ROYAL BOTANICAL GARDENS
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GREEN BELT
Possibility grows here.

# GARDENING IN A CHANGING CLIMATE

Wrapped around the westernmost tip of Lake Ontario is an oasis of green quite unlike any other. Royal Botanical Gardens (RBG) encompasses 11 square kilometres (2, 700 acres) of Carolinian forests, Niagara Escarpment cliffs, remnant prairies, shimmering wetlands, and some of Canada's most breathtaking gardens, right in the heart of the Greenbelt.

Known as Canada's plant biodiversity hotspot, RBG is home to more species of plants than any other area in the country. Its location in the middle of the Golden Horseshoe makes RBG a magnet for people as well, and each year over 645,000 visitors enjoy a variety of experiences, from enjoying almost 50 curated plant collections to taking part in education programs, art and music events, or hiking on 27 kilometres of trails.

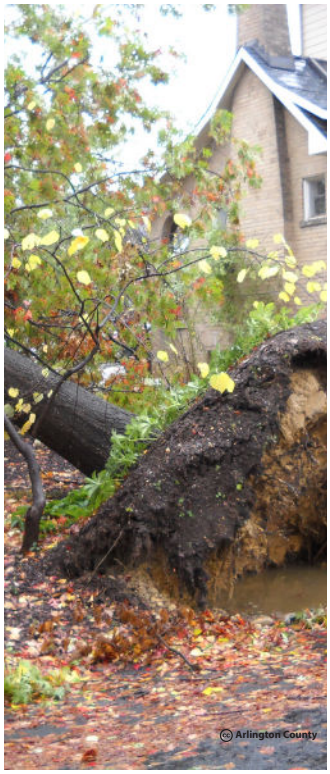
Part of a world-wide network of botanical gardens, RBG brings people, plants and place together for the purpose of nurturing and preserving healthy growing life on our planet.

## CLIMATE IMPACTS ON GARDENING

**MANY OF THE IMPACTS OF A CHANGING CLIMATE ON GARDENING ARE ALREADY HAPPENING AT RBG – AND YOU MAY HAVE NOTICED THESE IMPACTS IN YOUR OWN GARDEN.**

### Severe Storm Damage

Trees thrown over or snapped by gale-force winds.




### Invasive Species

Plants that were once borderline hardy now do fine without winter protection, while other garden plants are demonstrating their invasive potential by elbowing their way into nearby natural areas. In some areas, native woodland plants are quickly disappearing under a sea of aggressive invasives like Garlic Mustard and Dog-strangling Vine.

### Rapid Transition Between Seasons

Rather than slow, cool springs, the new normal includes unseasonably warm weather in early spring that pushes trees from dormancy to leaf-out over a very short period of time. Like being awakened from a deep slumber to immediately run a marathon, this places a lot of stress on trees and shrubs, and it also causes shifts in bloom timing that can put plants out of sync with their pollinators.

### Extreme Heat and Drought

A Canadian icon, Sugar Maple is one of many species that scientists know is vulnerable to a drier, warmer climate and therefore very likely disappear from the Greenbelt in this century. RBG's maple bush, home to the first public maple program in the province, stopped operations years ago as a result of tree stress caused by several very dry summers along with the impacts of Gypsy Moth.

### Shifting "climate envelope"

Gardeners know that plants are highly adapted to the climate of their native range, and that success in gardening depends on providing a plant species in your care with conditions like those found in that species' home. A gardener can move plants to more suitable spots, or purchase a better-adapted species, but wild species don't have the option of picking up their roots and relocating if conditions are changing faster than they can adapt or their seeds can travel.

While any of these stressors may not outright kill plants, their cumulative impact can weaken defenses, leaving many species vulnerable to disease or pests. System-wide stress can also open the door to the devastating effects of invasive species. Monitoring on RBG's properties turned up 10 new species in 2016-2017, all non-native, and some with invasive potential.

# ACTION YOU CAN TAKE

Gardening in the 20th century was largely about civic beautification, but gardening in the 21st century has a much more important role to play by helping to build community resilience and sustainability in rapidly changing times.

