Installing a Native Plant Garden



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How is installing a Native Plant Garden any different then installing a garden?



Added Question:



















































Why Plant Natives

- No fertilizers
- Fewer pesticides than lawns
- Less water than lawns
- Root systems help prevent erosion & reduce rainwater runoff
- Reduce air pollution: Little to no need for mowing
- Provide shelter and food for wildlife.
- · Promote biodiversity and stewardship of our natural heritage.
- Beautiful and increase scenic values!

US Forest Service https://www.fs.usda.gov/wildflowers/Native_Plant_Materials/Native_Gardening/index.shtml





"Native Plants Buffer Wildlife from Food Shortages, Environmental Disruptions Trap Carbon, Protect Cities from Heat and Weather"

Xerces Society https://www.xerces.org/blog/for-wildlife-and-humans-nativeplants-are-key-to-climate-resilience



Garden for a Greater Purpose

Plants for a native garden:

- Who does this plant provide for?
- What does it provide?
 - Food, Protection, Home
- How does it aid the environment
 - Soil, Rainwater, Carbon
- When does it provide?
 - Winter when resources are limited



Not a Native Plant:

- Near Native- non-native plants which have adapted to & benefit an ecosystem ~ weeping willow
- Ornamental- introduced, not causing ecological stress, may or may not contribute to habitat
- Weeds- any unwanted plant
- Noxious Weed- being watched by state, potential for invasive designation
- Invasive- Designated by State based on aggressive traits and negative effects on habitat &/or economy ~ various levels

Native Plants:

Naturally evolved within a set community & continues to contribute to the ecosystem

"Native plants are the indigenous terrestrial and aquatic species that have evolved and occur naturally in a particular region, ecosystem, and habitat. Species native to North America are generally recognized as those occurring on the continent prior to European settlement."

US Forest Service usda.gov

"Native plants are those that occur naturally in a region in which they evolved. They are the ecological basis upon which life depends, including birds and people. Without them and the insects that coevolved with them, local birds cannot survive."

National Audubon Society

"Over very long periods of time, native plants have co-evolved with other members of their ecosystem – including other plants, insects, birds, small mammals, reptiles and amphibians. Together, they form a biological community of interdependent relationships." Prairienursery.com



Clematis viorna (vasevine)

Outline

Step 1: Site Analysis

- Lighting
- Soil
- Moisture

Step 2: Prepare the Area

- Clear the space
- Amend soil

Step 3: Challenges

- Herbivores
- And more

Step 4: Identify Garden

- Plant habitat
- Goals

Step 5: Create a Plan

- Formal to Naturalized
- Garden Highlights
- Plant scale

Step 6: Plant Selection

- Use Established Lists!
- Categorize

Step 7: Install

- Planting Guide
- Water/Mulch

Step 8: Maintenance

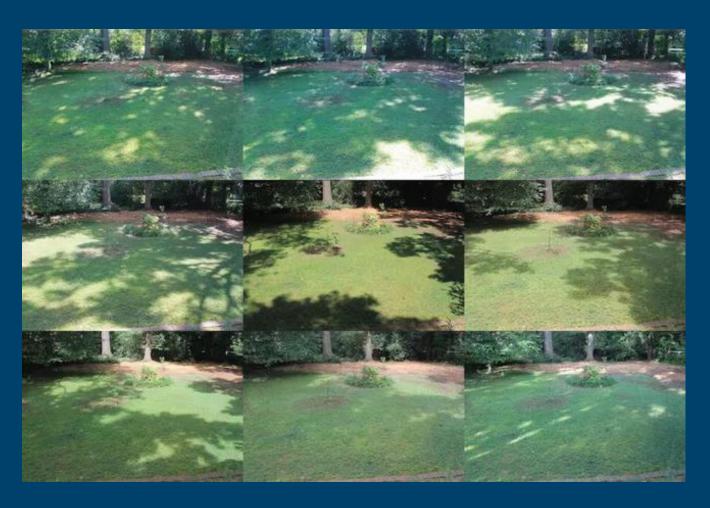
Environmentally Minded
 Gardening

Advice from the Jenkins Team

Step 1: Site Analysis



Site Analysis Light



- Full Sun: 6+ hours
- Part Sun/Part Shade: 4-6 hours
 - No need to distinguish between two but consider as a suggestion may be able to tolerate more of one
- Full Shade: Less than 4 hours
- Morning Sun verse Afternoon Sun
- Make a Sun/Shade map of your area
- https://www.gardenfundamentals.com/sun-mappinggarden/
- https://www.treehugger.com/how-make-sun-mapyour-garden-4868783



Site Analysis Soil

- •Combination of 3 materials in various ratios
 - Clay: smallest particle-drains slow
 - Silt: medium particle
 - Sand: Largest particle- drains fast
- •Plus:
 - Living organisms and Organic Matter
- •And:
 - Pores: *Important*
 - Hold water & air necessary for plants & animals
 - Compaction = bad

Soil Test: Dig, Squeeze...Smell!

