

Energy Efficient Landscaping

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Conway, SC — There are numerous expenses associated with running a household. One of the largest expenses we often see is the heating and cooling of a particular home. Not only is climate control inside a structure a strain on the homeowner's pocketbook but can also put a strain on regional and national resources as well. There are various well known approaches that can be implemented inside the home to help reduce the cost of heating and cooling however, thoughtful landscaping can also play a large role in energy efficiency.

According to Landscape Design for Energy Efficiency, a Clemson Extension Publication, proper landscaping around a home can save as much as 30 percent on heating and cooling costs. The proper addition of just three trees will save the average household between \$100 and \$250 annually in energy costs. A well-designed, energy efficient landscape will provide energy savings and a return on the initial investment in as little as eight years.

Plants can be used in a variety of ways for climate control around the landscape. Trees, shrubs, turfgrass and groundcovers, or a combination of all these, can play a significant role as solar radiation control devices. Plants are very effective at controlling both direct solar radiation and reflected radiation. Depending on the density of individual plant canopies or the density of plant groups, solar radiation can be filtered or completely blocked. Reducing or eliminating solar radiation from reaching a building will prevent the structure from heating up above the ambient air temperature. Plant foliage will provide shade for walls while turfgrass will protect ground surfaces by absorbing, reflecting and transmitting solar radiation.

During the summer, the heat of the sun will cause temperatures to rise around your landscape. Plants will perform several tasks during the summer sun's heat. During the day, plants will create a cooler microclimate by using the incoming heat to evaporate water. This process is called evapotranspiration. During the night, temperatures will fall and the plants will block outgoing accumulated heat warming the area under the plants. This can be seen on cold nights when the areas under plants are devoid of frost.

With this in mind, energy use during the warm months of the year can be reduced by as much as 40 percent by shading windows, walls and roofs. Utilizing vines can be a quick, inexpensive way to provide effective shade. On wooden structures, the vines can be trained on trellises away from the walls to prevent moisture problems. Several vines that can be used for this purpose include: trumpet honeysuckle (*Lonicera semperviren*), Virginia creeper (*Parthenocissus quinquefolia*) and yellow jessamine (*Gelsemium sempervirens*). Trees and shrubs can also act as insulators when properly placed. Situate your plants so when they mature, air will circulate between the plants and the building reducing moisture problems and providing a temperature buffer.

Trees alone can provide a tremendous amount of energy savings when properly placed in the landscape. Mature trees planted on the east or west side of the building will

provide protection from the early morning and late afternoon sun during the heat of summer. Before you choose a tree, be sure that it will fit in the location you want to place it in as it matures. By using deciduous trees, or those trees that lose their leaves during the winter, you can help warm the structure during the cooler months as sunlight will filter through the bare branches. One area to be cautious about is the south side of the structure. You can actually increase energy demand by planting evergreen trees too close to the structure on the south side as these trees will shade the building during the cooler months eliminating the warming effect of the southern sun.

Several large trees that can be used in an energy efficient landscape include: American beech (*Fagus grandifolia*), black tupelo (*Nyssa sylvatica*), eastern red cedar (*Juniperus virginiana*), live oak (*Quercus virginiana*), pecan (*Carya illinoensis*), red maple (*Acer rubrum*), river birch (*Betula nigra*), southern magnolia (*Magnolia grandiflora*), sycamore (*Platanus occidentalis*). Smaller trees would include: American holly (*Ilex opaca*), dogwood (*Cornus florida*), fringe tree (*Chionanthus virginicus*), southern wax myrtle (*Myrica cerifera*).

As a final checklist when developing an energy efficient landscape through climate control, use the following suggestions:

- Position the house if possible with the short sides facing east and west with the longer sides and sides with the most windows facing north and south.
- Plants properly placed on the east and west side of the building to shade windows, walls and roofs from the solar heating.
- Place evergreen shrubs or small trees along the northwest side of the building to moderate and buffer cold winter winds.
- Plants can be placed to direct cool summer breezes into windowed areas to help cool the structure with the air conditioning off.
- Use vines to shade walls.
- Do not block the south side walls with plants. Keep evergreen plants well away from the structure or use deciduous plants.