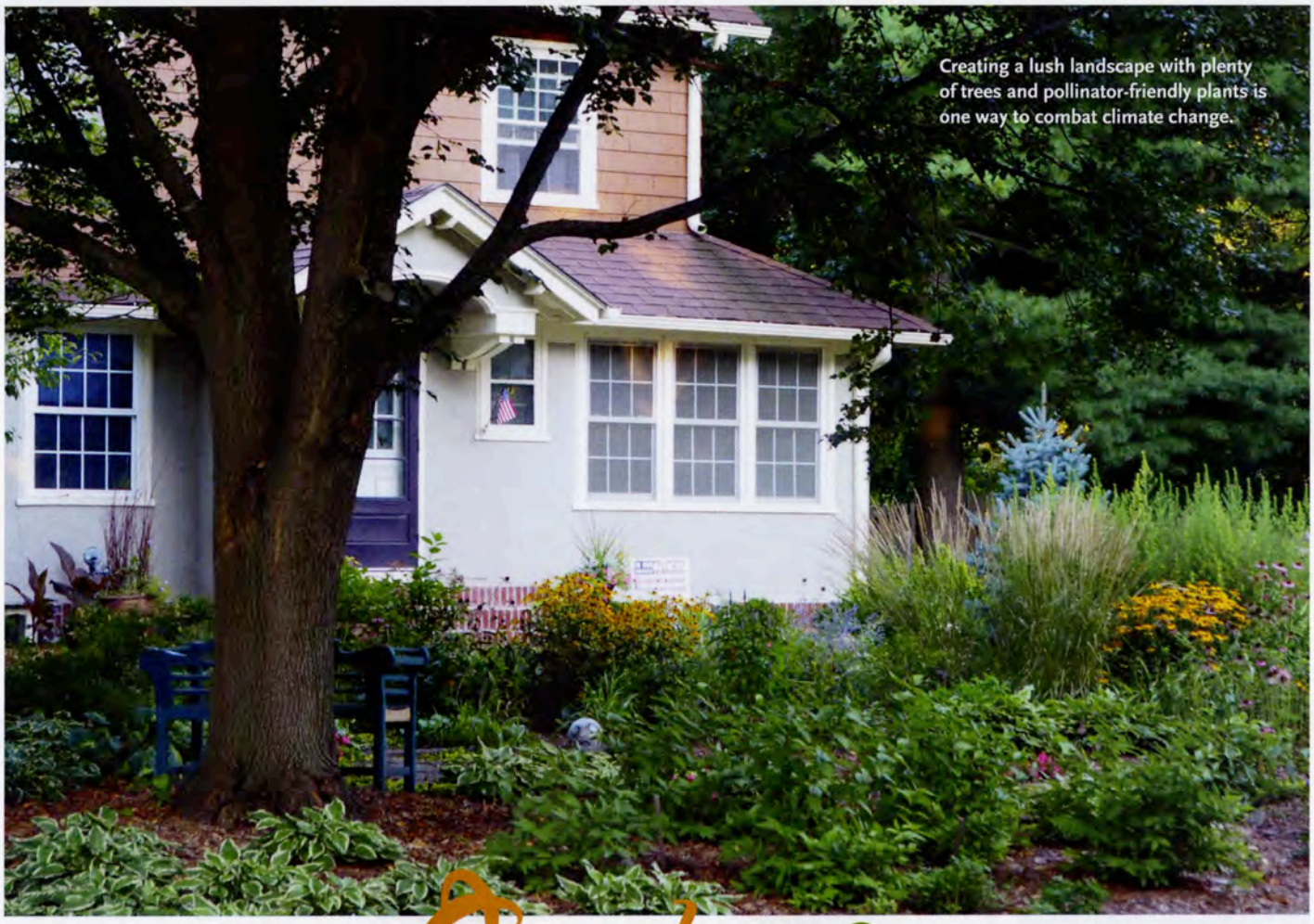


Creating a lush landscape with plenty of trees and pollinator-friendly plants is one way to combat climate change.

