Benefits of Trees

Most trees and shrubs in cities or communities are planted to provide beauty or shade. These are two excellent reasons for their use. Woody plants also serve many other purposes, and it often is helpful to consider these other functions when selecting a tree or shrub for the landscape. The benefits of trees can be grouped into social, communal, environmental, and economic categories.

Social Benefits

We like trees around us because they make life more pleasant. Most of us respond to the presence of trees beyond simply observing their beauty. We feel serene, peaceful, restful, and tranquil in a grove of trees. We are "at home" there. Hospital patients have been shown to recover from surgery more quickly when their hospital room offered a view of trees. The strong ties between people and trees are most evident in the resistance of community residents to removing trees to widen streets. Or we note the heroic efforts of individuals and organizations to save particularly large or historic trees in a community.

The stature, strength, and endurance of trees give them a cathedral-like quality. Because of their potential for long life, trees frequently are planted as living memorials. We often become personally attached to trees that we or those we love have planted.

Communal Benefits

Even though trees may be private property, their size often makes them part of the community as well. Because trees occupy considerable space, planning is required if both you and your neighbors are to benefit. With proper selection and maintenance, trees can enhance and function on one property without infringing on the rights and privileges of neighbors.

City trees often serve several architectural and engineering functions. They provide privacy, emphasize views, or screen out objectionable views. They reduce glare and reflection. They direct pedestrian traffic. They provide background to and soften, complement, or enhance architecture.

Environmental Benefits

Trees alter the environment in which we live by moderating climate, improving air quality, conserving water, and harboring wildlife. Climate control is obtained by moderating the effects of sun, wind, and rain. Radiant energy from the sun is absorbed or deflected by leaves on deciduous trees in the summer and is only filtered by branches of deciduous trees in winter. We are cooler when we stand in the shade of trees and are not exposed to direct sunlight. In winter, we value the sun's radiant energy. Therefore, we should plant only small or deciduous trees on the south side of homes.

Wind speed and direction can be affected by trees. The more compact the foliage on the tree or group of trees, the greater the influence of the windbreak. The downward fall of rain, sleet, and hail is initially absorbed or deflected by trees, which provides some protection for people, pets, and buildings. Trees intercept water, store some of it, and reduce storm runoff and the possibility of flooding.

Dew and frost are less common under trees because less radiant energy is released from the soil in those areas at night.

Temperature in the vicinity of trees is cooler than that away from trees. The larger the tree, the greater the cooling. By using trees in the cities, we are able to moderate the heat-island effect caused by pavement and buildings in commercial areas.

Air quality can be improved through the use of trees, shrubs, and turf. Leaves filter the air we breathe by removing dust and other particulates. Rain then washes the pollutants to the ground. Leaves absorb carbon dioxide from the air