•Texture:

- Crumbles/gritty=high sand
- Moldable = high clay
- Slippery or like baby powder=high silt

•Color:

Dark Brown= high organic matter

•Smell:

- Good: Fresh, Moist, Unami
- Bad: Rotten Eggs, Sulfuric = no air & rotting



Site Analysis

pH presence of hydrogen affects a plant's ability to absorb various nutrients/minerals

- pH: test from hardware or garden store
- Goal Between 5-7.5
- Too far either end = nutrient deficiencies or toxicity
 - Too Acidic <5
 - Too Alkaline >7.5

• Importance:

If at home test shows too far on either end Have a professional lab test completed. This will give very accurate results with proposed amendments

https://extension.psu.edu/soil-testing



https://www.amleo.com/do-it-yourself-soil-test-kit-box-of-40-tests

Site Analysis

Water/Moisture

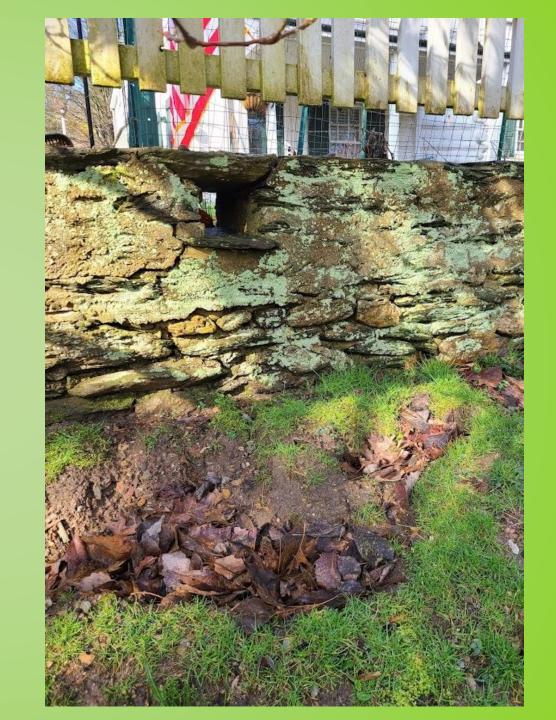
Key questions

- Is there rainwater moving through the area?
- How much?
- Does the water stay?
- Need to stay?
- Is it causing damage?

Right Plant Right Place =

Making sure to know if the plants will receive proper water

If yes, no need to irrigate



Site Analysis Water/Moisture Test

Follow the Rain Checklist

- Where does it travel through (how fast)
- Spots that are missed: canopy or an overhang on a house
- Where does it pool
- Where does it splash (causes erosion)
- Does anything need to be done to lessen or adjust these answers
 - Trenches, Buried porous pipe, adding river stones, adjusting soils, moving plant's location



