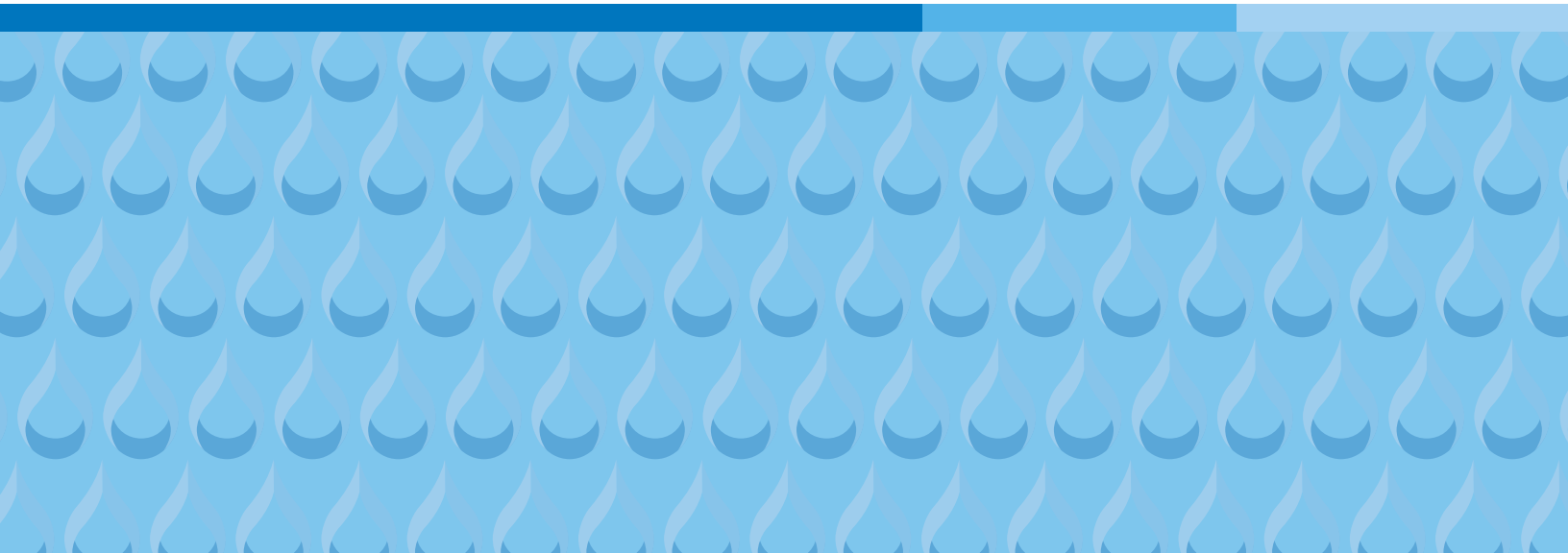




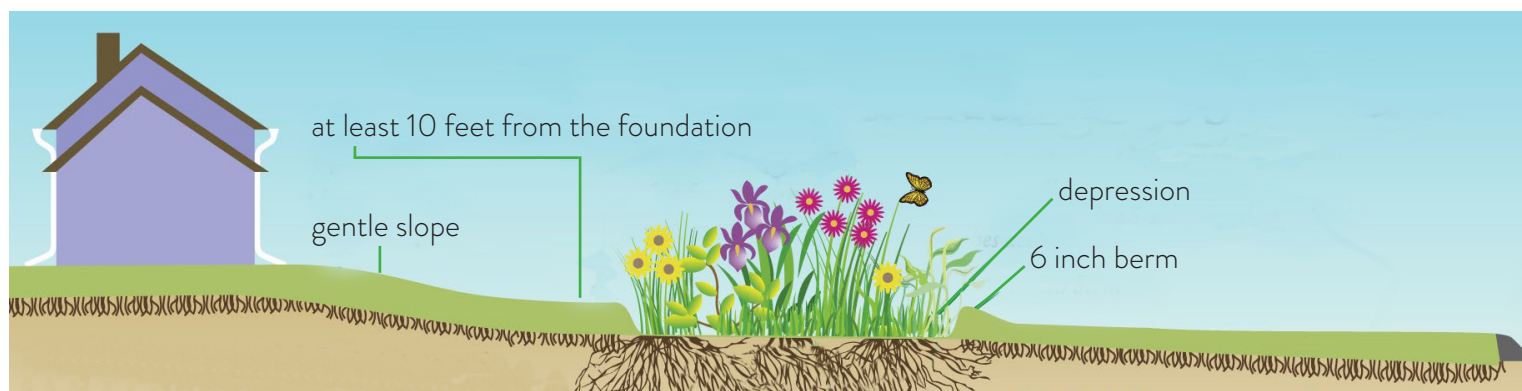
# A RESIDENT'S REFERENCE GUIDE TO CREATING A RAIN GARDEN



## What is a Rain Garden?

Rain gardens are shallow depressions filled with native plants designed to catch and absorb stormwater runoff from roofs, streets, parking lots and other areas. Stormwater runoff can negatively impact our waterways by increasing erosion and contributing harmful pollutants picked up from yards, streets, and parking lots. Rain gardens help reduce these negative impacts and recharge the ground water by utilizing stormwater runoff as a resource rather than channeling it to storm drains which lead directly to area creeks, rivers and lakes. Rain gardens can also help keep extra stormwater out of our sewer system, which can often become too full, causing sewer overflows. Water that is caught in a rain garden either infiltrates into the ground, is taken up by plant roots, or evaporates into the air. Native plants are a good choice for rain gardens because they are adapted to our local growing conditions. They have massive root systems that keep soil from eroding, help water soak into the ground, and keep the plants alive during droughts. Native plants are also a vital component in our local ecosystem as they provide food and shelter to birds and insects including pollinators.





## Designing a Rain Garden

1. **Determine the size** of your rain garden by estimating your roof area or driveway square footage. The garden should be about one-third the size of the area providing runoff. Sketch out your garden design on page 6.
2. **Choose a spot** at least 10 feet away from your foundation, and downhill from your home and your downspout, sump pump outlets, or other runoff source. Perform a percolation test as shown in the box on the right.
3. **Dig** a shallow, flat-bottomed hole with gradually sloping sides. The average depth of a rain garden is 6" - 12". Have a spot located in your landscape for excavated materials or build a berm on the downhill side of your rain garden. Fix your soil with the mixture listed on the bottom left if your percolation test showed your soil was not draining properly. You may want to test your soil's pH, as wildflowers grow best in soil with a pH level between 5.5 - 7.5. Before you dig, make sure to call 1-800-DIG-RITE so they can identify underground utilities that you should avoid.
