Phenology 101

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> "Those of us who live in temperate climates are constantly reminded of the intimate link between ecological events and seasonal climate changes, such as the sound of songbirds in the spring and the brilliance of foliage in the fall. Developing an intimate understanding of the relationship between biological processes and climatic cycles, particularly on a global scale, is the aim of Phenology."
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> - from *Phenology, an Integrative Environmental Science*, in the Journal of the Torrey Botanical Society

You too can be a phenologist. Learn the connection between season change and life cycles.

Did you know that 1200 years ago, gardeners in China noted the time of year that the peach trees blossomed? Records of the first cherry blossom have been kept in Japan for many centuries. Also, for over 500 years, the French kept records of the harvest dates of pinot noir grapes in Burgundy.

Most gardeners keep a variety of notes on digging in new plants, pruning, fertilizing and harvest times. We observe, but don't always record or commit to memory: first buds, first leaves, first fruit, summer birds, and the emergence of bees and butterflies from year to year. Today we would call people who keep records from their gardens phenologists, but in actual fact all gardeners are natural phenologists. Phenology is the study of the timing of life cycle events in plants (and animals). In other words, studying the environment to figure out what 'calendar' or 'clock' plants use to begin flowering, leafing or reproducing.

Looks and Timing

Phenology is literally "the science of appearance." Scientists who study phenology – phenologists -- are interested in the timing of specific biological events (such as flowering, migration, and reproduction) in relation to changes in season and climate. It is only with a large body of information (data) over time that scientists can determine whether or not their mathematical model for predicting changes are accurate or to what degree they are not. Many phenomena are very sensitive to small variations in temperature. Phenological records can be a useful substitute or proxy for temperature in historical climatology, especially in the study of climate change and global warming. Today using satellites, scientists are able to observe large inhospitable expanses of land such as the arctic tundra and are determining the retreat of the land that was permanently frozen. Data collected can impact decisions related to allergies, wildfires, water, pest management and conservation.

Scientists are not the only people gathering data. The Royal Meteorological Society of England had regular citizens keeping records of first buds, blossoms, and even birds seen each year from 1891-1948. Then the record stops until recently. The current UK phenology network is coordinated by the Woodland Trust and Centre for Ecology and Hydrology. Records are kept by 'citizen scientists' for selected species of trees, flowers, birds, insects, butterflies, and amphibians as indicator species.

Photos taken in chronological order from bud to bloom are one way a phenologist can record plant life cycle events. These photos are of a cloned lilac. **Photo courtesy budburst.org.**

Using computers, observant citizens, students, educators, and gardeners can participate in gathering data. Together these people provide more data than one researcher (or group of scientists) can provide. It is a very beneficial use of the internet. To participate, log onto www.budburst.org . There is a list of 58 targeted plant species. Information on local plants not on the list is also acceptable.

Become a Phenologist

Out of the list of plants, shrubs and trees being tracked, I've signed up to observe and record first blooms of two wild plants in my garden, Pacific Trillium (Trillium ovatum) and Common Snowberry (Symphoricarpos albus). I could have chosen first leaf or first fruit. In addition, I needed to figure out the precise location of my garden, which means the exact latitude and longitude of my property. This is not something I ever needed or memorized. Fortunately, using my postal address, Budburst was able to determine the GPS points of latitude and longitude used to identify my location. Now I'm ready to observe and report my findings in the spring.

I'm not expecting to match the Marsham family of Norfolk, England, who kept phenological records from 1736 to 1956, but I have a New Year's resolution I know I can keep. I can contribute to a body of scientific data from my garden.

To everything
there is a season,
and a time for every
purpose, under Heaven.

Ash before oak,
we're in for a soak.
oak before ash,
we're in for a splash.

- UK Phenology Network
www.naturescalendar.org.uk/

Skagit County Master Gardener Carole Jacobsen has signed up as a citizen phenologist to record the first bloom of a Trillium ovatum, such as this one, in her own garden. **Photo by Stan Shebs via commons.wikimedia.org.**

RESOURCES:

- USA National Phenology Network: www.usanpn.org
- Phenology Web Links, National Sustainable Agriculture Information Service: http://attra.ncat.org/attra-pub/phenology.html
- EEK! (Environmental Education for Kids) January Phenology: http://dnr.wi.gov/org/caer/ce/eek/nature/season/pheno.asp
- Insect Pollination Of Cultivated Crop Plants, S.E. McGregor, USDA www.beeculture.com/content/pollination_handbook
- Phenology of Lacanobia subjuncta [fruitworm] in Washington and Oregon Apple Orchards, WSU Tree Fruit Research and Extension Center, http://entomology.tfrec.wsu.edu/VPJ_Lab/downloads/v98n6s48.pdf