A QUICK REFERENCE GUIDE TO

Earth-Friendly Home Landscaping

Look for **TO DO** *Actions throughout this Guide. They indicate things you can do now to make your landscape more earth-friendly.*

Hennepin

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www.hennepin.us/sustainablelandscaping

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Visit an Eco-Yard

SEE A DEMONSTRATION OF EARTH-FRIENDLY HOME LANDSCAPING

The Eco-Yards demonstrate an approach to home landscaping in which plants thrive with minimal inputs of pesticides, fertilizer, water and time.

PLANTINGS HIGHLIGHTED AT THE ECO-YARDS

- Prairie and wildflowers
- Rainwater garden
- Fescue lawn
- Backyard composting
- Small and tall shrub massings
- Tree groves with plantings beneath
- Swale planting with sweet grass (Midtown)
- Permeable paver plaza (Midtown)

ECO-YARD TOURS

The Eco-Yards are open throughout the growing season for self-guided tours. Guided tours with a landscaping professional can be arranged. Call 612-348-3777 to schedule a tour.

Check out our website at *www.hennepin.us/ecoyardtours* for more information on eco-yard tours.

Eco-Yard in Brooklyn Park
8100 Jefferson Highway, Brooklyn Park
Adjacent to the Recycling Center

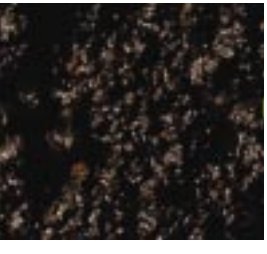
Hours: Tu, Th, Fri . . . .10 am - 6 pm
Wed . . . . . .10 am - 8 pm
Sat . . . . . .8 am - 5 pm

Eco-Yard Midtown
2801 21st Ave S, Minneapolis
Adjacent to the Green Institute

Hours: Open every day until sunset

Landscape Design

ON THE PATH TO AN ENVIRONMENTALLY-FRIENDLY LANDSCAPE



In Minnesota, we only have a short time to enjoy our yards. As a result, we take advantage of them as play areas, gardens and as places to gather with friends and family. We also spend a great deal of time and money making sure our shrubs, trees, flowers and lawns look great. Traditionally, this high-maintenance type of yard care may have included large quantities of inputs – water, fertilizers, pesticides, weed control and money; not to mention our own sweat and time.

Enter environmentally-friendly landscaping, otherwise known as sustainable landscaping. This type of landscaping employs some basic principles that can reduce the impact we have on the environment and the amount of time and labor while still creating a functional, aesthetically pleasing landscape that can be easily maintained in the years to come. These principles include such practices as improving your soil, choosing the right plant according to conditions, replacing lawn areas that are difficult to maintain with better adapted shrubs and trees and reducing inputs into the environment.

A sustainable landscape is not a "no-maintenance" landscape and some of these changes will take time to get established. Your landscape will still require some level of care, but not as much because ***you are working with the environment instead of against it.***

Look at your yard. Wouldn't it be great to spend more time enjoying it rather than working on it? You'd no doubt have a lower water bill, while minimizing the use of pesticides and fertilizers. To learn how you can do all this and more, take a look at the following tactics for turning your yard into an environmentally-friendly and sustainable landscape. *It's your chance to make a positive impact on the environment.*

GETTING STARTED: CREATE A BASE MAP

The first step to creating a new landscape design is to assess what you have and consider how you would like to use your yard.

TO DO/What are your current conditions?

- How much sun does the area receive each day? Keep track of how many hours of sun different parts of your yard receive during spring and summer days. Is it morning sun or afternoon sun?
- What is the soil like? Heavier, sticky clay? Lighter, more porous sand? Or is your soil rich, black loam? (see Improving Soil, pg 4)
- What is the moisture level of the area? Does it remain damp after a rainstorm or watering, or does it dry quickly? Are there low areas that may make for great rain garden locations? (see Rain Gardens, pg 19)
- Are there plants or other features that you would like to keep?
- Where are your utility lines (above and below ground)? What planting restrictions apply to these areas? (see TO DO/Call before you dig, pg 4)
- Do you have an underground irrigation system? If so, where are the lines/sprinkler heads?

TO DO/How would you like to use your space? (What are your needs?)

- Where are your high traffic areas?
- How much open space do you need for yard activities? (play areas)
- Which views would you like to enhance?
- Would you like to create areas for wildlife? A butterfly garden, a bird feeding station?
- Would you like more privacy?
- Would you like to add features to improve water quality? (see Practices to Improve Water Quality, pg 15)

TO DO/Drawing the Base Map:

Now that you have answered the basic questions, create a map to build from. First measure the dimensions of any permanent structures (home, shed, fence, etc.) and your lot. Include locations for major doors and windows. This will help as you develop views from inside your home, and determine available plant space. Then measure from a fixed location, the corner of the house, to the street, to the property line, to the driveway etc. Plot these measurements on a large sheet of graph paper. Next draw in the features

that you would like to remain or that cannot be moved (utility fixtures, large trees, sandbox). Use a piece of tracing paper to overlay the base map. Draw your new designs and ideas on the tracing paper. Using multiple sheets of tracing paper will allow you to create different landscape options without damaging or redrawing your base map.

WORK FROM THE GROUND UP: IMPROVING SOIL

The soil is the basis of your entire yard and garden. Consider it the foundation of your landscape similar to the foundation of your house. If you have a weak foundation, your house will have maintenance problems in the future. If you have a strong foundation, your house will endure.

Poor soil may be compacted, lacking in nutrients and organic matter and may have poor water-holding capacity. Healthy soil is loose, contains organic matter and holds water easily, yet allows it to easily drain excess water. We tend to pay more attention to our plants and lawns, forgetting that plant care begins with the soil. Here are some basic steps you can take to start improving your soil:

TO DO/Call before you dig:

Before you dig, call Gopher State One at 800-252-1166 statewide or 651-454-0002. Gopher State One will notify your local utilities and they will mark their electric, gas lines, and cable lines that are buried in your yard. Always be careful of lines installed by previous homeowners (e.g., from the house to an external garage), Gopher State One does not mark these lines.

TO DO/Do a soil test:

Find out the condition of your soil before you do anything. Your local county extension service can provide you with the proper instructions and bags used to collect soil samples. Be sure to collect samples from various parts of your lawn. The University of Minnesota Soil Laboratory (soiltest.cfans.umn.edu, 612-625-3101) will be able to give you valuable information on the current condition of your soil – nutrient levels, soil structure, and pH – and make recommendations for improvement.

TO DO/Aerify your soil:

Maintaining a healthy soil will improve short and long term lawn health. Where soils are hard and compacted, core aerifying can be used to improve plant health, increase rooting volume and improve infiltration. Aerification is done using a machine that can usually be rented from dealers in your area. The machine pulls 2-3" cores of soil from your yard, enabling air to be incorporated into the soil. Aerification will also allow greater access to soil water and nutrients, as well as improving plant stress tolerance.

TO DO/Add organic matter:

Organic matter is an important component of soil health. It increases the soil's capacity to absorb and release nutrients. It improves moisture-holding capacity of sandy soils and the drainage capability of heavy clay soils. It also improves the structure of soil by providing a good environment for root growth and by encouraging earthworms and microorganisms that are beneficial to plant health. You can easily add organic matter by using compost as a mulch on your garden soil and around shrubs and trees. To do this, mix 1-2 inches of well-decomposed compost into the top 6-8 inches of soil around your plants. You can also improve the health of your lawn by top-dressing. This means lightly spreading compost (about 1/4" maximum) over your lawn and gently raking it into the lawn.

TO DO/Amend soils:

Many lawns, especially those where the soil has been compacted by heavy machinery during housing construction are impervious and provide little infiltration of water. Tilling the soil to at least 4 to 6 inches with a garden tiller and incorporating 1 to 2 inches of well-decomposed compost will increase infiltration. Remember to lightly compact the soils before planting or seeding. A good rule of thumb is to measure how deep an impression your foot makes when stepping on the soil. Your foot impression should not be more than 1/4 inch deep. Choosing plants that develop a deep root structure (>4-6") will further increase the potential for water to infiltrate. (see Plant Selection, pg 7)

PLANT THE RIGHT PLANT

Choosing the right plant material for your yard is an important step in creating a landscape that is sustainable. It's easy to get caught up in the beauty of a plant you discover at the garden center, only to find it requires conditions that don't match your yard.

By selecting plants that are suited to the conditions of your location, you will reduce the work required to establish and maintain the plants and they will survive longer and look better in your landscape. Be sure to consider the location's soil, moisture, available light, and mature size when selecting plants.

The same goes for your lawn. The fine-leaved fescues as well as the older, common types of Kentucky Bluegrasses are better suited to lower inputs than turf-type perennial ryegrasses and many of the newer, improved types of Kentucky Bluegrasses.

LESS IS MORE: ALTERNATIVES TO GRASS

Let's make it clear up front: there is nothing wrong with having a lawn. Grass is one of the toughest, most successful ground covers available. It is easy to grow, reduces dust, cools the surrounding air, and it prevents wind and soil erosion.

However, sometimes we establish grass in areas that we don't actively use or in areas that grass doesn't grow well, or are difficult to mow and maintain. These are the areas where less is more. It is often better to utilize other plant materials for these areas: flower beds, shrubs, no-mow ground covers, or mulch, such as wood chips. This makes the area functional, maintainable, and environmentally-friendly. *Part of a sustainable landscape is analyzing how you use your lawn and the areas in which a different type of ground cover would be better.*

REDUCE INPUTS, REDUCE IMPACT

Inputs are anything you put into a landscape. This would include: pesticides, fertilizers, water, money and labor. At times, we will need to rely on these inputs to help our plants through weather, disease, insect infestation, or we may have to replace a plant altogether. The goal of sustainable landscaping is to reduce the need for these inputs as much as possible, by working with basics – soil, plant selection, lawn use – and by thinking ahead.

FOR MORE INFORMATION:

– Visit the University of Minnesota Extension Service's Sustainable Urban Landscape Information Series at *www.sustland.umn.edu*

– Visit the University of Metro Watershed Partner's "Tips for Keeping Minnesota Water Clean" at *www.cleanwatermn.org*

Plant Selection

A CRITICAL STEP IN CREATING A SUCCESSFUL LANDSCAPE

Selecting plants that fit the moisture and light conditions of a location is a critical part to a successful landscape. (see Landscape Design, pg 2) The following lists offer some suggestions for plants that fit various conditions. These lists are by no means all-inclusive. Homeowners should consult books, magazine articles, and web sites. County extension services and master gardeners are also good resources.

The plant materials below are listed by their italicized botanical names (genus, species and cultivar, if applicable) followed by the common name. Whenever possible, use the botanical name when purchasing a plant, as it is the most accurate and will ensure you are buying the right species.

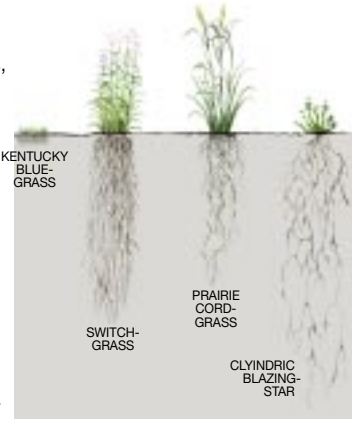
NATIVE vs. NON-NATIVE SPECIES:

Native plants are defined as plants originating in a particular location, such as Minnesota or the North Central United States. Non-native species have been brought into an area and naturalized. The Norway maple is a good example of a tree that has been naturalized in Minnesota, yet originated in Europe. Native species may be hardier, less invasive and less prone to disease and insect problems. However, there are many non-native species that have become adapted to climate as well as resistant to pests and diseases, which make good choices.

Native vs non-native species, con't next page

Some native plants develop deeper root structures, allowing for better water infiltration. A deeper root structure also provides stabilization along lake or stream banks which help us to improve the quality of our lakes, streams and wetlands. Native prairie plants often times develop roots that penetrate to a depth 2-3 times that of the plant's height.

A NATIVE PLANT THAT IS 2 FT TALL, LIKELY HAS A ROOT STRUCTURE AT LEAST 6 FT DEEP. TYPICAL LAWN GRASS HAS A ROOT STRUCTURE THAT REACHES ONLY 4-6 INCHES.



TREES & SHRUBS

Choosing a shrub that physically fits into a location is important. Pay attention to its mature size as noted on the plant information tag. You may also want to double check with the nursery staff as sometimes cultural influences such as light, moisture, soil condition and pruning will have an effect on the mature size a shrub can reach.

Deciduous Trees & Shrubs under 25 feet tall

Acer spicatum . . . . . .Mountain Maple
Amelanchier laevis . . . . . .Allegheny Serviceberry
Amelanchier canadensis . . . . . .Serviceberry (clump form)
Amelanchier x grandiflora 'Autumn Brilliance' . . .Autumn Brilliance Serviceberry
Carpinus caroliniana . . . . . .Blue Beech
Chionanthus virginicus . . . . . .White Fringe Tree
Crataegus crus-galli inermis . . . . . .Thornless Cockspur Hawthorn
Cornus sericea . . . . . .Pagoda Dogwood
Cornus alternifolia . . . . . .Redosier Dogwood
Hydrangea paniculata 'Grandiflora' . . . . . .Pee Gee Hydrangea Tree
Prunus americana . . . . . .Wild Plum
Syringa reticulata amurensis japonica . . . . . .Japanese Tree Lilac
Viburnum lentago . . . . . .Nannyberry
Viburnum dentatum . . . . . .Arrowwood Viburnum
Viburnum trilobum . . . . . .American High Bush Cranberry

Evergreen Trees & Shrubs under 25 feet tall

Juniperus scopularum . . . . . .Rocky Mountain Juniper
Juniperus virginiana . . . . . .Eastern Red Cedar
(height can be taller than 25 ft)
Thuja occidentalis 'Techny' . . . . . .Techny Arborvitae

SHRUBS THREE TO FOUR FEET TALL

Deciduous shrubs for **SUNNY & DRY** Areas

Amorpha canescens . . . . . .Lead Plant

Ceanothus americanus . . . . . .New Jersey Tea

Diervilla lonicera . . . . . .Dwarf Bush Honeysuckle

Physocarpus opulifolius 'Dart's Gold' . . . . . .Dart's Gold
(height can be > 3-4 ft)

Prunus pumila . . . . . .Dwarf Sandcherry

Rosa arkansana . . . . . .Prairie Rose

Symphoricarpos orbiculatus . . . . . .Coralberry

Vaccinium angustifolium . . . . . .Lowbush Blueberry
Note: Requires acidic soil for best results.

