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**How Plants Perceive And Respond To The World** Janine Connell, MGV

# FOUR-SEASON GARDENING IN THE HUDSON VALLEY

Presented by Victoria Coyne
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**Winter wonderland**

Tulips - in the snow and in a vase
Windowsill gardening
Views from each window

Winter views versus Summer view
Celebrating the borrowed view.

Evergreen
Reflective light - sparkle in our winter sunlight

Umbrella pine *Sciadopitys verticillli*
tree
looks very tropical
grow to 20 feet not dear resistant
Living fossil
Zone 5-8

Grey owl Juniper *Juniperus virginiana 'Grey Owl'*
shrub
Wonderful, soft, gray foliage spreads to 4 feet
Not deer resistant
Zone 3-9

Japanese white pine *Pinus parviflora 'Glauca Nana'*
tree
Wonderful white pine that only grows 8 to 10 feet stiff needles silver blue wonderful
open habit very Asian feel
Zone 4-7

Andromeda *Pieris japonica*
shrub

Broadleaf Evergreen, the only one that we have found to be deer resistant. Wonderful varieties can grow only 12 inches tall and some that go 12 feet tall. Must be planted in a dry shade. “Valley Valentine”, one of my favorite varieties.
Zone 5-8

Boxwood *Buxus sempervirens*
shrub
deer resistant and add wonderful structure to the garden.
Formal, rounding balls of green
Zone 5-8

Witch hazel *Hamamelis x intermedia*
tree
Native vs. Asian
March Blooming Tree.
fabulous fall color. 15 to 20 feet tall.
‘Arnold promise’ One of the best varieties.
Zone 3-8

Winterberry native Holly *Ilex Verticillata*
Shrub
Grow in a moist spot, bear stems of beautiful berries, ( Can be red, orange or yellow) wonderful in December often eaten by the birds by the end of the winter. Some small varieties are four or five feet but most will want to go 8 to 12.
Zone 5-9

Alberta Spruces
tree
Use in a grove or group
Very deer resistant
Most grow in full sun
Slowly to 10-12 ‘
Zone 2-7

Korean fur A*bies koreana*
tree
Violet purple cone
Soft foliage
Silver blue tone back side of needle
Zone 5-7

**Spring has sprung -**
**the easiest season to have a beautiful garden**

Bulbs many bulbs deer resistant
daffodils allium frittaliara

*Enkianthus campanulatus*
shrub
upright layered branches with tuffs foliage crowded at the end of the stems.
Wonderful drooping Bell flowers.
Bonfire of fall color.
Zone 4-7

Winter Rose, Lenten Rose
Hellebores
*Helleborus spp*
deer resistant
shade loving.
There are even some varieties that bloom in December.
Wonderful Evergreen foliage
flower looks good for months and months and months.
Self sowing.
Zone 3-9

Dogwoods *Cornus Florida*
- winner for the four-season tree. Wonderful spring flower handsome foliage fabulous fall color with leaves and fruit that show off amazing structure to hold snow.
Native and Kousa
Zone 5-8

Japanese maples *Acer palmatum*
another winner with the structure
fall color color
all season
Zone 5-8

Itoh peony *Paeonia x itoh*
won't flop has great, dead heads, fabulous footage, even into the fall
No staking needed

Zone 4-9

Crabapple *Malus spp.*
small, flowering tree
glorious in the spring and fabulous with fruit in the fall.
Do not plant on top of sidewalks
Zone 4-8

**Summer - bring on the heat**

Annuals are a must to keep the garden colorful through the heat of summer.
Self-seeding or direct sow are always easiest and least expensive
Poppies -seed into the snow.

Zinnia - wonderful new varieties out there.

Nigella love in the puff

Bachelor buttons

Verbena bonariensis

Nasturtium

Late blooming plants

Salvia

Grasses

Coleus

Castor beans

Bright light, Swiss chard

Mexican sunflower

Gomphrena Strawberry Fields, fireworks

**Fabulous Autumn**

Chaste tree *Vitex agnus-castus*
die back shrub
Blue, pink or white flowers
wonderful foliage
fabulous deadhead
silver stems with wonderful dead heads through the winter
Zone 6 (I believe and find if hardy in zone 5)

Seven-sons Flower *Heptacodium miconiodes*
large shrub/ Small tree
peely bark scented flower
pollinator celebrator
Zone 5-9

Montauk Daisy *Nipponthemum nipponicum*
perennial
will take a big footprint put it somewhere that it won't disturb other things
November flowers.
Zone 3-9

Russian sage *Perovskis atriplicfolia (Salvia yangii)*
perennial
- particularly wonderful with ornamental grasses.
Ghost like silver stems
Cut back in spring
Zone 4-9

Toad lilys *tricyrtis*
Perennial
Shade loving
Zone 4-9

Autumn blooming crocus *Colchicum*
Large then true crocus
Very toxic
Plant as soon as you get them
Zone 4-9

Bush Clover *Lespedeza thunbergii*
Fountain like habit
Purple pea like flowers
Zone 4-9

Cutting back perennials
Things to cut back in half before the Fourth of July.
Helpful to extend blooms as well as keeping the plants from flopping.
Autumn joy Sedums
Asters
Mum
Shop when your garden is quiet
We all know we want to buy things in Bloom go ahead this gives you permission.
Wet, hole wet plant.
As long as you can get a shovel in the ground, it’s not too late to plant.

Structures

Benches
Arbors
Statuary

# MAKING A MEADOW: A WORK IN PROGRESS

Presented by: Sarah Holsted and Courtney Churchill

*Financial support for the projects described here is provided by grants from **Partners for Climate Action Hudson Valley**. CCE Ulster County Master Gardener Volunteers DO NOT recommend businesses or products to maintain Cornell's standing as an unbiased source of information. However, in our presentation and in these notes, we include the sources of seeds and materials that we used to accomplish these projects.*

Master Gardener Volunteers were critical to every step of the meadow-making process, especially Richard Kilberg, Mike Piedmonte, Michael Hughes, and Ellen De Long. ♡

**Meadows are diverse ecosystems with grasses & flowers at varying heights.**

- Provide habitat – food & shelter - for pollinators and other animals
- Enhance carbon storage, nutrient recycling, runoff filtration & soil building
- Support connections between native plants and animals

**By using native plants that support pollinators in our meadows, we are restoring the foundation of the food web for our sites – and the surrounding areas.**

**Native plant diversity is directly correlated to native bird population & diversity.**

- Areas with a high number of non-native plant species have fewer caterpillars and fewer bird species. (Burghof, 2008)
- 96% of terrestrial birds in North America rear their young on insects. Insects are essential for baby bird growth. One nest of chickadees needs up to 9,000 worms before fledging. Narango et al., 2017
- During the breeding season, insect prey makes up 90% of bird food.

**Lawns are food deserts for pollinators and birds.** Lawnmowers are significant polluters. Lawn mowers create 5% of air pollution; use 800 million gallons of gas; release 30% of fuel as a toxic gas. If run for an hour produces as much pollution as a car driven for 100 miles.

## Sources

- Planting for Pollinators: Establishing a Wildflower Meadow from Seed [fact sheet]: https://extension.unh.edu/resource/planting-pollinators-establishing-wildflower-meadow-seed-fact-sheet
- Pollinate HV: A Comprehensive Guide to Supporting the Hudson Valley's at-risk pollinators. https://www.pollinatehv.org/
- Neighborly Natural Landscaping in Residential Areas. Penn State Extension, https://extension.psu.edu/neighborly-natural-landscaping-in-residential-areas
- Zimmerman, Catherine B. Urban & Suburban Meadows: Bringing Meadowscaping to big and small spaces. Matrix Media Press, Silver Spring, MD, ©2010

## What is a meadow?

| Meadow | Prairie (French for *meadow*) |
|---|---|
| • Found in Eastern North America<br>• Cool season grasses<br>• Native wildflowers<br>• Created when forest canopy opened via fire, flood, agriculture<br>• Experience plant succession – return to forest<br>• Meadows in the east are a temporary ecological community. | • Found in Midwestern North America<br>• Warm season grasses<br>• Native wildflowers<br>• Rainfall determines prairie type<br>• No plant succession – low rainfall, burn, and grazing prevent woody growth<br>• Burning is part of life cycle |

**Because meadows want to be forests, fighting succession will be part of any design and maintenance plan.**

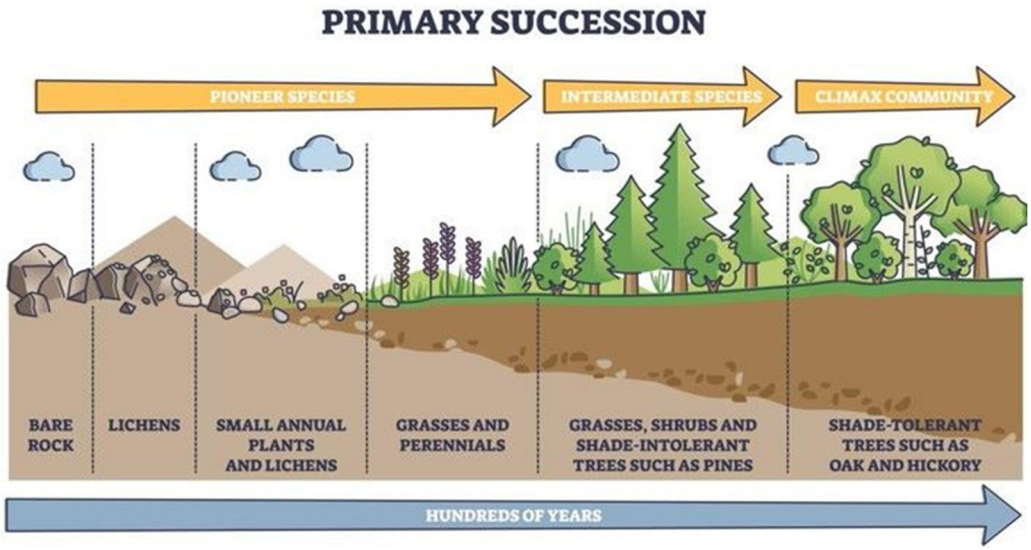


Image source: https://news.uchicago.edu/explainer/what-is-ecological-succession

## Process for Establishing a Meadow

**Site Preparation**
- Smother
- Strip
- Singe
- Speed

**Design**
- Site analysis
- Right plant, right place
- Process of change
- Design aesthetics

**Establishment**
- Hand seeding
- Mechanical seeding
- Planting with plugs
- Planting with container plants

**Maintenance**
- Mowing: Seeded Meadow
- Weeding: Plugs, container plants
- Burning

**Factors to consider when making a meadow: Site, Size, Visibility, Sun, Soil, Drainage, Site Access, Water, Vermin, Regulations, Labor**

