

**Linda Chalker-Scott, Ph.D., Extension Horticulturist and Associate Professor,
Puyallup Research and Extension Center, Washington State University**

The Myth of Wilting Leaves
“Leaf wilt is the best indicator of insufficient soil moisture”

The Myth

With longer days and increasing temperatures, plant growth and water demand will steadily increase. One of the best visual indicators for adequate plant moisture is leaf turgor. This makes sense, as leaves are the main destination points for water uptake, and up to 90% of transported water is lost through leaf stomates. When soil water availability lessens, the plant has a harder time extracting it from the soil, yet the leaves continue to require water for expansion, nutrient transport, and photosynthesis. The youngest and most tender leaves and shoots will show the effects of water stress first by wilting, as their cell walls have not yet lignified. Eventually, a permanent wilt point is reached – a point of no return for the plant. Any landscape manager will want to avoid this problem and therefore leaf wilt is often used as an indicator to increase water application. Unfortunately, this blanket approach to irrigation can often make the problem worse if lack of soil moisture is not the underlying cause of wilt.

The Reality

Leaf wilt can result from a number of stresses in the soil environment, many of which lead directly or indirectly to water deficits in the leaf. A common cause of leaf wilt in urban environments, especially sites with compacted, poorly drained soils, is root anoxia. Soils without sufficient pore space are deficient in oxygen which severely impacts root function. Roots, like any other living tissues, require oxygen for survival; since they are not photosynthetic they rely on oxygen from the soil or from above-ground parts of the plant. Excess water will fill soil pores and eliminate gas exchange. Without enough oxygen, root function shuts down and water uptake ceases. Leaf transpiration, however, continues and eventually leaves will wilt as their water content decreases. Ironically, the leaves suffer from drought stress even though soil moisture is more than adequate!

Other environmental factors besides soil compaction can cause root dysfunction and lead to leaf water stress; these include:

- Freezing temperatures in root zone
- Excessive heat in root zone
- Excess salts in fertilizers or water source
- Insect and rodent damage
- Fungal and bacterial pathogens
- Circling, girdling root systems

Some of these factors are most common in containerized plantings; root anoxia is probably the leading cause of death in houseplants and outdoor containers without adequate drainage. Obviously, one will want to ensure that water truly is the limiting factor before adding more to the root environment.

The Bottom Line

- Be sure to assess soil conditions before irrigating wilted plants
- If soil is wet, try to aerate through the root zone
- If soil is chronically wet, consider installing a French drain or other passive means of drainage
- Alternatively, select trees and shrubs adapted to wet conditions

For more information, please visit Dr. Chalker-Scott’s web page at <http://www.theinformedgardener.com>.