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Energy Conservation Landscaping-Summer Cooling

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Energy Facts

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# Energy Facts

## Energy Conservation Landscaping- Summer Cooling

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Shade and summer breezes can make homes cooler and reduce air conditioning costs, but remember the tradeoff between summer cooling and winter heating from the sun. In climates with cold winters, summer shading must be balanced with the need to allow winter sun to shine directly on the house. Landscaping that shades south and southwest facing windows and walls, shades south-facing roof surfaces, and protects the air conditioning units will be most helpful for summer cooling.

Deciduous trees are used for shade in the summer, but, even after they lose their leaves, they can block significant amounts of winter sun. Also, try to limit the use of paved surfaces in your landscape. The air temperature above paved surfaces will be higher than the temperature above grass or ground covers. Using trees that shade paved surfaces during the hottest part of the day will help keep surfaces cooler.

### Plan Your Landscape for Summer Tree Shading

Trees are the key plants for providing summer shade. Those with broad, spreading crowns are the most desirable. Some trees will have low or drooping branching habits, and some tree species have weeping or columnar habits so these cultivars are not well suited to provide shade. Avoid the use of such trees since the low branches will tend to block cooling summer breezes. If the crown consists of few small twigs, less

winter sun will be blocked when the tree loses its leaves in autumn.

Select trees that have no serious pest problems and resist the temptation to plant fast-growing trees, as they are generally weak-wooded and often have serious pest problems. Also, these trees are more susceptible to storm damage and usually live just a short time.

Only trees can do an effective job of shading the roof. The distance from the tree to the house must be sufficient to avoid damage to the house but close enough to provide effective shade. Large trees should be no closer than 20 feet and medium-sized trees no closer than 15 feet. It may not be possible to shade the entire roof surface. However, shading just some of the roof during most of the day will provide beneficial effects.

One disadvantage of having trees too close to the house involves the eaves trough (gutter). Leaves and seedpods may accumulate in the eaves troughs and reduce their effectiveness. Down spouts can become blocked causing water from the roof to overflow the eaves troughs and be dumped next to the foundation. Gutter guards may be necessary to keep materials from being a problem or the eaves troughs must be cleaned regularly.

Remember that deciduous trees without their leaves can block more than half the winter sun. If winter sun is a higher priority than summer shade, avoid planting

trees on the south side of the house. Use awnings as an alternative way to shade windows. If planning to build a house, use extended overhangs to block out the summer sun.

Homes with long dimensions oriented on an east-west axis will also be exposed to considerable sunlight on the east and west walls. If the home has two stories, additional trees can be planted to shade the walls. For one-story homes, smaller trees or even shrubs can provide needed shade.

## Using Vines and Shrubs Effectively

Vines can be used to shade walls but they must be used with great care. Some vines cling very well to masonry but the holdfasts - the structures that allow them to cling - may remain on the wall if the vine is removed. The use of clinging vines on wood walls may cause the wood to decay. Vines can be grown on a trellis to shade particular walls or windows. Fast growing annual vines or more permanent woody vines can be used. The vines not only shade the wall or window but the evapotranspiration from the leaves will provide additional cooling.

Vines that cover a wall may become infested with pests. Treating the pest problem may involve the use of sprays that must be cleaned off windows or other surfaces. In extreme cases, the vine may die and have to be removed, which can involve considerable effort and expense.

Foundation plantings can help conserve energy in both summer and winter. Plantings can be used to create a dead air space between the plants and the house. Such dead air helps insulate the house in summer and winter and evergreen shrubs are best for this use. The plants should be placed so that, when they mature, they will be five feet from the wall of the house. Some accommodation will need to be made to control weeds between the foundation wall and the plants, and a mulch or ground cover may help minimize the weed growth.

Dense foundation plantings can be a haven for certain insects that can be a nuisance, depending upon the

pest. In addition, as the plants grow, windows may be blocked and this can interfere with views or breezes. When placing shrubs near the house, consider what kind of maintenance must be performed on the house and whether or not the shrubs will interfere as they get larger.

Shading the air-conditioning unit can help increase its efficiency and reduce the temperature inside the home by several degrees. Large shrubs can provide shade while making the unit less obvious. The plants may also dampen the noise created by the air conditioner. The shrubs should not be so close that airflow to the unit is blocked, possibly impairing its operation. Do not allow fallen leaves or other materials to fall into the unit. Shrubs should not interfere with access to the air conditioner in case it requires service.

## Channel Summer Breezes through Landscape Design

This landscape design feature may be harder to put into practice. It's the idea of channeling summer breezes into the home for cooling purposes. The concept works essentially like a windbreak, but is used to obtain the opposite result-to act like a funnel to send the breeze to and through the house. This same technique may be used to redirect a southerly breeze so that it is channeled to blow in the north facing windows. This technique may be most suitable for warmer climates.

In regions that experience cold winters, tree planting for air channeling may not be the highest priority, since using a windbreak to deflect the cold wind will be more important. Also, the technique may be a low priority where homes are air conditioned and therefore do not rely on summer breezes for cooling.

## Sources of information:

Department of Energy. 1995. Landscaping for Energy Use. Consumer Energy Information: EREC Fact Sheets. The Energy Efficiency and Renewable Energy Clearinghouse. Merrifield, VA. Online. <http://www.eren.doe.gov/erec/factsheets/landscape.html>. [Downloaded July 20, 2001].

Mitchell, Paul J. Landscaping for Energy Conservation. OSU Extension Facts, F-6417. Oklahoma Cooperative Extension Service, Oklahoma State University.

North Carolina Solar Center. 1998. Energy-Saving Landscaping: For Your Passive Solar Home. Online. <http://www.ncsc.ncsu.edu/fact/09body.htm>. [Downloaded July 20, 2001].

Oberlin Municipal Light and Power. 2001. Energy Efficient Landscaping Ideas. Online. <http://www.omlps.org/Conservation/Landscaping.htm>. [Downloaded July 20, 2001].

Perry, Leonard P. 1997. Landscape to Conserve Energy. Ornamental Horticulture Leaflet 47, University of Vermont Extension.

Starbuck, Christopher J. 2000. Landscape Plantings for Energy Savings. Department of Horticulture, University of Missouri-Columbia. Online. <http://muextension.missouri.edu/xplor/agguides/hort/g06910.htm>. [Downloaded July 20, 2001]

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