Combined Proceedings IPPS 73:410-412. 2023.

# The Climate Ready Landscape Plant Trials

Lorence R. Oki

Department of Plant Sciences, MS6, Room 1110 Environmental Horticulture, University of California, One Shields Avenue, Davis, CA 95616-8780

lroki@ucdavis.edu

*Keywords*: climate, landscape, deficit irrigation

## Summary

The Climate Ready Landscape Plant (CRLP) trials evaluates ornamentals at three levels of deficit irrigation to yield information about their performance and irrigation recommendations from a network of trial sites in Arizona, California, Oregon, Utah, and Washington. A weather-based irrigation protocol was used to apply deficit-irrigation treatments of 80%, 50%, or 20% of reference evapotranspiration. The frequency and quantity of irrigations varied between treatments while the volume applied was constant for all treatments. Thus, the 80% treatment was irrigated more frequently and received more water overall than the 20% treatment. Plant growth and aesthetic data were collected monthly from spring to fall when deficit treatments were imposed. Each site held at least one field day, inviting master gardeners and horticultural professionals to assess the aesthetics of the plants. This allowed researchers to contextualize the monthly aesthetic ratings with local norms and preferences while providing participants an opportunity to discover new plant material that they may use professionally. Using these data, researchers will develop irrigation recommendations for each of the 41 evaluated taxa, identifying the treatment where the least water was applied without compro-

mising aesthetics. With the results, the project seeks to leverage the wide distribution of sites across the western U.S. to identify taxa that might perform well across wide geographic ranges and inform plant selection in future locations as the climate changes to support nursery growers in selecting and offering resilient landscape plants.

## INTRODUCTION

The Climate Ready Landscape Plant (CRLP) trials is a multi-state project evaluating ornamentals on three levels of deficit irrigation to yield information about their performance and irrigation recommendations. The project is an offshoot of the UC Landscape Plant Irrigation Trial (UCLPIT) program, started at UC Davis in 2004 by Lorence R. Oki and S. Karrie Reid. In 2020, funding from the Specialty Crops Multi-state Program allowed for the development of new tests sites located in five additional western states: University of Arizona (Tucson, AZ), Oregon State University (Aurora, OR), Utah State University (Logan, UT), and University of Washington (Seattle, WA), in addition to a previously developed site at the South Coast Research and Extension Center (Irvine, CA). The project seeks to leverage the wide distribution of sites across the West to evaluate new or recently introduced plant material to identify taxa that might perform well across wide geographic ranges and inform plant selection in future locations as the climate changes to support nursery growers in selecting and offering resilient landscape plants.

The project selected six taxa to grow at all sites: *Hibiscus* Purple Pillar®; *Philadelphus* 'Blizzard'; *Rosa* Petite Knockout®; *Vitex* Blue Diddley®; and experimental selections of *Hibiscus syriacus* and *Philadelphus*, which were developed by Dr. Ryan Contreras of Oregon State University. Cooperators at each site then selected 10 additional taxa for a total of 15 taxa per site. In some cases, the same taxa were planted at multiple sites to create a "regional" plant palette (e.g. the same taxon was grown at the Arizona, California, and Oregon sites). Plant selection was determined by industry cooperators submitting plants for evaluation or guided by suggestions from an advisory committee of industry professionals with members local to each site.

At each site, plants were installed in winter or spring of 2021, spaced 2 meters on center with rows spaced 2 meters apart, and covered with 5-8 cm of mulch. In 2021, supplemental water was regularly applied using a weather-based irrigation protocol to fully establish the plants. Starting in the spring of 2022, deficit irrigation treatments of 80%, 50%, or 20% of reference evapotranspiration ($ET_o$) were imposed with eight individuals per taxa assigned to each treatment, with the percentage functioning similarly to a crop coefficient. As a result, the frequency and quantity of irrigations varied between treatments while the volume applied was constant for all treatments. Consequently, the 80% treatment was irrigated more frequently and received more water overall than the 20% treatment. For all treatments, irrigations occurred when 50% of plant available water (PAW) was removed according to ET data collected from local agricultural weather station networks,

e.g. AgriMet, CIMIS, and PAW information was derived from soil survey data. Treatments continued until Fall 2022.

Researchers at each site collected length, width, and height measurements monthly while treatments were imposed to assess if there was any growth difference amongst the treatments. Researchers also assessed aesthetics for each plant in the following categories: foliage quality, flowering quantity, pest/disease resistance, vigor, and overall appearance with a 1-5 point scale. Plants were rated in all categories on a monthly basis during the deficit season with additional mid-month flowering quantity and overall appearance recorded for blooming plants.

During the deficit season, each site held field day events, inviting master gardeners and horticultural professionals to rate the foliage quality, flowering abundance, and overall appearance of one individual per treatment for each taxon. This allows researchers to contextualize the monthly aesthetic data in local norms and preferences, while providing participants an opportunity to discover new plant material, which could be used professionally. Using these data, researchers will develop irrigation recommendations for the 41 evaluated taxa, identifying the treatments where the least water was applied without compromising aesthetics.