- Choose a site that can be undisturbed – and not disturbing (to people)
  - Undisturbed: Safe for pollinators throughout their life cycle: bare soil, leaf litter, dead stems, no pesticide or chemical exposure, less foot traffic
  - Not disturbing: Informal and possibly floppy, twiggy, shaggy, untidy in some seasons: keep edges tidy, sidewalks and entryways clear
- Meadows need to be at least 400 square feet to support a good diversity of wildflower species that will pollinators: 20' x 20' or 40' x 10'
- An established meadow should be dense enough to out-compete weeds and provide a succession of diverse flowers to support pollinators.
- Right plant, right place… Not all wildflowers are suitable for all conditions. If using a seed mix, select one that aligns with site and soil conditions. A site with full sun and good drainage is ideal for many species. Partial shade and/or wet areas can be tolerated by many others.
- Soil: wildflowers generally prefer low fertility sites
- Drainage: Determine whether the soil tends to be wet or dry, if there are low spots
- How will you – and your equipment – access the meadow?
- How will the equipment be powered? power outlets, extension cords; Batteries; fuel
- Do you have access to a water source? If not, time installation to seasonal rainfall.
- What kind of wildlife and weed pressure do you have? Fencing? Spray? Poison ivy?
- Are there local ordinances about mowing?
- Who will do the work – installation, early maintenance, long-term maintenance?

**Site Prep: Results from test to eliminate vegetation from the MG Demo Meadow**

- Solarizing with UV-rated clear plastic is the most effective organic method for eliminating vegetation and weed seeds.
- Smothering with cardboard kills most existing vegetation but does not kill seeds.
- Herbicidal vinegar does not kill roots or the seed bank. It kills visible vegetation only after several applications.

**Lessons from using solarizing as a site prep method**

- Document site dimensions early on and remember where you put the numbers.
- Draw a scale model on graph paper and make copies.
- Wait until the weather is really warm before laying plastic.
- Plastic rolls come in several sizes. It is somewhat easier to work with smaller sizes. 10x100 or 12x100 vs 20x100
- Make the meadow perimeter less than the area of all of the plastic to account for trenches, folding, overlaps, miscalculation
- Overlap plastic sheets by 1'-2'. Space the landscape staples 1'-2' apart.
- Observation: Meadows will be square because plastic sheets are square. Incorporating curves requires more plastic.

**Thoughts on Planting Plugs**

- The optimal time to plant plugs is early Sept. so they can get rooted to withstand the heave of a winter freeze. The weather is more temperate, less likely to dry them out.
- Each plug required a hole 3” wide and 6” deep. Use a power drill with an auger bit.
- Lay out the plants in swatches to create visual interest. Then dig holes with the drill.

**Design Tips**

- Support entire pollinator life cycles with maintenance practices and plant choices
- Right plant, right place. Plant in drifts to save pollinator energy.
- Provide a diverse range of plants that bloom in succession from Mar/April-Oct/Nov
- Meadows need to have at least 40% grass to get the benefit of weed suppression. Grass provides a food source, nesting material, habitat for wildlife.
- In a small space, use less competitive grass species, so you don’t end up with a monoculture: clump forming (little bluestem) vs rhizome-spreading (switchgrass)
- In an urban space: Pair tall grass with tall flowers where they don’t overwhelm: switchgrass + goldenrod. Use lower, clump-forming grasses around entryways or paths: little bluestem, prairie dropseed, side oats gramma, blue gramma
- Around walkways, plan for salt on paths and provide a buffer (ex. bark mulch).

**MG Demo Meadow Plant List**

**Demo Meadow, 3,000 square feet, 3 pounds of seed, Ernst Seeds**

- *Schizachyrium scoparium*: Little Bluestem: 32.6 (% of seed mix by weight)
- *Elymus virginicus*: Virginia Wildrye: 25.3
- *Andropogon gerardii*: Big Bluestem: 20
- *Eragrostis spectabilis*: Purple Lovegrass: 0.7
- *Panicum virgatum*: Switchgrass: 3.6

**Old Meadow: 50 plugs of each, Treadlight Farms**

- *Drymocallis arguta*: Tall Cinquefoil
- *Helianthus giganteus*: Giant Sunflower
- *Lespedeza capitata*: Round Headed Bush Clover
- *Liatris spicata*: Blazing Star
- *Tridems flavus*: Purpletop Tridens
- *Andropogon gerardii*: Big Blue Stem
- *Monarda punctata*: Bee Balm

**Turning the Page for Pollinators Plant List - East Meadow (300 square feet)**

- Version 1: 3 oz of Northeast Native Wildflower Seed Mix, Hudson Valley Seed Co.
- Version 2: PollinateHV Local Ecotype Seedlings from Hudson Valley Seed Company
- *Aquilegia canadensis*: Eastern Red Columbine: 3
- *Doellingaria umbellata*: Flat-topped aster: 5
- *Monarda punctata*: Spotted Bee Balm: 67
- *Penstemon hirsutus*: Hairy Beardtongue: 72
- *Salix humilis*: Prairie Willow: 5
- *Solidago nemoralis*: Grey Goldenrod: 40
- *Verbena hastata*: Blue Vervain: 10
- *Zizea aurea*: Golden Alexander

# CREATING A BACKYARD POND:
# THINGS I WISH I WOULD'VE KNOWN

Presented by Mike Piedmonte

The overall biggest challenge of putting an informal pond in your backyard is blending into the existing style of gardening.
Being successful will require thoughtful planning and flexible execution.

SITE SELECTION
Sunlight: A Curse and a Blessing
Soil Type: Sandy, Clay, Rocky, Wet
Water Table
Grade: Level or Sloping
Footprint: Perimeter Use
Trees: Roots and Shade
Access to Water and Electric

BEFORE YOU DIG
Underground electrical and utility lines
Zoning
Homeowner Liability
Water Table: Test if uncertain
GFCI: Ground Fault Circuit Interrupter
Fill Disposal

CRITICAL POINTS: Pre-Formed
Have you tested your water table?
Is your final pond edge a few inches above the ground level
Allow a spot for overflow to be directed away from the house

CRITICAL POINTS: Free Form Pond Liner
Don’t pull too tight
Don’t trim excess to the perimeter, allow 10-12” for anchor/landscaping stones
Allow 24 hours before trimming
Allow a spot for overflow to be directed away from the house

POND LINER FORMULA
Pond Width + (Depth x 2) + 2 ft Overlap = Liner Width
Pond Length + (Depth x 2) + 2 ft Overlap = Liner Length
COMMON POND BLUNDERS

Poor Location
Underestimating Labor
Too Shallow; Too Small
Poor Access
Steep Sides
Skimping on Stone
Improper Filtration
Improper Berns for Waterfalls
Overflow to close to the house

PUMP CALCULATION
Rule of Thumb; Circulate –
50% - 100% of volume per hour plants only
100% - 200% of volume with a small school of fish
>200% per hour for Koi or larger schools
Waterfall: 100-200 gal * width of spillway

FILTERS
Natural: Plants and gravel
Mechanical: Removes debris and sediment
Biological: Breads bacteria breaks down fish waste and decaying debris into nitrates
Must run 24 hours
Filter Box: Combines both Mechanical and Biological
UV Clarifier: Passes water through a tube killing microscopic particles

PLANTS FOR WATER GARDENS: CATEGORIES AND SUGGESTIONS
Floating:  provide shade; reduce algae
    Water Lettuce, Water Hyacinth
Marginal/Bog: 4 to 6 inches of water
    Dwarf Cattails, Horsetail Rush. Pickerel Rush; Callas; Cannas
Submerged:12 to 24 inches
    Lous (Nelumbo), Water Lilies (Nymphaea)
Submerged Oxygenators: improve water quality; shelter for fish
    Hornwort, Water Milfoil, Anacharis, Bacopa

FISH
Ideal pH for a garden fish pond is 6.5 to 8.5;
Optimal, slightly alkaline: 7.5 to 8.5

For small and medium ponds <1000 gals; 2 to 2.5 feet deep

Mosquito fish: 3 inches; 1 or 2 years
Goldfish: Comets, Shubunkin; 8 to 14 inches; 10 to 15 years
For larger ponds > 1000 gals; 3 foot or deeper
Koi: Up to 3 feet; 20+ year life expectancy

WINTER MAINTENANCE
Remove Debris
Cut back hardy aquatic to prevent rotting
Maintain a hole in the ice to allow gas exchange: oxygen in and methane to.
Keep the pump circulation or use a “bubbler” to keep the pond from freezing
Stop feeding fish when water temperature drops fellow 50 F
Remove pumps if pond freezes solid

SOURCES AND REFERENCES
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Robinson, Peter, Pond Basics: A Step-by-Step Guide for Water Gardeners. Sterling Publishing Co, 2000.