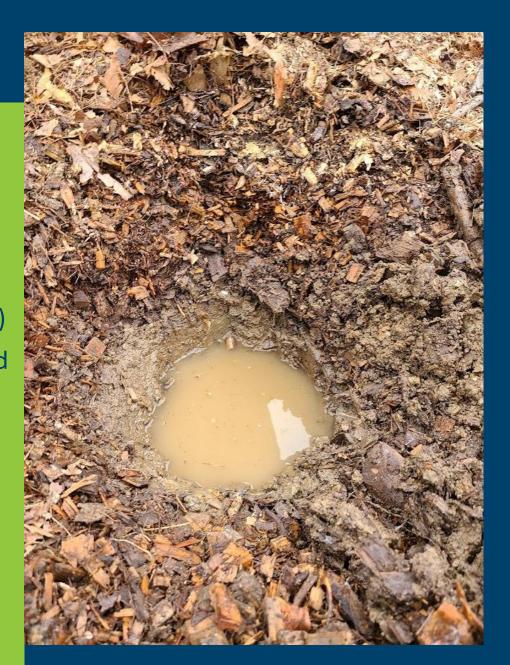
Site Analysis

Water/Moisture & Soil: Percolation Test

How well does the soil drain

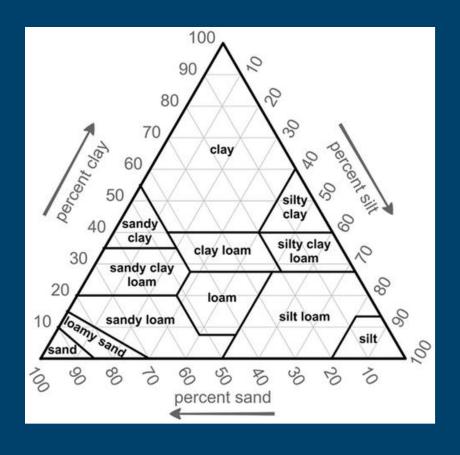
- 1. Dig a hole about 18" deep +4" wide
- 2. Fill with water, leave for 12-24 hours
- 3. Refill with water & measure as it drains
- Less than Half inch per hour Poorly drained. Repair: add organic matter, sand, plants prefer standing water (obligate)
- Half inch to One inch per hour Moderately well drained and acceptable for facultative species
- More than One inch per hour Well drained and suitable for all species including sensitive species.

https://www.bartlett.com/resources/soil-drainage.pdf



Additional Resource for Site Analysis





Summarize Site Analysis

Sketch it out!

- Lighting
- Water runoff
- Garden location
- Low water percolation



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Environmentally Minded
 Gardening

Advice from the Jenkins Team

Step 2: Prepare the Area

• Edge Bed

- Remove plants
 - Weeds, Unwanted plants
- Turf Removal
 - Flat shovel & scrape up (Hard work!)
 - Cover with cardboard, mulch & compost +5" thick leave for 2-6 months or more











AM Leonard tools



Weed Wrench

Step 2: Prepare the Area

Prep the Space

- Add organic matter: chopped leaves, mulch, compost
 - Don't use fresh wood chips against a house or structure – termites
 - Cover Crops: Legumes, and radishes are planted for farms to restore soil's pores & organic matter as well as nitrogen availability.
 - Use annuals, don't let go to seed
- Aerate/Reduce Compaction
 - Add stepping-stones or a path to prevent further compaction
 - Avoid Tilling- exposes seeds in soil to light & promotes growth: Use to advantage or know to avoid

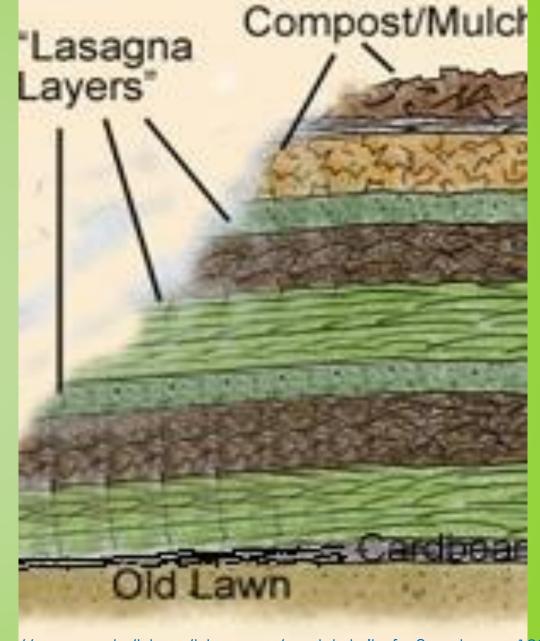




Step 2: Prepare the Area

•Lasagna Method:

- Layer:
 - Newspaper –push in along edge with spade
 - Cardboard-overlap
 - Cover with layers of compost, dried chopped leaves, woodchips
- •Let area sit for 1+ season
- Materials will break down & incorporate into soil long it is left
- Can plant into original soil layer and build up around



https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=12086

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Step 3: Challenges

Herbivores

- Deer, Rabbits, Groundhogs, & Voles
- Scented repellants
- Traps (see what is approved for your area)
- Rodenticides:
 - Put the food cycle at risk
 - Poisoned rodent is weakened, caught by owl = now owl is poisoned
- Fencing
 - Individual plants
 - Garden bed
 - Landscape









Step 3: Challenges

- Compact Soil
- Sandy Quick Draining
- High Clay, Standing Water
- High Road Salts (can't avoid)

Use these features to select the right plants!

•Choose from plants that evolved in the correlating habitat

Top: eastern prickly pear cactus (*Opuntia humifusa*) dry full sun Bottom: water lily (*Nymphaea odorata*)- standing water full sun