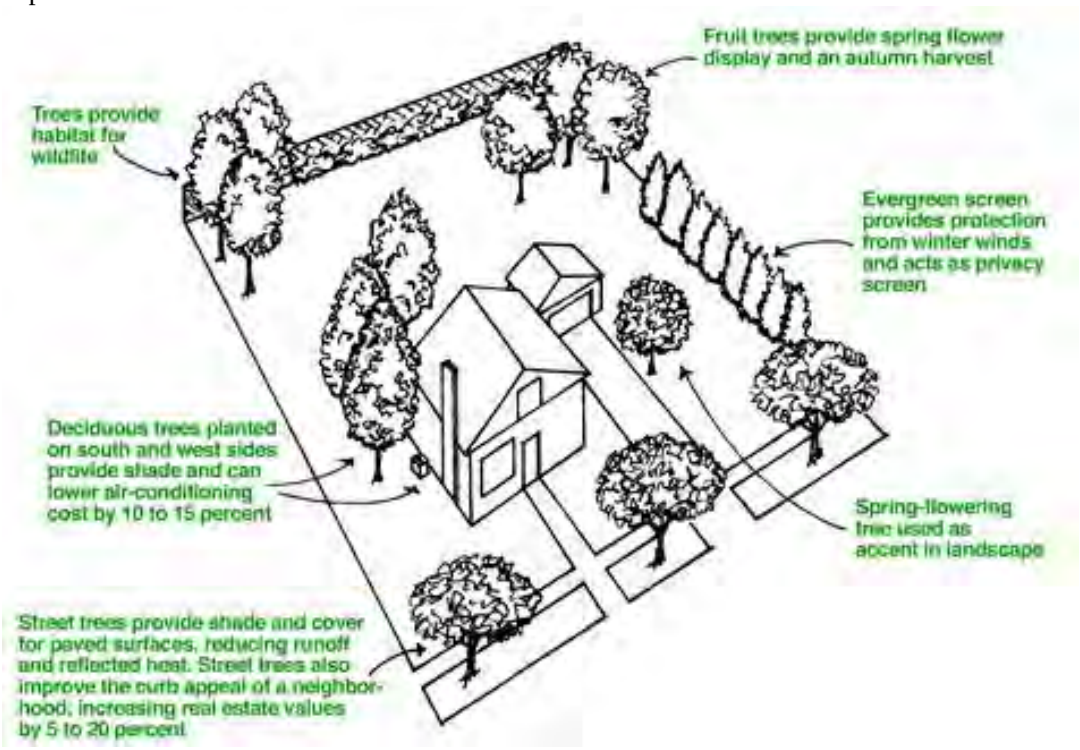
to form carbohydrates that are used in the plant's structure and function. In this process, leaves also absorb other air pollutants—such as ozone, carbon monoxide, and sulfur dioxide—and give off oxygen.

By planting trees and shrubs, we return to a more natural, less artificial environment. Birds and other wildlife are attracted to the area. The natural cycles of plant growth, reproduction, and decomposition are again present, both above and below ground. Natural harmony is restored to the urban environment.

Economic Benefits

Individual trees and shrubs have value, but the variability of species, size, condition, and function makes determining their economic value difficult. The economic benefits of trees can be both direct and indirect. Direct economic benefits are usually associated with energy costs. Air-conditioning costs are lower in a tree-shaded home. Heating costs are reduced when a home has a windbreak. Trees increase in value from the time they are planted until they mature. Trees are a wise investment of funds because landscaped homes are more valuable than nonlandscaped homes. The savings in energy costs and the increase in property value directly benefit each home owner.

The indirect economic benefits of trees are even greater. These benefits are available to the community or region. Lowered electricity bills are paid by customers when power companies are able to use less water in their cooling towers, build fewer new facilities to meet peak demands, use reduced amounts of fossil fuel in their furnaces, and use fewer measures to control air pollution. Communities also can save money if fewer facilities must be built to control storm water in the region. To the individual, these savings are small, but to the community, reductions in these expenses are often in the thousands of dollars.



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Research Shows a Walk in the Park Improves Attention in Children with ADHD

Published: Oct. 15, 2008 Source: Andrea Faber Taylor (217-244-0930; afabrtay@illinois.edu)
http://www.aces.uiuc.edu/news/stories/news4529.html

URBANA - For children with Attention Deficit Hyperactivity Disorder (ADHD) tasks that require concentration such as doing homework or taking a test can be very difficult. A simple, inexpensive remedy may be a "dose of nature."

A study conducted at the University of Illinois shows that children with ADHD demonstrate greater attention after a 20-minute walk in a park than after a similar walk in a downtown area or a residential neighborhood.

The study, conducted by child environment and behavior researchers Andrea Faber Taylor and Frances E. Kuo was published in a recent issue of the Journal of Attention Disorders.

"From our previous research, we knew there might be a link between spending time in nature and reduced ADHD symptoms," said Faber Taylor. "So to confirm that link we conducted a study in which we took children on walks in three different settings — one especially "green" and two less "green" — and kept everything about the walks as similar as possible."

Some children took the "green" walk first; others took it second or last. After each walk, an experimenter who didn't know which walk the child had been on tested their attention using a standard neurocognitive test called Digit Span Backwards, in which a series of numbers are said aloud and the child recites them backwards. It's a test in which practice doesn't improve your score.

"We compared each child's performance to their own performance on different walks," said Faber Taylor. "And when we compared the scores for the walks in different environments, we found that after the walk in the park children generally concentrated better than they did after a walk in the downtown area or the neighborhood area. The greenest space was best at improving attention after exposure."