Collectively, gardeners can both reduce their carbon footprint and play an important role in climate change adaptation and mitigation in their community! Most of the land in our cities is privately owned, and the green infrastructure each of us creates on our property will link with other gardens to create corridors across our communities.

Like urban river valleys, these can ultimately connect developed areas with greenspace in the Greenbelt to the benefit of both. Whether you grow vegetables, save seeds or help pollinators on your balcony/patio or rooftop garden, or green up your yard with rain gardens, xeriscapes, native species and habitat for birds and butterflies, you are making an important difference.

**Gardening for environmental sustainability means considering the footprint and functionality of your garden and garden practices from the ground up – the abiotic, or non-living world of rock, soil, water (and hardscaping); and the biotic, or living world of plants and animals – from fungi and bacteria, to worms, ferns and flowers. You can make huge changes at once or start with small changes and keep the momentum going. Here are some easy, scalable places to start:**

## Reduce runoff

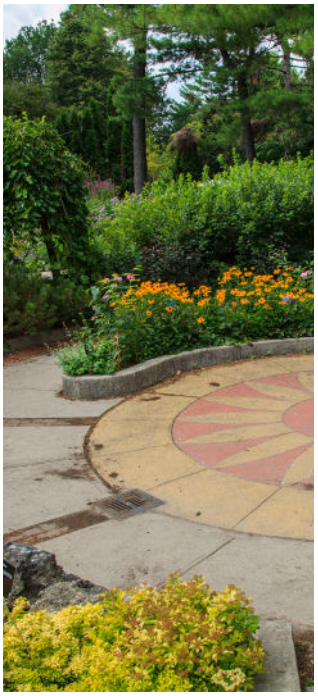
You can turn your property into part of your community's stormwater management infrastructure by looking for opportunities to replace cement or asphalt with permeable paving or decking that allows rain to soak into the soil. Green roofs are another way to absorb rain and reduce runoff, as are beautiful and functional rain gardens. These specially designed flowerbeds form a depression and are underlain by well-drained material. Instead of flowing into the nearest sewer, runoff is directed into the rain garden where it can pool and filter into the soil over several hours.


## Don't add water

Treated water has an environmental footprint of its own, requiring chemicals and energy for pumping, filtration and treatment. Those who rely on wells are already painfully aware of the fact that groundwater resources around the Greenbelt are being pumped out faster than they are being recharged. To reduce the overall demand for water, pick your plants wisely. Gardening for minimal water use, or xeriscaping, uses plants adapted to dry (xeric) habitat. Species native to the prairie habitat once found around the Greenbelt develop deep root systems suited to intermittent summer rain (and as a bonus, those deep root systems take up and store carbon from the air).

## Use rain barrels

Minimize the use of potable water by collecting water in rain barrels. And if you must water large areas, remember that much of the water sprayed from traditional sprinklers evaporates before touching the soil, so switch to drip irrigation.



## Plant for functionality

Take a close look at each species you have planted and ask yourself, will this plant support wildlife by providing shelter, or nectar and pollen for insects, or seeds and fruit for birds? Does it require minimal "inputs" of water and fertilizer? Is it invasive? Will it be susceptible to pests? Native plants are a go-to group to include in your garden, and you can further reduce your carbon footprint by growing vegetables. Even patio and balcony gardens can play a role, from hanging baskets featuring flowers for hummingbirds, bees and butterflies, to containers filled with salad greens and tomatoes.

## Choose trees for your grandchildren

Trees reduce carbon emissions from heating and air conditioning, reduce the urban heat island effect, reduce air pollution and store carbon. Well-chosen trees can live up to a century or more, so it's critical to keep a warm dry climate in mind when you are deciding which tree to plant.

ABOUT THIS SERIES:
The Greenbelt Foundation partnered with experts to understand how climate change is affecting our daily lives, and ways that we can individually and collectively respond to these challenges. For other topics in the series, visit www.greenbelt.ca/changing_climate



Prepared by Barbara McKean, Head of Education, Royal Botanical Gardens