4. **Test the overflow** pattern. Fill the excavated area with water and observe the overflow to ensure it flows away from buildings.
5. **Direct your runoff** into your rain garden if necessary by digging a shallow channel or using drainpipe.
6. **Plant!** Mix your amendments in the bottom of the garden (if you are using them). Place the plants at the appropriate spacing, then check your arrangement before digging holes and planting. Evaluate the texture and color of adjacent plants and make any design adjustments. **MULCH: add a 3-inch layer of mulch.** If you add mulch before planting, simply move it aside when digging holes, or after planting, place mulch loosely around plants. Untreated shredded hardwood mulch is best as it is less likely to float out of your garden, but any mulch is acceptable.

## Calculate Your Rain Garden Size

### How to figure the amount of space and number of plants you'll need.

**How much water?** Define your runoff area (e.g. 200 sq. ft. of roof or driveway).

**What size garden?** Divide the runoff area by 3 to obtain the rain garden size ( $200 \div 3 = 66.6$  or 67 sq. ft.) or fit the garden to your space.

**How many plants?** Your garden size divided by 2.25 for plants spaced 18" apart. ( $67 \div 2.25 = 29.7$ . Round to 30). So 30 plants are needed for the 67 sq. ft. garden in our example.

Use same calculation to add a rain garden to any drainage area.

## Percolation Test

Test your soil to make sure it has adequate infiltration for a rain garden.

- 1 Dig a hole twelve inches deep.
- 2 Fill it with water and let it drain all the way.
- 3 Fill it with water a second time. If the water drains at least half an inch in an hour the second time you fill it, your soil has adequate drainage for a rain garden and amendments are not needed.

## Fix Your Soil

If the composition of the soil does not allow for proper drainage (see percolation test) you may need to fix it. Excavate to twice the desired depth, then fill the bottom half with the amendment materials. You can mix materials right in your garden.