Evergreen shrubs for **SUNNY & DRY** Areas

Juniperus communis depressa . . . . . .Oldfield Common Juniper

Juniperus horizontalis . . . . . .Creeping Juniper

Deciduous shrubs for **SUNNY & MOIST** Areas

Aronia melanocarpa . . . . . .Black Chokeberry
(height can be > 3-4 ft)

Ilex verticillata cultivars . . . . . .Winterberry
(height can be > 3-4 ft)
Note: Requires male and female plants for berries

Salix purpurea 'Nana' . . . . . .Purpleosier Willow

Symphoricarpos albus . . . . . .Snowberry

Deciduous shrubs for **SHADY & DRY** Areas

Amelanchier stolonifera . . . . . .Running Serviceberry

Hydrangea arborescens 'Annabelle' . . . . . .Annabelle Hydrangea

Symphoricarpos orbiculatus . . . . . .Coralberry

Ribes alpinum . . . . . .Alpine Currant

Deciduous shrubs for **SHADY & MOIST** Areas

Clethra alnifolia cultivars . . . . . .Summersweet

Dirca palustris . . . . . .Leatherwood

Ledum groenlandicum . . . . . .Labrador Tea

Symphoricarpos albus . . . . . .Snowberry

Evergreen shrubs for **SHADY & MOIST** Areas

Thuja occidentalis 'Hertz Midget' . . . . . .Hertz Midget

Tsuga canadensis 'Gracilis' . . . . . .Gracilis Hemlock

Tsuga canadensis 'Coles Prostrate' . . . . . .Coles Prostrate Hemlock

GROUND COVERS

Ground covers are plants that spread rapidly and grow close to the soil level. They are good choices for areas that need erosion control and/or are difficult sites for other types of plants. Ground covers can also replace turf grass in areas that are difficult to maintain, eliminating the need to mow. It is important to note that some can be very invasive – a characteristic that may or may not be desirable in a ground cover.

Ground Covers for **SHADY** Areas

Asarum canadensis . . . . . .Wild Ginger

Aster macrophyllus . . . . . .Big Leaf Aster

Cornus canadensis . . . . . .Bunch Berry
Note: Needs acid soil

Galium odoratum . . . . . .Sweet Woodruff

Hosta species and cultivars . . . . . .Hosta or Plantain Lily

Lamiastrum galeobdolon . . . . . .Lamiastrum

Mitchella repens . . . . . .Partridgeberry
Note: Needs acid soil

Ground Covers for **SUNNY** Areas

Arctostaphylos uva-ursi . . . . . .Bearberry
Note: A broadleaf evergreen; prefers acid soil

Gaultheria procumbens . . . . . .Wintergreen
Note: A broadleaf evergreen; prefers acid soil, grows in partial shade

Sedum . . . . . .Sedum

Waldsteinia fragarioides . . . . . .Barren Strawberry
Note: A broadleaf evergreen

ORNAMENTAL & NATIVE GRASSES

There has been a surge of interest in the use of ornamental and native prairie grasses in home landscapes and it's easy to see why. They are easy to care for, have almost no disease or pest problems, have low nutrient requirements and grow quickly. Grasses can also add winter interest to landscapes with their persistent seed heads, varied colors, and textured leaves and stems.

Grasses for **SHADY** & DRY Areas

Bromus ciliatus . . . . . .Fringed Brome
Bromus kalmii . . . . . .Kalm's Brome
Carex pennsylvanica . . . . . .Pennsylvania Sedge
Carex sprengellii . . . . . .Long Beaked Sedge
Deschampsia caespitosa . . . . . .Tufted Hairgrass
Elymus hystrix . . . . . .Bottlebrush Grass
Hakonechloa macra . . . . . .Hakonechloagrass
Luzula multiflora . . . . . .Woodrush
Luzula parviflora . . . . . .Greater Woodrush

Grasses for **WATER GARDENS & MOIST** Areas

Acorus calamus . . . . . .Sweet Flag
Calamagrostis acutiflora . . . . . .Feather Reed Grass
Carex crinita . . . . . .Fringed Sedge
Carex comosa . . . . . .Bottlebrush Sedge
Carex vulpinoidea . . . . . .Fox Sedge
Hierochloe odorata . . . . . .Sweet Grass
Juncus effusus . . . . . .Soft Rush
Molinea caerulea . . . . . .Moorgrass
Panicum virgatum . . . . . .Switchgrass
Note: Aggressive
Scirpus cyperinus . . . . . .Woolgrass
Scirpus atrovirens . . . . . .Dark Green Bulrush
Spartina pectinata . . . . . .Cordgrass

Grasses, continued next page

GRASSES for **EROSION CONTROL** *(may be invasive)*

Calamagrostis canadensis . . . . . .Canada Bluejoint Grass

Hierochloe odorata . . . . . .Sweet Grass

Panicum virgatum . . . . . .Switchgrass
Note: Aggressive

Spartina pectinata . . . . . .Cordgrass
Note: Performs best in moist soils in full sun; invasive especially in sandy soils.

Grasses for **SUNNY & DRY** Areas

(Also excellent choices for erosion control)

Andropogon gerardii . . . . . .Big Blue Stem

Bouteloua curtipendula . . . . . .Sideoats Grama

Bouteloua gracilis . . . . . .Blue Grama

Koeleria brevis . . . . . .Blue Hairgrass

Koeleria macrantha . . . . . .Junegrass

Schizachyrium scoparium . . . . . .Little Blue Stem Grass

Sorghastrum nutans . . . . . .Indiangrass

Sporobolus heterolepis . . . . . .Prairie Dropseed Grass

Grasses for **SHADY & MOIST** Areas

(Also excellent choices for erosion control)

Bromus ciliatus . . . . . .Fringed Brome

Carex stipata . . . . . .Awl Fruited Sedge

Carex comosa . . . . . .Bottlebrush Sedge

Elymus hystrix . . . . . .Bottlebrush Grass

Glyceria striata . . . . . .Fowl Manna Grass

Juncus effusus . . . . . .Soft Rush

Deschampsia caespitosa . . . . . .Tufted Hairgrass

Luzula parviflora . . . . . .Greater Woodrush

Schizachyrium scoparium
Little Blue Stem Grass

NATIVE WILDFLOWERS

Planting tough, vigorous perennial wildflowers can make for an attractive, fairly low-maintenance garden. They add color and attract birds and butterflies.

Wildflowers for **SHADY & DRY** Areas

Anemone cylindrica . . . . . .Thimbleweed
Aster macrophyllum . . . . . .Big Leaf Aster
Astragalus canadense . . . . . .Canada Milk Vetch
Campanula rotundifolia . . . . . .Harebells
Galium boreale . . . . . .Northern Bedstraw
Geranium maculatum . . . . . .Wild Geranium
Helianthus strumosus . . . . . .Woodland Sunflower
Heuchera richardsonii . . . . . .Alum Root
Polemonium reptans . . . . . .Jacob's Ladder
Thalictrum dioicum . . . . . .Early Meadow Rue

Wildflowers for **WATER GARDENS & MOIST** Areas

Anemone canadensis . . . . . .Canada Anemone
Asclepias incarnata . . . . . .Swamp Milkweed
Aster umbellatus . . . . . .Flat-Topped Aster
Caltha palustris . . . . . .Marsh Marigold
Chelone glabra . . . . . .Turtlehead
Eupatorium maculatum . . . . . .Joe Pye
Helenium autumnale . . . . . .Sneezeweed
Liatris pycnostachya . . . . . .Prairie Blazingstar
Mimulus ringens . . . . . .Monkeyflower
Pycnanthemum virginianum . . . . . .Virginia Mountain Mint

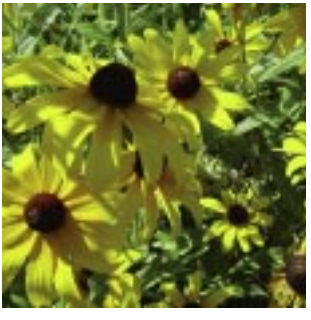
Wildflowers, continued next page

Wildflowers for **SUNNY & DRY** Areas

Agastache foeniculum . . . . . .Anise Hyssop
Asclepias tuberosa . . . . . .Butterflyweed
Dalea purpurea . . . . . .Purple Prairie Clover
Echinacea angustifolia . . . . . .Narrow-Leaf Coneflower
Lupinus perennis . . . . . .Wild Lupine
Penstemon grandiflorus . . . . . .Large Flowered Beardtongue
Ratibida pinnata . . . . . .Yellow Coneflower
Rudbeckia hirta . . . . . .Black Eyed Susan
Solidago rigida . . . . . .Stiff Goldenrod
Tradescantia bracteata . . . . . .Spiderwort

Wildflowers for **SHADY & MOIST** Areas

Adiantum pedatum . . . . . .Maidenhair Fern
Aquilegia canadensis . . . . . .Wild Columbine
Arisaema triphyllum . . . . . .Jack-in-the-Pulpit
Aster umbellatus . . . . . .Flat-Topped Aster
Caltha palustris . . . . . .Marsh Marigold
Lobelia cardinalis . . . . . .Cardinal Flower
Lobelia silphilitica . . . . . .Great Blue Lobelia
Matteuccia struthiopteris . . . . . .Ostrich Fern
Osmunda spp . . . . . .Ferns
Solidago flexicaulis . . . . . .Zig Zag Goldenrod



Rudbeckia hirta
Black Eyed Susan

FOR MORE INFORMATION AND TO VIEW PLANT PHOTOS:

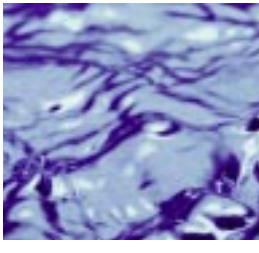
– Visit the University of Minnesota Extension Service's Sustainable Urban Landscape Information Series at *www.sustland.umn.edu*

Practices to improve water quality

REDUCE RUNOFF AND PREVENT POLLUTION TO IMPROVE OUR WATER

STORMWATER RUNOFF MANAGEMENT

Much of the rainwater that falls in urban areas, runs off rooftops and driveways to streets; through the storm sewers; and finally, to lakes, streams, or rivers without filtration or treatment. As it travels, water picks up a variety of pollutants, including sediment. The goal of runoff management is to keep excess water and pollutants from reaching the storm drains in your neighborhood streets.



KEEP WATER IN YOUR YARD

Increase the opportunity for water to soak in or infiltrate into your soil. Many of our flooding and erosion problems exist because we move water too quickly off of our landscape. Water that once took days to filter through to the nearest lake, wetland or stream, has been channeled and moved off the landscape quickly through a series of impervious surfaces and pipes.

TO DO/Divert roof top water runoff by:

- Moving or extending the downspouts to flow onto a vegetated area.
- Creating a rainwater garden. (see Rain Gardens, pg 19)
- Creating a water retention area with a shallow, grass-covered turf depression in the lawn.
- Stationing a rain barrel at the end of one or more shortened down-spouts. (see Rain Barrels, pg 36)

TO DO/Reduce runoff from your driveway, patio or sidewalk:

If you need to replace an existing hard surfaced area or would like to add an extra parking spot, patio, etc. install a porous surface that will allow water to seep through.

- Use cement or gravel tracks with a strip of vegetation in the middle for your driveway.
- Use reinforced soil products so that you can create a grass or gravel driveway.
- Place a drywell filter box of sand and crushed rock at the end of the driveway's down slope.
- Create a channel or gentle berm that diverts water running down the driveway into a rainwater garden or turf depression.
- Reduce unneeded impervious areas and replace it with vegetation.
- Slope one side of the patio toward a vegetated area.

TO DO/Reduce runoff from your lawn:

Many lawns allow for little infiltration because the soil has become compacted during house construction. The following practices can increase infiltration.

- Amend and aerate your soils. (see Improving Soil, pg 4)
- Replace shallow rooted turf grass with deep rooted alternatives. (see Plant Selection, pg 7)
- Create a rainwater garden (see Rain Gardens, pg 19)

POLLUTION PREVENTION

TO DO/Reduce pollution from impervious surfaces:

- Clean up oil, gas, radiator fluid, and other leaks and spills on your driveway with absorbent cat litter, and then place in the garbage. Fix persistent leaks.
- Sweep any fertilizer from the driveway into the grass.
- Sweep up any grass clippings, leaves, and dirt (including those on the street).
- Avoid using salt and chemical products for ice control.
- Take your car to a commercial car wash facility, where wastewater is treated.

TO DO/Reduce use of pesticides and fertilizers:

The U.S. Environmental Protection Agency estimates that homeowners and lawn care services apply nearly 70 million pounds of active pesticide ingredients (herbicides and insecticides) to urban lawns every year. Fertilizers are even more popular.

- Test your soil to determine how much fertilizer, if any, your lawn and garden needs (see Improving Soils, pg 4).
- Topdress with compost as an organic matter amendment to soil and/or lawn surface.
- Use fertilizers containing zero phosphorus if you must fertilize your lawn. Minnesota State Law prohibits the use of phosphorus containing fertilizers on existing lawns unless a soil test indicates a phosphorus deficiency. It's best to fertilize only in the fall.
- Instead of applying herbicides over the entire yard, spot treat weeds.
- Never use pesticides more than 10 years old. Bring them to a Hennepin County Drop-Off Facility (see Resources, pg 43).
- Never apply pesticides or fertilizer if rain is forecasted within the next day or two.
- Use low maintenance plants and grass varieties to reduce the need for pesticides and fertilizers.