Garden Greener

Use these strategies to reduce greenhouse gases and help the planet.

Story and photos by Susannah Shmurak

Gardeners naturally come to appreciate the interconnectedness of nature, as our gardening adventures teach us about local ecology, water and nutrient cycling, and other elements of plant biology that we may (or may not) remember from high school science classes. We know the choices we make in our yards and gardens can affect everything from how hot our homes get in the summer to which birds and pollinators frequent our yards.

According to the most recent climate change report from the U.S. National Climate Assessment, Minnesota is warming faster than much of the country. Many communities in Minnesota have enacted climate plans to reduce greenhouse gas emissions. While national and local action is necessary, homeowners and gardeners can make relatively simple changes to create a yard that combats climate change rather than contributes to it.

1 **Cut back on grass.** The first step to creating a more climate-friendly yard is minimizing or eliminating the lawn. Lawns are the biggest way most homes contribute to greenhouse gas emissions. Nationwide, gas-powered mowers consume over 800 million gallons of gas to keep lawns cut, releasing 16 billion pounds of carbon dioxide (CO_2) into our atmosphere annually, according to the U.S. Environmental Protection Agency. Fertilizers and pesticides used on lawns require carbon in their manufacture and, when fertilizer breaks down, it releases nitrous oxide, an even more potent greenhouse gas.

2 **Maintain your lawn in an eco-friendly way.** For the lawn you have, consider strategies to reduce its environmental impact. Allow grass cuttings and clover to fertilize the lawn, water as infrequently as possible, and mow less often with a human- or electric-powered mower. You might consider planting lawn alternatives, such as "no-mow" grass, clover or low-growing groundcovers, which require less time, fertilizer and water than

traditional grass. You'll save money and time, a win-win for you and the planet.

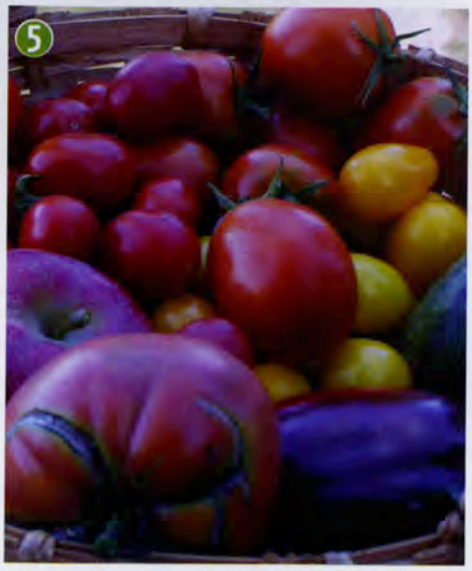
3 Sequester carbon with trees. Once you've cut emissions from your yard, consider ways your garden can take carbon out of the atmosphere, a process known as carbon sequestration. Trees pull carbon from the air and store it for long periods. According to the Center for Urban Forest Research, some trees are particularly effective at carbon capture, including yellow poplar, silver maple, oak, basswood and chestnut, a USDA Zone 5 tree that some growers are trying in southern Minnesota. The impact of trees can really add up. A single 12-inch diameter tulip tree can sequester over a half ton of CO_2 annually.

4 Plant BIG trees. David Nowak, senior scientist with the National Forest Service, advises gardeners to plant trees that live "as long as possible, grow as big as possible, and put them in a site where they conserve energy" for nearby buildings. The larger a tree gets, Nowak explains, the more carbon it sequesters; the longer a tree lives, the longer it keeps stored carbon out of the atmosphere. So while both an oak and an apple tree might live 100 years, the oak's greater mature size makes it much more effective at storing carbon.

When a tree is cut down and decomposes, it releases its trapped carbon, Nowak says. To keep the carbon out of the atmosphere as long as possible, consider turning the wood into lumber used for building homes or furniture, preventing the wood from breaking down. Chipping trees for mulch, says Nowak, hastens their release of carbon.

The best trees are those adapted to our region and your yard's growing conditions. And, if you place them so they shade your home and your air-conditioning unit or block the wind, they can help reduce energy use.