New York Building Standards and Codes
https://dos.ny.gov/system/files/documents/2024/08/tb-1014-uc-pool-summary-rev-1.pdf

How to Build a Backyard Pond
https://webbsonline.com/Article/build-backyard-pond

The Wildlife Trust: How to Make a Bog Garden
https://www.wildlifetrusts.org/actions/how-make-bog-garden

How to Create a Mini Pond
https://www.wildlifetrusts.org/actions/how-create-mini-pond

Detailed Instructions for Creating a Pond with a Preformed Pond
https://www.oase.com/_Resources/Persistent/b/2/f/1/b2f1c1d2965d58d27cda1d0237e651df399cc2e1/OA-WG_DIY-Anleitung-Teich-mit-Teichschale_B2C_2022_EN_V1.pdf

How to Install a Pond Liner
https://worldofwater.com/how-to-ponds/installation-guides/pond-liner-installation/

Calculator
https://pondacademy.com/pond-calculator?gad_source

VIDEOS: YOUTUBE
Easily Install a Wildlife Pond
https://www.youtube.com/watch?v=I6uTLCBROUk

How to Install A Rigid Plastic Pond in Your Garden
https://www.youtube.com/watch?v=rDWMs3JYi3I

Top 5 Mistakes When Building a Pond
https://www.youtube.com/watch?v=N7VnnWJbaUw

SUPPLIERS
Atlantic-OASE
https://www.atlantic-oase.com/public/uploaded/media/CATALOGS/2026_ATLANTIC-OASE_CATALOG.pdf

Just Pond Liners
https://justpondliners.com/

MacCourt
https://maccourtproducts.com/Pond-Liners

Tetra
https://www.tetra-fish.com/pond.aspx

The Pond Outlet
https://www.thepondoutlet.com/

Webb's Water Gardens
https://webbsonline.com/

World of Water
https://worldofwater.com/

# DOWN THE GARDEN PATH

Presented by David Thiergartner

Join us as we explore some of the world's most influential and beautiful gardens. The journey down the path will delve into 7 gardens from California to Europe. Each garden will be examined for the contributions it has made influencing the garden story, garden design, sustainability, bio-diversity, as well as mental and physical health. And of course- the beauty they share with all of us.

1. Tokachi Millennium Forest- Japan
https://www.tmf.jp/

2. Great Dexter - UK
https://www.greatdixter.co.uk

3. Sissinghurst Garden - UK
https://www.nationaltrust.org.uk/visit/kent/sissinghurst-castle-garden

4. Longwood Garden - PA
https://longwoodgardens.org/

5. Fenway Victory Garden - MA
https://fenwayvictorygardens.org

6. New York Botanical Garden - NY
https://www.nybg.org

7. Sunnylands Garden - CA
https://sunnylands.org

8. Lurid Garden - IL
https://www.luriegarden.org

9. Thomas Jefferson's Monticello Vegetable Garden
https://www.monticello.org/tours/gardens-and-grounds-tour

10. The High Line - NY
https://www.thehighline.org/

11. Matthaei Botanical Garden at Nichols Arboretum
https://mbgna.umich.edu

# BORDERS FOR THE EDGES OF YOUR PROPERTY

Presented by Cecily Frazier

The talk starts with a poem by Robert Frost called “Mending Wall,” in which Frost takes the position that there is no need for a fence, while the neighbor with whom he is arguing believes that Good Fences Make Good Neighbors.

Frost is disturbed by the neighbor clinging to his father’s idea that there must be a fence and that must never be allowed to change.

Frost is practical and has the idea that if at the end of the trail one finds two trees, an apple tree and a conifer, that those two trees will not quarrel. His neighbor, however, is quite stubborn and thinks trees are just like humans and likely to quarrel. Put two different people together, and you’ll eventually get a dispute. He extends this belief to trees and can’t see the difference between humans and trees. The neighbor is missing the idea that two trees will not fight. It is a fun poem since the neighbor is so set in his way.

If you are thinking of putting in a border (or a fence or other physical barrier), you should consider the reason for doing so, the benefits and drawbacks, the cost, the time it takes to plan, install, and maintain it, and the aesthetics.

One common reason for borders is privacy, whether that is because of an unfriendly neighbor, or the presence of a surly dog, or children who like to make a lot of noise. Depending on the nature of the barrier, it may be effective in addressing the issue. The kind of reason may dictate the need for a really strong and tall fence that blocks noise and interferes with communication of any kind. Your son is on the soccer team and wants to be able to practice kicks without having to go into the neighbor’s yard to retrieve the ball. On the opposite end of the spectrum, maybe you just want something that is attractive, to both yourself and your neighbor, something that has wider open areas that encourage communication. That might be what you want if your neighbor is an elderly couple who are friendly and willing to chat briefly. Or is it really necessary to spend the time and money that a fence requires?

Not every situation requires a fence. I am sure you can think of numerous reasons that “Good Fences Make Good Neighbors.”

The  poem continues by describing how Frost puts up with the neighbor who insists that there should be a fence, even though the apple tree on Frost’s side will not eat the pine cones on the neighbor’s side, despite how much the neighbor insists that fences are best.

In the talk I discuss materials that can be used in building fences and the assorted properties of fence. I also speak of the benefits and disadvantages of certain

products, as well as the need to approach the municipalities to learn the rules and regulations pertaining to fences. I have tried to put in costs but they are just estimates. Costs vary, as do the rules for different municipalities. I put in local prices I looked up but they are also just rough estimates. I hope you find this information helpful, but don't rely on any specific numbers. Costs are variable, and costs are influenced by governmental and other changes on a daily basis.

Here are some plants that you might consider:

In a small yard consider vertical plants to draw the eye up like Clematis (has short roots), Coral Honeysuckle (native) (*Lonicera sempervirens*). Layer with columnar shrubs like Sky Box Japanese Holly (*Ilex crenata 'Sky Box'*), or Karl Foerster Grass (*Calamagrostis × acutiflora 'Karl Foerster'*) for a lush space-saving screen for a tall fence in a thin space. You can let these plants grow on the small evergreens. Chain-link, and other fences that need a cover are perfect for these plants.

Climbing Hydrangea (*Hydrangea anomala subsp. Petiolaris*) can work along the fenceline. Let it trail across the fence. It adds a dense leafy layer to your plants. It softens edges and concrete edges.

Joe Pye Weed (*Eutrochium purpureum*)will stand high and tall but does not buckle outward. It produces large spaces for pollinators along the fence line. Use it as a repeating fence line. At the end of summer it will produce large bouquets of color and serve to anchor the fence.

Feather-Reed Grass (*Calamagrostis × acutiflora)* works well with its strong backdrop along a fence with added perennials in front. It is not bulky, and it stands tall all season. The flower plumes stand up in summer and even in winter for interest.

Tall garden phlox (*Phlox paniculata*) grows straight up and adds color in drifts and pairs with grasses over the summer.

Clumping bamboo (*Fargesia robusta*) also grows upward, moving gently in the wind. Plant in sections. It makes a statement growing fast and strong. It can give you instant privacy.

Russian Sage (*Salvia yangii*) works well along the fence. It creates layers well in summer. It adds a softness and will integrate easily into your other plantings. Thrives in heat. It will work itself into your fence and what you have already planted.

# THE EVOLVING GARDEN

Presented by Marge Bonner and Ellen DeLong

## Lessons Learned from 25 Years of a Demonstration Garden

The Demonstration Garden at **SUNY Ulster** began in 2000 as a small xeriscape garden designed to showcase drought-tolerant plants and water-wise gardening practices. Over the past 25 years, the garden has evolved in response to changing environmental concerns, new gardening knowledge, and the needs of pollinators and the local ecosystem.

What began as nine planting beds with 55 drought-tolerant plants has grown into a dynamic landscape that now includes:

- A **Xeriscape Garden**
- A **Rain Garden**
- A **Pollinator Meadow**
- A **Pollinator Pathway**

The garden continues to serve as a living laboratory where gardeners test ideas, observe outcomes, and share lessons learned with the community.

## What is Xeriscaping?

Derived from the Greek word *Xeros* (dry), xeriscaping is water-wise or water-efficient gardening. It is not a desert garden; it can be applied to any gardening style that promotes water conservation through appropriate plant selection.

## The 7 Principles of Xeriscaping

1. **Design and Plan**: Evaluate your site's topography, soil, drainage, and light before drawing a plan.
2. **Practical Turf Areas**: Reduce traditional lawn space, as over half of household water is used for irrigation.
3. **Appropriate Plants**: Group plants with similar water needs and choose native species where possible.
4. **Improve the Soil**: Incorporate 1”–2” of compost into the top few inches of soil to feed both plants and soil organisms.
5. **Water Efficiently**: Use drip irrigation or soaker hoses to minimize evaporation and runoff.
6. **Mulch**: Use mulch to suppress weeds, regulate soil temperature, and conserve moisture.
7. **Maintenance**: Avoid synthetic chemicals; use Integrated Pest Management (IPM) and prune or weed as needed.

**Lessons Learned in Soil and Mulching**

- **No-Dig Gardening**: Move toward layering organic materials instead of traditional rototilling.
- **The "Green Mulch" Shift**: Rather than importing wood mulch, transition to "living mulch" using low-growing groundcovers. Living mulch mimics natural ecosystems, eliminates bare soil, supports soil organisms, allow plants to self-seed and reduces the need for imported materials.
- **Avoid Over-Mulching**: Repetitive mulching with certain materials can create a "hydrophobic" crust that prevents water from reaching the ground.

