

NORTHWOODS YARD & GARDEN

Weekly Column

March 18, 2024

How Plants Know The Season

We know spring arrived this week because the calendar says so and hopefully, the weather is also springlike. How do plants know the season, especially with the extreme variations we often see as seasons change?

Hormones, organic compounds produced within plants, regulate plant growth processes. Hormone levels will determine when plants grow, flower, and go dormant and protect them from growing at the wrong time. The five major plant hormones are auxin, gibberellin, cytokinin, ethylene, and abscisic acid. Levels of each will change throughout the seasons, "telling" plants what to do. Light and temperature play key roles.

Plant hormones respond as light, or more commonly darkness, increases or decreases over an extended time. This is the consistent factor in season change. No matter how warm or cold a particular fall is, the changing length of day timing remains consistent each year. As darkness increases each day over a period of weeks, plant hormone levels change.

Plant hormones respond to temperature in an equivalent manner. Native trees and shrubs need a certain cold period to assure winter is over before they can resume growth in spring.

Next, they then need accumulating warming temperatures, measured by degree days. With 50 degrees as base temperature, each degree the daily average exceeds 50 degrees is an accumulated degree day. Once enough degree days accumulate, trees will break bud to leaf out or flower.

Auxins, along with cytokinin and gibberellins, all promote growth and development. Their levels in plants increase as growing conditions are favorable. Ethylene is a cell aging hormone and will increase to cause processes such as leaf drop, petal fall, and ripening of fruit. Abscisic acid will keep plant buds (and seeds) dormant.

As summer advances to fall darkness increases each day, causing levels of the three growth promoting hormones to drop. Ethylene levels spike. As a result, leaves turn color and drop off trees. Abscisic acid levels increase in leaf buds and must dissipate before growth promoting hormones can take control in spring. Exposure to a cold period with a minimum low temperature for a minimum amount of time over winter reduces abscisic acid.

Once the cold requirement is satisfied to break dormancy (even with our mild winter they will get enough cold), trees wait for the proper amount of accumulated degree days. This will then increase levels of growth promoting hormones, allowing buds to develop and open. Each species varies in degree day requirements, which explains why we have early and late bloomers as spring advances.

Interested in learning more about Horticulture in Iron County?
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