During the pandemic lockdown, people have been eager to get outside and experience the wonders of nature. This became especially clear at the Plant Answer Line last fall, when we received lots of questions about the color change of larches. I’ve bundled some of them together below.

**QUESTION:**

When do larch needles typically turn gold/yellow? (I have deduced from my limited reading that a frost is not required...) Which kinds of larches grow here in Pacific Northwest? I am passing through town and am wondering if you still have golden larches at the Arboretum? I look forward to hearing from you. Happy Halloween!

**ANSWER:**

**TIMING**

Halloween was a little late in last year’s larch fall–foliage calendar. The brilliant golden hues of the larches (*Larix* species) peaked around late September to mid–October. As is the case with other deciduous trees (larches are deciduous conifers) that undergo an autumn color change, the peak time depends on several factors. The primary and stable factor is longer nights, as hours of daylight grow shorter. Weather is another factor, and because temperature and moisture levels vary from year to year, so too does the timing of the color changes. In general,
the intensity of fall color is heightened when preceded by sunny days and cool nights (below 45 degrees Fahrenheit, but not freezing), though this may not be so important for plants that turn yellow (see below). Frost ruptures and kills leaf cells, so it does not lead to brilliant fall color. Wind and rain storms can also cut short the fall color season; larch needles are soft and delicate and are easily blown or knocked off once they start to turn yellow.

**COLOR**

According to plant expert Randall Hitchin (quoted in “The Seattle Times,” September 25, 2008), fall color change involves “four groups of pigments. You know about chlorophyll, the green chemical that does all the heavy lifting spring through summer. Then there are the carotenoids—carotene and a suite of related compounds—that give leaves yellow and orange coloring. Tannins produce the russets and browns. Finally, anthocyanin provides the classic autumn colors of red and purple. During the growing season, chlorophyll dominates.

It’s constantly being made to replace what’s degraded by ultraviolet light, and the leaf appears green. Depending on tree species, yellow, orange or brown pigments have been there all along, concealed by green chlorophyll. In autumn, as chlorophyll production slows and ultimately stops, the yellows, oranges or browns emerge.”

“[....] Anthocyanin is genetically controlled, so some tree species get red and some can’t. Unlike the carotenoids, anthocyanin isn’t usually present during the growing season, but is produced in leaves with fall weather conditions. In trees that can go red, the amount of it depends on environmental factors. In ideal conditions, you see vivid pinks, reds and purples—that ooh—and—ah factor. [...] The Northwest autumn is often overcast or rainy, with only minimal cooling at night; not optimal for fall color.”

If you’ve seen the fall color on our native western larch (*Larix occidentalis*) and subalpine larch (*Larix lyallii*) in the Cascade Range, you’ll know our autumn can generate plenty of oohs and ahs. (“Larch Madness” becomes the focus for many fall hikers in our region.) And because carotenoids are always present in larch leaves, the yellow and gold colors remain fairly constant from year to year.

In Seattle, there are several good places to observe the larches turning golden. The wide range of species in the Washington Park Arboretum includes quite a few *Larix kaempferi* (Japanese larch) and *L. laricina* (tamarack, native to Canada and the Northeast), as well as *L. decidua* (European larch), Kurilen larch (*Larix gmelinii* var. *japonica*), Polish larch (*Larix decidua* var. *polonica*), and western larch (*L. occidentalis*). Most of these are concentrated at the south end of the Pinetum and the south end of Azalea Way.

If you want to view the golden fall foliage of larches (in this case *Larix kaempferi*) from above, Ravenna Park’s upper trails and the 20th Avenue N.E. bridge over the ravine are ideal. Green Lake also has a small grove of *Larix kaempferi* and a couple of large *Larix decidua*.
WHAT’S IN IT FOR THE TREE?
Sometimes people call us with worries about a dying tree that turns out to be a perfectly healthy larch or other deciduous conifer (see sidebar) dropping its needles for the cool season.

How does being deciduous benefit a larch? Larches grow in cold, low-nutrient environments, and being deciduous helps them avoid damage to foliage by extreme winter weather. It also helps the trees to conserve resources during the least productive part of the year. For high-elevation species such as western and subalpine larches, heavy snow loads are less likely to damage branches, compared to trees that retain their foliage in winter. (The elevation range of western larch is about 1600 to 7000 feet, while that of subalpine larch is 5900 to 7900 feet. You are unlikely to see subalpine larch in Seattle because it does not thrive in mild winter climates.)

Larches are very fire resistant, and part of this has to do with the needles, which have a high water content (and so are less flammable) compared to those of evergreen conifers. Shedding needles may also be a defense against overwintering insects. And because larches don’t need to invest a lot of time and energy manufacturing chemicals such as lignins and toxins to make their leaves tough or durable—and resistant to herbivory—they have a high level of photosynthetic efficiency.