**Seasonal Cleanup: "Fall Asleep in the Fall, Spring to Action in the Spring"**

- **Fall Strategy**: "Leave the leaves" and stems to provide winter interest and support for wildlife. Provide winter habitat for pollinators. Leave most grasses standing. Only remove material that harbors specific diseases.
- **Spring Strategy**: Remove damaged plant material, weed. Use the "Chop and Drop" method, cutting back last year's stems but leaving older ones standing for stem-nesting pollinators.
- **The "Mullet Haircut" Approach**: Keep the front of the beds tidy for aesthetics while leaving the back "messier" for wildlife benefit.

**Rain Garden, Pollinator Meadow and Pollinator Pathway**

- **Rain Garden (est. 2014)**: A shallow basin designed to receive and filter storm water runoff, replenishing local underground water supplies. Supports native, deep-rooted perennials, grasses and shrubs. Plants must tolerate both waterlogged soil and dry, drought like conditions. **Lesson**: Always check the slope of the bed after digging to ensure proper water flow.
- **Pollinator Meadow (est. 2019)**: Created to provide habitat for pollinators. Invasive species and deer browsing pose major problems. **Lesson**: Experiment with small test plots before expanding to large areas.
- **Pollinator Pathway (est. 2020).** Modified college entry to turn defunct water feature into an elongated pollinator friendly pathway.

**Looking Forward**

- **Soft Landing Beds**: Establish areas under trees and shrubs to support overwintering pollinators.
- **Native Support**: Increase the use of native plants and self-sowing annuals to reduce yearly planting labor.

# DORMANT TO DAZZLING:
# THE SEASONAL JOURNEY OF FLOWER BULBS

Presented by Dottie DeMarco

## BULB BASICS & THE SEASONAL CYCLE

### 💐 Why Grow Flower Bulbs?

• Easy, reliable color—even for beginners
• Strong seasonal structure and early spring interest
• Endless design and naturalizing possibilities

### 🌱 What Is a Flower Bulb?

A self-contained underground plant storing:
• Energy
• Nutrients
• Next season's flower

### 🌿 Types of Underground Storage Organs

**Bulbs:** tulips, daffodils
**Corms:** crocus, gladiolus
**Tubers:** dahlias
**Rhizomes:** irises

### 🌸 Anatomy of a Bulb

Basal plate • Scales • Tunic • Shoot primordia • Root zone

### 🌷 Common Bulbs to Grow

Tulips • Daffodils • Lilies • Alliums • Hyacinths
Amaryllis • Fritillaria • Camassia

### 🌿 The Seasonal Cycle of Bulbs

### ❄️ Winter — Dormant
• Bulbs rest underground
• Cold triggers flower formation
• Soil insulates from temperature swings

### 🌱 Spring — Awakening
• Roots grow first, then shoots
• Leaves rebuild energy

• Bloom sequence:
Crocus → Daffodils → Tulips → Hyacinths → Alliums

### 🌞 Summer — Recharge
• Let foliage yellow naturally
• Bulbs refuel for next year
• Lift tender bulbs (e.g., dahlias)

### 🍂 Fall — Planting Time
• Warm soil encourages root growth
• Plant 2–3× bulb height deep
• Space for impact or naturalizing

## CARE, DESIGN & TROUBLESHOOTING

### 🌼 Indoor Winter Bulbs

**Amaryllis & Paperwhites**
• Easy indoor color
• Stagger planting for weeks of blooms

### 🌱 What Bulbs Need to Thrive

### 🌿 Soil
• Excellent drainage is critical
• Slightly acidic to neutral pH
• Add compost; avoid fresh manure

### 🌞 Sun & Water
• Most bulbs prefer full sun
• Water well after planting
• Spring moisture supports flowering

### 🌸 Fertilizer
• Apply in fall or early spring
• Avoid after flowering
• Slow-release formulas work best

### 🌷 Designing with Bulbs

### 🌼 Layering (Lasagna Planting)
• Stack early, mid, and late bloomers
• Ideal for containers and beds

### 🌿 Year-Round Interest
• Plan blooms from early spring to summer
• Mix heights, colors, and textures

### 🌸 Great Plant Partners
• Perennials: hostas, hellebores
• Grasses for structure
• Shrubs for contrast

### 🌷 Sample Bloom Calendar

**March:** snowdrops, crocus
**April:** daffodils, early tulips
**May:** late tulips, alliums
**June–July:** lilies

### 💐 Common Problems & Solutions

### 🐿️ Pests
• Squirrels dig; voles eat bulbs
• *Solutions:* wire mesh, gravel, repellant bulbs

### 🌧️ Rot & Disease
• Usually drainage related
• Improve soil and airflow

### 🌱 Weak or No Blooms
• Too little sun
• Bulbs too shallow or immature
• Insufficient winter chill

### 🌸 The Bulb's Year-Round Journey

**Dormant → Awaken → Recharge → Prepare → Bloom**
Gardeners influence every stage for stronger, longer-lasting displays.

# FUNDAMENTALS OF GARDEN DESIGN

Barbara Londa and Barbara Troan

**Landscape design vs garden design**

Landscape design – large scale planning of entire environment, including hardscape, terrain and drainage, structural foundation while garden design fills it with life.

Garden design - concentrates on the aesthetic, small scale, intimate spaces.

Step1: Set Goals: How is the area to be used? Seating, play areas, pets, wildlife, need for screening unsightly or undesirable views.

> Style of garden: formal, informal (cottage garden, meadow), desert or xeriscape, water garden, meditation garden
>
> Type of garden: Landscape, entry way, mailbox, driveway, Ornamental, vegetable

Step 2: Site planning – what will influence your planning. Call 811 to check for underground utilities- (water, electric, cable)

Unsightly view, preserve a beautiful view, noise or wind block; sun vs shade, permits needed? HOA rules, pH testing (Cornell Co-operative Extension), more complete soil testing to Rutgers, soil type (clay vs sandy), soil conditions (wet vs dry).

Other considerations: what is your budget? Hiring professionals?

PRINCIPLES - how to arrange features to make a more functional, beautiful and valuable landscape. Proportion or scale, order using balance, symmetry or asymmetry, repetition, focal points and unity.

ELEMENTS - physical qualities used to describe features in the landscape: Line, straight vs curved, forms, texture, color, and visual weight.

Step 3: Draw a plan – select a small area or part of a garden especially if an established garden, keep plan simple, consider budget (soil amendments, plant material, mulch, how much water needed to establish plants).

Hardscapes: Non-Living structures, meant to be permanent, framework for softscapes (plant material), sidewalks, driveways, stairs/ramps, walls/fences, arbors/pergolas, water features, edgings, lighting, in-ground irrigation, large rocks; should be in harmony with softscapes. Think about availability of materials, costs, maintenance. **Materials**: wood, metal, vinyl, pavers/bricks/wall block, concrete, asphalt, rock/stone, loose aggregates. Sustainability- local, recycled materials, retaining walls to prevent erosion.

Softscapes – living material, trees, shrubs, perennials and annuals, soil, and mulch.

Mark the ground where the garden will be placed: can use a hose, marking paint.

Prep ground, cardboard, dig up grass/weeds, amend soil as needed. If re-establishing a garden, dig out plants you want to save if possible.

Think about the future

Costs up front and ongoing (edging, plants, compost, soil), Maintenance of garden plants: watering, weeding, replanting, and mulch.

To calculate the amount of mulch needed use the mulch calculator:
https://mulchcenter.com/yardage-calculator/
Think about the effects of aging on energy levels, strength and flexibility

**Remember:** Simplicity is the key

Include natural features (slopes, boggy areas) preexisting features (Walls, large rock, structures) and include any plans for new hardscape.

Add proposed plantings - account for mature growth as it will affect what plants are happy and how they fit in their environment.

Add color to the finished diagram; it will give you a big picture of how the finished site will look; use tracing paper to adjust plan and save your base drawing. Be sure to include seasonal interest and plan for succession of bloom.

Remember with perennials:

→First year they sleep →Second year they creep →Third year they leap

Step 4: Implementation of the plan

Amend Soil, add compost, and adjust pH as needed (6.2 - 7.0 for most flowers);
CCE offers soil testing.

Order of planting– trees, bushes, perennials, annuals, ground cover, Avoids disturbing roots of larger plants.

Take the time to do a trial placement before planting for size and layout: practice makes perfect!

Remember:

Don’t plant behind/under the dripline, plants will not survive there: Don’t over plant - allow for plant maturity; Don't be afraid to move add/subtract plants as garden evolves or your tastes change; You don’t need to plant only natives, keep what you like as long as not an invasive plant.

DO: Plan for mature size, right plant, right place; Work/plan in a small section to start garden; Plant 3 feet out from house; Plant in odd numbers: 3,5,7’s for repetition and impact; Simplify; you can always add but harder to remove plants; Plan for pollinators and use native plants; strive for 70 percent native. Use less turfgrass.

Quote from Doug Tallamay

“In the past, we have asked one thing of our gardens: that they be pretty. Now they have to support life, sequester carbon, feed pollinators and manage water.”

**Resources**

Cudnohufsky, Walter. Cultivating the Designers Mind: Principles and Process for Coherent Landscape Design. 2019

Penn State Extension, www.extension.psu.edu “Design Basics for the Residential Gardener”, 6 hour course

Blog: https://Notanothergardeningblog.com by Sue Gaviller, March 2018.