TO DO/Properly dispose of pet waste throughout the year:

During spring snowmelt and during summer storms, pet waste that is left on the ground travels with runoff directly to water resources and contributes to elevated bacteria and nutrient levels. Keep pet waste from polluting:

- Flush pet waste down the toilet, so your septic system or the sewage treatment plant can treat it.
- Seal the waste in a plastic bag and throw it into your garbage.

TO DO/Compost yard waste:

It is a Minnesota state law that property owners cannot throw yard and tree waste (grass clippings, leaves, trees, stumps wood chips, garden debris, weeds) in with their household garbage. It is against some cities' ordinances to rake or blow leaves and grass clippings into the street, because they clog storm sewers and overload streams, lakes and rivers with nutrients and sediment. Here is what you can do:

- Leave grass clippings on your lawn when you mow. Decomposing grass clippings offer the same benefits as one application of fertilizer each year.
- Compost excess grass clippings and other yard waste. Yard debris will decompose into a soil amendment for your yard and garden (see Home Composting, pg 23).
- Use curbside collection or drop-off facilities for yard waste. Contact your waste hauler or city recycling coordinator.

CONSERVE WATER

TO DO/Water efficiently to conserve water:

- Be sure to water properly:
    - Choose the right size and type of sprinkler.
      Those that mist lose a lot to evaporation.
    - Water from 4-8 am
      (Cooler, less windy, reduced sunlight-all reduce evaporation loss.)
    - Do not water when it is windy or extremely hot.
      Water evaporates before it reaches the roots.
    - Sprinkle only plants – not pavement – to prevent unnecessary runoff.
    - Water thoroughly to a depth of 5-6 inches.
      (see Watering, pg 33)
- Rake in some compost to improve moisture retention and reduce the need for fertilizer.
- Let your grass grow longer to create a healthier root system.
  (see LiLaC: Low Input Lawn Care, pg 37)
- Spread mulch around the base of flowers, shrubs, vegetables, and trees.
  It keeps plants from losing water to evaporation and promotes plant growth.
  (see Mulching, pg 30)
- Replace some of your thirsty lawn with other attractive landscape plants that require less water. (see Landscape Design, pg 2)

FOR MORE INFORMATION:

– Visit the Metro WaterShed Partner's tips for keeping Minnesota Water Clean at *www.cleanwatermn.org*

Rain Gardens

DESIGNED TO COLLECT AND FILTER RAINWATER

Traditionally, rainwater has been directed from our rooftops and sidewalks into storm sewers. On it's way to the road, this water picks up pollutants such as oil from our cars and lawnmowers, fertilizer, and grass clippings. Storm sewers are often allowed to empty directly into our lakes and rivers, where the extra nutrients can cause algae blooms and other pollutants can harm wildlife. These are the very same lakes and streams we use for drinking water and recreation.

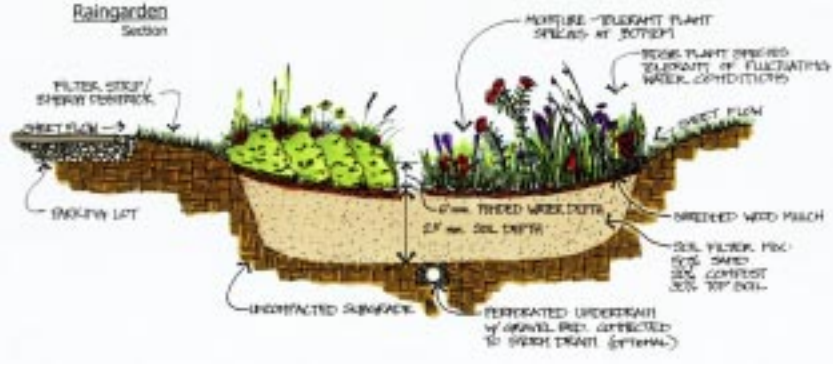
Rain gardens are depressional areas planted with a diverse mix of native wildflowers and grasses. rainwater, from your roof, driveway, or other impervious surfaces, collects in a shallow pool and slowly filters into the ground instead of into storm sewers. There are many benefits to rain gardens including:

- Stormwater retention reduces runoff of pollutants and nutrients into our lakes and streams. Reduced run-off into sewers can help with flooding problems as well.
- Deep-rooted native plants stabilize soil to prevent erosion during large storm events.
- Diverse plantings with many species are more resistant to drought, flood, insects and disease than a single type or low diversity planting.
- Once established, on-going maintenance is usually very minimal.

- The deep-rooting nature of many native species encourages infiltration of stormwater runoff.
- Native plantings are adapted to local conditions and, in some cases, are more tolerant of flooding, drought and disease than non-native plantings.
- A diverse native mix with wildflowers attracts a variety of wildlife including butterflies and birds.
- In the winter, vegetation collects snow and provides interesting texture as well as habitat.

GETTING STARTED

Site Design: Map your property, including property lines, buildings, utility lines and existing vegetation. Determine areas which will catch water from downspouts, driveways, or other impervious surfaces. The rain garden should be about 7-10% of the size it receives run-off from and at least 10 feet from your home. Choose local, native species based on your site conditions and personal preference.



YOUR RAIN GARDEN IS SIMILAR TO A LAKESHORE, ABLE TO TOLERATE BOTH FLOODING AND DROUGHT CONDITIONS, AND WILL CONTAIN SIMILAR PLANT SPECIES.

Site Preparation: If a depressional area is not already present, dig a shallow bowl to a depth of 3-4" with sides gently sloping up towards the lawn. If soil is heavy and does not drain well it may be necessary to dig down further and back-fill with a lighter soil. Remove unwanted vegetation through smothering, through the use of herbicides, or a combination of these. Line the site with 2-3" of shredded mulch, which is useful in retaining moisture for the young seedlings and discouraging weed seeds from germinating.

Planting: Seedlings can be planted from late May to mid September, however, summer planting may need frequent watering. Seedlings should be planted 12-18" apart with flood tolerant species towards the bottom and drought tolerant species towards the edge.

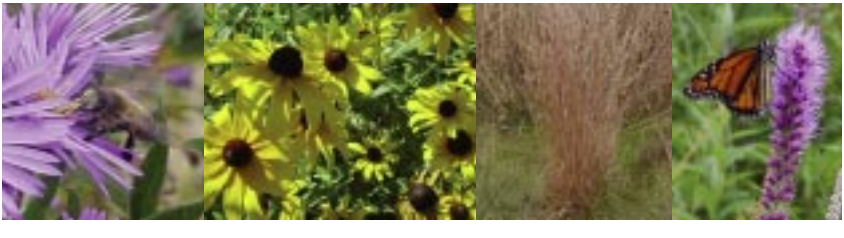
Maintenance: Make sure your plantings receive at least one inch of water a week for the first two months. Your garden will also require light weeding the first few years.

SUITABLE PLANT LIST

UPLAND – MESIC ZONE (SOIL IS MOIST, BUT NOT WET)

Achillea millefolium . . . . . .Yarrow
Agastache foeniculum . . . . . .Anise Hyssop
Allium stellatum . . . . . .Prairie Onion
Andropogon gerardii . . . . . .Big Bluestem
Anemone cylindrica . . . . . .Thimbleweed
Aquilegia canadensis . . . . . .Columbine
Amorpha canescens . . . . . .Lead Plant
Asclepias tuberosa . . . . . .Butterfly Milkweed
Aster species . . . . . .Aster
Dalea candida . . . . . .White Prairie Clover
Dalea purpurea . . . . . .Purple Prairie Clover
Echinacea purpurea . . . . . .Purple Coneflower
Geum triflorum . . . . . .Prairie Smoke
Heliopsis helianthoides . . . . . .Common Ox-eye
Heuchera richardsonii . . . . . .Alum Root
Liatris species . . . . . .Blazing Star
Lupinus perennis . . . . . .Wild Lupine
Monarda fistulosa . . . . . .Bergamot
Rudbeckia hirta . . . . . .Black-eye Susan
Schizachyrium scopariurm . . . . . .Little Bluestem
Solidago species . . . . . .Goldenrod
Sorgastrum nutans . . . . . .Indian Grass
Sporobolus heterolepis . . . . . .Prairie Dropseed
Verbena stricta . . . . . .Hoary Vervain
Veronicastrum virg. . . . . . .Culver's Root
Zizia aptera . . . . . .Heartleaf Alexanders

Wet Meadow Zone, continued next page



RAIN GARDENS ARE AN ATTRACTIVE, HEALTHY ALTERNATIVE TO TRADITIONAL GARDENS. THEY HELP REDUCE NUTRIENT AND SEDIMENT RUN-OFF INTO OUR LAKES AND STREAMS WHILE PROVIDING WILDLIFE HABITAT AND A BEAUTIFUL, LOW MAINTENANCE LANDSCAPE. PICTURED ABOVE, LEFT TO RIGHT: NEW ENGLAND ASTER, BLACK-EYE SUSAN, LITTLE BLUESTEM, BLAZING STAR.

WET MEADOW ZONE (SOIL IS WET, RARELY STANDING WATER)

Acorus calamus . . . . . .Sweetflag
Asclepias incarnata . . . . . .Swamp Milkweed
Aster novae-angliae . . . . . .New England Aster
Carex bebbii . . . . . .Bebb's Sedge
Carex comosa . . . . . .Bottlebrush Sedge
Carex stricta . . . . . .Tussock Sedge
Chelone glabra . . . . . .Turtlehead
Eleocharis species . . . . . .Spike Rush
Eupatorium maculatum . . . . . .Joe-pye Weed
Eupatorium perfoliatum . . . . . .Boneset
Gentiana andrewsii . . . . . .Bottle Gentian
Helenium autumnale . . . . . .Sneezeweed
Iris versicolor . . . . . .Blue Flag Iris
Liatris species . . . . . .Blazing Star
Lilium michiganense . . . . . .Turk's Cap Lily
Lobelia cardinalis . . . . . .Cardinal Flower
Lobelia siphilitica . . . . . .Great Blue Lobelia
Pycnanthemum virginianum . . . . . .Virginia Mountain Mint
Scirpus atrovirents . . . . . .Green Bulrush
Scirpus cyperinus . . . . . .Wool Grass
Spartina pectinata . . . . . .Prairie Cord Grass
Verbena hastata . . . . . .Blue Vervain
Vernonia fasciculate . . . . . .Ironweed

FOR MORE INFORMATION:

'*Lakescaping for Wildlife and Water Quality*'-DNR Publication

'*Restore Your Shore*' Interactive CD-ROM MN-DNR Publication

University of Wisconsin Extension Service – Rain Garden Publication
http://clean-water.uwex.edu/pubs/home.htm#rain

Wisconsin Department of Natural Resources – Resources on Rain Gardens
www.dnr.wi.gov/runoff/rg/links.htm

ACKNOWLEDGEMENT:

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Home Composting

TURN WASTE INTO A MATERIAL TO IMPROVE YOUR SOIL.

Composting is a microbial process that converts waste from your kitchen and yard, such as fruit and vegetable peelings, grass clippings and leaves, into a more usable organic soil amendment or mulch. Gardeners have used compost for centuries to increase soil organic matter, to improve soil's physical properties, and to supply some of essential nutrients for plant growth.

THE BENEFITS OF USING COMPOST

As a soil amendment: Compost loosens and aerates soil, and improves water and nutrient retention. By adding 1-2" of compost to the top 6-8" of garden, you can improve structure over time, making it easier to work while creating a better environment for plant growth. Compost also improves drainage and aeration in heavy clay soils. Sandy soils benefit from compost as well, it improves moisture-holding capacity.

Adding compost to your soil will attract beneficial organisms such as earthworms and microorganisms, that break down organic matter naturally. Compost can also improve seedling emergence and water infiltration by reducing the potential for soil crusting.

As a mulch: Adding 6-8" of compost to garden beds can suppress weeds by blocking light to the soil surface. The mulch will decompose, adding organic matter to the soil. Compost also reduces the potential for erosion by protecting the soil surface from wind and the impact of hard rain.

Using compost as mulch can reduce moisture loss. Top dressing your lawn with compost to conserve moisture and add organic matter. Use compost in window boxes and container gardens where rapid moisture loss is a factor. Compost may also keep soils cooler in the summer and warmer in the winter.

MATERIALS TO COMPOST

Many of us understand what we should compost, but we sometimes get confusing information about what we should NOT compost. Composting is a microbial process and microbes – also called microorganisms – will not decompose synthetic products such as plastics or glass. Meat, dairy, grease and oil can attract critters to your compost bin and, in an urban setting where homes are close together, can cause foul odors (and possibly complaints from your neighbors). Feces from pets may carry pathogens that could cause health problems and therefore should not be included in your compost. Weeds with seeds should be composted separately to reduce the potential for the weed seeds in your compost. Large pieces of wood do not compost quickly and require a lot of energy to decompose, so wood should be chipped or shredded and used minimally. Other organic materials that can be added to enhance the nutritive value of compost are blood and bone meal, cotton seed meal, livestock manure, and aquatic plants.

What to Compost

- **Yard waste:** grass clippings, plant trimmings, leaves, weeds without seeds, pine needles;
- **Kitchen waste:** fruit and vegetable scraps, coffee grounds, tea bags, egg shells, potato peelings;
- Small amounts of sawdust, wood chips, and small sticks;
- **Wood ashes:** use no more than 1 cup per bushel of compost. Ashes act as a lime source and affect the pH of your compost.

What NOT to Compost

- **Meat and dairy:** meat pieces, dairy products, bones, fish scraps, raw eggs;
- **Fats:** cooking oil, drippings and grease;
- **Synthetics:** motor oil, glass, plastic, Styrofoam, polyester;
- Feces from dogs, cats and humans;
- Weeds with seeds;
- Large pieces of wood.

What about cuttings treated with herbicides?

Studies have shown that low levels of herbicides are detectable even in well-decomposed yard trimmings, but these levels are less than 1% of the level found in trimmings prior to composting and is not considered a risk for using in the garden. Ideally, grass clippings from lawns treated with herbicides should be left on the lawn to decompose, also allowing the herbicides to degrade.

