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News Release

Chill hours and sap rising

Question: I really have two questions that may or may not be related. One has to do with chill hours; I grow backyard fruit trees and have been told mine may not be getting enough chill hours. What are chill hours and how do I get them? The other regards sap rising; does that have anything to do with chill hours?

Answer: Sap rising, while not strictly related to chill hours, is associated with weather patterns, so a connection does exist. More specifically, in spring, the largest structure in a tree is its "plumbing," the part through which water and nutrients are pushed and pulled into leaves and needles. Water moves into tree roots from wet or moist soil, but if we're in a dryer-than-normal pattern and soil lacks sufficient water, then no food and water flows into roots so they wither away. Tiny root hairs push deeper into the ground searching for water; if there is none, the root hairs will also die. And if we're experiencing windy conditions, even more water is sucked from plants and soils.

Sap is, in a sense, responsible for "spring." The movement of water from soil into roots, and from roots to buds and leaves, creates the condition we call spring, when the "sap rises." With spring comes rebirth, new beginnings, and new life in our gardens. We may see signs of sap rising during warm or abnormally warm spells in late February; but without sufficient moisture in the soil, sap may rise erratically or without the force needed to revitalize some of our plants, which can lead to plant decline as we head into warmer months.

According to many climatologists, we're in a La Nina weather pattern, which indicates a warmer and dryer winter. While the "warmer" part of the forecast is in question, there's not much doubt that most of Alabama has experienced a dryer than average winter. It's not known how far into spring and summer this pattern will exist, but plan now to conserve water in as many ways as possible.

Most fruit trees, in addition to requiring sufficient water, also have a dormant rest period that must be satisfied in order for trees to bloom. During the dormant season, deciduous trees (ones that lose their leaves during fall) are protected from cold damage during winter. During the summer, fruit trees develop the leaf and fruit buds that grow the following year. As the days get

shorter and colder, trees drop their leaves and go dormant. As the tree defoliates, other changes occur to protect buds from the coming cold.

Fruit trees of different varieties require a range of chill hours in order to produce fruit. If your fruit tree typically requires 800 chill hours, which is a moderate number of hours, but only gets about 200 in your landscape, you're probably looking at very low, if any, fruit development. OK, what is a "chill hour"? Unlike "chilling out," chill hours are every hour below 45° F. However, that number alone doesn't describe when you start recording hours in the fall, or when you stop counting in the spring. Another way of viewing chill hours is the minimum period of cold weather after which a fruit-bearing tree will blossom. Some bulbs, i.e. tulips, have chill requirements to bloom, as do some seeds.

There are more complicated formulas for calculating chill hour requirements for your peach, apple, orange, apricot, nectarine trees, etc. Lack of sufficient exposure to chill hours can result in delayed or substandard foliation, flowering, and fruiting.

To homeowners who aren't worried about chill hours for fruit set, biennial plants such as cabbage, sugar beet, celery, and carrots, usually considered "cool season" vegetables need chill hours to develop buds in their second year. Conversely, chilling in the early stages of some plants can trigger "bolting" in the plant's first season, not a desirable activity. One solution to this phenomenon has been to breed cultivars with higher or lower chilling thresholds for certain crops.

Weather patterns influence rainfall, chill hours, plus a host of other aspects of gardening and growing. Whether we have enough, too much, or too little moisture or chill time is pretty much out of our control. However, understanding what happens when these conditions occur makes us better able to deal with the results.

"Weather means more when you have a garden. There's nothing like listening to a shower and thinking how it is soaking in around your green beans." ~Marcelene Cox

For more information about this topic please contact Sallie Lee, Urban Regional Extension Agent-Home Grounds, Gardens and Home Pests at the St. Clair County Extension Office at (205) 338-9416 or email leesall@aces.edu.