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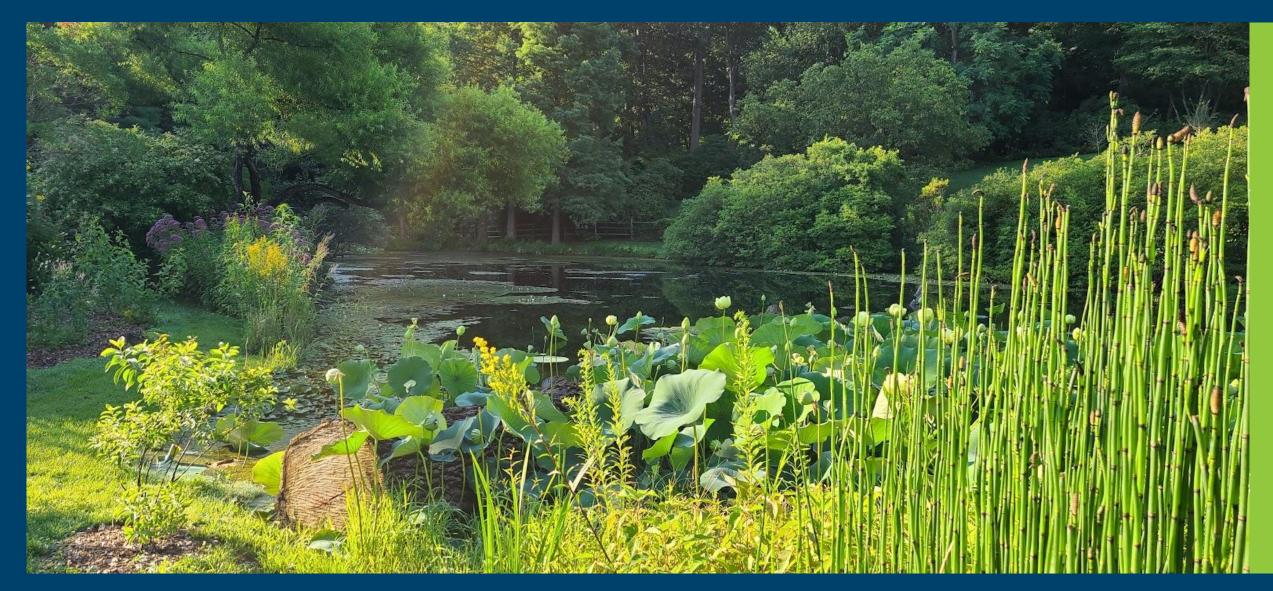
Advice from the Jenkins Team

Step 4: Garden Habitat: Based on Features

Habitat	Sun	Moisture	Residential Setting
Wetland/ Riparian	Sun-Shade	High	Raingarden, driveway/roadside garden, below a drain spout, low areas, stream or pond edge
Woodland/ Forest Edge	Full- Part Sun	Moist	Back of yard, along house, landscape with some canopy trees, adjacent to a mature hedge
Meadow/ Open Hillside	Sun	Dry-Well Draining	Middle of lawn, sunny side of house, tiered gardens, top of wall, bermed garden



Type of Garden: Based on Features Wetland



Type of Garden: Based on Features Woodland



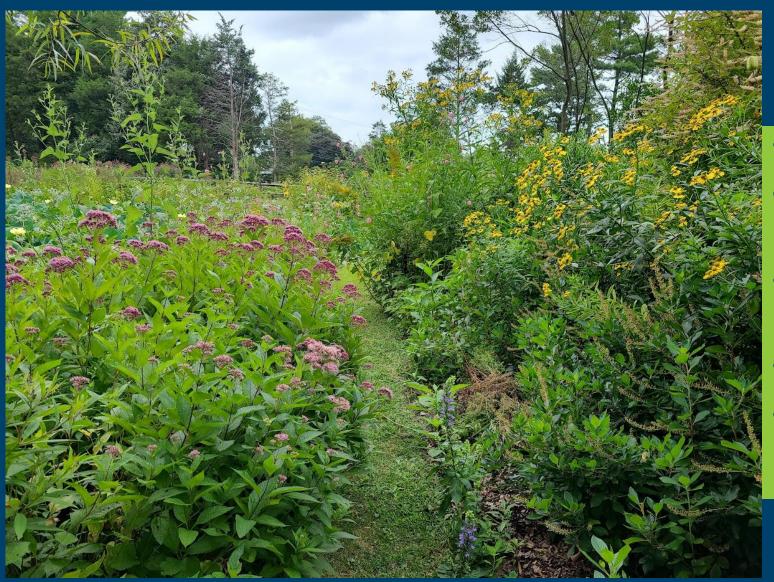
- Established Canopy of trees
- Shade to Part Shade
- Soil: High Organic Matter
- Even moisture in soil

Type of Garden: Based on Features Woodland Edge



- Established background of canopy trees
- Sun or Part shade depends on direction facing
- Soil could be more compact, clay, less organic matter
- Drier site due to sun, quicker rainwater runoff

Type of Garden: Based on Features Meadow



- Full Sun
- Established trees
 - singular "wolf tree"
- Low organic matter/poor quality soil
- Clay, rocky
- Percolation test could vary

