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A Guide for the Selection and Use of Plants in the Landscape
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A Guide for the Selection and Use of Plants in the Landscape

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Without a doubt, plants are the foundation of our outdoor environment. The diversity of plant species and the multitude of cultivars, hybrids and varieties make for creative and appealing landscape compositions. There are a number of reasons for choosing plants for the landscape. We may be attracted to their ornamental appeal or call upon them to serve a specific function or purpose in the landscape, such as providing a screen, blocking unwanted views, or stabilizing a soil bank. Others may be selected because of their ability to adapt to poor soils or simply for the ease of subsequent care.

Generally, when horticulturists are asked about plants, responding is not as simple as blurting out a few names. Plant selection is an organized process that examines several factors: function, aesthetics, site adaptability, and management. The priority placed on each category varies with the individual. The freedom to choose from a wide variety of plants depends on the flexibility or restrictions imposed

by the individual, the site, or in some cases the local availability of plants. Viewing plant selection as a process may at first seem cumbersome, but in time the process can make it easier to make decisions and provide more choices than first thought.

Function or purpose defines the reason for using a plant. Looking good certainly justifies a selection, but the value of a plant may go far beyond aesthetic appeal. Function guides the selection of a plant type, such as tree, shrub, or perennial for a specific space. Plants are packaged in many ways – their aesthetic qualities are as diverse as the species we have to choose from. Plant aesthetic qualities

include the overall habit or shape of the plant and its foliage, flowers, fruit, and bark. The combinations of plant forms, foliage, flowers, fruit, and bark can result in creative, artistic displays.

Once we have identified the potential aesthetic qualities, the next question is to determine whether or not the plant will truly perform in



Plant selection is an organized process.

the soil and environmental conditions on your property. A helpful adage is “Don’t fight the site.” If you test or challenge Mother Nature and pick a plant that does not match your site conditions, there is a good chance that it will fail. Factors related to site adaptability – such as the plant’s cold hardiness and tolerance for site conditions such as soil type, exposure, and light levels – will define whether your aesthetic selections will perform to your expectations.

The final consideration in plant selection is management. Landscape management or maintenance guides the development of plants in the landscape. After initial establishment, accent plants start to show off their qualities, plant masses begin to integrate, and border plantings achieve their intended shape. It is the feasibility and quality of maintenance that ensures the long-term aesthetic appeal of any plant and certainly highlights its contribution to the

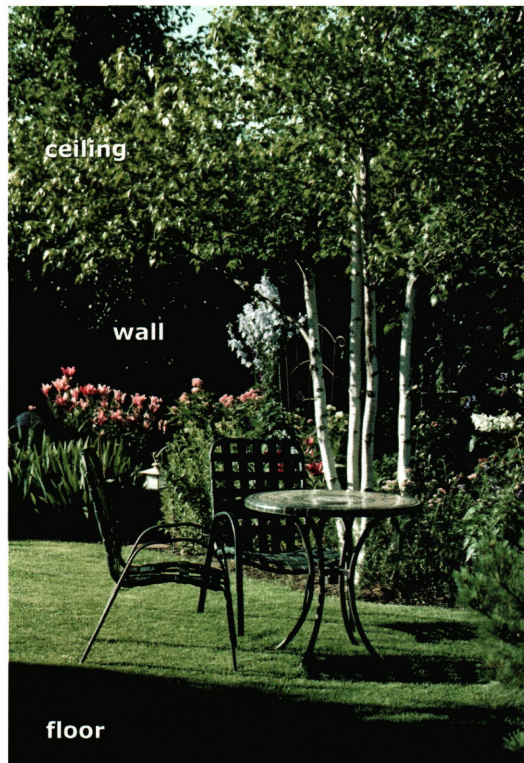
overall appeal of the landscape. Horticultural practices such as pruning, fertilization, irrigation, and pest management need to be considered in making our final plant choices.

This guide outlines an approach to selecting plants and identifies specific information that will be useful in making appropriate choices.

Function

“Function” refers to the purpose that the plant serves in the landscape. The shade of a tree canopy, the filtered screen from a hedge, or the erosion control of a ground cover addresses the specific objectives of the planting. Plants serve three major functions in our landscapes: architectural, engineering and environmental. Individually or in concert, plants are the foundation of the landscape and reinforce the intended use of our outdoor space, whether the use is active or passive. We can liken the development of our landscape to the development of rooms in our homes – each room is shaped for its intended use and is accessorized accordingly.

