

THE OUTSIDER

Illinois Extension Horticulture serving Henry, Mercer, Rock Island, and Stark



MONEY GROWING ON TREES? COST SAVING BENEFITS OF TREES

Trees provide an innumerable number of ecosystem services for our communities due to their increasing size and longevity. Energy saving and cost saving are among the benefits provided by residential and community trees. Planting the right tree in the right place can help homeowners, school districts, municipalities, and others save energy, and money, throughout the year.

ENERGY SAVING IN WINTER

In cooler seasons, trees act as a barrier that slows wind speeds as it passes through and around the plants. Wind that encounters any hard element will have its direction altered and lose velocity. Reduced wind speeds help conserve energy and lower heating costs by minimizing the windchill effect on buildings. Wind occurs when differences in air pressure cause air exchange as a balance is sought. In the winter, high wind speeds cause a pressure difference between the inside and outside of buildings, this difference in pressure tries to equalize in the form of cold air entering buildings through small openings and cracks. Cool air drafts can be experienced around windows and doors. Trees used to interpret wind reduce pressure differences resulting in warm air staying inside and cool air staying outside a dwelling. Energy and cost savings are achieved as heat demand is reduced.

GROWING VOCABULARY

Hardscape is term used to describe man-made landscape elements that are in contract to plant material. The size and impact on the landscape vary. Examples of hardscape include sidewalks, driveways, patios, pergolas, retaining and seat walls, water features, fire-pits, and garden art.

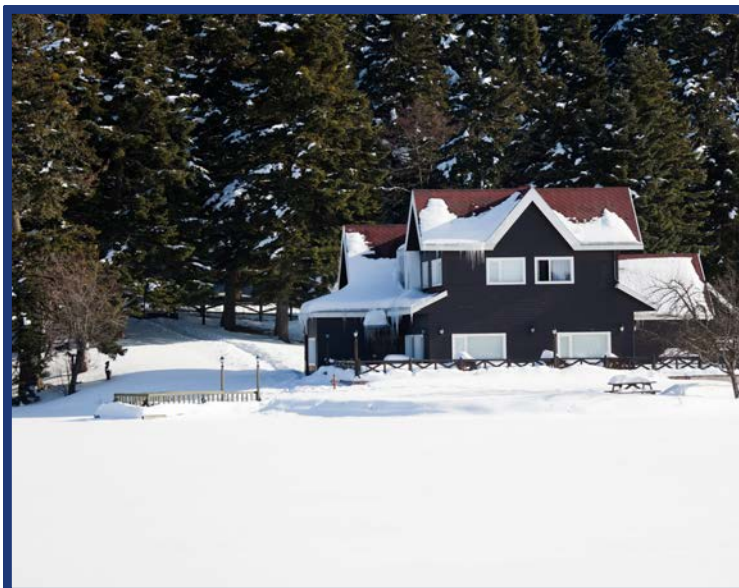
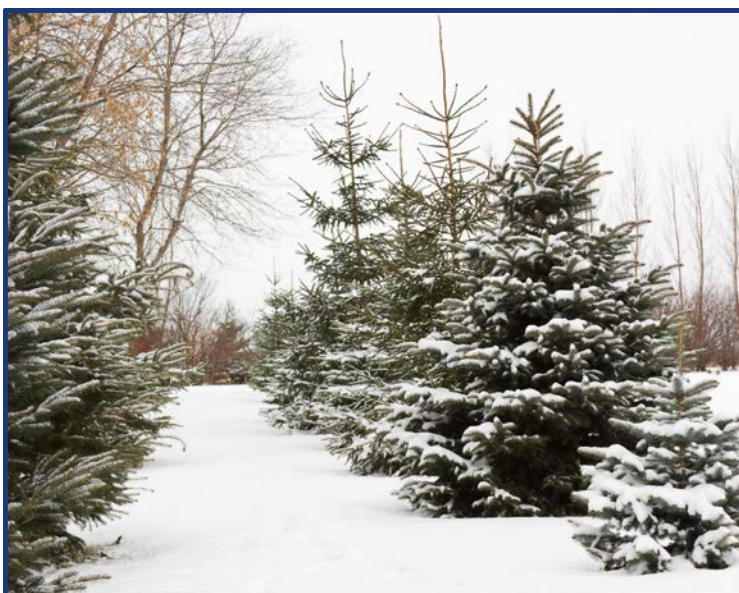


ENERGY SAVING IN SUMMER

Shade trees provide several benefits that contribute to energy savings. The shadows trees cast on buildings reduce the amount and strength of direct sunlight reaching structures. By shading buildings, this natural cooling effect helps decrease temperatures inside the house and reduces the need for air conditioning.