BUILDING YOUR OWN COMPOST PILE

TO DO/Choose a compost bin design:

You can find dozens of different styles of compost bins on the Internet and in garden supply catalogs, as well as many plans for building your own bin. Your bin can be as simple as a few stakes and chicken wire or as advanced as a tumbler-style bin. Choosing a bin can be a bit overwhelming, so here are some points to remember:

- The bin should be sturdy and have slits or spaces on the sides for air circulation. It should be made of a rot-resistant material such as cedar, plastic, concrete block or wire. The bin can be square or round.
- The lid or cover should fit or lock firmly to keep out critters and not be blown off by strong wind.
- The opening from which you retrieve the finished compost should be large and easily accessible with a spade or garden fork.
- Your bin should be no smaller than 3' x 3' x 3' and no larger than 5' x 5' x 5'. Smaller bins do not allow for enough material and larger bins are too big to manage successfully.

TO DO/Find a place for your compost bin:

Location, location, location! Choose a place in your yard where your bin is easily accessible, but not an eyesore for your neighbors. Some people incorporate a bin into the design of their landscape, sometimes planting their garden right around the bin! Select a spot where your bin gets some sun and heats up your pile. Locating your bin in full sun will heat up the compost pile faster, but it will dry out more often, requiring periodic watering. Some shade will prevent this.

Good drainage is important for your compost bin as is accessibility. You should have enough room around the bin to allow you to turn the compost, and a water source nearby in case you need to add moisture.

Each city has its own ordinances about composting. Check with your city recycling coordinator for details concerning your local laws.

THE RECIPE FOR A SUCCESSFUL COMPOST PILE:

There are four basic ingredients for good compost: carbon, nitrogen, oxygen and moisture.

In the composting process, microorganisms use carbon for energy and nitrogen to make proteins. For home composting, this translates to a proportion of three parts carbon (brown materials) and to one part nitrogen (green materials). Given this “diet,” microorganisms can make short work of your compost.

Successful Compost Pile, continued next page

Oxygen and moisture are important for the health and activity of the microorganisms. An active compost pile – one in which microorganisms are actively converting organic materials to compost – has good air circulation and moisture consistency of a wrung-out sponge. If a pile is compacted, or too wet or too dry, the microorganisms will cease their work, making the pile passive.

Air circulation can be accomplished through turning your pile with a garden fork or – in the case of the tumbler bin models – turning the whole bin! Do not allow the pile to become soggy. This causes anaerobic conditions (meaning no air) and usually will produce a foul smell. A pile that is too wet can be due to excess water from rain or from too much green material. This condition can be corrected by adding carbon material and turning the pile to increase the oxygen level.

TO DO/Layer your materials:

Start your pile with a six-inch layer of brown materials, such as twigs and/or cornstalks. This will help elevate your pile and allow air to circulate at the base of the pile. Then alternate layers of brown materials with green materials, adding layers of garden soil or finished compost. This layer will provide the microorganisms required to speed up the decomposition. Add a little water to dampen the pile and you are on your way!

TO DO/Maintain your compost pile:

As your compost pile begins the decomposition process, the temperature of the pile will begin to rise, especially in the center of the pile. A well-built pile may reach temperatures from 130˚–160˚ F in just a few days. The pile will begin to cool in four to five days and a depression may appear in the middle of the pile. At this point, it is time to turn the pile. Use a garden fork and turn the outside of the pile inward. Steam may rise form the pile–this is a sign that the decomposition process is working. If the pile is dry, add a small amount of water. If is too wet, add some dry material such as dry leaves or cornstalks. Cover the pile and it will start to re-heat.

Turn your pile on a regular basis – about once a week. Doing so will speed up the decomposition process and you will have compost sooner.

Browns (*carbon*)	**3 TO 1**	Greens (*nitrogen*)
straw, sawdust, twigs, dried grasses, leaves		grass clippings, green leaves, plant trimmings, fruit and vegetable peelings, coffee grounds

TO DO/Identify when your compost is finished:

Under warm conditions, a well-tended compost pile will be finished and ready for use in about 2-4 months. Left untended, a bin may take a year to decompose. A finished compost pile is about half its original size, is loose, dark and crumbly, and it smells good – like fresh soil. None of the materials should be identifiable. You can also tell your pile is composted when it is no longer heating up. This is a good indication the composting process is complete and the finished product is ready for use.

TIPS FOR HOME COMPOSTING

Keep your compost pile at the right moisture level.
If your compost pile has a bad odor, it lacks air circulation or it may be too wet.
Try turning the pile and/or adding dry material to the pile.

●

If your compost pile is not heating up, it may need more nitrogen or
"green" material. Add grass clippings or a nitrogen fertilizer to the pile.

●

Bury kitchen scraps at least 8" deep in the compost pile to discourage critters.

●

You can keep adding to your compost pile as it is composting.
However, you may want to start a second pile if you have enough materials.

●

Add a layer of straw or hay to the top of your compost pile
in the winter to keep it warm and keep on composting!

●

The best pile is made up of a variety of materials.

●

The smaller the pieces of compost material,
the faster the pile will decompose.

FOR MORE INFORMATION:

–The University of Minnesota Extension Service offers extensive composting resources, available in print or online at *www.extension.umn.edu*

–"Composting and Mulching: A Guide to Managing Organic Yard Wastes" (Extension Publication BU-03296) available online at *www.extension.umn.edu/distribution/horticulture/DG3296.html*

Managing Yardwaste

IDEAS FOR THE REUSE OF YARD WASTE

Leave grass clippings on the lawn. A growing season's worth of clippings is equal to one fertilizer application.

Compost in your backyard. Home composting is an easy way to turn much of the waste from your yard and kitchen into a rich material that you can use to improve your soil. To learn how to get started, visit *www.hennepin.us*, search: backyard composting.

Use curbside collection or municipal drop-off facilities. Contact your waste hauler or city recycling coordinator for options in your community.

Hennepin County maintains a list of yard waste drop-off locations. Call 612-348-3777, or visit *www.hennepin.us*, search: yardwaste.

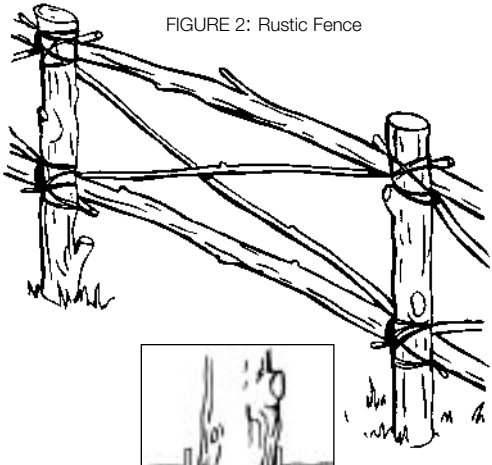
CREATIVE USES

Fences and trellises made from branches leftover from pruning can enhance your landscape by adding structure and vertical focal points, as well as provide great support for you plants. These kinds of supports are very popular and you can purchase them through gardening and landscape catalogs. However, they are expensive, and here you have all the materials to make your own while “reducing, reusing and recycling” your yard waste!

TO DO/Create fences and trellises:

To make them, lay out the pieces of wood on your driveway or sidewalk, arranging them in a pattern you like (SEE FIGURES 1 AND 2). Sometimes the wood is hard to work with and difficult to nail into easily. An alternative is to tie the branches together using wire from a floral or craft store (#16 or #18 gauge). To make them look more finished, tie raffia or twine over the wire. This will hide the wire (in case it rusts!) and still keep that rustic look. These creations will last several years. The wooden footings will begin to decompose from being in direct contact with the soil, so it's a good idea to lengthen the life of the fence or trellis by protecting them with a plastic pipe, such as PVC. Drill 3 or 4 small drain holes in an endcap and glue it to a piece of pipe. Sink it into the ground so the top of the pipe is just above the soil line. Then just insert the wooden footing of the fence or trellis into the pipe. The plastic pipe will protect the wooden footing and make it last much longer (SEE FIGURE 3).

FIGURE 2: Rustic Fence



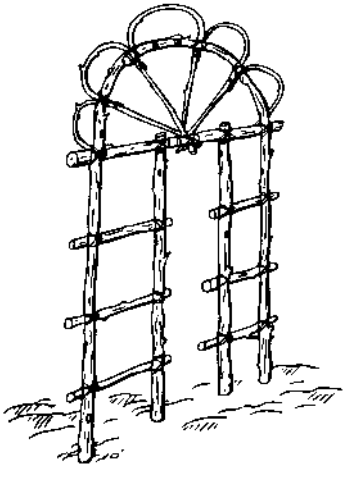


FIGURE 1: An attractive trellis can be made from woody yard waste.

FIGURE 3: Wooden footings can be protected from rotting in the soil by using capped PVC pipe.

TO DO/Use small branches for plant support:

Small to medium branches (about 1/2"–1 1/2" in diameter) can be used as plant supports. This works well for holding up taller perennials. Take four similar sized branches and secure them into the ground in the shape of a square around a plant (SEE FIGURE 3). Fasten smaller branches in a criss-cross pattern across the four supports. These should be 6-8 inches above the soil line. As the plant grows, continue adding small, criss-cross branches at 6-10 inch intervals until the plant reaches mature height. At maturity, the plant should hide the supports.

Mulching

HOLDS MOISTURE, DETERS WEEDS, PROTECTS THE ENVIRONMENT.

By definition, mulch is an insulating substance or material spread over the ground and around plant material. Usually it is organic material, and its primary purpose is to prevent loss of soil moisture by evaporation. It also will deter weeds and maintain an even soil temperature. *Mulch materials include: wood chips, shredded bark and wood, leaves, pine needles, straw, grass clippings, compost, and a variety of other organic materials.*

BENEFITS OF MULCHING

Mulch can serve several functions in your garden and landscape. For example, mulches can accent plants and give your landscape a finished look. Also, they have beneficial effects on plant growth and help reduce the time and effort you will have to spend on routine garden maintenance. Mulches also:

- *Provide a more uniform soil temperature* throughout the growing season.
- *Reduce soil erosion, compaction, and moisture loss.* For example, mulches improve soil water properties by reducing the impact of rain drops on the soil surface and permitting water to soak into the soil; helps prevent run-off into our storm sewers and gutters and, ultimately, our lakes, streams and rivers.

- *Improve soil structure* by adding organic matter to the soil as the mulch decomposes; increase earthworm activity which is valuable for soil aeration and decomposition of future organic matter.
- *Reduce or eliminate weeds*, making hand-removal more efficient, thus reducing the need for chemical control.
- *Reduce soil-borne disease* caused by water splashing onto lower plant foliage.
- *Reduce chance of injury to trees* by keeping weed whips, lawn mowers and other garden tools away from tree trunks and roots.
- Provide a way for you to *recycle* your woody yard wastes as a garden resource.
- *Reduce mud and weeds* in areas of heavy foot traffic and utility. Some examples include the area around firewood piles, paths, children's play areas, pet areas, trash can storage and tool sheds. Wood chips can easily be turned into the soil or a lawn area if the use of that area changes.
- *Create an environmentally-friendly and attractive finish* to your landscape.
- *Cover unsightly areas where grass and groundcovers will not grow* such as under fences.
- *Eliminate need for tilling*, lessens root injury, and reduce bruising of fruits and vegetables.

TYPES OF MULCHES

There is a large selection of mulches available commercially and locally to homeowners, which range from expensive to free of charge. Commercially, exotic mulches such as cypress, coco beans, cedar, and redwood chips can be purchased at garden centers and home improvement stores, and will certainly give you benefits listed above. *However, in sustainable landscapes, we are striving to reuse local and nearby materials.* Therefore, it is recommended that one take advantage of the municipal wood chip piles located in our area. These mulches are made of ground or chipped trees that have fallen in storms, been removed by the city or homeowners, or are the result of pruning by utility companies. They are easily accessible and usually free of charge to citizens.

Wood Chips: Wood chips are made by propelling pieces of logs and larger branches through a chipper, reducing them to chips of varying sizes. For mulch, chips 1 to 4 inches in diameter will give you the best results. They are less likely to be washed or blown away, and the large pieces will slow the decomposition rate, making replacement of mulch less frequent. Commercially, some chips are screened to give buyers a consistent size which creates a more finished and formal look to your landscape.

You can produce your own wood chips if you own a wood chipper. Be sure to follow all safety precautions and wear safety goggles when using a chipper. Sometimes you may have green leaves and smaller branches in your finished product if you have been chipping branches that were actively growing. While this may affect the appearance of your mulch, it will ultimately add more organic matter into your soil.

Shredded wood: Shredded wood mulch is made by running branches and wood pieces through a machine called a tub grinder. The finished product is irregular and usually elongated. It is also usually uneven and rough, causing the wood pieces to bind together well. This helps keep them in place on the soil surface, making shredded wood mulch an excellent choice for slopes and hillsides where wind and water erosion is a factor. Even though the pieces differ in size, the finished look of shredded mulch is more uniform and natural looking than wood chips, making it a popular choice for landscapes.

TO DO/Apply fresh wood chips:

Application of fresh wood chips can cause a temporary reduction of nitrogen in your soil. This is due to the large amount of nitrogen needed by the soil bacteria responsible for decomposition of organic matter to do their jobs. Because they are more efficient users of nitrogen than plants, these microorganisms may cause plants to suffer from a temporary nitrogen deficiency. *To counteract this, supply additional nitrogen* to your plants at the time you apply the mulch. This will help meet the demands of both the plants and the microorganisms. Ammonium Sulfate and Ammonium Nitrate are examples of nitrogen fertilizers you could use. Work into the soil one or two cups per bushel of chips prior to applying your mulch.

Concerns about wood chips and disease

Wood infected by Dutch Elm Disease and Oak Wilt is chipped by some municipalities and may be in the wood chips or shredded wood mulch you get from these sites. However, according to forestry personnel, you do not need to be concerned about the potential of these diseases being transmitted to your plant materials. The heat from the chipping process, subsequent drying out, and the small particle size of the finished product does not allow for the transmission of these diseases through wood chips or shredded bark. Do not use shredded or chipped wood from Buckthorn.

Watering & Rain Barrels

EFFICIENT WATERING CONSERVES WATER, REDUCING MAINTENANCE COSTS

Watering practices affect all areas of yard care: lawns, gardens, trees, shrubs and soil conditions. Efficient watering practices are important to all homeowners who want to conserve water, maintain a sustainable, healthy landscape as well as reduce maintenance costs.