**50%** sand +  
**25%** topsoil +  
**25%** finished compost.



## Maintain your rain garden

- Water your newly-planted rain garden during its first growing season.
- Remove weeds regularly.
- Remove any dead stems or seed heads that do not appeal to you.
- Evaluate your rain garden each year. Fill any holes with the addition of other appropriate native plant species.
- To keep your garden looking neat, maintain its boundary by clipping and mowing. Consider edging the rain garden with natural stone on the downhill side. Avoid using a raised edge treatment on the side where water flows into the rain garden.
- In early spring, cut back last year's growth from grasses and perennials. Leave the plants standing throughout the winter for visual interest. Many native grasses look attractive during this time of year.
- Do not apply lawn fertilizers too close to your rain garden. When native plants are fertilized, especially with nitrogen, they tend to grow too tall to hold themselves upright. Additionally, fertilizing can stimulate weed growth and create competition for the native plants.

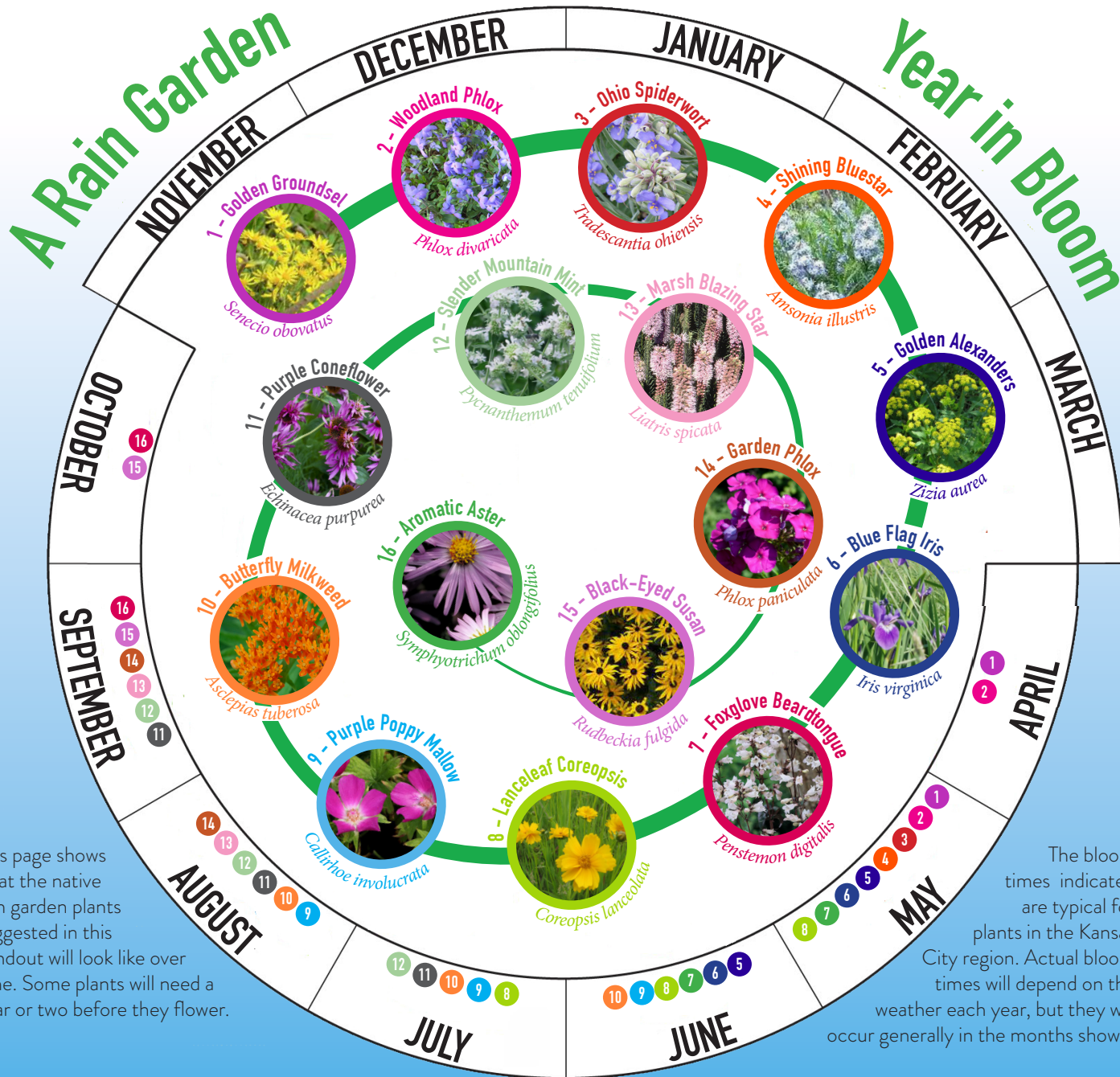
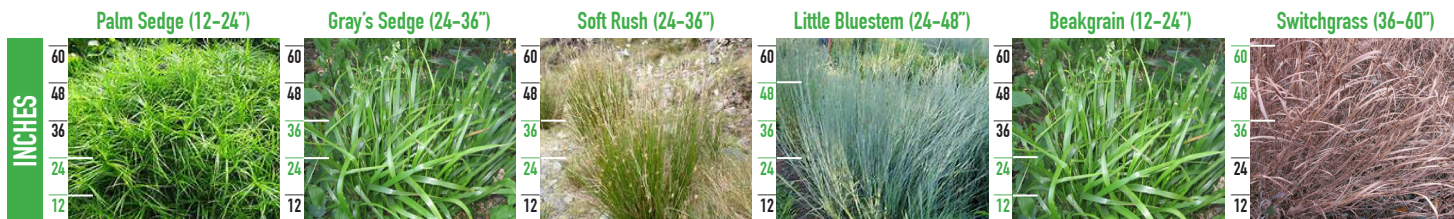
### What About Mosquitoes?

