

## How Climate Affects Biological Cycles

by Dr. H. Marc Cathey

**A**S A FORMER research horticulturist, I still tend to pay a great deal of attention to the physiological processes of plants, and this past spring I observed a number of different plants leafing out and flowering much earlier than normal. Among these were crape myrtle (*Lagerstroemia indica*), tree lilac (*Syringa reticulata*), and shadbush (*Amelanchier arborea*), all of which instigated their growing and flowering cycles three to five weeks earlier than I have ever observed in all of my years at River Farm. Even more

perplexing, other plants, such as flowering dogwood (*Cornus florida*) and American fringe tree (*Chionanthus virginicus*) flowered at their normal time. The varied flowering times and combinations of plants in flower at the same time are definitely noteworthy.

In reviewing the climate differences over the past several years, the controlling factor for these aberrations appears to be the dry soil conditions we have experienced over that period. In November 2003, I noticed that flowering pears (*Pyrus calleryana*) and tall bearded irises (*Iris germanica*) bloomed almost as heavily at that time as they did the following spring of 2004. This flowering occurred without supplemental watering or fertilization. The hardiness of these plants was demonstrated by the abrupt transition that fall from 60 degree Fahrenheit days to a total icing of all the plants. Most of these hardy trees, shrubs, grasses and ground covers were rated as being adapted to USDA Plant Hardiness Zones 3 to 8, AHS Heat Zones 9 to 3.

### SNOW COVER FAILS MIDWEST

Over the winter of 2003–2004, there was a period when the recorded temperatures were lower than they had been for 30 years. Fortunately for us here in the Mid-Atlantic, the substantial snow cover we received during that period helped protect many of our borderline hardy plants. But upper Midwest states such as

Michigan, Minnesota, and Wisconsin (USDA Plant Hardiness Zones 3 to 5), experienced severe losses of garden plants because they lacked the usual snow cover that ameliorates the impact of bitter temperatures and harsh chilling winds. Under those conditions, even the toughest landscape plants, including hardy evergreens like common juniper (*Juniperus communis*) and creeping juniper (*J. horizontalis*), suffered losses.

Given these many unusual variations we are seeing in our normal climate, it is

more important than ever that gardeners keep careful records of the temperature changes and levels of rain, snow, and wind each year. Developing this kind of detailed historical knowledge about local weather conditions—a key element of the American Horticultural Society's SMARTGARDEN™ program—can help gardeners make wise decisions about plant selection and placement in their landscapes.

### MORE RESEARCH NEEDED

There is much that research horticulturists can accomplish in breeding and selecting new hybrids and plant forms that will thrive in our gardens under adverse weather conditions. The only comprehensive species/cultivar research program I know of that focuses on hardy perennials is the Department of Horticulture at Michigan State University. They are evaluating plants species by species and cultivar by cultivar with respect to vernalization (chilling) requirements, temperature tolerance, daylength, supplemental lighting, growth regulators, and acclimatization in the garden. We need to support more of this kind of detailed research to find and select tough, resilient plants for these challenging climatic times. 🌱



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