LARCH LORE
Western larch is the largest larch species when growing in its native range. Its straight, upright growth makes it useful for lumber. Early 19th-century explorer David Thompson noticed 200-foot-tall larches on the Kootenai River (northern Montana and Idaho) and observed that they would be useful as ship masts. If he had asked the local Kutenai tribe, they could have informed him that the wood is used for the center pole in their ceremonial Sun Dance.

Frank A. Lang’s essay on western larch in the “Oregon Encyclopedia” (oregonencyclopedia.org) draws a connection between the name “larch” (possibly from the Celtic “lar,” meaning “fat”) and the copious quantities of resin the tree holds—a polysaccharide called arabino-galactan. Native American tribes have a long history of using the sap and resin as candy or as a gum to soothe sore throats and heal cuts. (Pliny the Elder noticed the resinous gum, too, in Old World larches: “The wood of this tree is far more valuable, being unimpaired by time, and proof against all decay... Resin flows from this wood in still greater quantities; it is of the color of honey, more viscous than the other varieties, and never turns hard.”)

Close up of Japanese larch needles and cones in fall.
According to “Ethnobotany of the Okanagan-Colville Indians of British Columbia and Washington” (Turner et al. 1980), the leaf color change of western larch (called tsikw’lx) is notable as a seasonal signal to the Okanagan-Colville tribe, as it coincides with the time in autumn when pregnant bears go into their dens for winter.

Henry Wadsworth Longfellow famously mentions the tamarack in his 1855 poem, “The Song of Hiawatha”:

Give me of your roots, O Tamarack!  
Of your fibrous roots, O Larch-tree!  
My canoe to bind together,  
So to bind the ends together  
That the water may not enter,  
That the river may not wet me!

The poem was inspired by Anishinaabe narratives, collected by 19th century Indian agent and ethnographer Henry Rowe Schoolcraft.

According to Canadian writer Bill Casselman, the species name of Larix laricina suggests it is “the larchiest of larches.” The common name tamarack is a mishearing of the native Abenaki name akemantanak, which follows the native tradition of naming plants by their uses. In this case, the name means “wood for snowshoes.” Tamarack prefers swampy, boggy conditions but will tolerate more open, dry sites. It is very cold tolerant—with a northern range limit at the Arctic tree line on the edge of the tundra! Its cones are smaller than those of western larch.

OTHER DECIDUOUS CONIFERS

Pseudolarix amabilis (golden larch, or false larch): Native to mountainous regions of China, this is probably the only tree one might mistake for a larch, even though it belongs to a different subfamily of the Pinaceae, or pine family. A large species—and the only extant member of its genus—it offers, like the larch, glorious golden fall color. However, according to Missouri Botanical Garden’s Plant Finder (see missouribotanicalgarden.org/plantfinder/plantfindersearch.aspx), golden larch cones are larger, the male catkin-like cones are held in clusters, and the female cones disintegrate to release their winged seeds. By contrast, larch catkins are borne singly, and the cones fall off in their entirety when ripe. In the Arboretum, you’ll find a grouping of five young golden larches growing in the Holly Collection.

Metasequoia glyptostroboides (dawn redwood): Another large tree from China, dawn redwood belongs to the Cupressaceae, or cypress family, and grows in wet lower slopes and stream valleys.
Fall color ranges from burnt sienna to brick red. There’s a particular dawn redwood I look for each fall on my walk to work. Its fiery color looms over a blue, two-storey house. The homeowner told me this tree was a seedling given away in a fast-food “happy meal” when her children were small, and it has been growing happily ever since. In the Arboretum, a great place to view dawn redwoods is Rhododendron Glen, where there are four mature specimens.

**Taxodium distichum** *(bald cypress):* This medium-sized tree in the cypress family is native to the Atlantic Coastal Plain, and to swamps and bayous of the U.S. Southeast. According to an article on the American Conifer Society blog, the autumn color is orange, and leaf drop depends on geographical latitude. In northern climes, bald cypress is wholly deciduous, while it is “tardily deciduous” in the South. The fall foliage display of the bald cypresses along Arboretum Creek in the Pinetum shouldn’t be missed!

**Ginkgo biloba** *(maidenhair tree):* This conifer relative from China is widely cultivated around the world for its distinctive form and foliage, which turns bright yellow in fall before quickly dropping. It is the star of Japan’s annual Icho Matsuri foliage festival, held at Meiji Jingu Gaien—a ginkgo-lined avenue—in Tokyo between mid-November and early December. The synchronous leaf drop of ginkgo trees growing together is the subject of Howard Nemerov’s poem, “The Consent” (www.poetryfoundation.org/poems/53817/the-consent):

“...the golden and green
Leaves litter the lawn today, that yesterday
Had spread aloft their fluttering fans of light.”

A beautiful ginkgo stands sentinel by the gate to the Graham Visitors Center parking lot at the Arboretum.

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**Bibliography**


