How Your Garden and Yard Can Weather Our Changing Climate

Increases in average temperatures will mean far less than learning to deal with unpredictable weather, storms and severe weather extremes.
February 8, 2011

Editor's Note: The following is an excerpt from Carol Deppe's The Resilient Gardener: Food Production and Self-Reliance in Uncertain Times *from Chelsea Green Publishing.*

My house has been much hotter in the summer in the last decade than it used to be. Global warming? Probably not. The two huge Douglas fir trees south of the house died and had to be cut down. The effect of that loss on the temperature of the house in summer was immediate and dramatic. Local often trumps global. When it comes to our home and yard, two big trees may matter more than global warming.

Global warming is happening, however. It's been happening since the glacial maximum about 20,000 years ago, so it is nothing new. How fast it is happening and how much is caused by people isn't the subject of this article. Nor will I address the global aspect of global climate change. I will instead consider the small and personal. What effect will climate change have on your yard and garden next year and in the next few years and decades? Here's my synthesis, based upon information from many sources. (See chapter 3 end notes and references in *The Resilient Gardener*.)

That the overall trend for the planet for the last 20,000 years has been one of warming is incontrovertible. However, climatic trends are full of irregularities and hiccups. Any period of a thousand years in which the overall trend is in one direction has periods of years, decades, and sometimes even centuries in which the climatic trend reverses temporarily. The Little Ice Age, from about A.D. 1300 to 1850, is named for the seriously colder weather in North Atlantic Europe and America. It was a period of several hundred years that was part of the overall global warming trend that has been occurring since the last ice age.

Even if the globe is warmer on average in years to come, that doesn't mean your yard will be any warmer, even on average. Climate change causes changes and irregularities in the patterns of ocean currents and winds. The local effects of those changes are huge compared with the few degrees cited as likely increases in average global climate in the next few decades. A change in wind patterns that brings Arctic inland air masses to you instead of mild ocean air will matter much more than a few degrees higher

average global temperature.

Even major trends are region specific, not globally uniform. And water may matter more than temperature. The Medieval Warm Period was lovely for Europe. Famines and diseases were rare. Populations swelled. Civilization and cities expanded and flourished. The same period was devastating for Mexico and the American Southwest, which experienced horrific droughts--droughts that probably contributed to the collapse of civilizations and the vanishing of entire populations. In the Sahara, the Medieval "Warm" Period was cooler, not warmer, and marked by more prolonged droughts. In many other parts of the world, the main impact of the global warming of the Medieval Warm Period also seemed to be droughts. Says Brian Fagan in *The Great Warming*, "with respect to California, it's sobering to remember that the past seven hundred years were the wettest since the Ice Age." Pointing to prolonged droughts that lasted decades and even generations, Fagan says that, viewing the overall global situation, not just that of Europe, "it is tempting to rename the Medieval Warm Period the Medieval Drought Period." The American Northwest, California, the Southwest, the inter-mountain West, and the lower Hudson River Valley are all vulnerable to increased aridity and droughts.

Finally, for agriculture, the regularity of weather patterns may matter much more than averages or overall climate change trends. In spring of 1350, it started raining in northern Europe and rained for the next several months. That spring marked the beginning of five years of colder, wetter, stormier, more erratic weather that was the obvious beginning of the Little Ice Age, which lasted another 550 years. Most of the famines in northern Europe during the Little ice Age were as much or more associated with erratic, rainier, stormier weather than with temperatures. In the Year without a Summer in New England (1816), the freezes were unremarkable, as New England freezes go. What mattered was that they happened right through the entire summer.

Long term tree-ring chronologies and other data indicate that the weather patterns of the last hundred years have been unusually stable. There has also been an unusually low level of volcanic activity; volcanoes also affect weather and climate. Our current gardening and farming patterns depend upon that relatively stable climate and predictable weather. We have, effectively, been growing "good-time" gardens and farms. We now need to expand our perspectives and learn, or relearn, how to garden and farm in wilder times. Agricultural humanity has adjusted to global climate change before, however, as, for example, during the Little Ice Age. We can review and rejuvenate patterns that worked in such periods in the past as well as extend them with modern

information.

In summary, we gardeners may or may not experience an increase in average temperature in our yards and gardens. What we are almost certain to experience, however, is wilder, less predictable weather with many more unusual seasons, unusual weather events, and more severe weather extremes. Furthermore, we need to be as ready for cold as for heat, and for droughts as well as deluges.

Every act of planting is a gamble. In times of erratic weather, every act of planting is a bigger gamble. I discuss how to minimize the gambles and hedge the bets with respect to annual, biennial as well as perennial plants in detail in *The Resilient Gardener: Food Production and Self-Reliance in Uncertain Times*. In this article I will limit my discussion to perennials, specifically trees (and bushes). These are the plants where we lose the most if we lose a gamble with the weather.

What I have seen written about the implications of global warming for gardeners all suggests that we can now plant varieties that are associated with climatic zones somewhat warmer than our own. These writers assume that global warming of the planet by a fraction of a degree per year actually means that our yards will be warmer. As I have explained, however, global warming of the planet does not translate into greater warmth in your yard. It is instead more likely to translate into more erratic weather with greater extremes. But go ahead and experiment with annual plants, though. It's always a good time to experiment with annual garden plants, I say, climate change or not.