Plants serve an architectural function by defining the floors, walls, and ceilings of our outdoor rooms. Floors direct our movement into and around the rooms. They are defined by colors and textures of turf, ground covers, creeping perennials, and other interesting materials. Several ground cover plants have been promoted for their ability to withstand foot traffic. These in combination with more traditional turf have certainly changed our definition of living



Plants serve an architectural function by defining the floors, walls and ceilings of our outdoor rooms.

carpets. Walls establish boundaries and set the mood in our outdoor space. They can allow or limit visual and physical access. The characteristics of a wall are defined by height, depth, and density. In combination these dimensions can provide an open, filtered, or enclosed feeling. Screens of evergreen trees, clusters of multistemmed trees, masses of intermediate shrubs, and low masses of herbaceous perennials all contribute to the characteristics of a wall and its influence on the mood or feeling the room projects. Ceilings are usually formed by our canopy trees and are characterized by their height and density. The branching height of a tree can contribute to the openness or intimacy of a room. Density influences light, whether it is blocked, filtered, dappled or bright. The location of the canopy can also contribute to changes in the atmosphere of the room through the day or season. Deciduous trees offer a wide array of seasonal characteristics that contribute to the artistic appeal of our ceilings.

Plants can also serve an architectural function by highlighting or masking architectural features of a house or building. Framing with plants can emphasize features or downplay an unwanted view. Plants also serve a very important role in shaping the rooms in our landscape. Their form provides the structural framework, and their foliage, flowers, and branches provide the wallpaper and decorative appeal.



When we speak of an environmental role for plants, our attention focuses on their influence on microclimates within the landscape. “Microclimate” refers to temperature, wind, and light in a relatively small area. Plants can modify microclimates in our landscapes and thus contribute to human comfort. The

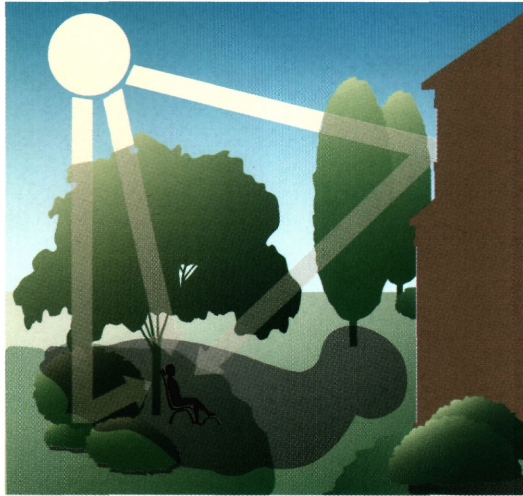
Plants serve an engineering function by: influencing how we walk through the landscape; blocking objectionable views on or off the property; establishing buffers between divergent activities; and minimizing drainage or erosion issues. Bordering a sidewalk with small shrubs may help direct people along the walk. Screens between patios and utility areas separate leisure from work space. Ground cover shrubs can hold soil on a slope or prevent excessive erosion during seasonal rains. The engineering role of plants tends to be more utilitarian in addressing site issues or irregularities but nonetheless contributes significantly to the overall success of the plantings.



A border of hostas helps direct people along the path.

Framing an arbor with roses highlights an architectural feature.

Canopy trees intercept the direct rays of the sun, providing a shade pattern.



Windbreaks are designed to intercept and deflect prevailing winds and reduce wind speed in the protected area.



positive contribution of plants to energy conservation has been well documented. Plants can reduce heat loss in the winter and minimize heat gain in the summer. Windbreaks are designed to intercept and deflect prevailing winds and reduce wind speed in the protected area. Plants along a foundation can form an insulating layer between the building and the outside wind. Plants provide benefits in the summer by intercepting direct and reflected rays of the sun. Canopy trees intercept the direct rays, providing a shade pattern, while shrubs can intercept reflected rays from pavement and the sides of buildings.

This landscape composition has several layers of plants, each contributing to the aesthetic appeal of its own layer and to that above or below.

Aesthetics

Aesthetics or curb appeal tends to be the most notable quality of a landscape. The success or failure of a landscape is often judged on the visual quality of the plants.

