

Landscape Site Assessment

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Before you plant trees or shrubs, you should take time to conduct a landscape site assessment. Evaluation of the features considered here (space limitation, climate, and soil properties) will increase the chance that whatever you plant will thrive, benefiting the environment as well as your wallet.

Right Plant, Right Place

The most common reason trees and shrubs fail to perform as anticipated is that their cultural requirements differ from the site characteristics. People often plant things they know and love from a distant state, purchase because they are on sale, or find attractive but don't understand the environmental requirements. In some cases, a site can be easily modified to make it more suitable for a desired species. Most of the time, it is difficult or impossible to change the site characteristics enough for the plant to thrive. Appropriate watering is essential for establishment of recently transplanted trees and shrubs. This becomes even more important (and challenging) for plants poorly matched to their sites. Selecting plant species that will thrive under particular site conditions is an easier and less expensive option. The first step in doing this is to understand the site where you plan to plant.

Plants that just survive, barely staying alive will be stressed and more susceptible to being attacked by insects and diseases. Most pests and diseases are opportunistic, attacking and killing only stressed plants. Because of this, matching the right plant to the right

site can reduce the need to apply pesticides, increase the functional lifespan of a plant, and result in a more aesthetically pleasing landscape. But the right plant can only be matched to the site when you have properly matched the cultural requirements with the site characteristics.

These site characteristics can be divided into three categories; space limitations, climate, and soil characteristics. Also keep in mind that assessing a site requires the ability to recognize these features at the present time as well as being able to foresee what the site will be like years later when the plant has grown. A site assessment does not include the function of the plant (providing shade, screening of unsightly views, adding color to the landscape, etc.), only the cultural conditions necessary for growth.

Space Limitations

Imagine you are conducting a landscape site assessment. Look up. Are there overhead utility lines on the property or on adjacent properties? Overhead utility lines are one of the most important limiters of space for urban trees. If there are overhead lines within 25 feet of the planting site this should be noted and a tree that will only grow to a smaller size should be selected. Over the life of a large tree (50 feet tall), it is not uncommon for the tree to send branches outward in all directions for half its height. Anticipating the future size of a tree and selecting a species that will not interfere with utility lines will save you trouble in the future. Pruning

to control the size of trees encroaching into utility easements lines results in an aesthetically unpleasing tree, is dangerous for the people who have to prune offending branches, and is an unnecessary expense that is added onto all of our utility bills.

In addition to looking up, look around. As trees and shrubs grow larger they also interfere with or damage gutters, roofing, and siding on a house. They can crowd other plants and block the movement of people and vehicles on walks, streets, and driveways. The poorest reason for pruning is to control the size of a large plant growing in a small area. The need to prune to control plant size can easily be avoided by selecting a species for the space available.

You cannot see into the soil but there may be buried utilities below the soil surface. The utility companies offer a free service in Kentucky (and most other states) to locate buried water, gas, and electric lines on your property. If you or a contractor damages a buried utility line, you can be held legally and financially responsible for repair and damage caused by any resulting loss of service. In Kentucky, call 811 at least a couple of working days before you dig. It's free and it's the law.

Always consider the soil volume before planting. When roots are confined, the lifespan of a plant will be limited. Large, mature trees need about 1,200 cubic feet of suitable soil. This area is 20 feet by 20 feet by 3 feet deep. Shallow soils will require a larger area to equal this same volume. Large mature trees require this volume of soil in order to

“A tree has its wants and wishes, and a man should study them as a teacher watches a child to see what it can do. If you love a plant, take heed to what it likes. You will be repaid by it.”

A Shaker elder’s comment to Thomas Merton while the elder was planting an orchard

satisfy the water and mineral element needs of the plant and to allow the tree to firmly anchor itself so that it does not blow over. Smaller trees and shrubs require proportionally less soil.

Climate

Most of Kentucky is in USDA plant hardiness Zone 6 (<http://planthardiness.ars.usda.gov/PHZMWeb>). The far Western counties are in Zone 7. Areas in Zone 6 will on average get down to 0° to -10°F each winter. It is important to understand that this is an average over many years and it is common to have winters that are colder or warmer than this range. Hardiness zones are based on years of observations and not specific sites. Therefore, you may still see damage to plants considered hardy for a given zone especially if they suffer from other stresses. Plants stressed by temperatures that are either higher or lower than their optimum range are more easily attacked or killed by diseases and insect pests.

