



Marcescent Trees Retain Leaves Longer

by Michele Warmund

Wondering when all those leaves are going to fall so you can finally get them all raked? The time of leaf drop depends on the cells that make up the abscission or separation zone at the base of the leaf petiole (stalk from the leaf that is attached to the twig). Shortening daylength, frost, or drought can trigger formation of the abscission layer.

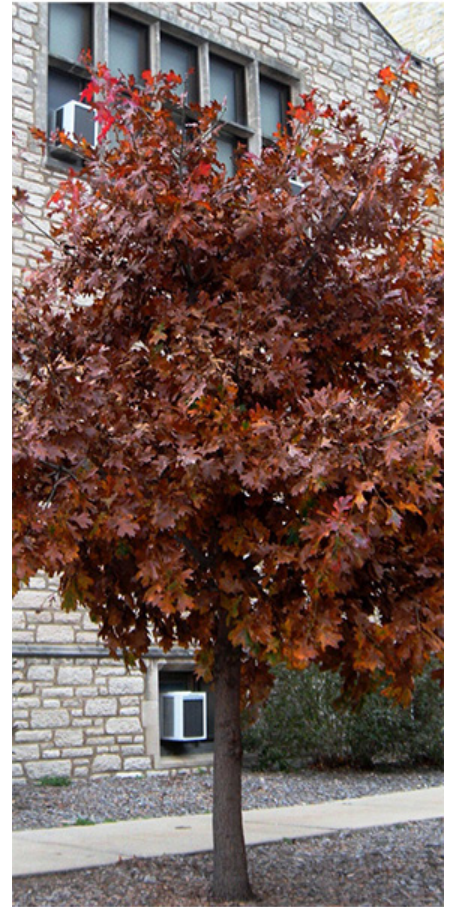
In most trees and shrubs, an abscission layer, composed of cells with weak walls, undergoes biochemical changes that cause the cell walls in this zone to dissolve, leaving the leaf dangling until a gust of wind breaks the connection with the tree. As the abscission layer is maturing, a different group of cells at the base of the petiole forms another protective layer of cells, containing compounds called suberin and lignin, to seal the wound after leaf fall. This corky layer protects the tree from disease infection and water loss.

Unfortunately, not all leaves fall at once. Some trees, such as *Quercus* (pin, red, and white oaks), as well as *Fagus* (beech) and *Carpinus* (hornbeam) retain many of their dried leaves until late winter and then drop them intermittently. This tendency for late retention of leaves, dropping them intermittently during winter, with a final leaf drop just before bud burst in the spring is called marcescence. In these types of trees, the abscission zone fails to develop fully during autumn, allowing the leaves to stay on the tree.

The reason why some trees keep their withered leaves into winter is unknown. Some ecologists have speculated that marcescence provides unpalatable leaves as a deterrent to deer browsing on buds or twigs during winter, protecting the trees from damage. Others have suggested that leaf retention is a means of trapping snow, resulting in increased soil moisture at the base of the tree after it melts. However, when this occurs, trees are at risk for limb breakage due to the weight of a heavy, wet snow.

It is known that marcescence is often a juvenile trait that can be lost as some trees age. In a recent study conducted at the University of Missouri, *Quercus rubra* (northern red oak) trees that had multiple flushes of growth during the growing season, retained their leaves later in the year than those with few flushes. Also, leaves from the last flush on trees having the marcescent trait tended to have higher levels of chlorophyll, as well as slightly higher rates of photosynthesis than leaves from non-marcescent trees (those with early leaf drop).

While scientists are learning more about the genetics of marcescence, keep the rake handy as you will be using it multiple times over the next five months if you or your neighbors have marcescent trees.



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Houseplant Acclimatization

by David Trinklein

As the autumn leaves fall outdoors, so do leaves often fall from our houseplants that recently were moved back indoors after enjoying an outdoor respite over the summer. Although this is a bit alarming to a plant enthusiast, the houseplants in question are not necessarily dying. They are simply acclimatizing to life back indoors.

Acclimatization is a term that refers to the adaptation of a living organism to a change in its surroundings. Humans are no exception. The 40 and 50 degree F. nights that seem cold to us in autumn will feel relatively warm, should they occur next February, because we will have acclimatized to cold temperatures by that time.

Houseplants are frequently moved outdoors for the summer for a brief reprieve from the poor light and other austere growing conditions typical of an interior setting. No matter how bright an interior room might appear to be, it pales in comparison to the amount of light encountered by plants placed outdoors for the summer. Houseplants often respond by putting on a “flush” of growth under the more ideal conditions. Upon being moved back indoors, lighting is not sufficient to maintain this additional growth.

The most obvious response occurs several weeks after a plant has been moved from an area of fairly bright light to poorer light. The cause for the problem is related to a variable known as the light “compensation point” of the plant. The latter is the point where the amount of sugars and carbohydrates (food) manufactured by the plant through the photosynthetic process equals the amount of the same materials used by the plant during respiration.