When it comes to planting trees and bushes, however, I suggest doing exactly the opposite from what is suggested by the words "global warming." If you are zone 8, for example, plant trees suitable for zone 7 or less instead of expanding in the warmer direction and taking on plants typical of zone 9. Even if the average of the winter low temperatures is going up in your back yard (which it might or might not be), that doesn't help if you now experience more extreme lows occasionally. In order to avoid freezing out your trees, you need every single year to have a lowest temperature that is permissive, not just some years. The average lowest temperature isn't really what matters.

Nursery catalogs often list the specific degree of freeze tolerance for tree varieties. Knowing that, in my own experience here in maritime Oregon, for example, there have

been at least a couple of winters in which the winter low was about 0ºF, these days I would refrain from planting any tree with a freeze tolerance of less than -10ºF. And I would prefer -20ºF.

On the other hand, winter lows are not always the characteristic that limits a perennial to a zone warmer than our own. Sometimes we plant or don't plant a fruit tree variety based upon characteristics such as whether we usually have enough summer heat for the fruit to ripen. In that case, we can better afford to experiment. The gamble over whether there is enough heat to ripen the fruit any particular summer risks only one crop, not the lives of the trees themselves.

So to make appropriate gambles with perennials, it's a good idea to know exactly why that more southerly variety you have been coveting isn't usually grown in your region. For varieties released in recent years or varieties commonly grown commercially, there is often excellent information on the Internet provided by the breeder or by your local land-grant university. You can often find the exact degree of freeze-hardiness, the exact amount of summer heat (degree days) needed, the length of growing season required, and many other advantages and limitations, including diseases that may be the factor that limits the geographic appropriateness for any particular variety.

My own approach in the coming years will be to gamble more with annuals but less with perennials than I did in the era of more regular weather. There are some fruit tree varieties that have been favorites and dependable producers in maritime Oregon for decades. I'm figuring these are the place to start for main crop plantings, with the gambles limited in number, or limited to branches grafted onto varieties that are established dependable favorites.

Altered weather patterns can translate into changes in disease or pest patterns. Now would not be a great time to plant a thousand-foot-long hedge of just one kind of bush or tree to be the visual highlight of your driveway. I say this as someone who once lived in St. Paul Minnesota on a street lined with stumps of elm trees. Dutch Elm disease had destroyed them all. The city did not have the funds to replace all the street trees at once. In the coming years, rejoice in biodiversity.

Don't fertilize too much. It's better if your woody plants don't grow as fast as possible. Overly fertilized plants make bigger cells that make softer weaker wood than the wood of plants that grow more slowly. This makes the plants into "good-time" plants that will

be more sensitive to freeze damage as well as more likely to break in wind and storms.

For many of us, more and longer droughts are likely to be typical of the coming years. One of my basic rules is, "Don't water what you can't eat." Let the grass be types that don't require watering in your region. And if this means it goes brown in August, but then revives, let it. If grass doesn't grow without irrigation in your region, grow something else that does.

Water needs are a matter of spacing. Pioneers grew fruit and nut trees throughout most of the East, Midwest, and maritime West, and they usually grew them without irrigation. Here in maritime Oregon, I know several people who have "old-time" orchards, and they never irrigate except for newly planted replacement saplings. This is in spite of our usually completely rainless summers. These trees have generous spacing, usually at least twice as much space as modern recommendations for commercial irrigated orchards. I strongly recommend planting trees with generous, traditional, pioneer-style spacing. Such plantings will better withstand drought, loss of electricity/irrigation, or loss of your labor (which is required to do the irrigating). Wider spaced trees are more resilient trees. (You can water a newly planted tree the first couple of years by just placing three or four 5-gallon buckets with pinholes in their bottoms in the root zone of the plant and filling the buckets with water as needed.)

If there are ornamental plantings that require irrigation that you simply cannot do without, consolidate them so that they can be watered with just one swath of drip lines or one setting of a sprinkler. And remember that less frequent deep watering promotes deeper stronger root systems than frequent shallow watering for grass as well as other plants.

Don't fertilize trees during a drought. Fertilizing promotes branch growth, which increases the water needs. Likewise, light pruning during a drought can be counterproductive. It, too, promotes water-demanding growth. In a major drought when you are in danger of losing trees, you might be able to rescue them by cutting them back dramatically, however. Remove a third to a half of the biomass. This both removes lots of the transpiring leaf surface as well as sets the trees back so dramatically that their water needs go down.

Among the various types of fruits, figs, apples, and grapes need the least water. Apricots, plums, and pears need somewhat more water. Then come cherries, peaches,

and nectarines. Raspberries, strawberries, blueberries, and domestic blackberries all need a lot of water. I have never seen these latter four fruits grown successfully here in the maritime Northwest without irrigation. On good, adequately deep soil, traditionally spaced orchards with all the rest of these fruits can thrive here in the maritime Northwest without irrigation.

It is often said that standard trees are more able to scrounge their own water than dwarfs. However, I haven't seen any actual data on that, and suspect that people are just guessing. Furthermore, I have seen many an unirrigated dwarf that was doing just fine. Even a dwarf fruit tree has a bigger root system than most perennial weeds and grasses, which can do fine unirrigated. Furthermore, the dwarf also has a smaller mass of transpiring leaves, so less water needs than a bigger tree. The balance between roots and leaves may be what most matters. I suspect that the specific variety of the fruit tree probably also matters, but have seen no data on that either. Plant what you want, I say. But just plant a joyous diversity of types of trees and varieties, and give them way more space than is currently usually recommended.

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