is it critical to support tomato plants? Without something to hold them up, tomatoes grow as vines snaking along the ground. Sure, they’ll grow just fine, but the leaves and fruit will touch the soil, keeping them wet and making them susceptible to soil-borne diseases.

This article will discuss a few of the most common methods for supporting tomatoes. With a little forethought, you’ll have no trouble devising a support system that’ll give you a productive, disease-free tomato crop next summer.

Cages

Homemade tomato cage. Image: Thawley, CC BY-NC-ND 2.0

Cages are just a wire grid encircling a tomato plant, with a spacing between wires of 6 to 10 inches. Choose a height that's consistent with the plants: shorter for determinate plants, taller for indeterminate. (Here's a quick explainer of the difference between determinate and indeterminate tomatoes.) Some cages are conical, with a larger diameter at the top than at the bottom. Other cages are cylindrical. Regardless, the bottoms of cages usually have wires extending downwards for several inches, so they can be secured to the soil. Some gardeners also stake their cages to the ground.

Tomato cages stacked for winter storage. Image: Stephen Melkisethian, CC BY-NC-ND 2.0

Put cages around plants while the plants are still very small. This is much easier than trying to fit a cage around a taller plant with large leaves! As the plants grow, it's usually not necessary to attach them to the cages. The leaves will grow out through the gaps between the wires, holding the plants more or less upright. Pruning the plants is a good idea, though, to keep the interiors of the plants open to airflow, dry, and disease-free. To minimize disease transmission, prune when the plants are dry, and use clean, sharp tools.

Cages can be purchased at most garden centers, or they can be made from wire fence material (see picture). Choose cages (or fencing) with nice sturdy wire, and with holes large enough for easy pruning and harvesting. Livestock fence panels and concrete reinforcing mesh are good choices for homemade cages. (The length of fencing needed for a circular cage will be about 3 times the diameter.)

Pros:

Plants don't need to be tied up.

Cons:

Lots of space needed for storage

Without pruning, plant interiors can be crowded, decreasing airflow and increasing the chance of disease

Stakes

Stakes are simple and versatile. They should be at least 5 feet tall, more for indeterminate plants. Stakes can be plastic, wood, or metal. That said, I personally have never found a plastic stake sturdy enough to handle a large tomato plant. Wood stakes should also be sturdy, at least 1 inch across. Skinny bamboo sticks won't be strong enough. Fence posts, e.g. T-posts and U-posts, make great tomato stakes, but they are heavy. ½" rebar is another great option: you can cut it to the desired length, and it's virtually indestructible.

Drive stakes at least 12 inches deep. A rubber mallet or fence post pounder will make placing stakes much easier. Better yet, set the stakes in the same holes as the seedlings when transplanting into the garden. This will avoid damaging roots when driving stakes near an established plant. Either way, put the stakes about 2 inches from the bases of the plants.

A nicely tied tomato. Image: bluekdesign, CC BY-NC-SA 2.0

Tie plants to stakes with strips of fabric, nylon hose, or stretchy plastic garden tape. Leave an inch between the plant and the stake, so the plant will have room to grow (see pictures of correctly and incorrectly tied tomatoes). Some gardeners use specialized tomato clips that form a loop encircling both stake and stalk. Start tying plants when they're a foot or so high, and add a new tie every 8 or 12 inches. When plants reach the tops of the stakes, I usually cut off their growing ends.

A tie that's too tight can cut into the stalk as it grows. Image: Cromley, CC BY-NC-ND 2.0

For tomato plants with multiple stalks, my solution is simply to attach the second (or third) stalk to a second (or third) stake a foot away from the first stake. Tying the extra stalks to the original stake will crowd the plant and leave it damp and prone to disease.

Pros:

Simple and inexpensive

Easy storage

Fruit and suckers are easy to access

Cons:

Repeated pruning and tying as the plants grow

Stakes can spread soil-borne diseases, so wash them at the end of the season

Florida or basket weave

This is a great method for large numbers of tomato plants. (It's also good for peppers.) Begin by placing stakes at the ends of a row, and after every two plants down the row (see picture). Use stakes with a height appropriate for the plants: shorter for determinate tomatoes, longer for indeterminate.

Tomato plants tied using the Florida or basket weave. Image: Dwight Sipler, CC BY 2.0

Tie one end of a roll of twine to the first stake, about a foot off the ground. (I like to use a taut-line hitch because it lets me tighten the twine later.) Run the twine down one side of the first two plants and loop it around the next stake while keeping the twine taut. Continue passing the twine down beside the plants, looping around each stake. When you've reached the last stake, reverse directions and pass the twine down the other side of the row, once more looping the twine around each post. Finally, cut the twine and tie the end around the first stake. Repeat every 8 to 12 inches up the stakes as the plants grow.