Stormwater runoff entering your rain garden should disappear within 24-48\* hours of a rain event. Mosquitoes need at least a week of standing water to complete their life cycle. A poorly maintained bird bath or rain gutter is a more likely breeding ground.

\*If your rain garden is not draining in 48 hours, you may need to fix your soil. See page 3 for more information.



# Rain Garden Plant Characteristics

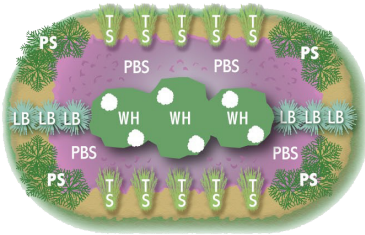


## Rain Garden Ideas

When placing plants in your rain garden you should keep in mind plant height. It is recommended that you place taller plants in the middle for a rain garden that is viewed from all sides, or place in the back if your garden is along a fence. You should also take into consideration when blooms appear. Choose a variety of plants that bloom throughout the growing season. Approximate bloom times are shown on Page 5.

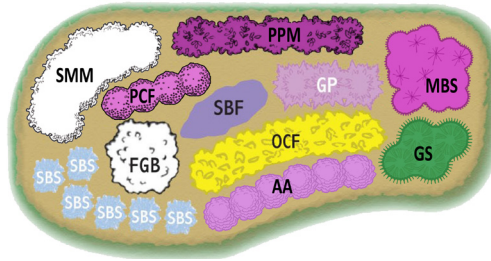
**SUN** - This design features sedges and grasses mixed with flowering plants in white and purple. Colors correspond to bloom.

**LB** = Little Bluestem  
**PBS** = Prairie Blazing Star  
**PS** = Palm Sedge  
**TS** = Tussock Sedge  
**WH** = Wild Hydrangea



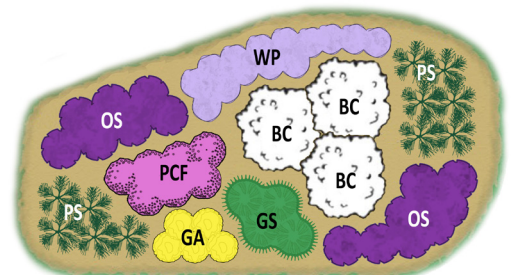
**SUN** - This design features a colorful mix of plants that bloom from May through October. Colors correspond to bloom.