PLANT WATER USE

Understanding how plants use water and their ability to tolerate dry conditions is the first step to placing the right plant in the right place to perform the right function. Water is an essential ingredient of all living cells. Plants absorb and take up water primarily through their roots. Nutrients from the soil are dissolved in the water and this solution is transported throughout the plant, nourishing all areas and supporting plant development. When the plant experiences water stress (usually meaning a lack of water) the first sign is wilting caused by reduced water pressure in its cells. Plants also use water to maintain their own temperature and the temperature of their immediate surroundings. Water vapor eventually diffuses out of the plant leaf through small pores called stomata. These small pores are spaced close together on upper and lower leaf surfaces. This evaporation process helps cool the plant and its surrounding microenvironment.

HOW TO WATER

It is best to keep watering to a minimum without stressing your plants. *Thorough, infrequent watering will force your plants to develop deep, strong root systems that will be able to absorb water from soil better* than shallow roots that develop from light watering. With the exception of the warm summer months of June, July and August our climate and weather in Minnesota usually supply enough moisture to support our plant life without supplemental watering. Water in the landscape is lost back into the atmosphere through evaporation and is used by the plant for cooling purposes (a process known as transpiration). Together these two phenomena are known as "evapotranspiration."

Watering time and frequency is affected by plant type, soil type, the weather, and the amount of sun and wind your plant or lawn is receiving. During hot, dry weather, the time between watering should be shorter. Cooler, dryer conditions enable you to water less often. Our cool-season turf grasses do a majority of their growing during cool spring and fall months. During the hottest parts of the summer months some of our older lawn grasses will actually go into a dormant state or slow their growth considerably in order to survive these periods. While they may not look their best at this time, it is actually a natural part of their lifecycle. Other plants, such as prairie grasses and flowers will actually suffer if watered as frequently as other plants, such as many garden perennials. Some plants will require more watering than others due to their size, placement, amount of sun and general physiology. Hand watering these plants and areas may be a more efficient use of your water than just turning on the sprinkler and watering areas that don't need watering. So understanding the needs and climate of your particular plants, shrubs, turfgrass, etc. is important to knowing how often you need to water.

A very light application of water is called syringing. Essentially, you are wetting the leaves of grasses and plants to reduce heat stress and cool plant and soil surfaces along with the surrounding air. Syringing is useful after seeding a lawn or lawns recovering from certain root diseases.

The amount of water you apply will depend on your type of soil and its moisture level. *The best method is to thoroughly dampen the soil to a depth of five or six inches.* Applying too much water will saturate the soil. Any additional water applied may be lost via run-off or it may move too deeply into the soil where plant roots cannot utilize it. Also, water needs will vary considerably from one type of plant to the next. For example, tree roots are much wider spreading and grow deeper in the soil than a shrub. Thus, adequately watering a mature tree will require watering a much larger area than a mature shrub.

TO DO/Measure when you water:

Determine the amount of water you are applying by putting several containers (coffee cans work!) under your sprinkler or drip irrigation hose. After an hour measure the amount of water collected in the container. This will tell you how much water has been applied in an hour. Note: When determining when and how much to water, be sure to consider any rainfall that has fallen recently.

WHEN TO WATER

You never want to tell it's time to water by seeing your plants wilting. This means they are under severe water stress.

TO DO/Check before you water:

Check your garden by feeling the soil a few inches below the surface. Squeeze a handful into a ball and poke it with your finger. If the soil ball holds its shape but breaks apart easily when poked, the moisture level is just right. If the soil ball holds its shape and doesn't break apart easily the soil is too damp. If the soil doesn't even form a ball, it's definitely time to water. Lastly, if you cannot easily dig down a few inches because the soil is too hard, you have bigger problems than watering! Generally, this condition is the result of severe soil compaction and will need to be modified to improve soil conditions.

The best time of day to water is early in the morning, from about 4 to 8 a.m. when cooler temperatures, lower wind velocity, and reduced sunlight will lower water losses due to evaporation. In addition, water demand on municipal systems is usually less at that time. While it will cool plants and reduce heat stress, watering in the middle of the day is not as efficient because some of the water will evaporate before it can be absorbed by the soil or used by the plant. Watering at night may result in plants and grass staying too wet most of the night thereby increasing the chances of disease development.

Watering too much is as detrimental as watering too little. Knowing your plants' requirements is important to good plant health. Plant roots that are growing in soil that is constantly wet become susceptible to many soil-borne pathogens such as fungi and bacteria. Root rots caused by fungi and bacteria will turn plant roots to mush and can weaken or even cause the death of those plants.

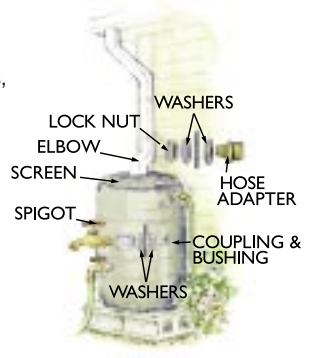
You can reduce the amount of watering required by using mulches (see Mulching, pg 30). Mulch will hold a significant amount of moisture in the soil, reducing evaporation and the need for water.

FOR MORE INFORMATION:

– More information and details about watering can be found on the Sustainable Urban Landscape Information Series website: *www.sustland.umn.edu*

RAIN BARRELS

Rain is naturally soft water and is devoid of minerals, chlorine, fluoride and other chemicals found in the water that comes from your home's faucet.



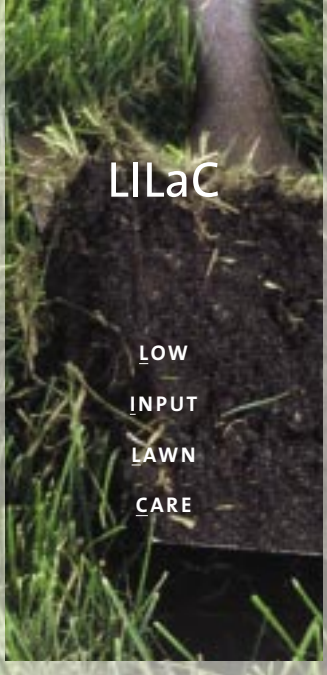
TO DO/ Install a rain barrel:

A rain barrel system placed under a shortened downspout collects the rooftop rainwater runoff and stores it for watering your lawn and gardens. A rain barrel system varies from the simple use of a 55-gallon drum, to a high tech system with flow controls.

BENEFITS OF RAIN BARRELS

- Help lower water costs (a rain barrel can save approximately 1,300 gallons of water during peak summer months.)
- Store rainwater for garden and lawn use- conserving municipal water.
- Reduce roof top water runoff to storm sewers.
- Soft water is good for plants.
- Easy to build and install and can be inexpensive.

Visit *www.cwp.org/Community_Watersheds/brochure.pdf* for instruction on how to build a rain barrel. To purchase- search the web for retail "Rain Barrels."



LILaC is a strategy of lawn care that focuses on low maintenance grass varieties and reduced use of pesticides and fertilizers as well as water, time and labor traditionally thought to be necessary for maintaining a healthy lawn.

WHY CHOOSE LILAC?

Because it focuses on less inputs, LILaC helps homeowners to conserve water by watering less frequently. LILaC also reduces the application of fertilizers and weed control products by improving soil and selecting the right plant material for the site conditions. All this helps to contribute positively to water quality and the health of our environment.

If you are considering converting your high maintenance lawn to a LILaC lawn, *you should first think about how much use your lawn gets*. LILaC lawns are best suited for low to medium use areas. Also, converting a high maintenance lawn to a LILaC lawn will take time, so you'll need to be patient – it will pay off in the long run.

Practicing LILaC strategies means thinking differently about how a healthy lawn looks. In the world of LILaC lawn care, it's OK to have a weed here and there – your lawn is still healthy. Controlling weeds and pests means assessing the severity of the problem and then targeting just the areas that need pesticide use or weed control, rather than applying to the entire lawn. *LILaC is a more focused effort.*

FEATURES OF LILAC	BENEFITS OF LILAC
• Utilizes low-maintenance grasses like fine leaved fescue and common types of Kentucky Bluegrass including varieties such as 'Park' and 'Kenblue'	• Low maintenance grasses thrive with less care
• Improve the condition of your soil	• Provides nutrients and a good root growing environment
• Mow your grass higher and less often	• Produces less noise, fewer emissions, and reduces time and labor
• Leave grass clippings on your lawn	• Recycles nutrients to your lawn
• Minimize use of fertilizers and pesticides	• Less potential for pollution

FREQUENTLY ASKED QUESTIONS

Can I use some of the LILaC techniques without totally converting my existing lawn to a LILaC lawn?

Yes. Improving your soil is a good place to start. You can also gradually reduce your use of nitrogen fertilizers and water. Start mowing your grass higher, maintaining it at approximately 2-3 inches high, and leaving the grass clippings on the lawn. Remember not to mow more than 1/3 of your grass height at one time. If you have very long grass, set your mower as high as possible or weed whip it first. Then wait about a week and cut it again, gradually bringing it back to the desired height.

How long will it take to convert my lawn to a LILaC lawn?

Successfully converting a lawn takes time – about 2-3 growing seasons. Be patient! It is worth it in the end.

What can I do now to start improving my soil for the future?

Have a soil test done first to determine the overall condition of your soil and any specific needs. You can obtain a soil test kit from your county extension service or the University of Minnesota Soil Laboratory. You should also aerate your soil to reduce compaction. This should be done about every two years. Top-dress your soil with compost by lightly spreading a high-quality compost over your lawn about 1/4" thick. Lastly, leave those grass clippings on your lawn. They won't contribute to thatch build-up. If clumps of clippings are left behind, just rake and compost them.

How should I treat for weeds in a low input lawn?

First, determine the severity of the problem and why an area is weedy. Are the weeds in one area? What kind of weeds are growing there? Many of our annoying weeds in our home landscapes are warm weather plants, meaning that they grow most in the warmer months of mid-summer. Sometimes altering the growing environment helps by encouraging grass to grow. For example, pruning evergreen branches to increase sunlight in shady areas.

Spot treat for weeds vs. broadcasting or spraying weed control over the entire landscape. This will save money in herbicides, will keep any negative impact on the environment to a minimum, and will still manage your weed population.

FOR MORE INFO:

The University of Minnesota Extension Service offers extensive lawn care resources, available in print or online at *www.extension.umn.edu*

"Low Input Lawn Care" (Extension Publication FO-07552-GO) available online at *www.extension.umn.edu/distribution/horticulture/DG7552.html*

Common Mistakes to Avoid

BASIC PRINCIPLES OF SUSTAINABLE LANDSCAPING

We often make mistakes when planting and caring for landscapes. The good news is most of these errors can be easily avoided by practicing some basic principles of sustainable landscaping and doing your homework before problems arise.

TO DO/ Avoid cutting lawns too short:

Lawns should be mowed at a minimum height of 2.5 – 3" with a sharp blade, and you should never remove more than 1/3 of the blade at a time. Cutting your lawn too short will make the grass more vulnerable to weeds. Higher blade height will encourage deeper root systems, better absorption of moisture and nutrients, and better stress tolerance during heat and dry conditions.

For more information on lawn care, see "LILaC."

TO DO/ Water less frequently:

Most landscape plants and turf require just one inch of water per week. By watering landscape plants and lawns too often, you are encouraging the grass roots to remain near the surface. By watering less, you are actually forcing the grass roots to search more deeply into the soil for moisture, resulting in deep, healthy root systems that can tolerate the hot summer months.

For more information, see "Watering & Rain Barrels."

TO DO/ Minimize fertilizing:

Lawns in Minnesota are made up of cool season grasses, meaning their heaviest growth period is during the cool months – spring and fall. Such grasses need only be fertilized each fall for a healthy lawn, and possibly in the spring for a lawn that needs a boost.

For more information, see "LILaC."

TO DO/ Plant trees, shrubs and perennials at the proper depths:

When planting most containerized plants, the soil level of the new planting location should match the soil level of the container. When planting most bare root plants, the soil level should meet the point where the roots meet the stem.

For more information, see "Plant Selection."

TO DO/ Match plant species with their preferred growing environment:

Sometimes people choose plants based on appearances, only to get them home and find they have chosen a shade-loving plant for a sunny area. Take note of the environmental conditions prior to going to the nursery – how much sun/shade a location gets, soil type (Sandy? Clay? Dry? Wet?) and then choose plants accordingly.

For more information, see "Plant Selection."

TO DO/ Take note of the recommended spacing and height requirements for trees and shrubs:

You should always note the grower's information about plants – the width requirement, the mature height, sun or shade, etc. Woody plants should be planted with mature height and width in mind. Planting too close together will result in lack of air circulation, poor form and potential health problems for the plants. Planting too far apart will result in poor design and dissatisfaction with the final result.

For more information, see "Plant Selection."

TO DO/ Avoid using too much wood mulch:

For a typical planting, 2-3" of mulch is plenty. Woody plants contains lignin, a chemical which gives the plant the strength and physical properties we call "wood." A great deal of energy is required to decompose wood. By using too much mulch, you are allowing the wood to take nitrogen and other nutrients away from the plants. Too much mulch also attracts detrimental insects and animals such as slugs and moles that like to burrow or like to stay protected in the cool mulch.

For more information, see "Mulching."

TO DO/ **Plant species that are hardy for your temperate zone:**

In Minnesota, we are in planting zones 3 & 4. Planting zones are based on the average high and low temperatures for our area. Plants that are not hardy for these temperatures and other climactic conditions (e.g. snow, drought) most likely require special protection from weather. By planting species that are proven to flourish in our area, you will have less maintenance and better results.
For more information, see "Plant Selection."