Resource for native plants list of New York
https://extapps.dec.ny.gov/docs/lands_forests_pdf/factnatives.pdf

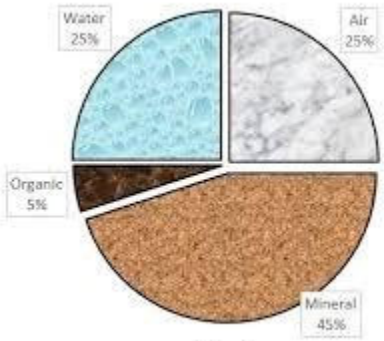
Resource for invasive plant list for New York

https://nyis.info/species-information/

Thanks to Sue Gaviller and Not Another Gardening Blog for use of some of her pictures.

# THE LIVING SOIL: FOUNDATIONS FOR HEALTHY GARDENS

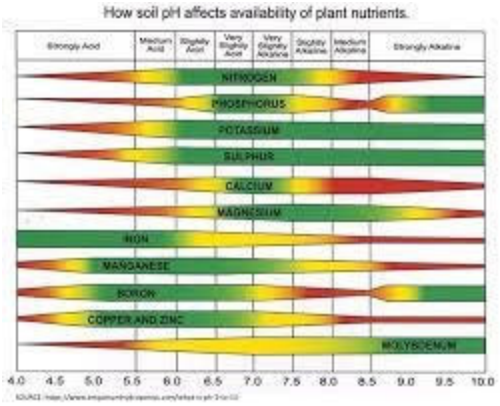
Presented by Barbara Bravo



Ideal

Ideally, soil is made up of 50% air and water (pore space), 45% minerals (soil, silt, clay) and 5% organic matter. Most soils have different percentages of these elements. This percentages of water and air are constantly changing depending on conditions - rain and drought. Organic matter (OM) is made up of compost, and cover crops that are turned into the soil, and ground covers that drop their stems and leaves enriching the soil. In addition, the shedding of roots as well as living and dead organisms are part of OM.

The Soil Texture Triangle – use this chart to determine what kind of soil you have. This information can be gained by using the soil separation technique describe in the Jar Test Jar Test - https://hgic.clemson.edu/factsheet/soil-texture-analysis-the-jar-test/




Have a soil test done to determine the pH of your soil. Most plants thrive in a neutral soil pH of 6 to 7, 7 being considered ideal. In this range all necessary nutrients are available. Exceptions: acid loving plants e.g. blueberries, raspberries, azaleas, rhododendrons, require a low pH in the range of 4.5 to 5.5.

University of Missouri extension
https://extension.missouri.edu/publications/mg4#:~:text=Optimum%20soil%20pH%20range%20varies%20for%20different%20kinds%20of%20plants&text=In%20alkaline%20soils%20(pH%20is,with%20legumes%20than%20with%20nonlegumes.

**Link for Soil Data**
Soil Survey provides soil data and information produced by the National Cooperative Soil Survey. Soil surveys can be used for general farm, local, and wider area planning including construction of new homes. https://websoilsurvey.nrcs.usda.gov/app/

**Soil Science 101**
Cornell CALS SOIL NOW https://blogs.cornell.edu/soilnow/the-science-of-soil/

**Soil Structure**
University of Wisconsin-Madison https://cropsandsoils.extension.wisc.edu/articles/soil-health-in-wisconsin-characteristics-of-healthy-soil/#Soil-Structure
https://gardenprofessors.com/lets-get-soil-physical/

**Fertilizers**
An excellent resource:
https://blogs.cornell.edu/soilnow/fertility-fertilizers/
https://blogs.cornell.edu/soilnow/ph/
https://extension.umd.edu/resource/garden-fertilizer-basics/

**Organic matter and compost**
**“**OM is any raw, decaying plant or animal material (leaves, manure), while compost is the finished, nutrient-rich product of decomposed OM.” *U of Maryland*
“Compost is partially decayed OM that feeds plants, feeds the soil biology and improves soil.” *R. Pavlis - Compost Science for Gardeners*
Humus means any organic matter which has reached a point of stability, where it will break down no further.

The Living, the Dead, and the Very Dead – Allen County Soil and Water Conservation District
https://allenswcd.org/the-living-the-dead-and-the-very-dead/

**Cover Crops**
https://covercrop.org/cover_crops/

**Videos:**
Soil Texture
Slake Test – www.Gardenmyths.com/soil-testing-methods/
Jar Test - https://hgic.clemson.edu/factsheet/soil-texture-analysis-the-jar-test/
Microorganisms in the soil
The Tighty-Whitey Soil Test: https://www.nrcs.usda.gov/state-offices/montana/soil-your-undies-challenge
Soil microbiomes:
https://soilmanagement.ces.ncsu.edu/news/the-power-of-soil-microbiomes/

**Cover crops**
You Tube: Soil Health On A Small Scale: Cover Crops for Gardeners
https://www.youtube.com/watch?v=nJTJvX-bY38

**Books:**
Joe Seals. Back to the New Basics – A Practical Guide and Reference Manual to the Ways, The Whys, and the new science of Better Easier Gardening – Books for the Good Life - 2023
Robert Pavlis. Soil Science for Gardeners: Working with Nature to Build Soil Health – New Society Publishers - 2021
Keith Reid. Improving Your Soil – A Practical Guide to Soil Management for the Serious Gardener –Firefly Books - 2014

**Building healthy soil**
How can we optimize soil health?
Vegetable and annual beds?
Aim for OM – 3 – 5% content
Grow cover crops and/or mulch
Both provide nutrients and feeds microbes, protects soil from erosion, suppresses weeds, improves bio-diversity
Practice no-till methods

Ornamental garden
Add up to 1" – 2" compost annually and mulch
Chop and drop
Minimize disturbance to soil structure and soil microbiota
Leave the roots and fallen leaves when possible

**Best Practices**

Choose plants that will grow in the native soil.

Limit use of rototillers.

- They break down the soil aggregates
- Rototilling causes organic matter to be digested by microbes too quickly resulting in low OM in the soil the food all soil organisms need to thrive and reproduce.

Use organic mulches – organic mulches contribute OM to the soil as the break down.

Top dress with compost

Use cover crops whenever possible

Grow ground covers in your ornamental garden

Plant a diverse selection of plants, everywhere

Keep your soil covered with living plants – **no bare soil**

# DESIGNING FOR BEAUTY & BIODIVERSITY IN YOUR SHADE GARDEN

Presented by Charlene Benson and Catherine Pietrow

SEE ATTACHED TABLE

## Designing For Beauty and Biodiversity in your Shade Garden

| | cover for wildlife | nest sites for birds | pollen and/or nectar producer | food for birds | food for mammals | food for caterpillars | spring flowers | summer flowers | fall flowers | winter flowers | fall foliage color | fragrance | evergreen ground cover | deciduous ground cover | screening | shade and cooling | edible fruits for humans |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TREES** | | | | | | | | | | | | | | | | | |
| scarlet oak | x | x | x | x | x | x | x | | | | x | | | | | x | |
| staghorn sumac | x | | x | x | x | x | x | | | | x | | | | | x | |
| hawthorn | | x | x | x | | x | x | | | | x | | | | | x | |
| redbud | | | x | x | | | x | | | | x | | | | | x | |
| dogwood | | x | x | x | | x | x | | | | x | | | | | x | |
| black cherry | | x | x | x | x | x | x | | | | x | x | | | | x | x |
| red maple | | x | x | x | x | x | | | | | x | | | | | x | |
| basswood | | x | x | x | x | x | | x | | | x | x | | | | x | |
| **SHRUBS & UNDERSTORY LAYER** | | | | | | | | | | | | | | | | | |
| silky dogwood | | x | x | x | x | x | | x | | | x | x | | | | x | |
| serviceberry | x | x | x | x | x | x | x | | | | x | x | | | | x | x |
| lowbush blueberry | x | x | x | x | x | x | x | | | | x | | | | | | x |
| red mulberry | x | x | | x | x | | | | | | x | | | | | | |
| spice bush | | x | x | | | x | | x | | | | x | | | x | x | |
| hazelnut | x | x | | | x | | x | | | | x | | | | | | |
| mountain laurel | x | x | x | | | x | | x | | | | x | | | x | x | |
| **HERBACEOUS LAYER** | | | | | | | | | | | | | | | | | |
| black cohosh | | | x | | | x | | x | | | | | | | | | |
| false hellebores | | | x | | | | | | | | | | | | | | |
| foam flower | | | x | | | | x | | | | | | | | | | |
| red columbine | | | x | x | | | x | | | | | | | | | | |
| coral bells | x | | | | | | x | | | | | | | x | | | |
| Virginia bluebells | | | x | | | | x | | | | | | | x | | | |

## Designing For Beauty and Biodiversity in your Shade Garden

| | cover for wildlife | nest sites for birds | pollen and/or nectar producer | food for birds | food for mammals | food for caterpillars | spring flowers | summer flowers | fall flowers | winter flowers | fall foliage color | fragrance | evergreen ground cover | deciduous ground cover | screening | shade and cooling | edible fruits for humans |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| American Spikenard | x | x | | x | x | | | | x | | | | | x | x | | x |
| blue lobelia | | | x | | | | | x | | | | | | | | | |
| bleeding heart | | | x | | x | | x | | | | | | | | | | |
| large flowered bellwort | | | x | | | | x | | | | | | | | | | |
| **FLOWERING GROUND COVERS** | | | | | | | | | | | | | | | | | |
| partridgeberry | | | | x | x | | | x | | | | x | x | | | | |
| eastern teaberry | | | | x | x | | x | | | | | x | x | | | | |
| bearberry | x | | x | x | x | x | x | | | | x | | x | | | | |
| wild ginger | | | x | | | x | x | | | | | | | x | | | |
| phlox subulata | | | | | | x | x | | | | | | | x | | | |
| alleghany spurge | | | x | | | | | | | x | | | x | | | | |
| green and gold | x | | x | x | | | | | | | | | | | | | |
| woodland stonecrop | | | x | x | | | x | | | | | | x | | | | |
| sweet woodruff | | | x | | | | x | | | | | | | | | | x |
| **SECRET FLOWERS** | | | | | | | | | | | | | | | | | |
| mayapple | | | | x | x | x | x | | | | | | | x | | | x |
| epimedium | | | | | | | x | | | | | | x | | | | |
| solomon's seal | x | | x | x | x | x | x | | | | | x | | x | | | |
| **SPRING EPHEMERALS** | | | | | | | | | | | | | | | | | |
| blood root | | | x | | | x | x | | | | | | | | | | |
| jack in the pulpit | | | x | x | x | x | x | | | | | | | | | | |
| liverwort | | | x | | | x | x | | | | | | | | | | |
| trout lily | | | x | | | | x | | | | | | | x | | | |
| spring beauty | | | x | | | | x | | | | | | | | | | |