"What this particular study tells us is that the physical environment matters," said Kuo. "We don't know what it is about the park, exactly — the greenness or lack of buildings — that seems to improve attention, but the study tells us that even though everything else was the same — who the child was with, the levels of noise, the length of time, the time of day, whether the child was on medication — if we kept everything else the same, we just changed the environment, we still saw a measurable difference in children's symptoms. And that's completely new. No one has done a study looking at a child in different environments, in a controlled comparison where everything else is the same."

The sample size was relatively small —17 children — mostly because the logistics were a nightmare to coordinate. "Because we kept everything the same, the children all went to the same park and walked through the same neighborhood and downtown area. The testing location had to be close by so that there wasn't a lot of lag time between going for the walk and taking the post-test," said Faber Taylor. "And each child was always paired with the same adult guide for their walks, and all the children were tested by the same tester."

Kuo said that the variables of the study were very hard to control. "We started with a much larger sample size. But when we threw out all of the things that could go wrong — the weather wasn't good one day, the child came late, or came medicated—when we threw out all of those, it left us with this relatively pure, clean sample to work with."

Faber Taylor added that their confidence in the findings from this study is bolstered by findings from other studies. "Because we have results from a national study which looked at over 450 children, we can have more confidence that this relationship between natural settings and improved attention is true not just for the children in this study." She said that the larger study included children from all over the United States, representing a wide range of ages, different community sizes, and both with and without hyperactivity. "The findings from the national study give us some confidence that this relationship applies to all children with ADHD."

Kuo emphasized that this study involved an objective test of attention, not just on children's or parents' impressions.

During the walks, all of the children were unmedicated -- those of the participants who normally took medications to control their ADHD symptoms stayed off their medications on the days of the walks. Interestingly, Faber Taylor and Kuo found that a "dose of nature" may be as helpful -- at least for a while -- as a dose of stimulants. "We calculated the size of the effect in our study and compared it to the size of effects in a recent medication study," said Faber Taylor, "and we were surprised to see that the dose of nature had effects the same size or even larger than the dose of medication." What remains to be seen is how long the effects of a dose of nature last.

"Some of the previous survey research suggests a relationship between children who regularly play in green spaces and how severe their symptoms are. Children who have regular exposure to green spaces have milder symptoms overall. So that's hinting that there may be a persistent effect," said Kuo.

She said that while there are hints that the regular doses of nature work long term — that you can expose a child to the same green outdoor settings day after day and still get a benefit — the science isn't advanced enough to give parents a strict formula. "We can't say for sure, 'two hours of outdoor play will get you this many days of good behavior,' but we can say it's worth trying, and we can say that as little as 20 minutes of outdoor exposure could potentially buy you an afternoon or a couple of hours to get homework done," said Kuo. "One reason we believe this is that if the effect were short-lived, we don't think that parents would have so consistently observed it. But they do. They report it over and over. And they report it independently. So, in the larger study with over 450 kids, we asked 'what's your kid like after watching TV or after playing outside' and none of the parents know what any of the other parents are telling us, but they overwhelmingly agree."

Faber Taylor believes it would be easy to add a dose of nature to a child's routine. "I could imagine parents hearing about this research and immediately applying it — just trying it out — taking their child to the park either when their child's symptoms are exacerbated or as a regular routine. It's not that hard to incorporate, especially if they have a green backyard or if they can get to a neighborhood park. Again, we can't say for sure that it would work for any given child — but there's probably very little risk involved in encouraging your child to play outdoors and seeing if their symptoms improve."

She also says that the benefits of a dose of nature don't apply just to children with ADHD. "We're all on a continuum of attention so this study has implications for all of us," said Taylor. "ADHD is just at the far end of attention functioning, but there're plenty of us who fall somewhere close to that end of the continuum, and we all experience times when we're mentally fatigued — times when we're less able to focus and do tasks and get easily distracted. The evidence suggests that natural settings can benefit everyone, even children (and adults) who have not been diagnosed with ADHD."