Step 4: Type of Garden Goal

- ❖Single Plant
- Refurbishing current gardens
- Creating a new garden
- Adding in Native plants
- Incorporating into a naturalized space



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Step 5: Create a Plan



- Take what you now know
- Add Design features
- Then seek out plants that fit these features

Step 5: Create a Plan

Year-round Interest



Combine What You Now Know

- Why you are making this garden
 - Birds, Pollinating insects,
 Winter resources(interest)
 - Native plants as a wildlife resource for one are typically a resource for many

Site conditions

• Sun/Shade, Dry/Wet

Challenges

- Deer/Rabbit Resistant
- Salt tolerant
- Compacted Soil

Correlating Habitat

 Woodland, Forest Edge, Meadow, Wetland

Step 5: Create a Plan Formal Style of Garden



Fine Gardening

- Clear separation between plant groups
- Repetition/Patterns/Symmet rical
- Avoid/Limit colonizing & self seeding
- Choose plants with neat & tight forms
- Have defined lines and use straight edges

Maintenance

- Edit plants to prevent blending
- Cut back perennials early summer to controlled form/height

Step 5: Creating a Plan Naturalized Style of Garden



- Group plants in irregular sweeping groups or not at all
- Intersperse by merging plants between groups
- Subtle repetition/patterns: repeat colors/textures with different types of plants and less rigid of locations
- Use colonizing plants, & self seeding
- Select plants that have looser forms
- No hard lines, more curves
- Variation of texture, color, heights

<u>Wild Ones</u>

Formal Naturalized

Use any variation of these two extremes



Step 5: Create a Plan Garden Highlights



Statement Plant

- 1 plant Showy moment
- Central or Key location

Plant 3s-5s

- Helps form noticeable groups
- Aids in Repetition/Pattern

Repetition:

- Determine Preferred Color pallet
- Repeat in multiple locations

Seasonal interest

• Something is happening in all seasons

Wildlife Value

Themes help: Pollinator, Berries or Seeds for birds

Personal importance/interest

- I.e. Cutflowers, Edible
- Include your favorite plants

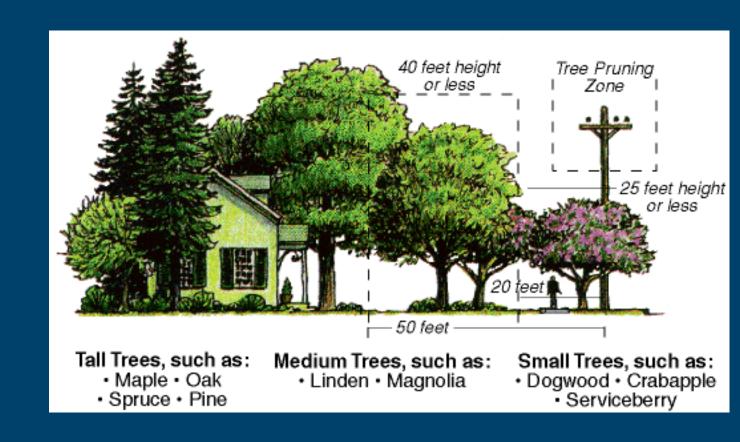
Step 5: Create a Plan Layers of Plants

Layers

Determine Appropriate Height Range

- Thriller Filler Spiller
- Canopy-Understory-Groundcover
- Upright-Mounding-Creeping

Make Plant lists designating what plants fill each layer



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Plant Selection

Plant Types~ in a nutshell

Woody

 Trees, Shrub & Vines: produce woody cells, above ground structure remains alive-regrows from previous years growth

Herbaceous terms

- Annual: Completes entire life in 1 yr.
- Perennial: Repeats lifecycle each year
- Bi-annual: Takes 2 years to complete entire lifecycle
- Tender perennial: acts like an annual in cooler areas but may survive a mild winter
- **Ephemeral:** Carries out yearly growth each year during a brief season then goes dormant
- Bulbs/Tubers/Rhizomes: Plant parts underground (root or stem structures) which the plant emerges from. May or may not be cold hardy



Clematis viorna (vasevine) & Asclepias purpurascens (purple milkweed)

Step 6: Plant Selection

Plant List Resources

- Jenkins Arboretum & Gardens
 - https://www.jenkinsarboretum.org/
- Bowman's Hill Wildflower Preserve: Right Plant Right Place
 - https://bhwp.org/grow/garden-withnatives/right-plant-right-place/
- Pennsylvania Department of Conservation & Natural Resources
 - https://www.dcnr.pa.gov/Conservation/WildPlan ts/LandscapingwithNativePlants/Pages/default.as px

Xerces Society

- https://xerces.org/pollinatorconservation/native-plant-nursery-and-seeddirectory
- Choose Natives PA: list of native plant nurseries
 - https://choosenativeplants.com/map



Native Plants for Meadows - Dry Site

Native plants are part of our rich natural heritage. These special plants are adapted to our local conditions, require less maintenance in the landscape and offer food sources for native wildlife. Native plants play a vital role in creating healthy ecosystems that can support a rich diversity of birds, insects, and other animals. Plant native!