5 Plant for food. Your trees and shrubs can serve double climate duty if they also produce food for your family, which shrinks the carbon footprint of your diet, a major contributor to climate change.



Resources

Plants for a Changing Climate (Rosenberg, 2011) by Trevor Nottle

Gardening in a Changing Climate (Lorenz, 2011) by Ambra Edwards

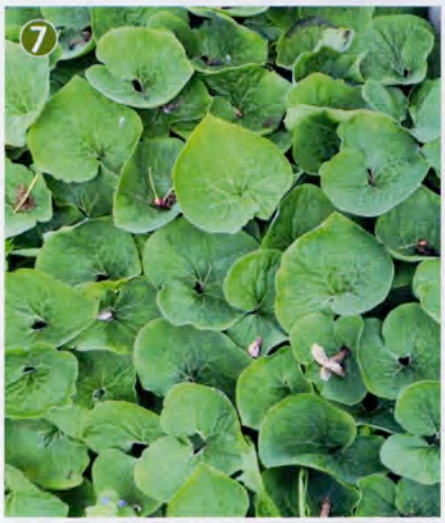
For information on the climate benefits of particular trees, see the National Tree Benefit Calculator: www.treebenefits.com/calculator.

For data on Minnesota's climate, past and present, and other local information, see Minnesota Climate Information: http://climate-apps.dnr.state.mn.us. —*S.S.*

While fruit trees may not sequester as much carbon as an oak, adding apple, pear or plum trees, berry bushes and grapevines as well as edible perennials and groundcovers can cut the emissions associated with your food.

Paula Westmoreland, owner of Ecological Designs in the Twin Cities, says that fluctuations in rainfall and temperature associated with climate change have led her to create landscape designs that "plant food everywhere." She believes it's critical that "people and the rest of nature have as many buffers as possible," including growing food for ourselves and creating landscapes that support wildlife.

6 Compost yard and food waste. Composting food scraps and garden cuttings works to help the climate in three ways. First, all that organic matter doesn't decompose anaerobically in a landfill, where it produces methane, a greenhouse gas with up to 80 times the heat-trapping ability of CO_2. Second, adding compost to your garden reduces or eliminates the need for fertilizer and its associated greenhouse gas pollution. Most importantly, compost nurtures soil microbes and enhances the structure of soil, both critical to soil carbon storage.



7 Keep carbon in the soil by tilling less. Much of the world's carbon is stored in soil, so protecting and building your soil is an important but often overlooked element of sequestering carbon in your yard. Your plants will be happier, too: Carbon enhances soil fertility and structure as well as water retention.

To encourage your soil's microbes and overall health, University of Minnesota soil scientist Jessica Gutknect advises homeowners to "always keep something growing." In addition to avoiding bare soil and tilling, which disturb the structures that move carbon into soil, she suggests minimizing impervious surfaces and mulch. Groundcovers and cover crops will prevent erosion, hold moisture, and also encourage microbial activity that pulls carbon out of the atmosphere.

Compacted soil, Gutknect says, also has reduced microbial activity, so avoiding compaction and remedying compacted areas will increase the amount of carbon your yard can sequester.

8 Water wisely. Waterwise gardening helps the climate on two fronts. While saving water is important in its own right, many people don't realize that city water requires carbon to treat and bring to our hoses. Cutting back on watering by using more xeric and deep-rooted plants will shrink the carbon footprint of your yard while also conserving a vital resource.

Westmoreland's designs now emphasize distributing and holding water in the landscape. She minimizes mulch and chooses diverse plants with varied root depths, which can cycle water through the soil more effectively while also moving carbon downward. She also suggests gardeners lay out paths carefully to avoid soil compaction and build the soil's water-holding capacity.

As with daily habits inside our homes, where simple acts such as turning out lights and conserving water can reduce our environmental footprint, gardeners can trim the impact of their yards and even create climate-improving landscapes using these strategies.

What role will your garden play in shaping the climate of the future? ng

Susannah Shmurak is a Northfield-based gardener and freelance writer.