Urban Forestry

Dearborn County SWCD

An overview of the advantages of urban forestry

REDUCED SURFACE TEMPERATURE

In a report from the Indiana Climate Impacts Study it was projected that Dearborn County's average annual temperature may increase 5^{o}F to 6^{o}F by 2050. This study also predicted that by 2050 Dearborn County's annual days exceeding 95^{o}F will surge from two days annually to 45 days annually. Urban areas maybe 1^{o}F to 7^{o}F warmer than surrounding rural areas according to MIT (Gregory, J., & Azarijafari, H. , 2021). The reason urban areas have such a significant temperature difference is due to the lack of natural buffers that help reduce air temperature such as trees and other natural vegetative covers. These warmer urban areas are also called heat islands. Shade trees in the summer have the capability to reduce surface temperature below the canopy up to 45^{o}F. As our local climate begins to change, it is possible that creating canopy cover in our cities will become progressively important.

REDUCED COOLING COSTS

Trees that are placed strategically to the East, West, South and Southwest of buildings help reduce the amount of energy needed to cool a building. "Joint studies by the Lawrence Berkeley National Laboratory (LBNL) and the Sacramento Municipal Utility District (SMUD) placed varying numbers of trees around houses to shade windows and then measured the buildings' energy use. The cooling energy savings ranged between 7 and 47 percent and were greatest when trees were planted to the west and southwest of buildings ", (U.S. Environmental Protection Agency, 2008). Planting shade trees near your home may provide you with a financial advantage. When selecting your shade tree it is ideal to plant a slow growing tree, fast growing species often have soft wood which is more susceptible to breakage. It is also recommended to verify the tree you have selected has no known predisposition to wide spread disease and allow your tree to have adequate distance from your home.

REDUCE HEATING COST

"A windbreak reduces heating costs by lowering the wind chill near your home. Wind chill is the temperature it "feels like" outside and is based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, the body is cooled at a faster rate and the skin temperature drops. For example, if the outside temperature is 10°F (-12°C) and the wind speed is 20 miles per hour (32 kilometers per hour), the wind chill is -24°F (-31°C). A windbreak will reduce wind speed for a distance of as much as 30 times the windbreak's height. But for maximum protection, plant your windbreak at a distance from your home of two to five times the mature height of the trees. The best windbreaks block wind close to the ground by using trees and shrubs that have low crowns. Dense evergreen trees and shrubs planted to the north and northwest of the home are the most common type of windbreak", (Energy.gov, n.d.).

INCREASED PROPERTY VALUE

Having trees on your property can increase property values due to an increased aesthetic. According to the University of Washington "The presence of larger trees in yards and as street trees can add from 3% to 15% to home values throughout neighborhoods. Homes that are adjacent to naturalistic parks and open spaces are valued at 8-20% higher than comparable properties, with the positive price effect declining to near zero about ½ mile away. "

REDUCED PAVEMENT MAINTENANCE

Sunlight can deteriorate asphalt by oxidation and raveling. The sunlight breaks down the binding agent in the asphalt that holds the aggregates together in a process called oxidation. Over time the surface of the pavement will become brittle, small cracks and breaks can form and grow in size without proper maintenance, this is called raveling. Planting shade trees near pavement can reduce the amount of ultraviolet rays directly hitting the pavement and can lessen the amount of oxidation and slow the breakdown of the binding agent. High temperatures cause the pavement to expand which can create cracks. Shade trees lower the temperature below the canopy and may lessen the amount of expansion due to heat.

REDUCED STORMWATER RUNOFF

As it rains stormwater picks up gas, oil, sediment , fertilizer, insecticides and various other pollutants. Impervious surfaces such as driveways, sidewalks, and parking lots do not absorb water, and the water continues to pick up pollutants as it makes its way towards our waterways. Trees help reduce runoff by improving infiltration, retaining water in the canopy, and evapotranspiration.

Large trees retain water by capturing it on the leaf surfaces. Large deciduous trees can capture over 1000 gallons of stormwater per year, whereas conifers can capture two-three times that amount as they have more surface area year round. Soils with trees can absorb 10 inches of rain per hour, whereas soils without trees can only absorb 4 inches of rain per hour, this is because tree roots help improve infiltration. Large trees can transpire 80-100 gallons of water per day, whereas swamp species can transpire up to 800 gallons of water per day. (Penn State Extension, 2022).

REDUCE AIR POLLUTANTS

Greenhouse gases trap heat in the atmosphere. Carbon dioxide makes up 79% of the greenhouse gases in the United States according to the Environmental Protection Agency. Trees convert carbon dioxide to oxygen in a process called photosynthesis. Through photosynthesis trees help remove carbon dioxide from the atmosphere. Carbon dioxide emissions are primarily from vehicle emissions, so urban areas have increased quantities in comparison to rural and suburban areas.

PREVENT EROSION

Splash erosion is when the impact from rain fall loosens soil particles. Trees help to reduce splash erosion by functioning as an umbrella and shielding the ground below the canopy from direct impact. Tree roots help to hold the soil in place and prevent the development of rills or gullies. Large trees function as wind breakers and diminish the effects of wind erosion.

SUPPORTS BIRD AND POLLINATOR POPULATIONS

Seeds from willows, birch trees, spruces, and maples are all food sources for various bird species. By planting these trees in an urban setting you provide an accessible food source for bird populations.

Planting flowering trees such as crabapples, lilacs, redbuds and golden rain trees provide nutrients for pollinators and help support pollinator populations.

INCREASED SENSE OF WELL-BEING

The University of Wollongong in Australia conducted research on 46,000 residents from three different communities of citizens aged 45 and older. The research tracked the overall mood and anxiety of the research participants and took into account the canopy coverage in each area. The study concluded that in neighborhoods with 30 percent or more canopy coverage, the residents were 31 percent less likely to develop psychological distress and 33 percent less likely to rate their general health as fair or poor. (Long, 2019)

Citations

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