TO DO/ **Brush up on pruning techniques before you make the first cut:**

Pruning is an important part of plant care. Pruning our dead or diseased wood or branches that are too close together will improve air circulation and the overall health of the plant. When to prune is as important as what to prune. Pruning certain plants at the wrong time of the year can open them up to a host of disease and insect problems. Always find out about the best time and method of pruning for your particular plant before you make a single cut.
For more information, visit the University of Minnesota Extension Service website: www.extension.umn.edu

TO DO/ **Make sure you can accommodate an overly aggressive species BEFORE you plant it:**

Sometimes we introduce a new plant to our landscape only to find out it is invasive and choking out the other plants. Be sure to read about or discuss a new plant selection with a professional. Find out how it spreads – by seed, by rhizome, by root – and make sure you are ready to accommodate it. Don't select it thinking you can contain it completely.
For more information, see "Plant Selection."

Resources

GREAT PLACES TO START FOR MORE INFORMATION

Hennepin County Environmental Services

612-348-3777

www.hennepin.us

Hennepin County provides a variety of information on managing your yard in an earth-friendly way. Information is available on topics ranging from composting to the proper disposal of fertilizers and weed killers.

- Eco-Yard Demonstration Site (see Visit the Eco-Yard, pg 1) and educational programs
- Drop-off Sites for household hazardous waste and recycling, www.hennepin.us, search: A to Z or Drop Off Facilities

U of M – Extension Service of Hennepin County

612-596-2110

www.extension.umn.edu

The Extension Service provides education outreach for the University of Minnesota, delivering education programs on a variety of topics, including yard and garden information.

- Hennepin County Master Gardener Hotline, 612-596-2118
  www.hcmg.umn.edu
- Yard and Garden Line, 612-624-4771
- INFO-U Hotline, 612-624-2200
- Sustainable Urban Landscape Information Services
  www.sustland.umn.edu
  SULIS provides sustainable landscape information to the public and to the horticulture/landscape industry, from planning to maintenance.

Minnesota Department of Natural Resources
651-296-6157
www.dnr.state.mn.us, search: buckthorn

Metro Watershed Partners
Tips for Keeping Minnesota's Water Clean
www. cleanwatermn.org

Wisconsin Department of Natural Resources
1-888-936-7463
www.dnr.wi.gov, search: garlic mustard

BOOKS & PUBLICATIONS

Ornamental Grasses for Cold Climates.
Meyer, Mary Hockenberry; White, D.B.; and Pellett, Harold. North Central Regional Extension Publication 573. Department of Horticultural Science, University of Minnesota. St. Paul, Minnesota. 1996.

Landscaping for Wildlife and Water Quality
Henderson, Carol; Dindorf, Carolyn; and Rozumalski, Fred. Minnesota Department of Natural Resources, St. Paul, Minnesota.

Manual of Herbaceous Ornamental Plants.
Still, Steven. Stipes Publishing L.L.C., Champaign, Illinois. 1994.

Native Plants for Northern Gardens
Snyder, Leon C. Andersen Horticultural Library, University of Minnesota, St. Paul, Minnesota. 1991.

Think Clean Air Landscaping

EARTH-FRIENDLY HOME LANDSCAPING ALSO CONTRIBUTES TO CLEANER AIR

An innovative approach to landscape design and maintenance that minimizes air pollution is called clean air landscaping. Reducing ground-level ozone (smog) is important for maintaining good air quality in the Twin Cities metropolitan area. Lawn mowing, trimming, and leaf blowing are big contributors to ground-level ozone pollution. These common landscape maintenance practices typically result in high emissions of volatile organic compounds (VOCs), which combine with nitrogen oxides, sunlight and heat to cause smog. Emissions are especially high from older, gas-powered yard care equipment – particularly from two-cycle (gas/oil mix) mowers. Old gas cans lacking spill-proof spouts are also a problem. You can help reduce smog and make a difference by implementing the clean air landscaping practices highlighted on this page.

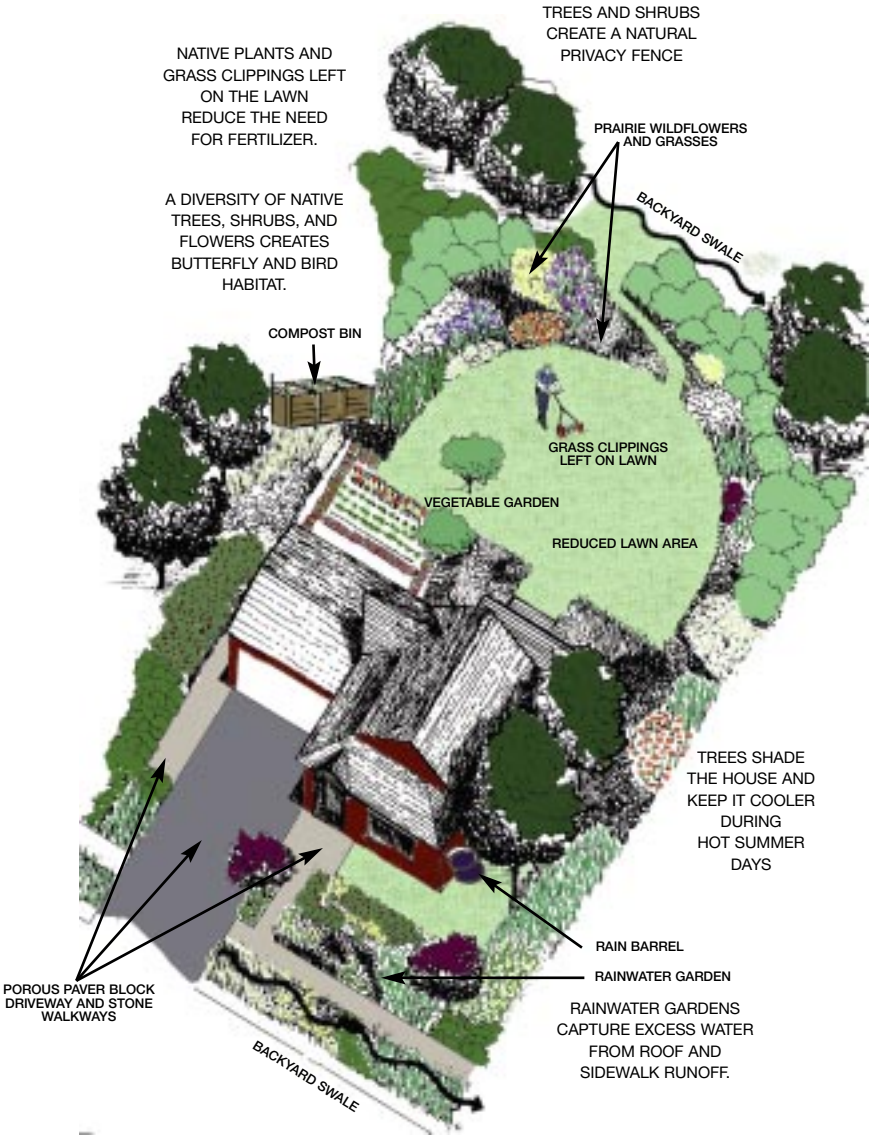
For more information on improving our air quality through modified landscaping practices, visit ***www.hennepin.us/cleanairlandscaping***

The Minnesota Pollution Control Agency notifies people when air quality in the area is compromised. You can sign up for Air Pollution Alerts at ***www.pca.state.mn.us/air/aqi-subscribe.html****.*

- Do not use a gas mower, trimmer, or leaf blower on very hot days or on Air Pollution Alert days
- Mow or trim less frequently, in general, and keep equipment well-maintained
- Convert some turf to 'no-mow' vegetation, such as native grasses and wildflowers
- Replace your old gas can with a new, no-spill model
- Replace your 2-cycle mower with a 4-cycle gas mower, OR
- Replace your gas mower with an electric or reel-to-reel (push) mower
- Never burn yard waste; compost it in your backyard, use your yard waste pick-up service or drop it off at a compost site
- Talk to neighbors and friends about changing their landscaping and yard care practices

HENNEPIN COUNTY IS A FOUNDING PARTNER IN CLEAN AIR MINNESOTA.

EARTH FRIENDLY HOME LANDSCAPING



Hennepin County
Environmental Services
612-348-3777

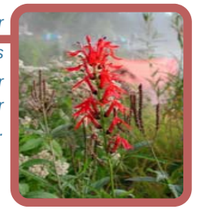
www.hennepin.us/sustainablelandscaping

Native Plants for Wildlife

Wild Columbine
Aquilegia canadensis
Ht: 6"-30" Flower: Red or yellow Bloom: May-August
Wildlife value: An excellent food source for hummingbirds and insects.

Little Bluestem
Schizachyrium scoparium
Ht: 12"-30" Flower: White Bloom: August-September
Wildlife Value: Attracts butterflies and a source of ground cover for birds and small mammals.

Butterfly Milkweed
Asclepias tuberosa
Ht: 24"-36" Flower: Orange Bloom: June-September
Wildlife Value: A great food source for butterflies as well as caterpillars.



Cardinal Flower
Lobelia cardinalis
Ht: 36" Flower: Red Bloom: July-October
Wildlife Value: Excellent source of food for hummingbirds and insects.

Rough Blazingstar
Liatris aspera
Ht: 24"-36" Flower: Pink or purple Bloom: July-September
Wildlife Value: Blazingstars are a favorite food source for many butterflies species and other insects.

Indiangrass
Sorghastrum nutans
Ht: 60" Flower: Amber Bloom: July-September
Wildlife Value: Provides year-round cover for birds and small mammals.

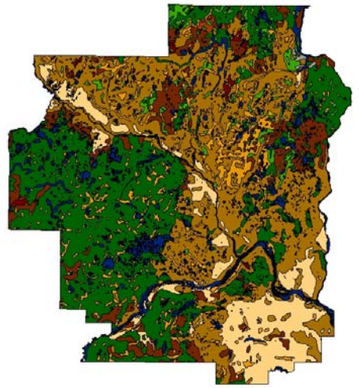
Highbush Cranberry
Viburnum trilobum
Ht: 8-12 ft. Flower: White Bloom: Spring
Wildlife Value: Provides a great source of cover as well as food through late-winter.

American Elderberry
Sambucus canadensis
Ht: 6-12 ft. Flower: White Bloom: Summer
Wildlife Value: An excellent source of food and cover for many species of birds.

White Pine
Pinus strobus
Ht: 75-100 ft. Flower: Purple Bloom: Summer
Wildlife Value: Provides year-round cover that is especially important in winter.

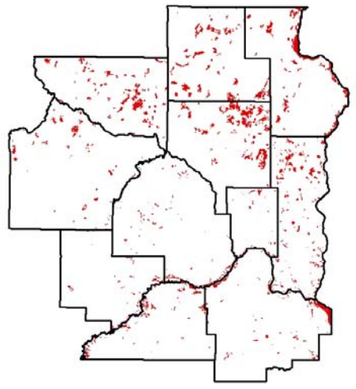
Bur Oak
Quercus macrocarpa
Ht: 60-100 ft. Flower: Yellow Bloom: Spring
Wildlife Value: Provides excellent cover as well as a great source of food (acorns).

Native Plant Communities



Native plant communities (Early 1800's, pre-settlement)

The landscape around us once hosted a mosaic of plant communities: oak savanna, tallgrass prairie, wetlands, maple-basswood forests, etc. The occurrence of a particular plant community depends on topography, geology and disturbances, such as fire. Extensive land development and introduced invasive species have led to the destruction of a majority of these native plant communities and a fragmentation of the few plant communities that remain.



Native plant communities (present)

Of the 3,221,041 acres that comprise the eleven county metro area, native plant communities occupy approximately 3.8% (123,183 acres) of the total land area. Efforts should focus on restoring areas that re-connect and protect the remaining native plant communities.

Metro Conservation Districts

Anoka Conservation District
763-434-2030

Carver Soil & Water Conservation District
952-466-5230

Chisago Soil & Water Conservation District
651-674-2333

Dakota County Soil & Water Conservation District
651-480-7777

Hennepin Conservation District
612-348-9938

Isanti Conservation District
763-689-3224

Ramsey Conservation District
651-266-7270

Scott Soil and Water Conservation District
952-492-5425

Sherburne Soil & Water Conservation District
763-241-1170 Ext. 3

Washington Conservation District
651-275-1136

Wright Soil and Water Conservation District
763-682-1970

LANDSCAPING
For Wildlife

Metro Conservation Districts

A partnership between the eleven soil and water conservation districts of Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Sherburne, Washington and Wright Counties.

Prepared by the
ANOKA CONSERVATION DISTRICT

Landscaping for Wildlife

Urbanization has dramatically impacted wildlife by fragmenting and reducing the abundance of natural habitat. Adding native habitat to your yard relieves some of the pressure put on wildlife. Including multiple habitat components in your landscaping will help to attract a variety of animals such as butterflies, deer, birds, and frogs. Creating and improving habitat increases connectivity among other existing habitats and improves the ecological value of your yard.

Fragmented habitats are too small and have little value to wildlife.

Connecting groups of habitat creates an area much more beneficial to wildlife.

Components of Habitat

There are four basic needs of wildlife that can be considered the key components of landscaping for wildlife. They are:

1) Food

Every species has different food requirements. Animal food preferences often change with age and with the seasons. Including flowers, grasses and trees that provide fruits, seeds, nectar, nuts, and fiber will help to provide a year-round food source for a variety of wildlife.

2) Water

All animals depend on water for survival. That's why lakes, ponds, streams and wetlands are so important to our environment. Water can be the most difficult habitat component to include in your landscape. It can be anything from a simple bird bath, to creating a large pond. Even a small aquatic garden can have an immense value to the frogs and insects that depend heavily on available water sources. The sound of flowing water is particularly effective at attracting wildlife.

3) Shelter

Harsh weather and predators are a constant danger to animals. Shelter is especially important when animals are raising their young and when they sleep. Bird houses are an obvious source of shelter, but there are other ways to include shelter in your landscape. Trees, shrubs, tall grasses, and logs all provide cover during a storm or a place to hide. Structures like rock piles, standing dead trees and hollow logs also provide excellent cover and add another landscaping element to your yard.

4) Space

All animals have different space requirements and territorial needs. Some animals defend a large area when nesting while others don't. Learn about the territorial requirements of the wildlife in your area to determine how much wildlife you can expect in your yard.

Planning

Planning is an important step in any landscaping project. Landscaping for wildlife takes some additional consideration if you want your yard to have beneficial habitat for wildlife. Below are some good steps to take when planning your project.