Within your plant hardiness zone you can find areas that are significantly warmer or cooler than the regional average called “microclimates.” Cold air can settle into low areas; large bodies of water can warm the air in winter and cool it in summer. You need to recognize these areas and, where necessary, match the hardiness of the plant to the microclimate instead of the region.

Plants do not feel wind chill, but drying winds can desiccate their foliage

and stems, especially when the water in the soil is frozen and winter sun strikes the foliage. Because of this be aware of potential exposure of the plant to winter wind and sun, especially if you are considering using broadleaf evergreens such as holly, magnolia, and laurel, which are known to be sensitive to these conditions.

Rainwater runs off slopes more rapidly than on flat ground. With less infiltration into the soil, plants growing on unirrigated slopes must be more drought tolerant. The direction of the slope (aspect) is also important. Southern and Western facing slopes tend to be dryer than those to the east or north.

The number of hours of sunlight as well as the time-of-day that shade occurs can be important. Plants adapted to growing in full sun may not tolerate shading. Species that are marginally heat tolerant will grow better in afternoon shade than morning shade.

Soil

The quality and quantity of soil is the third factor influencing the health and longevity of trees and shrubs. Texture is the percent sand, silt, and clay in the soil. Structure is the way these materials are formed into particles. Together these factors influence the ability of water to move into the soil (infiltration) and move through the soil (percolation). Soils that do not drain or drain very slowly will become waterlogged resulting in the suffocation of plant roots.

You should perform a percolation test, also known as a perk test every time you plant. This will help determine if the soil drains well enough for planting trees and shrubs or if corrective measures need to be taken. Soils that are compacted also drain poorly. Species adapted to floodplains will tolerate poorly drained and compacted soils better than other species. You can find additional information on this at <http://www2.ca.uky.edu/agcomm/pubs/ID/ID237/ID237.pdf>.

Soil acidity and alkalinity are measured as pH. The pH determines the availability of mineral elements in the soil to plants and the ability of beneficial organisms (fungi, bacteria, worms, etc.) to survive in the soil. Soil can be made more acidic by adding sulfur or more alkaline by adding lime. These materials do not move well into the soil when applied to the surface. If the pH needs to be adjusted this should be done before planting so that these materials can be tilled into the soil.

A thorough site evaluation is necessary to discover which factors may impede the survival of the landscape plants. This takes time and the ability to observe the site. Once the site has been assessed and you have determined your expectations for the plant, you can begin the process of selecting the most appropriate plant material. Planning before your plant prevents future problems and saves time and money.

Landscape Site Assessment Checklist

Client: _____ **Date:** _____

Client Contact Info: _____

Site Location: _____

Space Limitations:

Buried Utilities (Call 811) _____

Overhead wires (height) _____

Impervious pavement (distance/size) _____

Soil area (size) _____

Climate:

USDA Hardiness Zone: _____

Microclimates: _____

_____ Windy (direction _____)

_____ Prevailing winds (direction _____)

_____ Slope (_____ %)

_____ Aspect (direction of slope)

Sun light (_____ hours) _____ morning _____ mid-day _____ afternoon

Rainfall: _____

Irrigation: _____ turf on separate system from trees & shrubs

Soil:

Texture: _____ Structure: _____

Depth: _____ pH: _____ buffer pH: _____

Compaction: _____ severe _____ moderate _____ somewhat _____ uncompacted

Penetrometer reading: _____

Drainage: _____ poor _____ average _____ excellent (_____ inches / hour)

Other Observations:

- _____ recent construction
- _____ topsoil removed
- _____ drainage from downspouts
- _____ drainage from impervious pavement
- _____ deicing salt, oil, etc. in runoff from pavement
- _____ salt spray from road
- _____ potential overflow from chlorinated pools
- _____ existing tree / shrub roots
- _____ noxious weeds
- _____ black walnut in adjacent areas
- _____ traffic (unpaved path)
- _____ wildlife interference
- _____ pet waste
- _____ legal restrictions (fences, easements, structure height, line-of-sight, prohibited species, etc.)

Other observations and concerns: _____