Use sturdy twine: 3- or 6-ply, with a diameter of 3 mm. (#60 and #72 twine also have the right diameter.) Twine made from natural fibers like cotton, jute, manila, or sisal will degrade, but thick twine should last a full season. UV-stabilized polypropylene twine is also a good option. It's not biodegradable of course, but you should be able to re-use it a few times. Polypropylene twine also won't stretch as much as natural fiber twine.

Pros:

Efficient for managing a whole row of plants

Inexpensive

Easy storage

Cons:

Repeated effort to secure plants as they grow

Plants must be pruned to stay within the twine

Overhead support

This is another way to handle a lot of plants. It's very common in greenhouses, but works just as well outdoors. Place strong stakes, e.g. fence posts, at either end of a row. If a row is longer than 8 feet, put one or more stakes in the middle. Use stakes tall enough that the bottoms can be firmly placed in the ground while leaving the tops at about the expected height of the plants, i.e. 4 or 5 feet for determinate plants and 6 or 7 feet for indeterminate.

Then attach one or more pieces of 10-foot electrical conduit to the tops of the stakes, so that the conduit runs from one end of the row to the other (see picture). Attach by lashing the conduit to the stakes with twine. Or attach with two "zip-ties", crossing diagonally and looping around both post and conduit. (There are many variations of this design, for example using rope or wire cable instead of conduit, or building open-sided structures from PVC or metal pipe.)

Make an overhead support by running conduit down the row, supported by fence posts. Image: © 2022 S. Christopher Stroupe

Finally, for each plant in the row, tie a piece of twine to the conduit. Run the twine down to the base of the plant, cut it, then tie it in a loose loop around the plant's base. As the plants grow, pass the twine around the stems (or vice versa) several times to support the plants. (Be sure to wrap in the same direction each time). Alternately, attach the stalks to the twine using tomato clips or loops of fabric. Prune the plants so they have only one stem.

This method also works well for climbing beans, peas, and cucumbers.

Zip ties work well to hold the support to fence posts. Image: © 2022 S. Christopher Stroupe

Pros:

Flexible and efficient (once the support system is built)

Breaks down for easy storage

Cons:

Requires extra gear, e.g. conduit

A bit of a hassle to assemble

Needs repeated attention for pruning and tying plants

Concluding thoughts

There is no single best way to support tomatoes: use the method that's most appropriate to your plants and your location. But I will offer two suggestions. First, it's worth the time – and, likely, expense – to find sturdy and long-lasting materials for a support system. And second, time spent pruning and attaching plants to their supports will be rewarded with healthy plants and a plentiful harvest.

Above all, of course, have fun! The seed catalogs will be arriving in the mail soon.

References and further reading

featured image: Lufa Farms, CC BY-NC-SA 2.0

Epic Tomatoes (2015, Craig LeHoullier)

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The stake and weave training system for training tomatoes in the home garden New Jersey Agricultural Experiment Station

Stake your tomatoes Penn State Extension

Staking and pruning tomatoes in the home garden University of Georgia Extension

Three ways to trellis tomatoes University of Minnesota Extension

Tomato staking techniques University of California Master Gardeners, Santa Clara County, CA

Yard and garden: Staking tomatoes Iowa State University Extension and Outreach

Upcoming Events

By Cathy Caldwell | December 2022-Vol.8, No.12

PMG Speakers Bureau: Wintertime De-icing Solutions That Reduce Potential Impacts.

December 6 @ 6:30 pm – 7:30 pm

The Center at Belvedere will host an in-person presentation by the Piedmont Master Gardeners on "Wintertime De-icing Solutions That Reduce Potential Impacts." Participants will learn about smart choices for dealing with snow and ice that can reduce the impacts traditional de-icing chemicals can have on our landscapes and that are friendly to people, pets and our watersheds.

Find out more and register here »

Identify and Control Non-Native Invasive Plants in Fall and Winter

December 6, 8, and 10, 2022

Part 1: Introduction and Identification: Tues. December 6 @ 7:00 to 9:00 p.m. **Zoom** ⇒Register **here**

Part 2: Control Methods: Thurs. December 8 @ 7:00 to 9:30 p.m. **Zoom** ⇒Register **here**

Associated Pen Park Walk: Sat. December 10 @ 10:00-11:30 a.m. ⇒ Register **here**

Tree Steward Tim Maywalt will present this two-part class by Zoom. Managing the invasive plants that are overtaking our green spaces is a challenge. But any of us can do it with the knowledge to identify and treat them. This class will show you how to identify about 30 common invasive plants in the Virginia Piedmont and illustrate a wide range of options for treating them. To be covered:

Identifying invasive plants

Which invasives you can best treat now and when to treat them if fall isn't the best time

Using manual & mechanical control methods

Methods for controlling invasives with herbicides

Choosing the right herbicide and equipment, and using it properly

Forest safety, equipment and herbicide safety, and personal protective equipment

Reference documents for more detailed identification and treatment information

Sources for equipment, supplies and professional help from State Foresters and Conservationists and commercial vendors