The same is true of hardscapes adjacent to the house or building. Concrete roads, driveways, sidewalks, or patios have high thermal mass properties meaning they are very capable of absorbing heat. By absorbing heat, hardscape elements can increase the ambient air temperature. On a large scale, in urban spaces, this is referred to as the heat island effect and has been shown to increase daytime temperatures from one to seven degrees Fahrenheit and nighttime temperatures from two to five degrees. Trees strategically planted to shade buildings and hardscapes can help reduce the warming effect of solar rays and the workload on air conditioning systems and energy demand.

Additional cost savings can be achieved as trees protect hardscapes from harmful solar exposure. Over the long term, shade on buildings and hardscapes helps extend their useful life. Excessive exposure to sunlight can cause roofing materials to deteriorate more quickly. Trees intercept harmful UV rays, extending the lifespan of the roofing materials and minimizing the need for premature repairs or replacement. Likewise, the expansion and contraction effect of concrete is affected by changing temperatures. Using shade to minimize temperature fluctuations can ease deterioration, extend the life of the hardscape, and reduce repair and replacement costs.



RIGHT TREE, RIGHT PLACE

Trees planted strategically around buildings can help buffer cool winter winds or provide shade relief from the powerful summer sun. Species diversity is always recommended but for energy conservation, the mature size of the tree and leaf retaining or shedding properties are especially important characteristics. To maximize energy-saving benefits, it is important to plant the right type of tree in the right place.

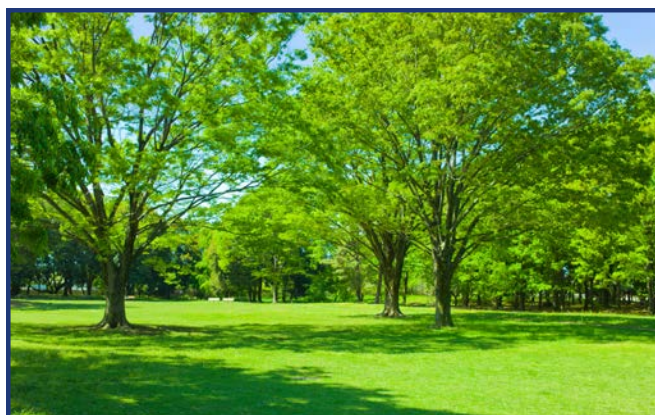
Deciduous trees help shade buildings, paved areas, and air conditioner units in the heat of the summer. In the Midwest, the sun moves higher in the sky as the summer progresses. During the summer solstice, the sun is nearly overhead at the warmest time of day. During these hot summer days, most shade benefits will be achieved by intercepting the sun's rays during the morning and afternoon hours. For maximum benefit, plant deciduous trees on the east and west sides of buildings, although planting deciduous trees on the southern side of buildings will provide some benefits of shading.

Evergreen tree species are recommended as windbreaks. By retaining leaf materials throughout the winter months, they have a greater capacity to intercept wind. Prevailing winter winds, in the Midwest, are primarily from the north and west. Planting a windbreak on the west, northwest, and west sides of a structure is recommended to optimize energy-saving impacts. Windbreaks should have branches that extend from the ground to the top of the canopy. As space allows, multilayered windbreaks are recommended and most effective.

When it comes to maximizing energy efficiency, the larger the tree the more potential savings however space can be limited in urban spaces and yards. If a site is unable to accommodate a large growing tree, smaller growing species are recommended and will provide some benefits.



Evergreen trees



Deciduous trees

OUTSIDER ACTION

Try these activities to be more of an Outsider

- Revisit this past Outsider article for more information on [windbreaks](#).
- Track how the sun moves across the horizon by making small marks on a window one day a week at sunrise or sunset.

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