

Plant hardiness zones and global warming

By Bruce Wenning/Special to the TAB
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Global warming is already here. We are experiencing prolonged droughts, flash floods and dramatically different patterns of precipitation than those we had just fifty years ago. Many life forms are affected by these changes. Daily air temperatures now vary so widely around seasonal norms that we are putting on sweaters in August as well as in February. We should not be surprised that temperature fluctuations have had a profound effect on plant ecology, because temperature impacts plant germination, growth patterns, colonization, planting dates, and harvest times.

Seasonal temperatures within different plant hardiness zones determine which plant species survive through the winter. The U.S. Department of Agriculture plant hardiness zone map of the U.S. long provided farmers and horticulturists with guidelines for plant selection in relation to frost and low winter temperature extremes. Last updated in 1990, the map is divided into 11 climatic zones of winter plant hardiness, each with a different range of average annual low winter temperatures. Plant species occupying the same zone can be expected to survive the low winter temperatures characteristic of that zone, although they may have varying genetic tolerances to pests as well as varying soil, water, nutrient, sun and shade requirements for growth and survival.

In 2006, the National Arbor Day Foundation published an updated plant hardiness zone map www.arborday.org/media/mapchanges.cfm based on 15 years of climate data recorded from National Oceanic and Atmospheric Administration climate data stations in 5,000 locales around the U.S. The map shows that temperatures in the U.S. have been rising over the past 15 years. It also shows that plants (and other organisms) once limited to eastern Massachusetts are now benefiting from milder winter temperatures and are thriving in western Massachusetts.

This past February, Cornell University Professor David Wolfe spoke on “Climate change and its implications for horticulture” at New England Grows, a national green landscaping conference and exposition held in Boston. Wolfe documented the warming of our winters over the past fifty years and presented data about the early bloom of many plant species. Annual January and February mean temperatures have been increasing and snow-covered days have been decreasing. (Snow cover reflects heat away from the earth.) In New York State, grapes are blooming six days earlier, apples eight days earlier and lilacs four days earlier. And just as crop and landscape plants are affected by the increase in mean temperature, most invasive organisms — plants, insects, mammals, and microbes — are benefiting as well. This is wrecking havoc in many ecosystems and negatively impacting public health.

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