Aesthetics starts with the plant type and the size of the designated planting area. All plants will take up space, some more so than others. To ensure the integrity of the planting we must plan accordingly and identify the amount of space we want or will allow the plants to cover. The size of the available space influences the type of plant we select. Each plant type sparks an image, some large, some small. “Shade tree” implies large canopy; “evergreen tree” usually suggests dense foliage and a conical shape; an ornamental/flowering tree could be a small, delicate threadleaf Japanese maple or a wide-spreading crabapple. Shrubs offer a diverse array of sizes from dwarf barberries to massive viburnums. Ornamental grasses and perennials offer seasonal changes in color and texture as well as in size. “Ground cover” implies a carpet-like growth habit.



Plant Selection Check List



The following information will be useful in working with garden center managers, landscape designers or nursery specialists in identifying the most appropriate plant(s) for your landscape.

Function

Describe the intended use or function that the plant(s) will serve in your landscape. Function may be described as architectural (screens, borders, floors, walls, canopy/ceiling), engineering (guide pedestrian movement, block unwanted views, minimize soil erosion), and/or environmental (develop favorable microclimates, wind reduction, shade, reduce reflective sunlight, channel summer breezes). Be specific about particular concerns with your property or desired life style. _____

Aesthetic Preferences

Available space, plant type, form/shape, and ornamental characteristics of plant parts are the focus of aesthetic preferences.

Size of the available space

Plant type, size and form/shape should be selected to fit the assigned space or designated planting area. If the desired plant exceeds the allotted space, it may need to be managed by pruning.

Height: _____ feet/inches (refers to the maximum allowable height for the plant to attain).

Width: _____ feet/inches (refers to the maximum diameter the plant can cover).

Plant type

- Shade Tree Ornamental/Flowering Tree Evergreen Tree
- Broadleaf Evergreen Shrub Deciduous Shrub
- Herbaceous Perennial Ornamental Grass
- Ground Cover Vine Biennial Annual Aquatic



broad



round



oval



pyramidal



upright



fastigate/
columnar



arching



irregular



weeping



mounded



creeping



spreading

Form/Shape

Broad

Round

Oval

Pyramidal

Upright

Fastigate/Columnar

Arching

Irregular

Weeping

Mounded

Creeping

Spreading

Flower

Preferred color(s) _____

Undesirable color(s) _____

Timing: Spring Summer Fall Late Winter

Fragrant: Important Not important

Foliage

Color and seasonal display (spring, summer, fall, winter): _____

Texture, density (fine coarse, open dense): _____

Fruit

Desirable or undesirable: _____

Seasonal display (spring, summer, fall, winter): _____

Stems/Branches/Bark

Color: _____

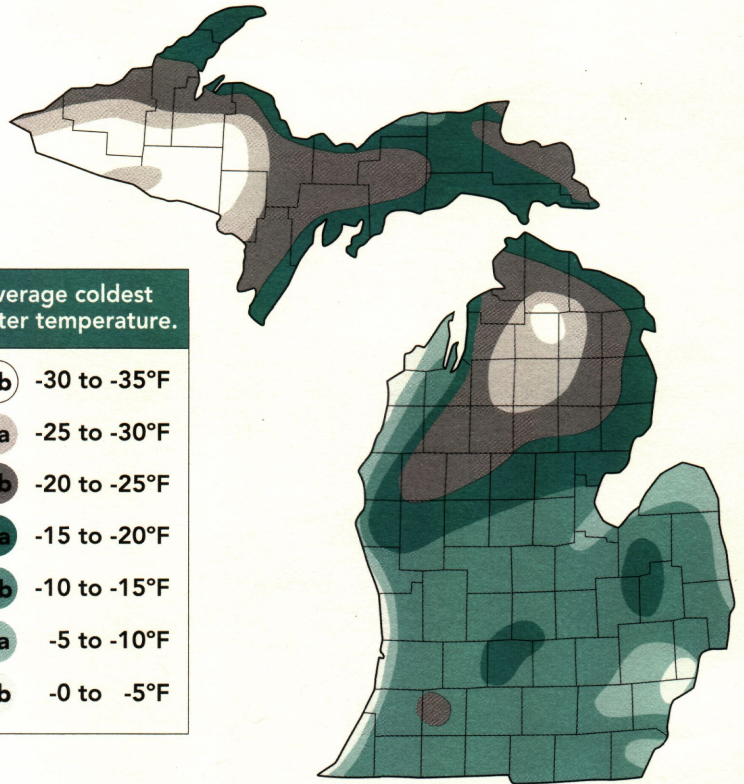
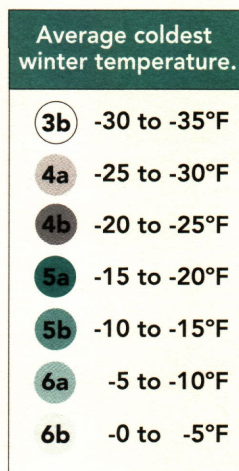
Texture (smooth, rough, flaky, shredded): _____

