

Arid Zone Times

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Desert Trees Form and Structure

Even to the most casual observer, the “forests” of the desert southwest are profoundly and unmistakably different from forests found anywhere else in North America. It is, in part, this austere, dispersed landscape and distinct environs that have made the desert a place of wonder and unique beauty. Survival in this environment required adaptation to conditions where light was abundant and water scarce, in stark contrast to eastern hardwood forests where water is abundant and competition was for sunlight. This distinction is critical in understanding the form and structure of desert adapted trees in both natural setting and landscapes. Multiple trunk forms, as observed in Acacias, Palo Verdes, Ironwoods and Mesquites in the Sonoran desert, are the end product of an evolutionary process that allowed these species to survive and flourish in an uncompromising environment. Multiple trunk forms provide essential physical adaptations to dry desert conditions. The broad, spreading canopy shades the soil beneath the drip line reducing surface evaporation, following rains, and allows more moisture to penetrate into the root zone. Canopy shade inhibits the germination of seedlings, even of the same species, from growing near established trees and potentially competing for the limited supply of water. In the more mature forms, branches extends all the way down to the surface of the soil, creating a dome shaped, boundary layer of still air within the canopy that forces hot dry air over the majority of the leaf surfaces, rather than through. This redirection of hot wind, and consequently the reduction of transpiration (water lose through the leaves) further improves moisture conservation. The form and structural characteristics of the majority of desert native trees more reasonably resembles that of a very large shrub, particularly in comparison to non-desert species. This form should be enhanced and complimented through the pruning process, and should not be seen as a challenge to overcome.

It has been enormously gratifying to witness the growth in popularity of desert adapted trees in a wide array of landscape applications and their use as substitutes for traditional, high water demanding trees. This evolution in design has given rise to a landscape aesthetic that is more reflective of the desert region we live in and celebrates the beauty and diversity of this environment instead of trying to mask it. Desert adapted, multiple trunked specimens have been successfully used in streetscapes, commercial, residential, multi-family and municipal landscapes of all sizes. There has been discussion that the natural, multiple trunk form of desert species can lead to compromised structural integrity and some have suggested that single trunk forms of these trees are more appropriate and durable. While it's clear that some desert trees come to the marketplace with defects (included bark, tight branch angles, bound roots), these are byproducts of poor quality management or poor stock selection during the propagation and production process in the nursery. The notion that desert trees should be pruned and shaped into single trunked forms, more closely resembling those of traditional, introduced, hardwood trees species, denies the basic genetics of desert species, and ignores fundamental (and evolutionary) differences between these two very different types of trees. Dr. Ed Gillman, in his recently revised “An Illustrated Guide to Pruning,” observes, “...a number of small-maturing trees and shrubs...can be displayed nicely by creating a multi-trunked, multi-leader, or low-branched tree. Many develop a multi-trunk form without pruning.” This is, quite literally, a description of the vast majority desert adapted and desert native trees.

Community or municipal landscape codes work at cross purposes when they encourage or require the planting of desert adapted species and then require that these trees be planted as single trunked or single leader specimens. Pruning desert adapted trees into unnatural single leader forms decreases structural integrity and potentially reduces durability and longevity. Severe weather events, obviously, can have catastrophic effects on the landscape. In the worst cases these effects are unfortunate and often unpreventable. The very nature of biology is the adaptation to adversity and the interaction with the environment. Desert adapted trees take their form and structure from the environment they evolved in and the conditions they have endured. Their durability, in this difficult region, is a testament to a hard won perfection they achieved after millennia of struggle. Our job is to acknowledge and respect this perfection and reflect it in our approach to nursery production methods, landscape designs, installation and maintenance.