



ECOBROKER International **Green Topic Pages**

Landscaping Shade Trees and Windbreaks

Technology Snapshot & Benefits:

Perhaps the most pleasant economic savings can be derived from judicious and mindful planting of trees and shrubs. The value of traditional plantings serving as windbreaks is well known. Additionally, well-placed deciduous trees can shade a building during hot summer months yet allow warming sunshine to enter a building when warmth is needed in the winter. The summer shading feature of trees is particularly important for the following reason. Most homes are cooled with traditional window- or central- air conditioners using fractional horsepower single-phase electric motors and modern refrigerants (chlorofluorocarbons that are less potent greenhouse gases than their predecessors). The electro-mechanical efficiency of air conditioner components ranges from 35-50% based upon the electrical energy available at the plug. But that electricity is arriving at your building with an overall efficiency of about 30% based upon the energy content of the fuel going into the central electrical power plant. So, when the overall fuel cycle is considered, building air conditioning is about 10-20% efficient, on the basis of energy flow. Fortunately, humans feel a cooling effect from simple air movement that increases evaporation from the skin. Most air conditioning rating systems incorporate this cooling effect, so their efficiency numbers do not appear quite so grim. However, when shade trees cool a house such that one unit of air conditioning energy is avoided, 5 to 10 units of primary energy are avoided at the power plant. This is not only an important economic savings to you, but also a very important environmental savings to the community.

Estimated Cost Savings:

Air conditioning in buildings represents 13-15% of your annual electricity budget, and a larger fraction during summer months. By reducing the amount of air conditioning required, shade trees directly affect your bottom line. The cost of quality shade trees ranges from a few dollars for a seedling to several hundred for a much larger tree. Its a good idea to get at least an 8-10 foot high tree if possible. The sooner the tree grows shading capacity, the sooner you can enjoy savings. The amount of savings can vary widely due to local circumstances but typical savings are on the order of 10-20% of a summer electric bill. Similar savings from a windbreak will be realized in winter during the heating season.

Issues:

Consider planting several varieties of trees: some fast-growing species (such as ash or aspen) for quick shade and more durable, slower-growing and longer-lasting trees (such as maple or oak) that will eventually dominate. Shop around for the best warranty on trees. Many nurseries provide planting and care instructions and will offer a one-year replacement guarantee.

Regional Issues:

Plant varieties appropriate to your climate. Some species of trees grow more slowly than others so you need to get started as soon as planting season arrives.

Installation (Getting It Done):

Spring and fall are the best times to plant. Be sure to follow planting instructions and err on the side of digging too large a hole. Be sure to incorporate organic material in the planting soil and to stake trees to provide mechanical support. Mulch heavily and water thoroughly during summer dry spells.

Be sure to get bids from two or three (or more) nurseries and/or landscaping contractors if you choose not to plant the trees yourself. Multiple bids will allow you to gain immediate perspective on the true costs and value of trees in your area.

References:

Cooling Our Communities, A Guidebook on Tree Planting and Light-Colored Surfacing, US EPA 22P-2001, January, 1992.

More Information On This Topic:

[U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy: Landscaping](http://www.eere.energy.gov/consumerinfo/energy_savers/landscaping.html)

http://www.eere.energy.gov/consumerinfo/energy_savers/landscaping.html

[U.S. Department of Agriculture's National Resource Conservation Service: Windbreaks](http://www.nrcs.usda.gov/technical/ECS/forest/wind/windbreaks.html)

<http://www.nrcs.usda.gov/technical/ECS/forest/wind/windbreaks.html>