Site Adaptability

This section focuses on your property's environmental and soil conditions, specifically in the designated planting area. This information will aid in identifying plants that will adapt to or tolerate your site conditions.

USDA Hardiness Zone:

Identify the hardiness zone you are located in _____.
See adjacent map.



Soil type:

Sandy (dry/droughty soils) Loam (well drained)
 Clay (moderately drained) Clay (poorly drained, wet soils)
Area is susceptible to periodic flooding: Yes No

Soil pH (in the designated planting area):

Soil pH _____

Light Exposure (in the designated planting area):

Full sun Full sun/partial shade Partial shade/full shade Full shade

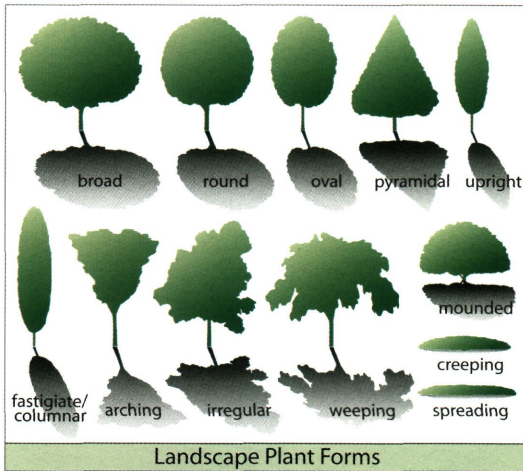
Compass Orientation or Exposure (in the designated planting area):

Exposure relates to prevailing winds and winter sun patterns.

North Northeast East Southeast
 South Southwest West Northwest

Other Considerations:

Air pollution tolerance Heat tolerance Salt tolerance



Looking first at plant type allows us to match the plant with the space and leads us to consider shape. Shape adds another dimension to the ornamental quality of a plant composition. It also aids in characterizing the relationship between or among plants in the composition. Selecting for shape will give us plants for overhead, underneath, as well as side by side. Many of our landscape compositions have several layers of plants, each contributing to the aesthetic appeal of its own layer and that above or below.

Flowers, foliage, fruit, and stems/branches/bark add to the aesthetic appeal of our landscape by providing color and texture. The impact, duration, and seasonality of these characteristics vary. Spring flower colors, the textural qualities of the foliage, fall color, and winter displays of fruit, branches, and barks contribute to the four-season appeal of the landscape.



Site Adaptability

Site adaptability is the relationship between the needs of the plant and the environmental and soil conditions on the property and/or the designated planting area. It ultimately determines whether a plant will perform to expectations. If the plant is unable to establish and resume vigorous growth after planting, it is not likely to exhibit the aesthetic qualities that led to its selection. “Don’t fight the site” – either let the site conditions guide selection or be prepared to modify the site (soils, drainage, microclimate) to accommodate the plant introductions.

Soil type influences aeration, water retention, drainage, and nutrient-holding capacity. Sandy soils are noted for their drainage and low nutrient-holding capacity. Loams are often considered the best soils for plant growth and development because of their adequate aeration, drainage, and nutrient levels. Clays are suspect for poor aeration and drainage problems. Knowing your soil type and its benefits and liabilities will aid in identifying the right plant for your site.

Soil pH is another soil parameter influencing plant growth. Soil pH regulates the availability of micronutrients in the soil. For example, iron is relatively unavailable in soils with high pH (above 7.0). Acid-loving plants find it difficult to extract iron in adequate amounts from high pH soils. The result is a deficiency called iron chlorosis. Chelated iron applications are necessary to correct the problem. Knowing your soil pH will help you avoid pH sensitive plants.



