U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Guide to Home Landscaping

Simple landscaping techniques, such as using trees, vines, and shrubs to create shade in the summer or to block wind in the winter, can help cut heating and cooling bills.

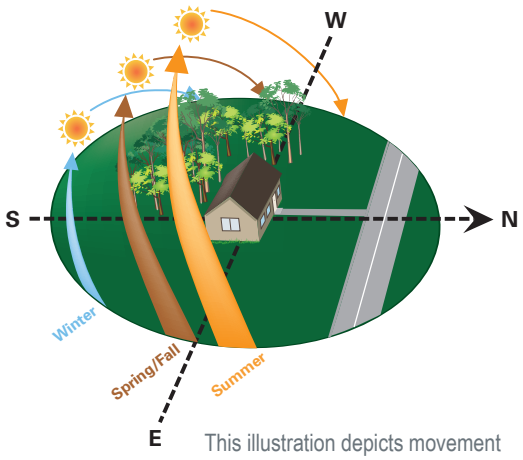
Bottom image: iStockphoto #2457262

Smart landscaping can reduce your energy needs and save you money on heating and cooling bills.

Summer Landscaping

Creating Shade

During summer, heat from the sun absorbed through windows and roofs makes air conditioners work harder. By incorporating shading techniques into your landscape design, you can reduce this "solar heat gain" and lower your cooling costs. Simply shading an air conditioner can increase its efficiency by as much as 10%.



This illustration depicts movement of the sun throughout the year.

Deciduous trees block the sun's heat in summer, but let sunlight pass through in the winter because they lose their leaves in autumn. Dense evergreen (coniferous) trees and shrubs provide year-round shade and can block strong winds.

Tall deciduous trees with high and spreading branches should be planted on the south side of a house to provide maximum summertime shading over the roof. Trees with leaves and branches lower to the ground are best planted on the west side of a house where shade from the afternoon sun is needed.

Six to eight-foot tall deciduous trees planted near a house will begin shading windows the first year. A slow-growing tree may require up to 10 years of growth before it shades a roof. However, slow-growing trees have a number of advantages over faster growing ones. They tend to live longer, possess deeper roots that make them more drought resistant, and have stronger branches which are less prone to breaking in storms or under heavy snow. Plant trees far enough away from the home so that when they mature, their root systems do not damage the foundation and branches do not damage the roof.

Selection and Placement of Trees

Air temperatures directly under trees can be 25°F cooler than air temperatures above a nearby blacktop parking lot. Trees can be selected for almost any desired shading based on their sizes, densities, and shapes.

Think Globally, Plant Locally

To ensure lasting performance of energy-saving landscaping, use plant species that are adapted to the local climate. Native species are best, as they require little maintenance once established and avoid the dangers of invasive species. To find the best choices for your area, visit www.plantnative.org.

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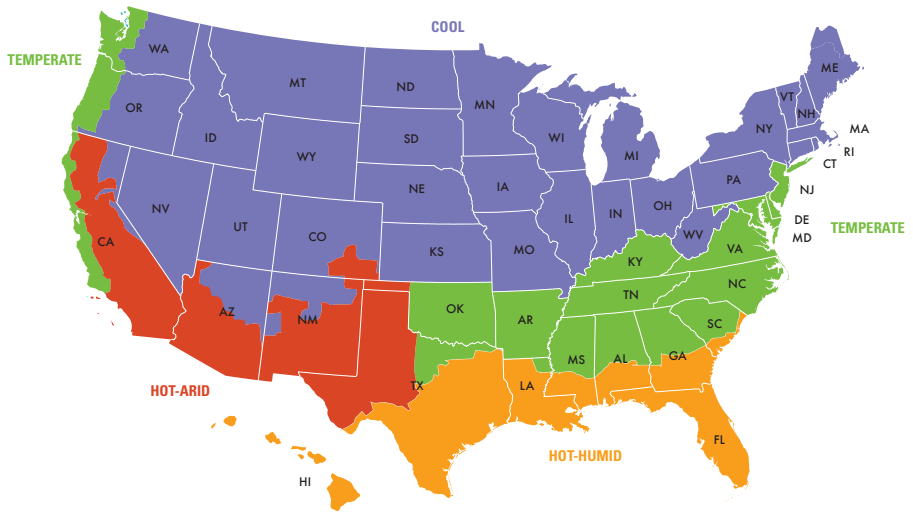
Cooling the Local Climate

The shadier the landscape, the cooler its temperatures. Trees, shrubs, and groundcover can be used to shade the ground and pavement around the home, while a large bush or row of shrubs can shade and cool a patio, driveway, or front walk. However, do not allow dense foliage to grow immediately next to a house where it can become a pathway for pests to enter the home, or where moisture and roots can become problems. Keep the soil around the home dry. In arid climates, check local fire codes for proper plant spacing.



Map of the four broadest categories of climate zones for the lower 49 United States.

Winter Landscaping

Windbreaks

Trees and shrubs can form windbreaks to block cold air from your house. Follow these steps to create windbreaks:

- **Maximize protection** by planting trees with low-growing branches away from the house by a distance of about two to five times the mature height of the trees.
- **Plant dense evergreen trees and shrubs** together on the north and northwest side of the home to create the most common type of windbreak. Evergreen trees combined with a wall or fence can deflect or lift the wind over the home. In snowy areas, plant low shrubs on the windward side of windbreaks to trap snow.
- **Create adequate air spaces next to the house** by allowing at least one foot of space between full grown plants and the exterior wall of the house.

Climate-based Strategies

When choosing landscaping strategies, be aware not only of your regional climate, but also the local "microclimate" that immediately surrounds your home. Plan for both summer and winter needs.

Temperate Region. Creating windbreaks of trees and shrubs on the north and northwest side of the house will deflect winter winds while allowing southerly summer breezes.

Hot-Arid Region. Shade roofs, walls and windows. Allow summer winds to access naturally cooled homes, but block or deflect winds from air-conditioned homes.

Hot-Humid Region. Channel cool summer breezes toward the home. Maximize summer shade with trees that still allow penetration of low-angle winter sun. Avoid placing plant beds near the house if they require frequent watering.

Cool Region. Use dense windbreaks to block cold winter winds and allow the winter sun on south-facing windows. Shade south and west windows and walls from the direct summer sun if summer overheating is a problem.

Further Reading

DOE Energy Savers: Landscaping
www.energysavers.gov/landscaping

EPA's GreenScaping for Homeowners
www.epa.gov/epawaste/conserve/rrr/greenscapes/owners.htm#plant

PlantNative
www.plantnative.org

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