**AA** = Aromatic Aster  
**FGB** = Foxglove  
**GP** = Garden Phlox  
**GS** = Gray's Sedge  
**MBS** = Marsh Blazing Star  
**OCF** = Orange Coneflower  
**PCF** = Purple Coneflower  
**PPM** = Purple Poppy Mallow  
**SBF** = Southern Blue Flag  
**SBS** = Shining Blue Star  
**SMM** = Slender Mountain Mint

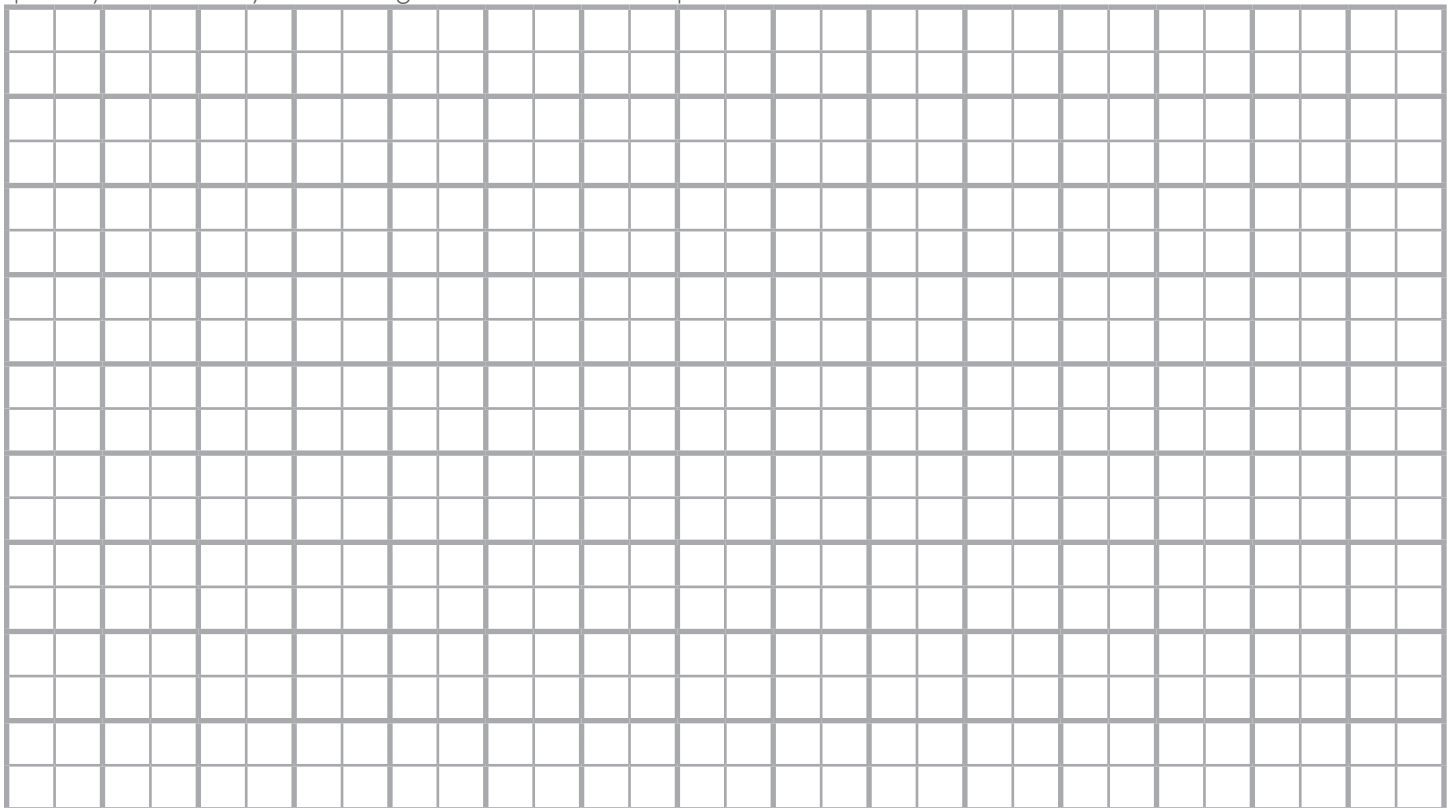


**PART SHADE** - This design features a mix of shrubs, sedges, and flowering plants that will work well in shady areas. Colors correspond to bloom.