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University of Washington
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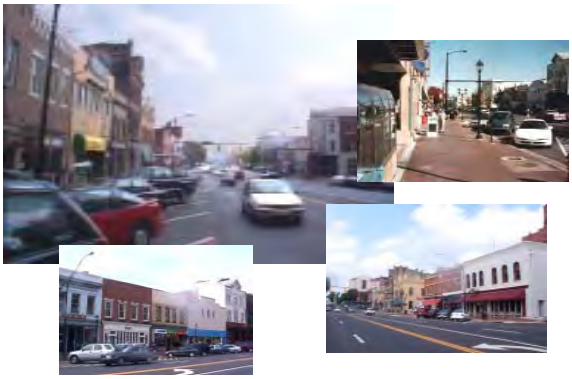
HUMAN DIMENSIONS OF THE URBAN FOREST

FACT SHEET #17

Trees on Main Street: Influences on Retail and Shopping Behavior



District 1 - No trees in the streetscape

District 2 - With large, full-canopy trees

Comparing Two Shopping Districts
Studying How Shoppers React to Trees!

Trees make business districts more pleasant places! Yet long-term care and maintenance is needed to gain the most benefit from trees in downtown business centers. Are the returns worth the costs?

Several scientific studies indicate that trees are good for business! A recent study tested the response of shoppers and visitors in smaller cities throughout the U.S. Three general areas of response were evaluated: district perceptions, patronage behavior and product pricing. More positive responses were reported when people viewed shopping districts having trees.

Merchants in many downtown business districts in the U.S. are working hard to create vital, competitive retail places. Why should trees be part of an action plan? This fact sheet summarizes the perceptions shoppers and visitors have of trees, and potential economic gains.

Research Project

A national study, conducted by the University of Washington, used survey questionnaires to assess public perceptions of trees in downtown business districts of smaller cities. Surveys were mailed to people who live in selected cities (10-20,000 population) in the states of Idaho, Oregon, Washington, Arkansas, Georgia, Nebraska and Virginia. Surveys were also sent to residents of large cities (>100,000 population) that are near the study cities. Potential visitors and shoppers were invited to participate. Their responses were compared to learn more about how trees might influence local retail economics, and how the urban forest contributes to tourism in smaller communities.

Place Perceptions

Each respondent rated a series of descriptions about one of the two hypothetical districts. Two categories of perceptions emerged from the ratings:

Place Character

Products and Merchants

Ratings for both categories were significantly higher for the place that has large, full-canopy street trees. Place character (such as having a pleasant atmosphere and positive image) was rated 35% higher for the place having large trees. Judgments of products and merchants (such as customer service, informative merchants, and well-made products) were 10% more positive for places having trees. Consumers made judgments about their potential shopping experience based on tree cues.

Patronage Behavior

Actions follow perceptions. Respondents were asked to give opinions of their behavior regarding the two shopping districts, including **travel time, travel distance, length of visit, frequency of visits and willingness-to-pay for parking**. For ALL behaviors, higher measures were reported in the districts having trees. Longer and more frequent visits means more revenue for merchants. Respondents also claimed they would be willing to pay more for parking in a shaded business district Although tree planting and care costs money, extra parking revenue could be dedicated to trees, generating benefits for all downtown merchants.

Product Pricing

Do trees influence how much people are willing to pay for goods? A method called contingent valuation was used to assess place-based consumer pricing. Survey respondents were asked to specify a price for each of nine items representing **three categories of goods: convenience, shopping, specialty**. All three indices were **priced higher in the district with trees**. Prices averaged about 9% more for products in the *With Trees* district, as compared to the *No Tree* district. This was true of low-price, impulse-buy convenience goods (such as lunch sandwich or flower bouquet), as well as bigger ticket, comparison-shopped items (such as camera or watch). Given the low profit margins of most retail businesses, trees appear to provide a significant "amenity margin."

Our physical environment affects our behavior, often in ways that we are not aware of. Marketing studies of "atmospherics" test how interior store features influence buying behavior. For instance, a pleasant store atmosphere is correlated with higher spending intentions. Trees are a positive atmospheric for business districts. They create a retail mood that appeals to shoppers and visitors. Trees greet shoppers with a message of *welcome* even before entering a merchant's door.

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