Spring Blooming Perennials

Common Name	Botanical Name	Height	Bloom Color
Foxglove, Beard-Tongue	Penstemon digitalis	2-4'	white
Nodding Onion	Allium cernuum	1-2'	pink
Spiderwort, Virginia	Tradescantia virginiana	1-3'	purple

Summer Blooming Perennials

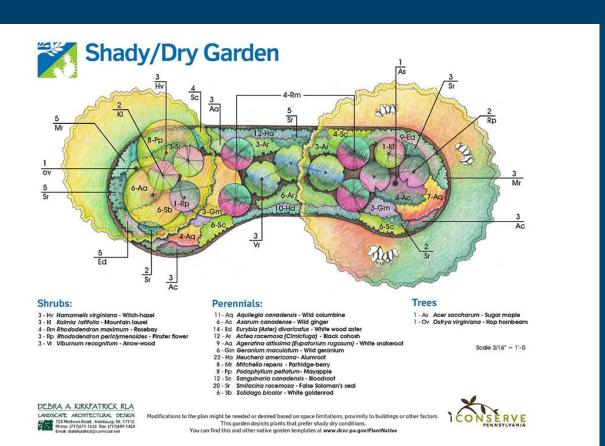
Common Name	Botanical Name	Height	Bloom Color
Bergamot, Wild	Monarda fistulosa	2-3'	purple
Black-Eyed Susan	Rudbeckia hirta	1-3'	yellow
Blazing Star	Liatris spicata	3-4'	pink, purple
Butterfly-Weed	Asclepias tuberosa	1-2'	orange
Coneflower, Grayheaded	Ratibida pinnata	4-5'	yellow
Milkweed, Common	Asclepias syriaca	3-5'	pink
Milkweed, Purple	Asclepias purpurascens	3'	purple
Mountain-Mint, Hoary	Pycnanthemum incanum	2-3'	white
Mountain-Mint, Narrow-Leaved	Pycnanthemum tenuifolium	1-3'	white
Mountain-Mint, Short-Toothed	Pycnanthemum muticum	2-3'	white
Mountain-Mint, Virginia	Pycnanthemum virginianum	2-3'	white
Spiderwort, Ohio	Tradescantia ohiensis	2'	purple
Senna, Maryland	Senna marilandica	3-6'	yellow
Senna, Wild	Senna hebecarpa	3-4'	yellow
Tickseed, Tall	Coreopsis tripteris	3-6'	yellow
Whorled Rosinweed	Silphium trifoliatum	3-7'	yellow

Summer-Fall Blooming Perennials

Common Name	Botanical Name	Height	Bloom Color
Aster, Calico	Symphyotrichum lateriflorum	1-2'	purple, white
Aster, New England	Symphyotrichum novae-angliae	3-5'	purple
Boneset, Hyssop-Leaved	Eupatorium hyssopifolium	2-3'	white
Culver's-Root	Veronicastrum virginicum	3-5'	white
Field Thistle	Cirsium discolor	3-6'	pink-purple

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Step 6: Plant Selection



Plant Selection Resources:

- Use known resources for Native Plants
- Watch out for Googled plant lists
 & Blogs
- Search results for Plants for dry soil likely not to include native plants
- All plants are native somewhere, be specific: Native to Northeastern United States, Native to Southeaster Pennsylvania, Native to North America

Plant Selection

1)Cross Reference Lists

- For plants that fit all your categories
- 2)Highlight several plants in 3 groups suiting to your scale
 1)Thriller/Big:
 - Tree/Large Shrub/Tall Perennial/Tall Grass

2) Filler/Medium:

• Small Tree/Shrub/Perennial

3) Spiller/Small:

- Creeping shrub/Perennial/Groundcove r
- 3)Only include plants you like!
- 4)Really love a plant outside your categories: may be worth a try
 - ❖ Just buy one ~ plants can surprise you
- 5)This will narrow down ©



Agastache foeniculum Giant Anise Hyssop

- Sun/Part Sun
- Moisture: Dry-Medium
- Clay Tolerant
- Deer/Rabbit Resistant
- Bloom June-August
- Wildlife: Birds,
 Butterflies, Bees,
 Hummingbirds
- 2-3' tall upright

Extras:

- Showy long-lasting flowers
- Spreads in location forming mass
- Low maintenance



Site:

- Wetland/ Riparian
- Sun
- Medium moisture



- Canopy 40-60'
 - Bald cypress, Swamp white oak, Black willow, Sycamore
- Understory 10-25'
 - Winterberry & Inkberry Hollies, Bay laurel, Buttonbush, Swamp Rose, Redtwig dogwood
- Herbaceous layer 1-5'
 - Iris, Sedges, Obedient Plant, Lobelia, Pickerel, Swamp Hibiscus, sneezeweed, marshmarigold



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 Bald cypress, Swamp white oak, Black willow, Sycamore

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Site:

Forest: Shade

Medium moisture







 Canopy: Established trees Oak, Maple, Hickory, Pine

- Thriller/Understory trees: 15-25'
 - Redbud, Sourwood, Pawpaws
- Filler/Shrubs & tall perennials: 5-10'
 - Rhododendrons, Mt Laural, Cinnamon Ferns, Hydrangeas
- Spiller/Groundcover: 1/2-3'
 - Ginger, white wood aster, blue mist flower, golden ragwort, dutchman's breeches

Site:

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<u>NCSU</u>

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Site

- Forest Edge: Part Sun
- Medium moisturedry





Canopy: Established trees
 Add:

- Thriller/Understory trees: 15-25'
 - Fringe Tree, Dogwood, Witch hazel
- Filler/Shrubs & Larger perennials: 5-15'
 - Viburnums, Blueberries, purple flowering raspberry, bottlebrush buckeye
- Spiller/Groundcover: .5-3'
 - Wood asters, goldenrods, ferns, sedges, phlox, heuchera, foamflower





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<u>Oregon State</u>

missouribotanicalgarden



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Site

- Meadow: Full Sun
- Medium moisture









NCSU

Canopy: "Wolf Tree" - single tree

• Black Walnut, Oaks, Maples, Hickories, Willow

- Thriller: 6'
 - Viburnums, Rose, Fothergilla
 - Joe-pye, Ironweed, Cupflower, Grasses-Big Blue Stem, Switchgrass
- Spiller/Groundcover: .5-4'
 - Coneflowers, Milkweeds, Aromatic Asters, Lobelias, Phlox, Beebalm, Mountainmints, Stoke's aster, Primrose
 - St. John's Wort, Clethra, Itea

Site

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Step 4: Identify Garden

- Plant habitat
- Goals

Step 5: Create a Plan

- Formal to Naturalized
- Garden Highlights
- Plant scale

Step 6: Plant Selection

- Use Established Lists!
- Categorize

Step 7: Install

- Planting Guide
- Water/Mulch

Step 8: Maintenance

Environmentally Minded
 Gardening

Advice from the Jenkins Team

Step 7: Installation



Purchase plants

- Too costly? Start with the largest plants then gradually add in smaller
- Plant Woody plants first
- Stage all plants before planting
- Use colored landscape flags to mark plant locations



Step 7: Installation Proper planting techniques





1.Dig Hole

- 1.Twice as wide
- 2.As Deep As the root ball

2.Prepare Root ball

- 1.Keep solidity of ball
- 2.Loosen outer roots
- 3. Purpose: prevent circling root growth

3.Fill Planting Hole

- 1.With removed Soil *not* Potting Soil
- 2.Compress in around root ball

Step 7: Installation Proper planting techniques





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Step 7: Installation Watering

- Water immediately after planting
- Slowly water until not draining
 - Wait until drained
 - Water slowly again until full



Step 7: Installation Mulch

Purpose:

Retain moisture, reduce weed competition

Trees/Shrubs

- Rule of 3
 - 3 feet wide (diameter) minimum
 - 3" deep
 - Don't touch stems/trunks

Use Natural materials for mulch

- Pine bark, Leaf mulch, Pine Straw
- Chopped vs Whole leaves
 - Small herbaceous plants may not be able to push through whole leaves
- Herbaceous plants
 - Cover when dormant
 - · When growing mulch around



Outline

Step 1: Site Analysis

- Lighting
- Soil
- Moisture

Step 2: Prepare the Area

- Clear the space
- Amend soil

Step 3: Challenges

- Herbivores
- And more

Step 4: Identify Garden

- Plant habitat
- Goals

Step 5: Create a Plan

- Formal to Naturalized
- Garden Highlights
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Step 6: Plant Selection

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Step 8: Maintenance

Environmentally Minded Gardening

Advice from the Jenkins Team

Step 8: Care Spring

- Lightly rake leaves to loosen where delicate plants emerge
 - i.e Trillium & other ephemerals
- Avoid walking in garden beds
 - Freeze/Thaw of the season helps aerate the soil
 - Walking re-compacts soil
- Water during hot/dry weather for 1st 2 years