## Designing For Beauty and Biodiversity in your Shade Garden

| | cover for wildlife | nest sites for birds | pollen and/or nectar producer | food for birds | food for mammals | food for caterpillars | spring flowers | summer flowers | fall flowers | winter flowers | fall foliage color | fragrance | evergreen ground cover | deciduous ground cover | screening | shade and cooling | edible fruits for humans |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ramps | | | x | | x | x | | x | x | | | x | | | | | |
| dutchmans breeches | | | | | x | | x | | | | | | | | | | |
| virginia bluebells | x | | x | | | | x | | | | | | | x | | | |
| wood poppy | | | x | | | | x | | | | | | | | | | |
| **STYLISH FRIENDS OF SHADE PLANTS** | | | | | | | | | | | | | | | | | |
| ferns | x | x | | | | | | | | | | | x | | | | |
| sedges | x | x | | x | x | | | | | | | | | x | | | |
| moss | | x | | | | | | | | | | | x | | x | | |
| rocks | | | | | | | | | | | | | | | | | |
| logs | x | x | | | x | | | | | | | | | | x | | |
| **BEAUTIFUL SHADE PLANTS THAT MIGHT BE ON YOUR LAND** | | | | | | | | | | | | | | | | | |
| jewel weed | x | | x | | | | | x | | | | | | x | | | |
| clematis virginiana | | | x | | | x | | | x | | | x | | | | | |
| carex pennsylvania sedge | x | x | | x | x | | | | | | | | | x | | | |
| skunk cabbage | x | | x | | | | x | | | | | | | x | | | |
| cinnamon fern | x | x | | | | x | | | | | | | | x | | | |
| pagoda dogwood | | x | x | x | | | x | | | | | | | | | | |

Source: Dark, Tallamy, The Living Landscape, Timber Press, 2014

# EVERLASTING FLOWERS: PRESERVING YOUR BLOOMS FOR YEAR-ROUND ENJOYMENT

Presented by Courtney Churchill and Dawn Hubbell

## What Is A Nature Press/Herbarium?

A herbarium or a nature/flower press serves as a library of preserved plants, acting as a crucial resource for various scientific and educational purposes. These collections of dried and mounted plants, along with detailed information about their collection, are used for research in plant identification, taxonomy, ecology, and conservation, as well as for educational outreach and public engagement.

Today, these historical specimens and others collected over the past 400 years provide interesting insights into plant biodiversity and planting practices.

You can also use the pressed plants in artwork!

## How To Use Your Press

1. In a spot where you have permission to pick plants, carefully pick a section from a plant. Try not to damage other plants, take too many, or pick a plant you're allergic to.

2. Open your press and place your plant (as flat as you can) on the page.

3. Carefully close the press and secure the rubber bands, if you are pressing something bulky you can weight it down - heavy books work well as weights.

4. Store this in a warm, dry place and check on your plant specimens daily.

5. Once your plants are dry, carefully remove them. Store them in a cool, dry place until you are ready to use them.

6. You can then create your own plant collection or make some beautiful art.

7. If you are creating a collection or would like to record details about your plants, add a label. The key information to note on a herbarium sheet is when and where it was collected, by whom, and, if you know, what the flower is.

**Materials Needed for Drying:** Clippers, Rubber Bands or Twine, Wire and/or Clips, A Dark, Well-Ventilated Drying Space, Silica Gel and Air-Tight Container (optional), Storage Containers/Boxes

**Favorite Plants to Dry:** Celosia, Globe Amaranth, Sweet Annie, Mountain Mint, Ammobium, Statice, Amaranth, Strawflower, Marigolds, Yarrow, and More!

## Harvesting Flowers for Drying:

Harvest flowers at their peak for the best quality, color, and petal retention.

Flowers for drying do not need to be harvested early in the morning; let the dew evaporate, then harvest in the afternoon.

Remove all foliage one inch below the neck of the flower.

Bundle stems, but don't overpack them.

Dry within 24 hours of harvest to maintain structure and form.

**Air Drying:**

**Tie your flowers together in small bunches:** Remove lower leaves. Stagger the heights of the flowers so the heads aren't touching. Tie five to ten stems using a rubber band or twine. Fasten tightly, as stems will shrink as they dry. Hang bunches at sufficient spacing for air circulation.

**Hang the bunches upside down:** This keeps the stems and flowers straight and rigid while drying. *(Exceptions: Sunflowers, Zinnias, and Hydrangeas)* Hang on hooks or on suspended wire in a well-ventilated, dark space at room temperature. If you can't dry them away from light, wrap them in brown paper for protection. Note: Drying flowers can be messy; seeds and petals may fall!

**Leave to dry:** Each plant takes a different amount of time to dry. Some, like statice or lavender, take less than a week. Others with more moisture and mass, like sunflowers or marigolds, can take up to three weeks. Humid environments can also affect drying times. Consider using a fan or a dehumidifier to improve circulation. To check whether the flowers are dry, gently squeeze the centermost flower in the bunch. It should feel brittle and have very little give when squeezed.

**Silica Drying:**

Silica gel can be found at most craft stores or online. It will change color when moisture is absorbed and can be reused by drying it out in an oven on very low heat for a few hours.

Because silica draws moisture in, it must be kept in an airtight container with a sealable lid. This limits the number of flowers you can dry at once, but they dry within a few days.

Spread an inch or two of silica on the bottom of the container. Gently lay the flowers face down. Continue adding silica until all parts of the flowers are completely covered.

Keep containers in a dry, warm place while they dry. Let dry for three to seven days.

To remove flowers, gently brush away the silica. Give a soft shake to remove loose silica grains and use a paintbrush to clean if necessary.

Store dried flowers in airtight containers, as moisture may make them floppy.

Flowers that dry well with silica include roses, cosmos, clematis, poppies, tulips, zinnias, and dahlias.

**Addressing Issues:**

**Brittle Flowers:** Dried flowers are delicate! Before arranging, you can rehydrate them slightly by placing them in a cooler or refrigerator for 24 hours. You can also put a damp towel over the bunches you plan to use.

**Damage From Pests:** Spiders do not damage dried flowers, but they can build webs in them. Use a feather duster to clean them. Mice may eat dried grains, so store dried materials in rodent-proof boxes.

**Losing Color:** Harvest flowers at their peak and keep dried flowers out of direct light to prevent fading.

**Molding or Browning:** Store in a well-ventilated area and check bundles before storing. Do not overcrowd bundles when drying. A fan or dehumidifier can help in humid environments.

**Shedding Petals:** Harvest at the correct stage and hang to dry immediately to avoid petal loss.

**Storing Your Dried Material:**

Dried flowers are fragile; handle gently

Store in boxes or bins until using. Do not pack tightly. Alternate the direction of the bunches. Label the boxes with the names of the flowers, their colors, and the date.

Store boxes out of reach of rodents in a well-ventilated area.

After crafting, position your dried bouquets away from direct light and humidity.

Keep flowers clean with a hair dryer on a low setting or a soft paintbrush.

**Crafting Your Preserved Flowers:** Create Mini Posies, Mobiles, Bouquets, Domed Jars, Ornaments, Notecards & Gift Tags, Flower Crowns & Wearables, Wreaths, Framed Pictures, Bookmarks, Photo Frames, and More!

**Herbarium Name:** _____

(Person or Institution)

**Taxon:** _____

(Genus and Species) Plant Identification

**Collected By:** _____

**Identified By:** _____

**Collection Data:** _____

**Location** _____

(GPS Coordinates if available)

**Date:** _____

**Site Notes:** _____

**Additional Notes:** _____

_____

**Accession Number:** _____

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**Additional Notes:**

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**Taxon:** _____

(Genus and Species) Plant Identification

**Collected By:** _____

**Identified By:** _____

**Collection Data:** _____

**Location** _____

(GPS Coordinates if available)

**Date:** _____

**Site Notes:** _____

**Additional Notes:** _____

_____

**Accession Number:** _____

# VEGETABLE GARDENING: FROM SEED TO HARVEST

Presented by Skip Carlson

## New York Vegetable Planting Planning Guide

### General Growing Guidelines

- Most vegetables require 6–8 hours of sunlight daily.
- Average last frost in New York is early–mid May.
- Average first frost is late September–mid October.
- Cool-season crops can be planted 4–6 weeks before last frost.
- Warm-season crops should be planted after frost danger has passed.

