

Tree Placement for Energy Savings

The planting of trees to reduce winter heating costs and summer cooling costs is a proven way to reduce use of fossil fuels (oil and gas) and realize significant savings for homeowners and businesses. Correct placement is key to getting the desired cost savings.

To reduce winter heating costs, a well designed wind break to the north, west and sometimes the east sides of homes and business properties can be very beneficial. The best windbreaks have a separating space between the building and the windbreak of 30 ft to 120 ft. Snow can settle in this area so that less snow piles up on the roof, and there is less drifting.

A single row of evergreen trees such as spruce, pine or arborvitae will certainly help break the wind, but if you have enough space, a three row to fifteen row windbreak of shrubs and trees will do an even better job. For the outside rows use shrubs that grow to a height of 8'-10' tall. Next have 1-5 rows of shade trees (such as Maple, Linden, Oak, Hackberry or Honeylocust) and lastly, 1-5 rows of spruce/pine/arborvitae. These evergreens are positioned on the side closest to the building.

If you decide to do a multiple row windbreak that includes one or more rows of shade trees, be sure to allow an extra wide space between the shade trees and the evergreen trees. This will allow the evergreen trees to stay nice and thick by getting plenty of sunlight. If shade trees grow tall and throw shade on spruce/pine/arborvitae, the evergreens will get thin and spindly looking. A space of 40' to 50' between the shade trees and the evergreens should be enough. See the diagram for additional space information.

Once you determine the spacing for your heat saving windbreak, the next most important factor is to get the trees and shrubs planted this year. Even if you start with small trees and shrubs that are less expensive, time will work in your favor. Within a couple of years, the trees will be growing at full speed and hasten the time when the size will be large enough to give the desired relief from winter winds and high heating costs.

Saving summertime heating costs requires placement of shade trees close enough to the south, southeast and southwest sides of the building to throw shade onto the roof and siding. Be sure you do not use evergreen trees to provide the shade. They are not shaped right to create a really good size shade pattern across the roof, and by shading the windows in the winter, an evergreen prevents the capture of daytime winter sun energy that passes through the windows and warms the rooms.

A nice sized shade tree keeps summer sunlight from heating up roofs, and siding, and direct sunlight can't penetrate through windows. Lower temps equal lower cooling costs. In the winter, the bare branches of the shade tree allow enough solar radiation to pass through windows to nicely warm rooms for ¼ to 1/3 of each 24 hour period.

I recommend planting shade trees ten to twenty feet from the roof edge of the house. The closer you plant to the roof edge, the sooner you will cast shade on the house. Fast growing varieties

will of course, produce shade sooner. The bigger the mature size, the better the shading of the building, and the more cost savings will result.

No matter what shade tree variety you pick, be sure to prune your tree every 2 years during the first 10-15 years to establish the height of the first permanent branches, usually at 12' to 18' above ground level. The other goal of frequent pruning is to make sure that every branch that is a permanent part of the tree has very strong attachments to the trunk. Steeply angled branches are usually weak and can easily tear off during storms. Branches that are attached at 45 degree angles or lower (more horizontal) usually have strong attachments to the trunk and are good candidates for permanent branches. Trim out steeply angled branches even if it leaves a temporary gap in the crown of the tree. It will fill in, in a few years.

People often wonder why the first branches of a shade tree should be 12' to 18' off the ground. This is to both let in enough light so grass will grow properly under the tree and to allow the lowest branches plenty of clearance from the roof edge of the building.

Depending on the size of the building, 3 to 7 shade trees positioned 10 to 20 feet from the SE, south and SW sides should provide good protection from summer heat, and lower air conditioning bills. See the diagram for spacing. Usually the best appearance is achieved when the shade trees are a mix of distances from the roof edge. As insurance against future tree diseases, plant a mixture of varieties.

Again, it is important to plant soon. Do not delay or you will delay the time when your house is more comfortable, more beautiful and costs less to heat and cool.

Adapting the above theory to smaller spaces:

To adapt to confined space on urban lots, consider using some of the narrower form shrubs and trees listed on the Chart for Narrower Form Trees and Shrubs. Normal evergreen trees and shade trees have heights ranging from 35' to 80' and widths of 35' to 70'. Compare these heights and widths to the trees/shrubs on the chart.

If you only have room for one row of windbreak plants, this will certainly be better than no windbreak. It may be that space will only allow for one cluster or small grove of trees or shrubs. Again, this is better than nothing, given the space available. You may notice with only one row of plant material, a snow drift where you'd prefer to not have a drift, or more snow piling up on your roof.

If you really want lots of summer shade on your roof, siding and windows, but have limited space, in many cases you can still plant a shade tree that matures to a tall size with a wide spread by being sure that you consistently remove lower branches, and do good structural pruning during the first ten years so that the lower permanent branches are established at 12' to 20' above ground level, and so that all branches in this tree with a high crown are strongly attached to the trunk.