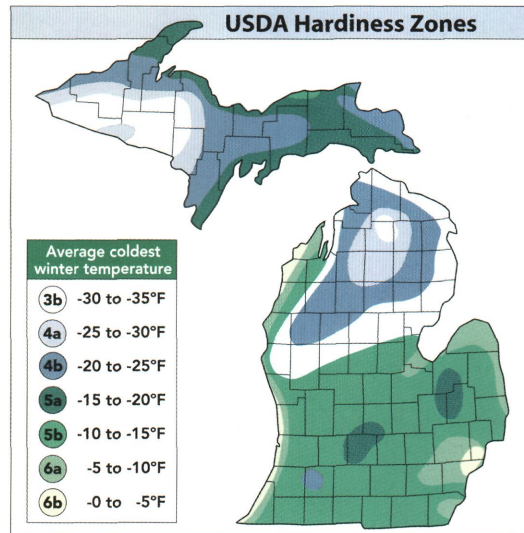
Kurt Stepmatz, MSU



Kurt Stepmatz, MSU



Color and texture from flowers, foliage, fruit and stems/branches/bark add to the aesthetic appeal of our landscape.

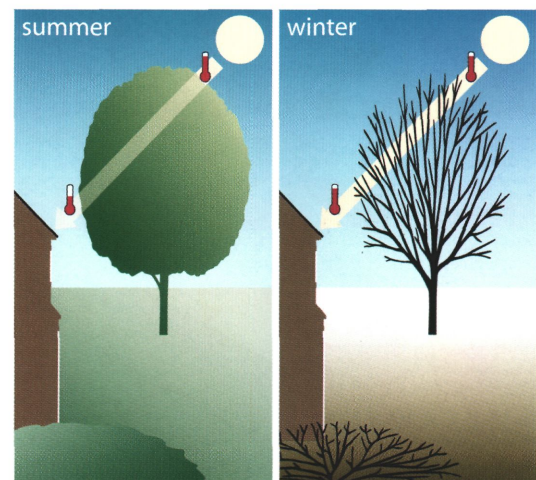
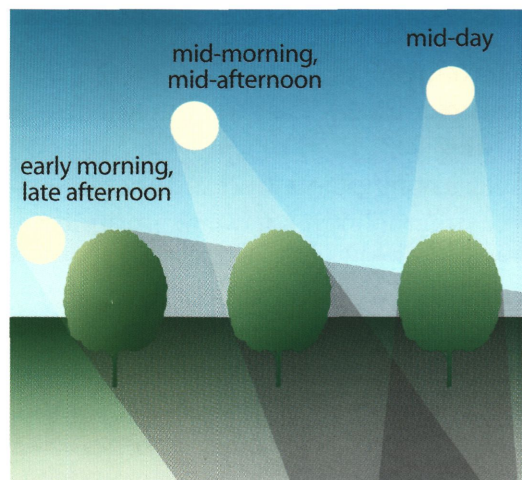


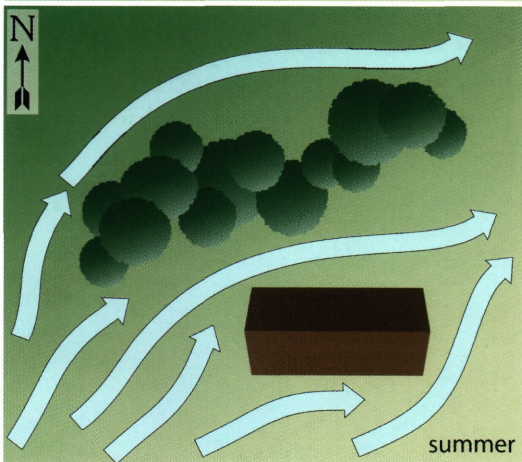
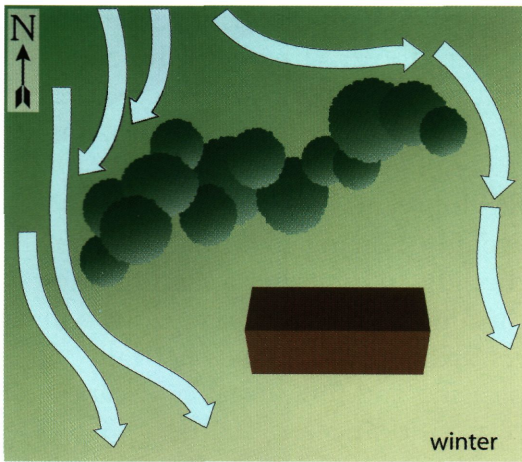
Hardiness refers to the plant's ability to withstand cold temperatures. USDA hardiness zones are based on the average minimum cold temperature. It is critical to base your plant selection on its ability to withstand the lowest expected temperature. Michigan lies within zones 3, 4, 5, and 6. Zone 6 is the warmest zone with plants expected to withstand temperatures between 0 degrees and -10 degrees F. Zone 6 is a narrow band in southwestern Michigan along Lake Michigan and in southeastern Michigan along Lake Erie. Most of Michigan's Lower Peninsula lies within zone 5 with an island of zone 4 in the upper Lower Peninsula. Zones 3 and 4 cover most of the Upper Peninsula.

