

# Significance to the Horticulture Industry

## Calibrachoa Flowering

**Increased Flower Production of *Calibrachoa x hybrida* by the Soil Fungus *Mortierella elongata*.** Lindsey E. Becke and Marc A. Cubeta. *Journal of Environmental Horticulture* 38(4):114-119

Growers prize Calibrachoa for their abundant production of aesthetically pleasing and colorful flowers, an aspect known to be influenced by fungal endophytes in other plants. Our research suggests that the soil fungus *Mortierella elongata* can increase the number of flowers produced by Calibrachoa during peak marketable periods. Leaf/stem and root growth varied in response to amendment of the fungus to potting media. The addition of a biological-based amendment that conveys a beneficial and desirable horticultural characteristic has the potential to become a valuable component for increasing marketability of Calibrachoa while also potentially decreasing synthetic fertilizer costs for growers.

## Consumer Purchasing

**Seeing Red? The Role of Font Color, Size, and Sale Sign Location in Retail Garden Center Displays.** Bridget K. Behe, Melinda J. Knuth, Patricia T. Huddleston, and Charles R. Hall. *Journal of Environmental Horticulture* 38(4):120-127

Sale signs are part of the array of signs merchandisers use to stimulate sales in the retail setting. More often than not, the word “sale” appears in red font color on a white background, but visual measures demonstrating the effectiveness of a red font color in capturing visual attention or eliciting purchase intention has not been thoroughly investigated. Researchers investigated the effect of font color for the word “sale” (red versus black) and font size (25% smaller, identical, or 25% larger than other font on the sign) and showing an equivalent sale price in three ways (dollar amount, 25% percent off, and buy-3-get-1-free), with the sale sign location varied (left v. right in display). There was a synergistic effect between sale font color, sale font size, and sale sign location. Findings suggest that when a red font is used for the word “sale” it should be larger than other font sizes and the sale sign should be placed to the right of the display. As study participants appeared to read the display from left to right, the red font had greater attention-grabbing power on the right side of the display and when sale appeared in a larger or smaller font size. No one way of conveying the sale offer (in terms of dollar amount, percentage, or buy one get one free) had a greater/lesser impact on likely to buy, so regional conventions may be most effective.

## Irrigation Water Alkalinity

**Alkalinity of Irrigation Return Water Influences Nutrient Removal Efficacy of Floating Treatment Wetland Systems.** Lauren M. Garcia Chance, Joseph P. Albano, Cindy M. Lee, Ashley M. Rovder, and Sarah A. White. *Journal of Environmental Horticulture* 38(4):128-142

The quality of water obtained from municipal, municipal reclaimed, surface- or ground- water sources may vary seasonally and with changes in upstream practice (e.g., herbicide residues from upstream application could enter irrigation water). Unmanaged changes in water quality could result in crop losses due to presence of plant pathogens, excess salts (foliage burns), and pesticide residues. The capacity to (1) remediate irrigation return water and water added from other sources, (2) store the water onsite, and (3)

reuse water for plant production could mean the difference between business success or failure, especially during drought events.

Floating treatment wetlands hold promise for remediation of acidic or alkaline water without the need for expensive injection systems (e.g., acid or base). Growers need better information relating how water chemistry (pH and EC) influences plant nutrient uptake (both in production systems and with regard to treatment efficacy), as conventions regarding nutrient fate and soil chemistry may not translate directly to aqueous systems. Floating treatment wetland systems can also be used to cleanse production return water prior to release offsite, limiting potential for negative environmental consequences, aiding with compliance to current and future regulations related to capture and treatment of production return water.

## Root Architecture

**Development of Root Architecture in Thirty-seven Tree Species of Field Grown Nursery Stock.** G. W. Watson and A.M. Hewitt. *Journal of Environmental Horticulture* 38(4):143-148

The nursery industry strives to produce quality plants. Considerable attention is given to developing quality root systems. Devising methods of evaluating root system architecture when transplanting seedlings early in production could result in trees with better root systems and greater vigor, both in the nursery and in the landscape. It could also reduce the number of plants with a poor root system that need to be culled later after additional expenses have been incurred. Though number and size of lateral roots as a seedling can be easily evaluated visually, these characteristics did not prove to be useful for predicting development of the architecture of the structural root system of most species. Other characteristics need to be investigated. This study did confirm that roots regenerated from the cut end of the seedling taproot do become a major component of the architecture of the structural root system in all 37 species tested. Most species had equal or greater regenerated root development than lateral root development one year after replanting the seedlings. Even when regenerated root development was significantly lower than lateral root development, the regenerated roots still comprised up to nearly half of the root system. Since these regenerated roots become a major component of the root system, this emphasizes the need to prune the taproot as short as possible so that the regenerated roots are shallow enough to survive and grow vigorously when they are later planted in shallow urban soils.

## Rooting American Chestnut

**Improving Ex Vitro Rooting and Acclimatization Techniques for Micropropagated American Chestnut.** Allison D. Oakes, Hannah C. Pilkey, and William A. Powell. *Journal of Environmental Horticulture* 38(4):149-157

When developing propagation protocols for woody species, it's almost imperative that each species, and perhaps each variety, will need its own regime for optimal growth. This paper will ideally give propagators new ideas of what culture factors to test or new ideas to try, and help propagators choose different products that might work well for their species of interest.

## Soil Solarization

**Soil Solarization to Eradicate Soilborne *Phytophthora* spp. in Container Nurseries with Surface Gravel.** Fumiaki Funahashi

and Jennifer L. Parke. *Journal of Environmental Horticulture* 38(4):158-167

Soil solarization is expected to provide effective management of many soilborne diseases, including ones caused by *Phytophthora* spp. in nurseries. However, container nursery beds are often covered by a layer of gravel, and the effect of the gravel layer on soil solarization efficacy has not been described. This research provides critical information to nursery managers about the effect of different thicknesses of gravel on belowground temperature and moisture conditions during soil solarization. Our findings demonstrate that presence of a gravel layer can be expected to increase the belowground temperature during soil solarization, but also indicate the potential for extended survival of the inoculum in the gravel

layer by being in a dry condition. Our results suggest that the 2.5 cm gravel treatment would be sufficient to enhance the effect of soil solarization throughout the soil profile, at the same time minimizing the thickness of the drier layer where the inoculum becomes more tolerant to heat. Although solarization is a promising method for eradicating *Phytophthora ramorum*, causal agent of sudden oak death (SOD), it is important to expand the research to include another species of *Phytophthora* as a possible proxy for *P. ramorum* in evaluating solarization efficacy in other locations because *P. ramorum* cannot be tested outside a quarantine facility. This research also provides a direct comparison between *P. ramorum* and *P. pini* in evaluating solarization efficacy and suggests that *P. pini* is a useful indicator of lethal conditions of solarization for *P. ramorum*.

Copyright 2020  
Horticultural Research Institute  
2130 Stella Court, Columbus, OH 43215  
p. 614-487-1117 | f. 614-487-1216 | [hriresearch.org](http://hriresearch.org)

The Journal of Environmental Horticulture (ISSN 0738-2898) is published online quarterly in March, June, September, and December. Reprints and quotations of portions of this publication are permitted on condition that full credit be given to both the HRI Journal and the author(s), and that the date of publication be stated. The Horticultural Research Institute is not responsible for statements and opinions printed in the Journal of Environmental Horticulture; they represent the views of the authors or persons to whom they are credited and are not binding on the Institute as a whole. Where trade names, proprietary products, or specific equipment is mentioned, no discrimination is intended, nor is any endorsement, guarantee or warranty implied by the researcher(s) or their respective employer or the Horticultural Research Institute.