At light levels above its compensation point, a plant continues to grow because the food manufactured via photosynthesis exceeds the amount used by respiration. Conversely, when the amount of food used by respiration exceeds the amount manufactured during the photosynthetic process, the plant stops growing and loses leaves. The latter usually ceases when the light compensation point is reached (i.e., the rate of food manufactured from remaining leaves equals the rate of food consumed).

In order to avoid severe leaf drop, acclimatization need to be done gradually. If changes within the plant are fairly slow, new leaves begin to develop that are better suited to utilize lower amounts of light more efficiently. The latter are termed “shade leaves” and morphologically are different from traditional (sun) leaves. Shade leaves usually are larger, thinner and have light-capturing organelles known

as chloroplasts more evenly distributed and horizontally oriented between the various layers of the leaf.

Perhaps most importantly, shade leaves have lower light compensation points than do sun leaves. Although they are not as photosynthetically prolific as sun leaves, they are much better equipped to make better use of lower amounts of light than are sun leaves. In short, the development of shade leaves allow full-sun plants to adapt to the low light intensities common to interior settings.

For the reasons described above, houseplants purchased from a retail outlet often shed some leaves after being placed in an interior setting. The plants in question most likely were produced in a nursery where light intensity was relatively high and other growing conditions were good. The shedding of a few leaves simply indicates the plant is acclimatizing to its new environment.

Pre-acclimatized plants are commercially available for those in the interior “plantscape” industry. These plants usually are larger plants that have been acclimatized in the production field or greenhouse by gradually reducing the amount of light they receive. This is accomplished by growing them under shade fabric. As more shade fabric is added, the light intensity experienced by the plants approaches that of a typical interior setting. Plants handled this way usually are a bit more expensive, but perform better when used in an interior setting.

Acclimatization of the root system is another consideration that must be taken into account. While a plant should not be allowed to wilt severely, extending the interval between watering and reducing the amount of fertilizer supplied to the plant can help in the adjustment process. Fertilizer rates should be reduced to about one-half of that supplied under normal production in bright light. This tactic reduces top growth while roots continue to grow. Applying less water also helps harden the plant’s foliage so it will be less sensitive to the low humidity typical of indoor settings.

Conversely, take care not to overwater houseplants. It is generally agreed that more houseplants die from overwatering than from any other cause. Most houseplants will recover from slight wilting, upon being watered. At the other extreme, plants that are overwatered often lose their roots due to the stress caused by a lack of oxygen. Houseplants that suddenly wilt most often do so because they are losing/have lost their root system. Plants that wilt because of root loss rarely are able to recover and survive as attractive additions to the interior environment.

DECEMBER GARDENING CALENDAR

Gardening Calendar supplied by the staff of the William T. Kemper Center for Home Gardening located at the Missouri Botanical Garden in St. Louis, Missouri. (www.GardeningHelp.org)

Category	Week				Activity	
	1	2	3	4		
Houseplants	x	x	x	x	Water houseplants with tepid water. Cold tap water may shock plants.	
	x	x	x	x	Be sure newly purchased indoor plants are well protected for the trip home. Exposure to icy temperatures for even a few moments may cause injury.	
	x	x	x	x	Overwintering geraniums like bright light and cool temperatures. Keep soils on the dry side.	
	x	x	x	x	On cold nights, move houseplants back from icy windows to prevent chilling injury.	
			x	x	x	Holiday poinsettia plants do best with sun for at least half the day and night temperatures in the 50's or 60's. Keep plants away from drafts, registers and radiators and let the soil should dry only slightly between thorough waterings. Be sure to punch holes in decorative foil wraps to prevent soggy soil conditions.
	x	x	x	x	Hairspray works well to keep seed heads and dried flowers intact on wreaths and arrangements.	
	x	x	x	x	If you plan to have a live Christmas tree, dig the planting hole before the ground freezes. Mulch and cover the backfill soil and the planting hole to keep them dry and unfrozen. When you get the tree, store it outdoors in a cool, shady, windless area until the last minute and mulch the roots to prevent cold injury. Don't allow the tree's roots to become dry and spray the needles with an anti-transpirant to reduce moisture loss. Set the tree up in your coolest room. Don't keep the tree indoors for more than one week and plant outdoors promptly.	
	x	x	x	x	Be sure the root zones of azaleas and rhododendrons are thoroughly mulched. Any organic material will do, but mulches made from oak leaves, shredded oak bark, or pine needles are preferred.	
	x	x	x		Christmas trees hold needles longer if you make a clean, fresh cut at the base and always keep the trunk standing in water.	
	x	x	x		Only female holly trees bear the colorful berries. There must be a male tree growing nearby for pollination, if fruits are desired.	
	x	x	x		Hollies may be trimmed now and the prunings used in holiday decorations.	
	Miscellaneous	x				Apply mulches to bulbs, perennials and other small plants once the ground freezes.
		x				All power equipment should be winterized before storage. Change the oil and lubricate moving parts. Either drain fuel systems or mix a gas stabilizing additive into the tank.
x					Clean and oil all garden hand tools before storing for winter.	
x					If you feed rabbits corn or alfalfa, they may leave fruit tree bark unharmed.	