### Monthly Planting Guide

#### March

- Start indoors: broccoli, cabbage, cauliflower, onions, leeks
- Direct sow outdoors (late March if soil workable): peas, spinach

#### April

- Start indoors: tomatoes, peppers, eggplant, basil
- Direct sow outdoors: lettuce, carrots, radishes, beets, kale, Swiss chard, potatoes

#### May

- After frost danger passes: transplant tomatoes, peppers, eggplant
- Plant beans, cucumbers, sweet corn, squash, zucchini

#### June

- Plant second crops of beans and cucumbers
- Plant zucchini and late sweet corn

#### July

- Plant for fall harvest: beans, carrots, beets, Swiss chard

#### August

- Plant fall crops: spinach, lettuce, kale, turnips, radishes

#### September

- Plant garlic for next year's harvest
- Late spinach planting for fall harvest

### Quick Vegetable Timing Reference

| Vegetable | Start Indoors | Plant Outdoors |
|---|---|---|
| Peas | — | March–April |
| Lettuce | March | April–August |
| Carrots | — | April–July |
| Beans | — | May–July |
| Tomatoes | April | Mid–May transplant |
| Peppers | March–April | Mid–May transplant |
| Cucumbers | April | May–June |
| Zucchini | April | May–June |
| Spinach | — | March & August |
| Garlic | — | September–October |

# SPACE TO GROW

Presented by Shannon Smith

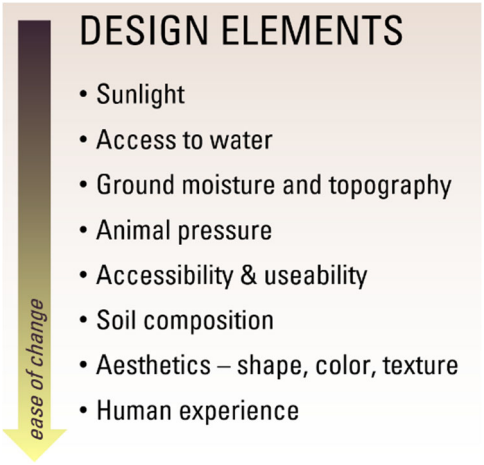
Working from Shannon's own experience in building a vegetable garden from scratch in the "lock-down" of 2020, we will cover design ideas to create flexible growing spaces that can expand and adapt over time. We'll focus on "DIY" methods and designs that use common hand-scale tools, accessible materials, and minimal labor inputs. We'll also cover how materials and design can align with minimal waste and ecological integration goals.

Great for new and aspiring gardeners or gardeners working in new-to-them spaces!

**Some takeaways:**

- A garden is a living, changing space. Think about creating elements in phases that can be adapted and implemented over many years.
    - How can impermanence be an ally?
    - How can time replace effort?
    - How can other forces replace effort?
- This year's fence line might become next year's trellis. This year's covered walkway might become next year's pollinator pathway.

- Upfront decisions should prioritize the elements that will be hardest to change, like orientation to sunlight, access to water, and existing topography




- Permaculture principles offer some guidance, especially:
    - Observe and interact
    - Least change for greatest effect
    - Use small scale intensive systems
    - Collaborate with succession
    - Value biological / renewable resources
    - Turn problems into solutions

- Raised beds can be easier to manage overtime, especially if you crave order in your garden, although they require more material upfront.

**Mix and Match Design Components**

- ON THE GROUND:
  - Containers
  - DIY Raised beds
  - Pre-fab Raised beds
  - Fenced perimeter with row crops
  - Rain gardens
- UP:
  - Trellises
  - Archways
  - Hanging plants
- AROUND:
  - Straw bale gardens
  - Hugelkultur
  - Planted buffers
  - Organic material buffers

| | | |
|---|---|---|
| BED STRUCTURE | • Untreated wood - rot resistant (e.g. cedar) or not<br>• Treated wood - pressure treated, painted/stained<br>• Metal - pre-fab fencing, rebar<br>• Pre-fab or hand-built beds<br>• Stone / pavers<br>• Fabric bags | • Wood - More aesthetic, more/less maintenance?, needs more work to fasten & "install"<br>• Pre-fab - EASIEST, FASTEST |
| FENCING | • Galvanized steel<br>• Plastic garden fencing<br>• Live fencing | • Steel is reusable, durable<br>• Plastic is easier to install but less durable<br>• Live fencing is penetrable but can offer ecosystem services |
| SOIL | • Amend existing soil<br>• Add new in bulk or by bag | • It's really heavy!<br>• Consider existing soil structure before investing in bulk purchases |
| PATHWAYS | • Grass<br>• Chips<br>• Crushed stone / pebbles<br>• Stone / Pavers | • How permanent or rigid do you want it to be? |

**Soil and testing:**

- A full nutrient work-up isn't needed to get started. In most cases, soil structure, moisture, light, and care will be more important than soil nutrient content.
- C*ertain* ornamental or food plants require a particular acidity (pH) e.g. blueberries. CCEUC offers pH and soil composition testing.
- Contamination – If you are gardening in an area that may have been exposed to industrial uses or construction debris, consider testing for metal contamination. Soil contact and uptake into food are both risks if soil is heavily contaminated.
- PFAS – generally less of a concern unless you know of a reason for potential contamination. There are few options for residential soil PFAS testing and no standardized thresholds for interpreting results.

If purchasing compost or soil…

- Know the source! Check for seed and pest contamination
- Ask about STA Certified Compost – requires standard processes, minimum testing frequency for heavy metals and pathogens
- Be aware of "bio-solids" products, which may have accumulated PFAS

## Sources and More Resources

### Books

Hemenway, Toby. *Gaia's Garden: A Guide to Home-Scale Permaculture, Second Edition.* Chelsea Green Publishing, 2009.

Piercy, Marge. "The Seven of Pentacles." *Circles on the water, selected poems of Marge Piercy,* Knopf, 1982.

### Websites

Shape and Design

- https://www.interdependentweb.com/articles/case-sinuous-raised-beds
- https://extension.umn.edu/planting-and-growing-guides/raised-bed-gardens

Fencing and structures:

- https://savvygardening.com/fencing-a-vegetable-garden/
- https://youtu.be/KXzRzMt9bRI?si=Q09tN47yONcp48ez
- https://extension.okstate.edu/fact-sheets/sustainable-landscapes-creating-a-hugelkultur-for-gardening-with-stormwater-management-benefits.html

Trellis Ideas :

- https://marylandgrows.umd.edu/2021/07/19/diy-garden-structures-with-materials-you-have-on-hand/
- https://www.apieceofrainbow.com/21-diy-trellis-structures/

Materials & Product Safety

- https://blogs.cornell.edu/healthysoils/
- https://extension.umd.edu/resource/safety-materials-used-building-raised-beds/
- https://hgic.clemson.edu/factsheet/treated-wood-in-the-landscape/

# COMPOST: 'BLACK GOLD' FOR YOUR GARDEN

Presented by John McCormick

## 1. **What is Composting?**

Composting is the controlled, aerobic (oxygen-requiring) decomposition of organic materials by microorganisms (bacteria, fungi, insects, worms) into a dark, crumbly, nutrient-rich soil amendment called **compost** or **humus**.

Benefits include:

- Reduces household/yard waste going to landfills (up to 30% of waste)

- Improves soil structure, fertility, water retention, and suppresses some plant diseases

- Returns nutrients to the soil naturally (closes the nutrient loop)

- Low-cost or free soil amendment

## 2. **The Key Ingredients for Good Composting**

Balance these to get fast, odor-free decomposition:

- **Greens** (nitrogen-rich, moist): Provide protein for microbes

Examples: vegetable/fruit scraps, coffee grounds & filters, fresh grass clippings, plant trimmings, fresh leaves, tea bags, manure (chicken, rabbit, horse – herbivore only).

- **Browns** (carbon-rich, dry): Provide energy for microbes

Examples: dry leaves, straw, hay, shredded cardboard/paper (no glossy), wood chips, small branches, pine needles (in moderation), sawdust (untreated), corn cobs/stalks.

**Ideal ratio** 2–3 parts browns : 1 part greens (by volume)

Roughly 25–30:1 carbon-to-nitrogen (C:N) ratio overall.

- Other essentials

-**Oxygen** (**air**): Turn/aerate pile regularly

-**Moisture**: Like a wrung-out sponge (50–60% moisture)

-**Particle size**: Chop/shred materials (faster breakdown)

## 3. **What NOT to Compost (Avoid These)**

- Meat, fish, dairy, bones, oils/fats- attract pests & cause odors

- Pet waste (dog/cat)- can carry pathogens/parasites

- Diseased plants or weeds with seeds- may survive & spread

- Treated/pressure wood, glossy/coated paper, plastics, metals

- Large amounts of citrus peels, onions, garlic (slow to break down or mildly antimicrobial)

- Coal ash, synthetic fabrics, chemicals/pesticides

## 4. Common Composting Methods (Home Scale)

**Backyard Pile/Bin** (cold/slow) Simple heap or enclosed bin, 6–12+ months Advantages- Cheap, easy, large volume. Disadvantages- Slow, may attract pests if unbalanced

**Hot/Active Pile** (Berkeley method) Layered, turned frequently, large pile, 2–3 months Adv- Medium-large amount, fast, kills weeds/seeds/pathogens, Disadv.- Needs regular turning & monitoring

**Tumbler**- (Rotating drum) Adv.- Fast, contained, less pests. Disadv.- expensive, limited capacity, harder to turn when full

**Vermicomposting** (Worm bin) Red wigglers in indoor/outdoor bin, 3–6 months, Adv.- Great for apartments, produces worm castings (excellent fertilizer) Disadv.- Worms sensitive to temperature/moisture

**Bokashi**- Anaerobic fermentation in sealed bucket, 2–4 weeks. Adv.- Handles meat/dairy, fast initial step. Disadv.- Needs secondary aerobic composting, produces strong smell initially

**Sheet/Direct/Lasagna** Layers directly on garden beds, 6–12 months, Adv.- No turning, builds soil in place, Disadv.- Slow, visible during process

## 5. How to Start & Maintain Compost

1. Choose location: Level ground, good drainage, partial shade, convenient.

2. Build pile/bin: Minimum 3×3×3 ft for heat buildup (larger = better).

3. Layer: Start with coarse browns, alternate greens/browns, moisten as you go.

4. Aerate: Turn every 1–2 weeks (hot pile) or less (cold).

5. Monitor:

   - Temperature: Hot pile reaches 130–160°F (kills pathogens/weeds)

   - Moisture: Squeeze test – few drops only

   - Smell: Earthy = good; ammonia = too many greens; rotten eggs = too wet/no air

## 6. Common Problems & Fixes

- No heat / too slow- add greens

-Too small pile- combine or insulate

-Lack of greens- add nitrogen.