- *Create a list of project objectives. If there are certain animals you would like to attract, plan your project to incorporate habitat components they need. For example, use water features if you want to attract frogs or dragonflies. Or, include different types of flowers to attract butterflies and hummingbirds. Many small mammals require rock or wood piles for making dens. Learn about the native plant communities in your area and how you can use them in your landscape.*

- *Map out your property. Note topography, buildings, existing vegetation, sunny and shady areas, soil types and other important features. Decide which elements you want to keep and what areas you could enhance. Make sure you consider family use in the yard so you still have room for a vegetable garden or for the kids to play. Look at your neighbors yard as well and consider adding to any natural features that border your yard. You can also use landscaping as a natural fence or to screen views.*

- *Group similar plants together. It is more appealing to the eye and provides larger areas of similar habitat.*

- *Plant deciduous trees on the south side of the house. Along with providing habitat, they will create shade for your house in the summer and allow sun to reach the house in the winter, reducing energy expenses. Evergreens are great year-round windbreaks and should be positioned near the north-west corner of the house.*

- *If you are using a water feature, consider installing a water pump that will move the water. You could create a small waterfall or just have it trickle over some rocks. This keeps the water clean longer, prevents mosquitoes from breeding and is much more attractive to wildlife. "Disappearing" streams are a great way to avoid standing water.*

Landscape Features

Butterfly Garden

Butterfly Gardens are made up of flowers that are especially attractive to butterflies and caterpillars. There are over 200 species of butterflies in the Midwest, and a huge selection of beautiful plants they enjoy.

Frog Pond

A great way to add a water source to your landscape is with a frog pond. Small and easy to maintain, frog ponds will attract more than just frogs! Introduce some aquatic plants and a small waterfall or rock fountain and you will have a feature that's appealing to the eye, and to wildlife.

Native Prairie Garden

These gardens are designed to replicate the natural prairies in our area. They are adapted to our climate and require minimal maintenance once they are established. They provide ground nesting cover for birds and small mammals. Strong prairie grass holds up even under heavy snow providing valuable shelter in the winter.

Rock or Brush Piles

These landscape features are a great element to incorporate into your gardens or in a corner of your property. While adding another interesting landscape component into your yard, they also provide great escape cover and den sites for rabbits, chipmunks, toads and many other animals.

Birdbaths

Another way to introduce water to your landscape is with a simple bird bath. The key to making them attractive to birds is making sure they stay full and clean. A reliable water source will have birds coming back again and again.

Feeders

Providing food in addition to what is produced by your trees, shrubs, and flowers ensures you will have a variety of wildlife visiting your yard. Seed and suet feeders are great for songbirds and can provide an important food source in the winter. Nectar feeders will attract hummingbirds and orioles. You can also spread seeds or corn on the ground for squirrels. If you choose to use feeders, be consistent and keep them full.

Hummingbird Garden

Ruby-throated hummingbirds are a garden favorite. Hummingbirds prefer red-tubular flowers, and it's a good idea to choose some flowers that bloom in spring and others in the fall. This way you will have hummingbirds visiting your garden all summer.

Native Plants — Dry Soils - Shade

Wild Columbine
Aquilegia canadensis
Ht: 6"-30" Flower: Red or yellow Bloom: May-August
Habitat: Full sun to shade. Dry to moist soils.
Forest, savanna, forest edge or grassland.

Large White Trillium
Trillium grandiflorum
Ht: 6"-18" Flower: White Bloom: April-June
Habitat: Full sun to shade. Moist to dry soils.
Forest or forest edge.

Pennsylvania Sedge
Carex pennsylvanica
Ht: 4"-12" Flower: — Bloom: April-May
Habitat: Full sun to full shade. Moist to dry soils.
Forest, forest edge or grassland.

Wild Geranium
Geranium maculatum
Ht: 10"-24" Flower: Purple, white, pink Bloom: April-June
Habitat: Full sun to shade. Moist to dry soils.
Forest, forest edge or savanna.

False Solomon's Seal
Smilacina racemosa
Ht: 24"-36" Flower: White Bloom: May-July
Habitat: Part sun to full shade. Moist to dry soils.
Forest or forest edge.

White Snakeroot
Ageratina altissima
Ht: 12"-48" Flower: White Bloom: August-October
Habitat: Full sun to full shade. Wet to dry soils.
Woodland and Lake Edge.

American Black Currant
Ribes americanum
Ht: 1-3 ft. Flower: Yellow Bloom: Spring
Habitat: Part sun to full shade. Moist to dry soils.
Woodland and Forest.

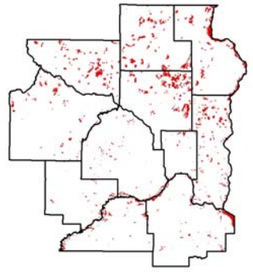
American Hazelnut
Corylus americana
Ht: 6-12 ft. Flower: Brown Bloom: Spring
Habitat: Part sun to full shade. Moist to dry soils.
Forest or forest edge.

Red Oak
Quercus rubra
Ht: 60-80 ft. Flower: Brown Bloom: Spring
Habitat: Full sun to part shade. Moist to dry soils.
Forest.

Common Chokecherry
Prunus virginiana
Ht: 10-20 ft. Flower: White Bloom: Spring
Habitat: Part sun to shade. Moist to dry soils.
Forest, forest edge or savanna.

Native Plant Communities

Native plant communities (Early 1800's, pre-settlement)



Native plant communities (present)

The landscape around us once hosted a mosaic of plant communities: oak savanna, tall-grass prairie, wetlands, maple-basswood forests, etc. Extensive land development and introduced invasive species have led to the destruction of a majority of these native plant communities and a fragmentation of the few plant communities that remain. Of the 3,221,041 acres that comprise the eleven county metro area, native plant communities currently occupy approximately 3.8% (123,183 acres) of the total land area. Efforts should focus on restoring areas that re-connect and protect the remaining native plant communities.

Native Plant Selection

Plants differ in their requirements for sunlight, moisture, and nutrients. Therefore, consider the factors below to select species that are well adapted to your site.

Plant Requirements Influenced

Site Properties	Sunlight	Moisture	Nutrients	Explanation
North/South Orientation	X	X		North facing slopes receive a lower amount and intensity of sunlight than south facing slopes.
Canopy Cover	X	X		Dense canopy cover creates shaded conditions, also influencing evaporation rates.
Slope		X		Steep slopes result in lower water retention.
Soil Type		X	X	Soil properties are important, influencing moisture retention and nutrient availability. Textures range from dry sands to rich loams to heavy clays, and even wet organics.
Water Availability		X		Increased soil moisture is common close to lakes, rivers, and wetlands, in depressions, and in areas with high water tables.

Consider the characteristics of plant species during your selection.

- *Plant height*
- *Growth form (e.g. tree, shrub, grass, forb, vine, etc.)*
- *Bloom time and color*
- *Foliage color and texture*
- *Drought tolerance*
- *Flood tolerance*
- *Root depth and structure*
- *Wildlife value*
- *Growth rate*
- *Native/ invasiveness*

The Minnesota Department of Transportation provides an informational plant selection tool that allows you to query based on site conditions or desired plant characteristics (http://dotapp7.dot.state.mn.us/plant/).

Metro Conservation Districts

Anoka Conservation District
763-434-2030

Carver Soil & Water Conservation District
952-466-5230

Chisago Soil & Water Conservation District
651-674-2333

Dakota County Soil & Water Conservation District
651-480-7777

Hennepin Conservation District
612-348-9938

Isanti Conservation District
763-689-3224

Ramsey Conservation District
651-266-7270

Scott Soil and Water Conservation District
952-492-5425

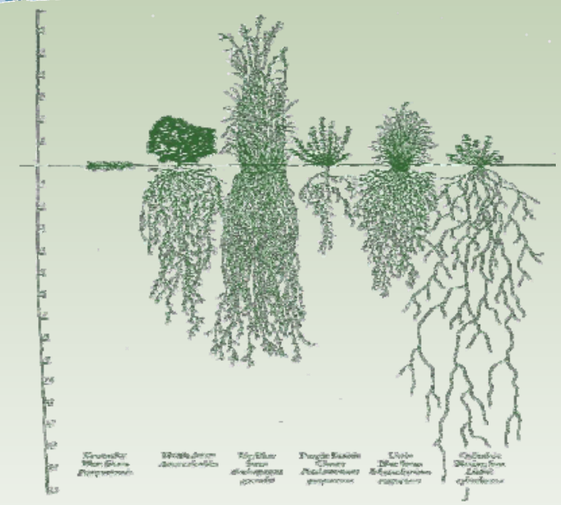
Sherburne Soil & Water Conservation District
763-241-1170 Ext. 3

Washington Conservation District
651-275-1136

Wright Soil and Water Conservation District
763-682-1970

NATIVE PLANTS

Restoring Habitat in the Metro Area



Metro Conservation Districts

A partnership between the eleven soil and water conservation districts of Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Sherburne, Washington and Wright Counties.

Prepared by the

ANOKA CONSERVATION DISTRICT

Native Plants — Dry Soils - Sun

Pale Purple Coneflower
Echinacea angustifolia
Ht: 12”-48” Flower: Purple Bloom: July-August
Habitat: Full sun. Dry soils.
Grassland.

Little Bluestem
Schizachyrium scoparium
Ht: 12”-30” Flower: White Bloom: August-September
Habitat: Full sun to part shade. Moist to dry soils.
Savanna, forest edge, and grassland.

Butterfly Milkweed
Asclepias tuberosa
Ht: 24”-36” Flower: Orange Bloom: June-September
Habitat: Full to part sun. Dry to moist soils.
Savanna, forest edge or grassland.

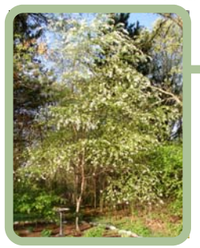
Prairie Dropseed
Sporobolus heterolepis
Ht: 18”-48” Flower: Brown, pink, green
Bloom: August-September
Habitat: Full sun, dry to wet soils. Savanna or grassland.

Rough Blazingstar
Liatris aspera
Ht: 24”-36” Flower: Pink or purple Bloom: July-September
Habitat: Full sun. Dry or moist soils.
Grassland or savanna.

Black Eyed Susan
Rudbeckia hirta
Ht: 12”-36” Flower: Yellow Bloom: July-October
Habitat: Full to part sun. Dry soils.
Savanna, forest edge, meadow, or grassland.

Red Raspberry
Rubus spp.
Ht: 6 ft. Flower: White Bloom: Spring-Summer
Habitat: Full sun. Dry to wet soils.
Forest, forest edge or Savanna.

Juneberry
Amelanchier spp.
Ht: 10-20 ft. Flower: White Bloom: Spring
Habitat: Full to part sun. Dry to wet soils.
Forest, forest edge or Savanna.



Black Cherry
Prunus serotina
Ht: 70-100 ft. Flower: White Bloom: Spring
Habitat: Full to part sun. Moist to wet soils.
Forest, forest edge or Savanna.

Bur Oak
Quercus macrocarpa
Ht: 60-100 ft. Flower: Yellow Bloom: Spring
Habitat: Full sun, dry to wet soils.
Forest or Savanna.

Native Plants — Moist to Wet Soils - Sun

Marsh Milkweed
Asclepias incarnata
Ht: 21”-48” Flower: Purple Bloom: June-August
Habitat: Full sun to part shade. Moist to wet soils.
Wet Meadow, marsh, wooded swamp or lake edge.

Prairie Cordgrass
Spartina pectinata
Ht: 48”-120” Flower: Yellow Bloom: August-October
Habitat: Full sun. Moist to wet soils.
Wet Meadow, marsh, or grassland.

Boneset
Eupatorium perfoliatum
Ht: 36”-60” Flower: White Bloom: August-September
Habitat: Full sun to part shade. Wet to moist soils.
Wet Meadow, marsh, forest edge, savanna or Prairie.

Indian Grass
Sorghastrum nutans
Ht: 36”-96” Flower: Yellow Bloom: August-September
Habitat: Full sun. Moist to wet soils (some dry).
Savanna or grassland.

Blue Flag Iris
Iris virginica
Ht: 18”-36” Flower: Blue Bloom: June-July
Habitat: Full sun. Wet to moist soils.
Wet Meadow or marsh.

Big Bluestem
Andropogon gerardii
Ht: 36”-96” Flower: Purple Bloom: August-September
Habitat: Full sun to part shade. Moist to wet soils.
Savanna, forest edge or prairie.

Red Osier Dogwood
Cornus sericea
Ht: 6-12 ft. Flower: White Bloom: Spring
Habitat: Full sun. Moist to wet soils.
Wet meadow, wooded swamp, forest edge or grassland.

Nannyberry
Viburnum lentago
Ht: 15-18 ft. Flower: White Bloom: Spring
Habitat: Full sun to shade. Moist to wet.
Forest or savanna.

Paper Birch
Betula papyrifera
Ht: 50-70 ft. Flower: Yellow Bloom: Spring
Habitat: Full sun to part shade. Moist to wet soils.
Forest.

Red Maple
Acer rubrum
Ht: 50-70 ft. Flower: Red Bloom: Spring
Habitat: Full sun to part shade. Moist to wet soils.
Forest.

Native Plants — Moist to Wet Soils - Shade

Marsh Marigold
Caltha palustris
Ht: 8”-16” Flower: Yellow Bloom: April-June
Habitat: Part sun to shade. Wet soils.
Wet Meadow, wooded swamp or marsh.

Wild Ginger
Asarum canadense
Ht: 36” Flower: Green Bloom: May-June
Habitat: Part sun to shade. Moist to wet soils.
Wet Meadow and Lake Edge.

Jacobs Ladder
Polemonium caeruleum
Ht: 18”-24” Flower: Blue, white or orange Bloom: May-July
Habitat: Part sun to full shade. Moist to wet soils.
Forest or forest edge.

