

SIGNS *of* SPRING

A SCIENTIST OBSERVES AND EXPLAINS THE IMPACT

OF GLOBAL CLIMATE CHANGE ON HER GARDEN AND YOURS. By Amy Seidl

Like many other gardeners, I'm eager to try novel varieties that could bring more cultivated diversity to my Vermont garden, not to mention new tastes that will be the envy of my neighbors. And so when 'Reliance' peaches appeared on the table of a friend's house last August, a whole basket of drippingly sweet and fleshy drupes, I immediately and greedily investigated growing peaches. It was pure covetousness—I too wanted these delicacies in my garden.



An extended growing season in North America has been touted as a benefit of climate change. Warming temperatures and greater precipitation are predicted to increase productivity in USDA Plant Hardiness Zones 3, 4, and 5, my own garden being in Zone 4. Gardeners and farmers in these cold, often northern places will be able to add new crops and see less winter stress, and the rate of photosynthesis may increase if there is enough available nitrogen to match the acceleration of carbon in the atmosphere. In fact, I already see these changes where I live.

"November is more like October, April more like May," I hear people say as they try to make sense of the extended season, the fact that children

are still swimming in the river after the beginning of school, or that sugaring season begins before rather than after Town Meeting Day, which for more than 200 years has been held on the first Tuesday in March. People are observing the differences as the growing season lengthens. People are asking: What is responsible for these changes, and how are they affecting the world around us?

Life in the garden is adapted to temperature as a primary cue to begin new growth, like a newborn baby who when placed on her mother's chest scoots upward toward the breast. Temperature is the orient-

ing cue for plant and animal life in the garden; it is the signal that stimulates growth, setting in motion the transition from dormancy to activity. This transition appears to us to take place at the whole plant or animal level, the glossy pink rhubarb nubs thrusting forth or the just-hatched fly lazily looking for edibles, but in actuality it is far smaller.

Within the cell, temperature controls the expression of enzymes, which catalyze specific reactions, turning on the proteins and hormones that manifest growth. Enzymes are closely adapted to their environment, and throughout time temperature has become a key feature of how they work. If temperatures are too high, enzymes tend to break apart and dissolve into the aqueous contents of the cell. If temperatures are too low, they become tightly bound and ineffective. Climate change is interrupting the lock-and-key relationship that temperature has with enzyme activity, the cues that have evolved over millennia.

It goes against a northerner's intuition, used to more cold than warmth during the calendar year, not to feel pleasure for a warm day. Yet it feels conflicting to benefit at all from climate change, to plant peaches in anticipation of the coming warm temperatures. Paradoxically, it also seems like a natural reaction. As environments change, we cultivators have always experimented with new crops, fitting them to the conditions at hand. On one hand, we may gain in pitted fruits; on the other, we might lose the cold-loving crucifers. Between the increasingly erratic weather and the whole host of new fungi, pathogens, and insect pests that will colonize our gardens and farms, the challenges will be enormous. It is hard to imagine that agriculture will truly benefit from the changes, especially given the predicted changes in rainfall patterns. Yet global warming will force us to respond creatively to the new dynamics and the disequilibrium in our landscapes. Frankly, we can do nothing else.

Adapted from *Early Spring: An Ecologist and Her Children Wake to a Warming World*, by Amy Seidl, who is an ecologist and research scholar at Middlebury College in Vermont. Copyright 2009. Reprinted with permission from Beacon Press.