**BC** = Black Chokeberry  
**GA** = Golden Alexanders  
**GS** = Gray's Sedge  
**OS** = Ohio Spiderwort  
**PCF** = Purple Coneflower  
**PS** = Palm Sedge  
**WP** = Woodland Phlox



Use this worksheet to sketch your ideas estimating the garden's size and shape, plant selection, placement and quantity, rock, or any other design features. Scale: 1 square = 6"



# Rain Garden Plant Details

	Botanical Name	Common Name															Varieties to consider & comments
			Rain garden bottom & lower edges	Upper edges of rain garden	Height (feet)	Recommended Plant Spacing (feet)	Full Sun	Partial Shade	Shade	Dry	Medium moisture	Wet	Birds	Butterflies	Fall color	Winter interest	
Grasses, Rushes, and Sedges	Boutloua curtipendula	Sideoats Grama	✓		1.5-2.5	1.5	✓			✓	✓		✓	✓		✓	
	Carex muskingumensis	Palm Sedge	✓		2-3	1.5	✓	✓	✓		✓	✓	✓			✓	
	Carex stricta	Tussock Sedge	✓		2-3	1.5	✓	✓			✓	✓				✓	
	Juncus effusus	Soft Rush	✓		2-3	1.5	✓				✓	✓				✓	semi-evergreen leaves
	Panicum virgatum	Switchgrass	✓		3-6	1.5	✓				✓	✓	✓			✓	'Shenandoah' or 'Northwind'
	Schizachyrium scoparium	Little bluestem		✓	2-3	1.5	✓			✓	✓		✓		✓	✓	'Blaze'
Wildflowers (Forbs)	Amsonia illustris	Shining Bluestar	✓		2-3	1.5	✓	✓		✓	✓	✓		✓	✓		
	Asclepias tuberosa	Butterfly Milkweed		✓	1-2	1.5	✓			✓	✓			✓			foliage fades by mid-summer
	Callirhoe involucrata	Purple Poppy Mallow		✓	.5-1	1.5	✓			✓	✓			✓			
	Coreopsis lanceolata	Lanceleaf Coreopsis		✓	2	1.5	✓			✓	✓			✓			short lived but spreads by seed
	Echinacea purpurea	Purple Coneflower	✓	✓	2-3	1.5		✓	✓	✓	✓		✓	✓		✓	gold finches visit winter seedheads
	Iris virginica	Blue Flag Iris	✓		1-3	1.5	✓				✓	✓				✓	
	Liatris spicata	Marsh Blazingstar	✓	✓	2-3	1.5	✓			✓	✓	✓	✓	✓		✓	'Kobold'
	Penstemon digitalis	Foxglove Beardtongue		✓	2-3	1.5	✓			✓	✓		✓	✓	✓	✓	
	Phlox paniculata	Garden Phlox	✓		2-4	1.5	✓	✓			✓		✓	✓			'David'
	Pycnanthemum tenuifolium	Slender Mountain Mint	✓	✓	2	1.5	✓			✓	✓			✓			
	Rudbeckia fulgida	Orange Coneflower	✓		2-2.5	1.5	✓				✓	✓	✓	✓		✓	can be short lived but spreads by seed
	Senecio obovatus	Golden Groundsel	✓	✓	1-1.5	1.5	✓	✓			✓	✓		✓			
	Tradescantia ohiensis	Ohio Spiderwort	✓		1.5-3	1.5		✓	✓		✓	✓					
	Symphotrichum oblongifolius	Aromatic Aster		✓	2	1.5	✓			✓	✓		✓		✓		
Trees and Shrubs	Aronia melanocarpa	Black chokeberry	✓		5-7	5		✓	✓	✓	✓	✓	✓		✓	✓	'Morton'
	Betula nigra	River Birch	✓		40-70	25	✓	✓	✓	✓	✓	✓				✓	exfoliating bark adds interest
	Hydrangea arborescens	Wild Hydrangea	✓		3-5	3		✓			✓						'Annabelle'
	Itea virginica	Virginia Sweetpire	✓		3-5	3		✓	✓		✓	✓			✓		'Henry's Garnet'
	Nyssa sylvatica	Black gum	✓		40-50	25	✓	✓		✓	✓		✓		✓	✓	slow growing but worth the wait
	Taxodium disticum	Bald cypress	✓		40-60	20	✓	✓		✓	✓	✓			✓	✓	unique feathery leaf texture



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[water.communications@kcmo.org](mailto:water.communications@kcmo.org) or call 816-513-0582.



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