

Ornamental Research News

Central Florida Research and Education Center

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Pulsing irrigation of container trees stimulates growth

Physiology

Dr. R.C. Beeson,
Ornamental Horticulturist

While growing trees in containers makes for easier handling, this ease comes at the cost of slower growth rates compared to field-grown trees. Studies conducted in 1990 suggested this slower growth was caused by water stress occurring in plants irrigated at dawn. To alleviate this water stress, different irrigation regimes were tested during 1992 and 1993 on crape myrtle, live oak, red maple and winged elm. Each experiment started with liners potted in March into 3- gallon containers using a 3 pine bark: 1 Florida peat: 1 sand medium. Plants were pruned as required and fertilized with Osmocote 18-6-12 in March and July. Water was applied using microirrigation via individual spray stakes and each treatment received 0.71 or 1.42 inches applied in 1, 2 or 3 subvolumes. Growth after 9 months was compared to similar trees irrigated overhead with 0.71 inches once daily.

Tree height, mass, and trunk caliper were significantly increased when irrigation was supplied as 2 or more pulses compared to overhead irrigated trees. There were no differences between single pulse irrigation and overhead irrigation. Thus, growth advantages measured were due to pulsing the irrigation rather than microirrigation alone. The minimum recommendation for producing superior xeric trees of live oak and winged elm involved splitting the irrigation into 2 pulses. The largest red maple and crape myrtle were grown with 3 pulses and would have required the equivalent of about 1.5 times more water (56 oz; 1.1 inch/day) if supplied by overhead. Even with the extra water applied in the fastest growing treatment, overall irrigation volume per bed area was extrapolated to be only 33% of that needed to produce trees with overhead irrigation. Current work involves determining when, during a 24-hr period, pulsed irrigation produces the greatest effect.

Avoid ethylene damage to foliage and flowering plants

Seasonal Watch

Dr. R.W. Henley,
Ext. Foliage Specialist

Each heating season, ethylene damages potted crops in a few greenhouses in central Florida. Unfortunately, many of the nurseries which have experienced toxic levels of ethylene in their greenhouses or tightly covered shadehouses have incurred extensive damage of sensitive crops. Damaged crops may be rendered unsalable due to loss of flowers or leaves or distortion of stems and leaves. In many of these cases, waiting for recovery through subsequent growth is not economically feasible. A very few crops may only be delayed due to partial defoliation or flower drop. Those that can quickly develop new foliage and flowers may recover sufficiently to prevent loss of the entire crop.

Ethylene, a clear, odorless, unsaturated hydrocarbon gas, is one of several by-products of incomplete combustion of fossil fuels (coal, oil and gas). Most ethylene phytotoxicity which occurs in central Florida greenhouses is due to malfunctioning forced-air heating units. Many malfunctions can be attributed to new equipment without adequate venting installed or heating units which have not been properly maintained. Although most unit heaters are installed with appropriate venting, every year we receive several reports of problems with new equipment. The majority of the problems with new units have been with portable heaters which were not vented. Such units should be used with some provision to allow outside air to the heater during its operation.

While improper maintenance can include a number of factors, the most frequent problem reported is deterioration of the burner units and heat exchangers. Incomplete fuel combustion can be estimated by looking at the burners during operation to determine the color of the flame. A blue flame indicates combustion is nearly complete while an orange flame is caused by a lack of oxygen which results in incomplete combustion. Do not wait until the day before a suspected freeze to check out your greenhouse heating system. Major flaws can be identified early and replacement parts obtained and installed before they are needed. Additional testing is desired with the onset of the heating season as houses are winterized. Unless you are an expert on installation and maintenance of the greenhouse heating systems employed in your nursery, it is best to use the services of a reputable heating company, preferably one which has experience with greenhouses.

In praise of volunteers

On Center

Dr. C.A. Conover, Center Director

In the last issue, I discussed our volunteer Research Gardener program and its benefits to this Center. In addition to Research Gardeners, there are other volunteer programs that benefit this center and the nursery industry, including service on advisory committees for research and extension, donations of

plants, growing media, agri-chemicals, pots and other contributions.

Research advisory committee members provide input, from an industry perspective, on the research needs of growers and assist in obtaining funding for our programs. If you have an interest in being a member of a research advisory committee, please let me know.

Probably the most significant and generous contributions by industry have been the donations of plants for use in research. We could conduct considerably less research if we had to purchase or grow all our own plants. We estimate that if we had to purchase plants alone, our ability to conduct research would be reduced by 20 to 25%. You can easily see why these donations are so important to all our research programs.

This newsletter was developed because of the interest of advisory committee members and an initial donation of funds. Based on the favorable comments we have received, we feel it is fulfilling its purpose of updating the industry on research and other activities at this research center. However, we hope to find a volunteer/or volunteers to underwrite the printing costs which are slightly over \$1600 per year or about \$130 per month. If you are interested, please give me a call at (407)884-2034; we will provide recognition of your contribution in the newsletter.

Consider *Malvaviscus*, or Turk's cap, as a holiday pot crop

Plant Breeding

Dr. R.J. Henny, Geneticist

In many of the older landscapes of central Florida one can find a relative of hibiscus known as *Malvaviscus arboreus*. Flowers on these plants are red, approximately 2 inches long, pendant, and never fully open, resembling a Turk's cap. The manner in which the flowers hang on a Turk's cap bush also resemble ornaments on a Christmas tree. Flowers may be present throughout the year, but production is much greater on plants during the shorter days of the fall and winter seasons. Perhaps this plant has possibilities as a holiday crop.

Since we had no cultural information on production of Turk's cap we obtained some cuttings and initiated the following study on September 28, 1993. We placed cuttings, 3-4 inches in length, directly into 4-inch pots and propagated them under 30% shade, where they rooted within 3 weeks. The rooted plants were then placed back in full sun where they were grown for an additional 8-weeks. At this time all the plants had grown significantly, developed many flower buds and looked attractive as flowering pot plants. Fertilization with 2.5 to 4.5 grams of 19-6-12 Osmocote provided no difference in growth or flowering. A single application of Cycocel at 750 ppm did reduce growth by 50%.

More work needs to be done to fully develop the potential of Turk's cap as a flowering pot plant for the

holiday season, but give some a try this fall. They root easily, grow fast and make an attractive pot within 12 weeks from sticking the cuttings. We used both tip and lateral cuttings, sticking 5 lateral or 2 tip cuttings per pot. Lateral cuttings are smaller and have only one growing point whereas tip cuttings have secondary branches that develop to make a fuller plant.

Cycocel treatment does have potential, but we need to work out the proper rate-750 ppm is too high. One benefit observed was that Cycocel-treated plants had darker green leaves than untreated plants.

Red Turk's cap are commonly seen, but there are also pink and white cultivars. We have both the red and pink cultivars but have not been able to find a white form. If any reader knows where a white-flowered cultivar is, please inform the author, because we would like to include it in our production tests.

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