

Arid Zone Times

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Reflected Heat and Desert Trees

Areas that can benefit most from the shade and cooling effect of landscape trees, can also create very difficult growing conditions. anyone who has stood in the middle of an asphalt parking lot or next to south facing walls or windows in July or August can appreciate how these surfaces seem to amplify the heat of the desert sun. Imagine the heat stress these settings put on landscape trees.

Structure walls (masonry or glass) and paved surfaces (concrete, brick or asphalt) serve to both reflect and store summer heat. During daylight hours reflected sunlight and heat can significantly increase the temperature of the environment surrounding landscape plants. The radiant energy of the sun also acts to heat these surfaces. at night the heat accumulated during the day is released back into the surrounding environment. The net effect of this re radiated heat is to create a microclimate that does not experience a substantial drop in temperature at night. The combination of reflected and radiated heat create an environment where trees are subjected to heat stress 24 hours a day during the summer months.

The most extreme conditions are found where paved surfaces extend, uninterrupted, to the base of structures with trees planted somewhere in between. These "heat island" conditions can be found in many commercial, residential and municipal landscape settings and are particularly common in parking lots. Appreciate the conditions: Evaluate the orientation of structures and the amount and distribution of paved surfaces when determining where and what type of trees are planted.

Studies have shown that to optimize the benefit of tree shade in cooling homes and buildings it is best to plant trees in front of the south and southwest facing walls. Leave enough space between the trunk and the wall so the "mature" canopy has adequate room to expand and provide the maximum amount of shade. Providing space between walls and trees also allows for air circulation that can reduce the impact of reflected heat on the trees.

THIS IS MORE THAN A DESERT: It is a mistake to assume that all desert species will tolerate high heat environments. Appreciate that conditions in most urban landscapes can be vastly more severe, when it comes to environmentally induced heat stress, than any native desert setting. One means of reducing the effects of this heat stress would be to increase the amount and frequency of irrigations. This strategy works reasonably well for those desert species that will tolerate frequently saturated soils (Mesquite, Sweet and Shoestring Acacia, Vitex, Desert Willow). Additionally, as these species grow they develop rough or fissured bark that provides additional protection from heat and sunlight and allows the bark to heat up slowly and cool rapidly.

Trees that will not tolerate increased irrigation include Blue, Sonoran and Foothill Palo Verdes, Ironwoods, Acacia aneura (Mulga) and A. craspedocarpa (Leather Leaf Acacia). The generally smooth trunks of Palo Verde species make them particularly susceptible to sunburn injury. Sun burn damages Palo Verdes in two important ways. A significant percentage of photosynthesis is conducted through the green "bark" on the trunks and branches of Palo Verdes. Sun damage to this bark is equivalent to permanently losing a similar amount of leaf area. Further, the dead tissue created by the injury become feeding sites for wood boring insects.

Evaluating the site for potential heat problems, carefully selecting an appropriate species and proper tree placement can reduce the detrimental effects of "heat island" microclimates on landscape trees.