“Light exposure” refers to the amount of light available in the designated planting area. Knowing daily light patterns and their changes with the season again help tailor selections. Available light can also change with the maturity of the planting. As plants grow, what once was considered full sun can now be classified as partial shade. It may be necessary to change plants in a composition as time influences light levels.

Compass orientation refers to exposure to the north, east, south, and west. Orientation may subject plants to prevailing winds or seasonal sun patterns that may have a negative influence on their development. Prevailing winds in the winter come from the north-northwest. The wind direction shifts in the summer to south-southwest. As a rule, broadleaf evergreens should not be placed in north-northwest exposures unless they are protected from the direct influence of the wind. Winter sun patterns can also be a problem for broadleaf evergreens and thin-barked trees. The sun is in the southern portion of the sky in winter. Late afternoon sun warms plants in southwest exposures. Late afternoon

Daily and seasonal variations in light exposure.





warming followed by the abrupt temperature change when the sun sets causes frost cracks (splitting bark on trunks). Exposure to drying sun and wind can cause sunscald and dessication of broadleaf evergreens.

Other environmental considerations that influence plant performance include sensitivity to air pollution, exposure to and tolerance of deicing salt, and tolerance to light reflected off pavements and buildings.



Management

Maintenance practices within the landscape contribute to its overall appeal. The visual quality of the landscape can fall short if horticultural practice does not fall in line with plant needs. We must be realistic in determining the level of maintenance that we are willing to administer and adjust our plant selection accordingly. There is no such thing as a maintenance-free landscape, but low-maintenance landscapes are possible.

Pruning can be minimal if plants are picked to fit their allotted space. Pruning may be necessary to minimize encroachment of one plant into another's space. If a formal hedge is an integral part of the design, intensive pruning becomes more of a priority. Sanitation is a necessary part of plant management. Leaves, fruit, and stems are normal plant litter. Some plants litter more frequently than others; some produce larger amounts of litter than others. Sanitation can be limited to the fall or a constant chore throughout the growing season. Supplemental irrigation can be a weekly requirement in some landscapes. Some plants require more water at regular intervals. Understanding the water requirements of certain plants will ensure long-term aesthetic quality.

Once established, most landscape plants do not need regular fertilization. Micronutrient deficiencies may require special treatments but in most cases this is not a major consideration in selection. Pest management, however, is another case. In plant selection we

Prevailing winds come from the north-northwest in the winter, while in the summer the wind direction shifts to south-southwest.

need to consider the susceptibility and/or tolerance to major insects and diseases. Major problems are those that reduce plant quality and must be controlled on a regular basis. Plant selection can focus on resistant species or cultivars to avoid the need for preventative or curative control applications. One pest that has to be considered in plant selection is deer. We must either focus on deer-resistant plants or provide the necessary protection from feeding.

Plant selection follows an organized process. The criteria used in the process integrate function, aesthetic preferences, adaptability of a species

to the site, and the management required to ensure establishment and subsequent performance. The process may be simple or complex, depending on your priorities, flexibility, and restrictions. In any event, following the process, giving thought to the criteria, and filtering through the possible selections will reward you with an aesthetically pleasing and functional landscape composition.

Use the accompanying plant selection checklist to assist in working with your plant professionals in identifying the most appropriate choices for your landscape.



Photos by Robert Schutzki, except as noted; illustrations and design by Marlene Cameron; landscape rendering on page 1 by K. Langley, on page 8 by M. Mee-Wilson.