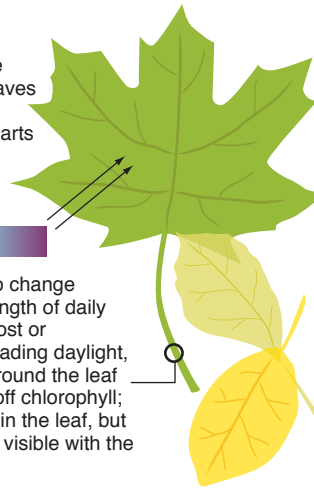
# Drought effects fall colors

*The effects of the drought may be seen in this year's fall foliage because the lack of water makes it harder for the leaves to produce carbohydrates, which are used in the growth process.*

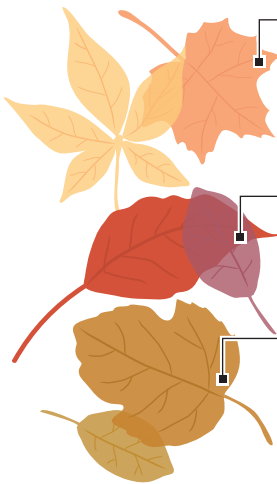
## How leaves work

Leaves use carbohydrates (sugars) to continually produce chlorophyll, which gives the leaves their green color; chemical absorbs the blue and orange parts of sunlight and converts them into energy for the tree



**Daylight spectrum**

Signal for leaves to change correlates to the length of daily sunlight, not just frost or temperature; with fading daylight, the layer of cells around the leaf stem starts to harden, cutting off chlorophyll; other colors that were present in the leaf, but blocked by the green, become visible with the lack of chlorophyll



### Yellows and oranges

These pigments are made by xanthophylls and carotenoids (the same as in carrots) and absorb the green light the cholorophyll misses

### Reds and purples

Some leaves turn red from anthocyanins, a chemical manufactured from the sugars trapped in the leaf

### Browns

When all the pigment breaks down, only the brown tannins remain

Source: U.S. National Arboretum, State University of New York College of Environmental Science and Forestry
Graphic: Kate Nieland, Chicago Tribune