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Did you know?

- *Tiny pores on the underside of each leaf trap and absorb air pollutants such as sulphur dioxide, nitrous oxide and ground level ozone making our air healthier to breathe.*

- *Trees in an urban setting produce an oasis effect by shading concrete and asphalt surfaces and by reducing ambient air temperatures when moisture evaporates from leaf surfaces.*

- *For the average Toronto home, three well-placed trees can cut air conditioning needs by up to 40% and heating needs by up to 10%.*

- *Trees protect us from harmful UV radiation, cool our communities and increase our property values..*

- *Large, healthy trees offer the greatest cooling and air quality benefits.*

Trees: The Key to Cleaner Air

Global climate change and smog are separate problems with a common source – the burning of fossil fuels such as coal. Urban trees help slow climate change and improve air quality by absorbing pollutants. They also reduce the demand for fuel by shading our homes in summer and protecting them from the winds in winter.

What is Climate Change?

Global climate change is a result of a build-up of greenhouse gases in the atmosphere. These gases are a natural component of the atmosphere. However, the burning of fossil fuels to power our cars, heat our homes and provide us with electricity is causing their overabundance. The result is an increase in the amount of heat trapped in the atmosphere, which leads to changes in weather patterns and climate around the globe.

What is Smog?

Smog is a mixture of gases that forms a brownish-yellow haze. It results from a reaction between heat, sunlight and air pollutants, which are mainly a by-product of the burning of fossil fuels. Since the reaction relies on heat, the hotter the weather, the more likely we are to experience smog days. According to Toronto Public Health, 1,000 Toronto residents die prematurely each year due to air pollution and another 5,500 are hospitalized.

What's the Connection between Climate Change and Smog?

Climate change, energy consumption and smog form a vicious cycle. Climate change has been linked to increased summer temperatures. Toronto's highest demand for electricity comes on hot days when air conditioners are constantly running. Coal-burning generators are used to satisfy the increased demand, resulting in the emission of additional pollutants, thus continuing the cycle.

The Role of Urban Forests

Urban forests help to reduce climate change and improve air quality in two important ways:

- by taking up and storing, or “sequestering”, the pollutants, and
- by enabling us to reduce the pollutants we produce.

Pollution Sequestration

Trees naturally absorb carbon dioxide to carry out photosynthesis and other life processes. Other airborne pollutants that contribute to smog are removed from the air when absorbed by a tree's leaves or when they simply come to rest on a tree's surface.

Pollution Avoidance

Individual trees can shade buildings from the hot summer sun and block cold winter winds thereby reducing the demand for heating and air conditioning. The shade from three mature trees properly planted around a home can cut air conditioning demands by 20 to 40%.

The urban forest also keeps the whole city cooler. Toronto's hot summers are made worse by the Heat Island Effect, which occurs when the dark surfaces of parking lots, roads and roofing absorb the sun's rays, trapping the heat. This causes a 3-5°C increase in air temperatures. By shading these surfaces, trees help to keep the city cool. Cooler temperatures mean less energy is required to run air conditioners. The result is that less of the pollution that leads to climate change and smog is created.



Factsheets in the series:



The Three "P"s of Healthy Trees



Top 10 Things To Do for Your Trees



Selecting a Tree Care Company



Inventories: The Place to Start



Improving the Urban Forest in your Neighbourhood



Protecting Our Trees: City of Toronto Bylaws and Policies



Fundraising for Your Urban Forest Project



Made in the Shade: Shade Trees for Sun Safety



Volunteer Opportunities in Urban Forestry



Trees: The Key to Cleaner Air



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What can I do to help?

Absorbing existing pollution can help to alleviate the problems but avoiding its production should be our first priority. Lowering ambient air temperatures in summer and reducing energy consumption are fundamental to our efforts to combat climate change and smog. Properly maintaining existing trees and planting new trees on your property and throughout your neighbourhood are two of the easiest ways to contribute.

Protect Mature Trees

The environmental benefits of a tree increase exponentially as the surface area of its leaves increases. In other words, the more leaves a tree has the more it is doing to help. So when we lose a large mature tree, even if a young tree is planted immediately, it will take decades for it to grow as many leaves as the one it replaced.

Plant the Right Tree in the Right Place

Planting trees that are well-suited to the conditions of the site will maximize the benefits provided. Be sure you select a tree that will tolerate the soil, light and moisture conditions of your yard. Trees that are not well-adapted will grow slowly, look less healthy, and be likely to die at an early age.

Plant a Tree to Shade Your House

Shading your house and other heat-absorbing surfaces nearby with deciduous trees will help reduce air conditioning costs in the summer, but still allow the sun to warm your home in the winter. On a per tree basis, the annual energy savings from a well-placed, 25-foot deciduous tree ranges from 10 to 15% due to reduced cooling costs.

Plant a Tree or Shrub to Shade Your Air Conditioner

You can reduce the amount of energy your air conditioning unit uses by shading it with trees or shrubs. Air taken in by the unit will be cooler so it won't have to work as hard to cool your house.

Create a Windbreak of Trees

You can reduce the amount of energy you use for heating by planting evergreens on the northwest side of your home. These windbreaks can reduce a typical home's demand for heating by 5-15%.

Keep Your Trees Healthy

The amount of carbon dioxide and other air pollutants taken up by our urban forests depends on tree health. Healthy, vigorous trees will absorb more air pollution and provide more shade than trees that are diseased or otherwise stressed. Proper care and a preventative approach to maintenance will help ensure your trees are healthy and of most benefit to you.

Resources

For information on tree planting and care, visit the LEAF website at www.leafontario.org.

For information on how global warming will affect Southern Ontario and what you can do to help, check www.davidsuzuki.org/great_lakes.

For Ontario smog advisories, check www.airqualityontario.com or call the Ontario Air Quality Index phone line at 1-800-387-7768.