-Bad odor/Ammonia smell- add browns;

-Rotten/Sulfurous- turn/aerate & add browns.

-Attracts flies/rodents- Bury food scraps deep, avoid meat/dairy, cover pile, use enclosed bin.

- Too wet/slimy- Add dry browns, turn frequently.

- Too dry/matted- Water & turn; break up clumps.

- Weeds/seeds survive- Only hot composting (140°F+) reliably kills them.

7. **Using Finished Compost**

- Dark, crumbly, earthy smell (no recognizable originals)

- Ready in 2–12 months depending on method

- Sift if desired (remove large chunks)

- Use: Mix into garden beds (1–3 inches), top-dress lawns/plants, make compost tea, potting mix component.

- Cure 1–2 months before using on sensitive plants if very “hot” (high nitrogen).

***Composting is forgiving—start small, observe, and adjust. Even imperfect compost is valuable! For local rules (some areas restrict certain methods), check municipal guidelines. Happy composting!***

## Sources and Additional Educational Material on Composting

**Websites-**

US EPA Composting at Home (https://www.epa.gov/recycle/composting-home)

Cornell Waste Management Institute/Master Composter Resources – *https://compost.css.cornell.edu/*

**Podcast-**

"Composting Guide A to Z: The Quick and Dirty on Everything Compost" at joegardener,com, hosted by Joe Lamp, Episode 016 and Episode 089- (55 min)

**Books-**

Campbell, Stu. *Let It Rot! The Gardener's Guide to Composting*.3rd ed., Storey Publishing, (1998). ISBN-13:978-1580170239

Gershuny, Grace, and Deborah L. Martin, editors. *The Rodale Book of Composting: Easy method for every gardener*. Rodale Press (1992) ISBN-10:0878579907

Balz, Michelle. *Composting for a New Generation: Latest Techniques for the Bin and Beyond*. Cool Springs Press, (2017) ISBN13:978-1591866923

Jenkins, Joseph C. *The Humanure Handbook (4th ed.): Shit in a nutshell.* Jenkins Publications, (2019) ISBN-13:978-0964425880

**Pamphlets-**

*Backyard Composting Guide, UCRRA Home Composting Guide (PDF),* Ulster County Resource Recovery Agency

*The Dirt On Compost*- for direct pdf -

https://dec.vermont.gov/sites/files/wmp/SolidWaste/Documents/Universal-Recycling/The-Dirt-On-Compost.pdf, Vermont DEC

# ORNAMENTAL GRASSES AND SEDGES

Presented by Diane Backus

**DO NOT PLANT:** Cogon Grass: *Imperata cylindrica*

Chinese Silver Grass: *Miscanthus sinensis*

Common Reed Grass: *Phragmites australis*

Reed Manna Grass: *Glyceria max*

General Information

https://grasses.cfans.umn.edu/sites/grasses.umn.edu/files/files/30_grasses_extension_final_optimized.pdf

https://yardandgarden.extension.iastate.edu/how-to/selecting-ornamental-grasses-your-landscape

NYS DEC

https://extapps.dec.ny.gov/docs/lands_forests_pdf/isprohibitedplants2.pdf

https://extapps.dec.ny.gov/docs/lands_forests_pdf/factnatives.pdf

Missouri Botanical Garden

https://www.missouribotanicalgarden.org/plantfinder/plantfindersearch.aspx

Carex Trials Mt Cuba Center

https://mtcubacenter.org/trials/carex-for-the-mid-atlantic-region/

Pruning Grasses

https://northcoastgardening.com/2014/01/how-to-prune-ornamental-grass/

https://www.ruralsprout.com/prune-ornamental-grasses/

Native grasses: butterflies and moths

https://ncipmhort.cfans.umn.edu/sites/ncipmhort.cfans.umn.edu/files/2020-06/native%20grasses%20for%20butterflies%20meyer.pdf

Perennial Plant of the Year

https://perennialplantoftheyear.com/

Native Plants

http://www.nativeplanttrust.org/about/

https://homegrownnationalpark.org/

Cornell Native lawn demonstration area

https://cornellbotanicgardens.org/explore/on-campus-natural-areas/native-lawn-demonstration-area

| | | | | |
|---|---|---|---|---|
| Little Blue Stem | N | FS | 2-4’ | ‘Standing Ovation’, ‘Prairie Winds’, ‘Jazz’ |
| Big Blue Stem | N | FS | 6-8’ | ‘Blackhawks’, ‘Red October’ |
| Bottle Brush Grass | N | PS | 2-4’ | |
| Northern Prairie Dropseed | N | FS | 2-4’ | ‘Tara’ |
| Switch Grass | N | FS | 2-5’ | ‘Hanse Herms’, ‘Shenandoah’, ‘North Wind’ |
| Purple Love Grass | N | FS | 1-2’ | |
| Feather Reed Grass | NN | FS | 3-5 | ‘Karl Foester’ WET soil |
| Blue Oat Grass | NN | FS | 2-3’ | ‘Saphirsprudel’ |
| Blue Fescue | NN | FS | 1’ | ‘Elijah Blue’ |
| Japanese Forest Grass | NN | PS | 2’ | ‘Aureola’, ‘Stripe it Rich’, ‘Fubuki’ |
| Common Brome Sedge | N | PS | 16” | |
| Tussock Sedge | N | FS | 2-4” | WET Soil |
| Wood’s Sedge | N | Any | 14” | |
| Pennsylvania Sedge | N | PS | 6-12” | ‘Straw Hat’ |
| Plantain-leaved Sedge | N | S | 1-2’ | |
| Evercolor | NN | Any | 12’ | ‘Everlime’, ‘Everest’, ‘Eversheen’ |
| Carex ‘Ice Dance’ | NN | PS | 12’’ | Moist to Wet Soil |

# HOW PLANTS PERCEIVE AND RESPOND TO THE WORLD

Presented by Janine Connell

## SOURCES


### Books

Calvo, Paco. *Planta Sapiens*. W.W. Norton & Co., 2022.
Chamovitz, Daniel. *What a Plant Knows*. Scientific American, 2012.
Darwin, C. & Darwin, F. *The Power of Movement in Plants*. New York, Appleton 1851.
Darwin, C. *On the Movement and Habits of Climbing Plants*. London: John Berry 1865
Gagliano, Monica. *Thus Spoke the Plant*. North Atlantic Books, 2018.
Schlanger, Zoe. *The Light Eaters*. Harper Perennial, 2025.
Sheldrake, Merlin. *Entangled Life. How Fungi Make our Worlds, Change Our Minds and Shape Our Futures (*New York; Random House: 2021).

### Articles

Loomis WE, Ewan LM. 1936. *Hydrotropic responses of roots in soil*. Botanical Gazette 97, pp. 728–743.

Warren L. Butler, et al., "Detection, Assay, and Preliminary Purification of the Pigment Controlling Photoresponsive Development of Plants," *Proceedings of the National Academy of Sciences of the USA* 45, no. 12 (1959): 1703-8.

A. Copetta, et al. "Fruit Production and Quality of Tomato Plants Are Affected By Green Compost and Arbuscular Mycorrhizal Fungi," *Plant Biosystem* 145, no. 1 (2011).

J. Arpana et al. "Symbiotic Response of Patchouli to Different Arbuscular Mycorrhizal Fungi," *Advances in Environmental Biology* 2, No. 1 (2008).

Orrock, J., et al., 2017. "Induced defences in plants reduce herbivory by increasing cannibalism," *Nature Ecology & Evolution* 1:1205-07.

Sultan, S. (2018). "Getting Into the Weeds. Individual Plasticity and Adaptive Variation. *Extended Evolutionary Synthesis.*

Shiojiri, K., et al., 2021. "Plant-plant Communication and community of herbivores on tall goldenrod. *Ecology and evolution*

Dudley, S., et al., 2007. "Kin Recognition in an Annual Plant," *Biology Letters* 3: 435-38.

Pereira, M., et al., 2017. "Light Mediated Self Organization of Sunflower Stands Increases Oil Yield in the Field," *Proceedings of the National Academy of Sciences* 114, no. 30.

Karban, R. et al., 2013. "Kin Recognition Affects Plant Communication and Defence," *Proceedings of the Royal Society B* 280, no. 1756: 201223062.

Torices, R., et al., "Kin Discrimination Allows Plants to Modify Investment towards Pollinator Attraction," *Nature Communications* 9, no. 1 (2018).

Parise A.G., et al. "Detection of Different Hosts From a Distance Alters the Behavior and Bioelectrical Activity of *Cuscuta racemosa*." *Frontiers in Plant Science* 12:594195

Mark J. Jaffe, "Experimental Separation of Sensory and Motor Functions in Pea Tendrils," *Science* 195, no. 4274 (1977).

Violent experiences alter the genome in ways that persist for generations | Yale News

**Websites**

Society for Plant Signaling and Behavior. https://plantbehavior.org/about-us/