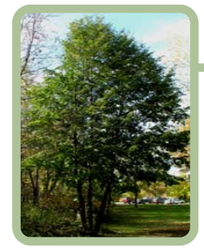
Cinnamon Fern
Osmunda cinnamomea
Ht: 24”-63” Flower: Red/brown spores Bloom: July-October
Habitat: Full sun to part shade. Moist to wet soils.
Forest, wooded swamp, wet meadow.

Bloodroot
Sanguinaria canadensis
Ht: 8”-10” Flower: White Bloom: April-June
Habitat: Full sun to shade. Moist to wet soils.
Forest, forest edge or savanna.

Jack-In-The-Pulpit
Arisaema triphyllum
Ht: 12”-24” Flower: Purple or green Bloom: April-July
Habitat: Part sun to shade. Moist to wet soils.
Forest, forest edge or bog.

Highbush Cranberry
Viburnum trilobum
Ht: 8-12 ft. Flower: White Bloom: Spring
Habitat: Full sun to shade. Moist to wet.
Forest, marsh, wooded swamp.

American Elderberry
Sambucus canadensis
Ht: 6-12 ft. Flower: White Bloom: Summer
Habitat: Part sun to shade. Moist to wet soils.
Forest, savanna, bog or grassland.



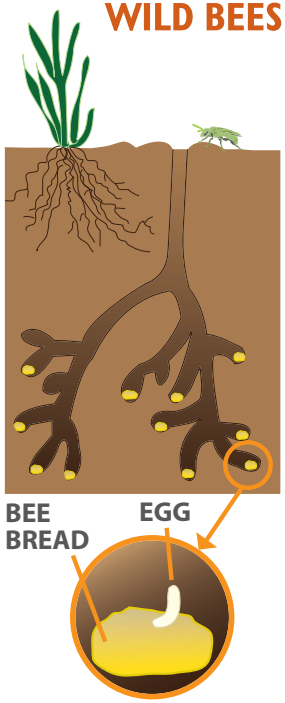
Basswood
Tilia americana
Ht: 60-130 ft. Flower: Yellow Bloom: Spring
Habitat: Part sun to shade. Moist to wet soils.
Forest.

White Pine
Pinus strobus
Ht: 75-100 ft. Flower: Purple Bloom: Summer
Habitat: Full sun to part shade. Dry to wet soils.
Forest.

NATIVE PERENNIALS FOR POLLINATORS

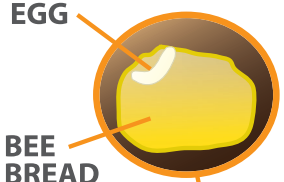
	BOTANICAL NAME	COMMON NAME	COLOR	SOIL	MOISTURE	HT	BLOOM							POLLINATORS					
							APR	MAY	JUN	JUL	AUG	SEP	OCT	BEES	BUTT/MOTH	WASPS	FLIES	BEETLES	OTHER/NOTES
SUN / UPLAND	Agastache foeniculum	Anise Hyssop	purple	sand to clay-loam	med to dry	1-2 ft								X	both	X	X	X	hummingbirds
	Allium cernuum	Nodding Onion	pink	sand to clay	med	1-2 ft								X		X	X	X	
	Asclepias tuberosa	Butterfly Milkweed	orange	sand to loam	med to dry	1-3 ft								X	butterflies	X		X	ants, hummingbirds
	Baptisia lactea	Wild White Indigo	white	sand to clay-loam	wet-med to dry	3-6 ft								X					important spring bumble bee plant
	Campanula rotundifolia	Harebell	violet	sand to loam	med to dry	0.5-1.5 ft								X	moths				grows well in containers
	Coreopsis palmata	Prairie Coreopsis	yellow	sand to loamy clay	med to dry	2-3 ft								X	butterflies				
	Dalea purpurea	Purple Prairie Clover	pink	sand to clay	med to dry	1-2.5 ft								X			X	X	browsed by rabbits
	Echinacea pallida	Pale Purple Coneflower	pink	sand to clay-loam	med to dry	3-5 ft								X	both	X	X	X	
	Eryngium yuccifolium	Rattlesnake Master	white	sand to clay-loam	wet-med to dry	3-5 ft								X	both	X	X	X	
	Helianthus maximilianii	Maximilian Sunflower	yellow	sandy-loam to clay	med to dry	3-8 ft								X	both	X	X	X	
	Heliopsis helianthoides	False Sunflower	yellow	sandy-loam to clay	med to dry	2-5 ft								X	both	X	X	X	
	Heuchera richardsonii	Prairie Alumroot	yell/lime	loam	wet-med to dry	1-3 ft								X					grows well in containers
	Liatris ligulistylis	Meadow Blazingstar	purple	loam to clay-loam	wet to med	3-5 ft								X	both	X	X		hummingbirds, monarch nectar plant
	Lupinus perennis	Wild Lupine	blue-violet	sand to loam-sand	med-dry to dry	1-2 ft								X			X		larval host plant for karner blue butterfly
	Monarda fistulosa	Wild Bergamot	pink	sand to clay-loam	wet-med to med	2-5 ft								X	both	X	X	X	hummingbirds, important bumble bee plant
	Monarda punctata	Spotted Bee Balm	white/pink	sand to sand-loam	med-dry to dry	1-3 ft								X		X		X	short-lived perennial, reseeds
	Penstemon digitalis	Smooth Beardtongue	white	sand to clay-loam	wet-med to med	2-3 ft								X		X	X		hummingbirds
	Phlox pilosa	Prairie Phlox	pink	sand to clay-loam	wet-med to dry	0.5-2 ft									both				hummingbirds
	Ratibida pinnata	Gray-Headed Coneflower	yellow	sand to clay-loam	wet-med to dry	3-6 ft								X	both		X	X	
	Rudbeckia hirta	Black-Eyed Susan	yellow	sand to clay-loam	wet-med to dry	1-3 ft								X		X	X	X	short-lived perennial, reseeds
	Solidago rigida	Stiff Goldenrod	yellow	sand to clay-loam	med to dry	3-5 ft								X	both	X	X	X	clump-forming, fibrous-rooted
	Tradescantia occidentalis	Western Spiderwort	blue-violet	loam to clay-loam	med-dry to dry	1-2 ft								X			X		nectarless flowers
	Verbena stricta	Hoary Vervain	purple	sand to loam	med to dry	2-4 ft								X	both		X	X	hummingbirds
	Zizia aurea	Golden Alexanders	yellow	sand to clay-loam	wet-med to dry	2-5 ft								X	butterflies	X	X	X	important spring forage plant
WETLAND EDGE	Asclepias incarnata	Swamp Milkweed	pink	sand to clay-loam	wet to med	3-5 ft								X	both	X	X	X	hummingbirds, pollinators visit for nectar
	Chelone glabra	White Turtlehead	white	sandy-loam to clay	wet to wet-med	2-4 ft								X					larval host plant for Baltimore checkerspot
	Eupatorium perfoliatum	Common Boneset	white	sand to clay-loam	wet to med	2-5 ft								X	both	X	X	X	attracts beneficial predatory wasps
	Eutrochium maculatum	Spotted Joe Pye Weed	pink	sand to clay-loam	wet to med	4-10 ft								X	both				
	Helenium autumnale	Sneezeweed	yellow	sand to clay-loam	wet to wet-med	3-5 ft								X	both	X	X	X	
	Liatris pycnostachya	Prairie Blazingstar	pink	sandy-loam to clay	wet to med	2-4 ft								X	both		X		hummingbirds
	Lobelia siphilitica	Blue Lobelia	blue-violet	sandy-loam to clay	wet to med	1-4 ft								X					hummingbirds
	Pycnanthemum virginianum	Virginia Mountain Mint	white	sandy-loam to clay	wet to med-dry	1-3 ft								X	butterflies	X	X	X	mint-scented foliage
	Symphyotrichum novae-angliae	New England Aster	purple	sandy-loam to clay	wet-med to med	2-6 ft								X	both		X	X	
	Verbena hastata	Blue Vervain	blue-violet	sand to clay-loam	wet to med	3-5 ft								X	butterflies		X		
	Vernonia fasciculata	Common Ironweed	purple	sand to clay-loam	wet to med	3-6 ft								X	butterflies		X	X	
	Veronicastrum virginicum	Culver's Root	white	sand to clay-loam	wet to med-dry	3-6 ft								X	both	X	X	X	
WOODLAND / SHADE	Dicentra cucullaria	Dutchman's Breeches	white	loam to clay-loam	wet-med to med	0.5-1 ft								X					important spring bumble bee plant
	Eurybia macrophylla	Large-Leaved Aster	white-pink	sandy-loam to clay	wet-med to med	1-4 ft								X			X		
	Geranium maculatum	Wild Geranium	pink	sand to clay-loam	med to dry	1-3 ft								X			X	X	
	Hydrophyllum virginianum	Virginia Waterleaf	pink-violet	sand to clay-loam	wet-med to dry	0.5-2 ft								X			X		reseeds
	Osmorhiza longistylis	Long-Styled Sweet Cicely	white	sand to loamy-clay	med	1-3 ft								X			X		
	Polemonium reptans	Jacob's Ladder	blue-violet	sandy-loam to clay	wet-med to med	1-2 ft								X			X		
	Solidago flexicaulis	Zigzag Goldenrod	yellow	sandy-loam to loam	med to dry	1-4 ft								X		X	X	X	

GROUND-NESTING WILD BEES



CAVITY-NESTING WILD BEES

Cavities in plant stems



Cavities in rocks

Holes in standing dead trees

 www.pollinatorsnativeplants.com Facebook.com/PollinatorsNativePlants Facebook.com/RestoringTheLandscape

Bee Squad

Bee Lab

PLANTS FOR MINNESOTA BEES

Bees rely on flowers to supply them with the food they need to survive. Some flowers (e.g. tomatoes) provide only pollen, the main source of protein for bees. Other flowers (e.g. clovers) provide both nectar and pollen, thus providing both protein and carbohydrates.

There are hundreds of different bee species in Minnesota. Different types of bees prefer different flowers. Some of these preferences are due to the physical size or shape of the bees and the flowers. Some flowers have long tubes with nectar at the bottom. Long-tongued bees are the only bees able to reach the nectar. Other preferences are based on nutritional needs. Some bees are only able to raise their young with pollen from particular plants. These bees are called "specialists". Other bees are "generalists" and will collect pollen from a wide range of plants.

There are also seasonal differences in the activity of different bee species. Many bee species forage as adults for only a few weeks out of the year, with different species emerging throughout the spring and summer, into early fall. The rest of the year, the young are developing in nests that are underground or in cavities. Each bee was provided with a pollen ball, a mixture of pollen and nectar, left there by their mother. They will emerge the following season. Many other bee species, including honey bees and bumble bees, are present through the entire spring, summer and early fall.

Providing a diverse array of plants will help ensure that you support a diverse array of bee species. Do your best to provide blooming flowers from April to September.

www.beelab.umn.edu

Agapostemon metallica on *Symphyotrichum* sp.
Photo by Karl Foord

Apis mellifera on *Dalea purpurea*
Photo by Heather Holm

Bombus auricomus on *Monarda fistulosa*
Photo by Karl Foord

This list is not inclusive of all plants that bees will visit in Minnesota. These are flowers that are particularly attractive to bees and can be easily integrated into most landscapes.

= Tree = Herbaceous plant = Shrub ○ = Full sun ◑ = Part-shade ● = Shade

Early=March to May Mid=June to July Late=August to September

Scientific name	Common name	Habit	Sun	Native	Bloom time	Honey bees	Other bees
Crataegus crus-galli	Hawthorn		○	X	Early	X	X
Geranium maculatum	Wild geranium		◑ ●	X	Early		X
Penstemon grandiflorus	Large beardtounge		○	X	Early		X
Salix discolor	Pussy willow		○	X	Early	X	X
Coreopsis lanceolata	Lanceleaf coreopsis		○ ◑ ●	X	Early to Mid	X	X
Hydrophyllum virginianum	Virginia waterleaf		○ ◑ ●	X	Early to Mid	X	X
Lupinus perennis	Wild lupine		○ ◑	X	Early to Mid		X
Aruncus dioecus	Goatsbeard		○ ◑ ●	X	Mid	X	X
Echinacea angustifolia	Purple coneflower		○	X	Mid	X	X
Lobelia siphilitica	Blue lobelia		○ ◑	X	Mid		X
Pycnanthemum tenuifolium	Slender mountain mint		○	X	Mid	X	X
Agastache foeniculum	Anise hyssop		○ ◑	X	Mid to Late	X	X
Asclepias incarnata	Swamp milkweed		○ ◑	X	Mid to Late	X	X
Borago officinalis	Borage		○ ◑		Mid to Late	X	X
Chamaecrista fasciculata	Partridge pea		○	X	Mid to Late	X	X
Cirsium discolor	Bicolor thistle		○	X	Mid to Late	X	X
Dalea purpurea	Purple prairie clover		○	X	Mid to Late	X	X
Eupatorium maculatum	Joe-pye weed		○ ◑	X	Mid to Late	X	X
Eupatorium perfoliatum	Common boneset		○ ◑	X	Mid to Late	X	X
Helianthus spp.	Sunflowers		○ ◑ ●	X	Mid to Late	X	X
Hylotelephium telephium	Autumn joy sedum		◑ ●		Mid to Late	X	X
Impatiens capensis	Jewelweed		○	X	Mid to Late	X	X
Liatris aspera	Rough blazingstar		○ ◑	X	Mid to Late	X	X
Monarda fistulosa	Beebalm		○	X	Mid to Late	X	X
Nepeta x faassenii	Catmint		○ ◑		Mid to Late	X	X
Origanum vulgare	Oregano		○ ◑		Mid to Late	X	X
Ratibida pinnata	Yellow coneflower		○	X	Mid to Late		X
Silphium perfoliatum	Cup plant		○	X	Mid to Late	X	X
Trifolium hybridum	Alsike clover		○ ◑		Mid to Late	X	X
Vernonia fasiculata	Ironweed		○	X	Mid to Late	X	X
Veronicastrum virginicum	Culver's root		○ ◑	X	Mid to Late		X
Solidago rigida	Stiff goldenrod		○ ◑	X	Late	X	X
Symphyotrichum lateriflorum	Calico aster		○	X	Late	X	X

Content and design by Elaine Evans