Step 8: Care Summer

Water

- During hot/dry weather for 2 years
- Monitor for Wilting
- Better to water a lot slowly at one time & allow to drain/dry
- Unless a wetland ~ continuous watering will cause rot

Herbaceous Cut Back- June

- Cut perennials back which get too tall/flop
- Height depends on plant estimate 6"-1' or higher
- Skip single stem perennials
 - lobelia, liatris, iris
- Tier groupings = Stadium pruning

Weed around plants

Edit back perennials crowding other plants







Step 8: Care Fall



- Use leaves to cover garden beds
- Leave Herbaceous Stems
 - 18" or all the way
 - Insect habitat
 - Need to cut down-cut then chop & leave
 - Cut back messy looking stems only
 - Cover with chopped leaves to give a tidier look



Step 8: Care Winter





Prune

- Prune Broken, Damaged
- Avoid pruning woodies until dormant (pathogens are typically also dormant)
- Prune on dry days
- Prune back to branch intersections
- Keep plants natural form
- Never remove more than 1/3
- Clean pruning tools!

Break up Branches and toss back in garden

Edge beds before plants start growing

Install Native Plant Gardens



- Understand your site's features
- Determine your goals
 - Contribute to the habitat
 - Your design preference
 - Sizing needs
- Choose plants that fit both setting and goals
- Install
- Environmentally maintain the garden
 - Reducing water, chemicals and machine needs
 - Keep the organic matter!

Steve Wright Director of Horticulture

"Start with common plants, not the unusual ones, which are unusual mainly because they're difficult to establish, slow to grow, or have low survival rates."

"Second, don't overdo it with too many different plants – can make a space look too busy and incoherent. Plus, it is better to have bigger clusters of plants so the pollinators can find them easier."

Remember "Plants are living things and don't always act like they want them. A plant that thrives on one person's property, might not on theirs. Some things aren't going to work out. That's just how a garden works and it's important that people understand that and don't get discouraged."



Common blue violet, Viola sororia

Tara Spears Curatorial Assistant

"A project can be tackled in multiple phases (i.e. you don't need to take on a huge project all at once)."

"Start with a manageable amount of prep and plants and see how it goes (evaluate how removal is going and readjust as needed, see how plants are behaving, etc.). If it goes well, you can move on to the next phase."



Plumleaf Azalea, Rhododendron prunifolium

Helen Standen Greenhouse Manager



"Learn which plants happily seed about, purchase one or two plants of each and collect seeds from these plants in the fall to toss into spaces where they want to cover ground (so as to out-compete weeds). This is great for an area of the yard you aren't ready to tackle yet or may never want to keep highly managed.

It's a way to bring lots of natives to the property and make an ecological impact for little financial input. In three seasons I was able to populate the woods in my backyard with aggressive self-seeders. It's like a wildflower meadow in open, part sun areas.

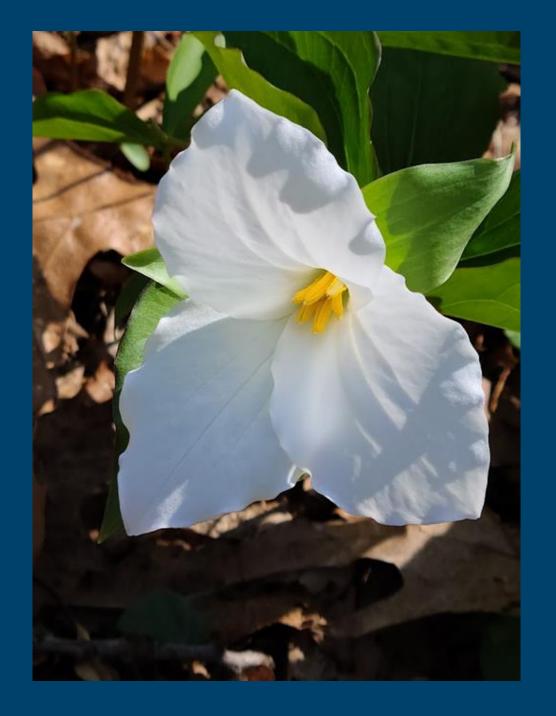
Agastache, Vernonia, Rudbeckia subtomentosa and triloba (although the deer do munch that a bit)
Monarda didyma, various Joe Pye and Elephantopus, mountain mints. They all do fine in part shade. They all seed about on their own now. I don't have to do anything unless I want to introduce additional species, in which case I plant one or two specimen which will make seeds for me or toss seed I have purchased or collected from a friend."

Karen Miller Head Horticulturist

"Gardens are always evolving; anticipate the future and grasp opportunities to move plants or incorporate new ones."



Questions & Comments





JENKINS ARBORETUM & GARDENS