PROCEEDINGS OF

RESEARCH CONFERENCE

Sixty-third Annual Report
2019

Compiled and Edited By:
Dr. Nick Gawel
Tennessee State University
College of Agriculture
Nursery Research Center
472 Cadillac Lane
McMinnville, TN 37110
63rd Annual
Southern Nursery Association

Research Conference Proceedings
2019

Proceedings of the SNA Research Conference are published annually by the Southern Nursery Association.

It is the fine men and women in horticultural research that we, the Southern Nursery Association, pledge our continued support and gratitude for their tireless efforts in the pursuit of the advancement of our industry.

Additional Copies:
2019 CD-Rom Additional Copies:
SNA Members $15.00*
Horticultural Libraries $15.00*
Contributing Authors $15.00*
Non-Members $20.00*
*includes shipping and handling

© Published May, 2019
Southern Nursery Association, Inc.

BOARD OF DIRECTORS

President
Joseph Napoli
Athens Wholesale Growers
495 Belmont Rd
Athens, GA 30605
Tel: 706.546.6638
Fax:706.546.0263
Email: awn1984@att.net

Vice President/Treasurer
Director Chapter 3
Arkansas, Kentucky, Missouri, Oklahoma, Tennessee
Rickey Minton
Triangle Nursery
8526 Beersheba Hwy
McMinnville, TN 37110
Tel: 931-688-8022
Fax: 931-683-3297
Email: triangle@blomand.net

Director Chapter 4
Alabama, Louisiana, Mississippi, Texas
Todd Ellefson
Windmill Nursery
12398 Hwy 25
Franklinton, LA 70438
Tel: 985-786-9655
Fax: 800-370-3854
Email: todd@WindmillNurseryLLC.com

Director Chapter 2
Florida, Georgia, South Carolina
Marcus Cook
Marcus Cook Farms
PO Box 336
1229 Hwy 92
Gray Court, SC 29645
Tel: 864-876-2351
Email: Marty@marcuscookfarms.com

Director Chapter 1
Maryland, North Carolina, Virginia, West Virginia
Matthew Shreckhise
Shreckhise Nurseries
PO Box 428
Grottoes, VA 24441
Tel: 540-249-5761
Fax: 540-249-5762
Email: matthew@shreckhise.com

Immediate Past President
Norman Cole, III
Cole Nurseries
PO Box 210
Pipestem, WV 25979
Tel: 304.466.1970
Email: thecoles1@frontiernet.net

Executive Vice President
Karen Summers
Southern Nursery Association
PO Box 801454
Acworth, GA 30101
Tel: 678.809.9992
Fax: 678.809.9993
ksummers@sna.org

Board Advisor
Danny Summers
PO Box 801454
Acworth, GA 30101
Tel: 678.809.9992
Fax: 678.809.9993
dsummers@sna.org

RESEARCH CONFERENCE
Director of Horticultural Research & Conference Chair
Dr. Nick Gawel
Tennessee State University
Nursery Research Center
472 Cadillac Lane
McMinnville, TN 37110
ngawel@tnstate.edu
Acknowledgments

The Editor and Board of Directors of the Southern Nursery Association wish to express their sincere appreciation to Anthony Witcher, Karla Addesso, Win Dunwell, Lesley Judd, Yan Chen, Raul Cabrera, Fulya Baysal-Gurel, Lisa Alexander, Donglin Zhang, Zenaida Viloria and Anthony LeBude for the fine job they did as Section Editors and Moderators. Without the efforts of all these people, the conference would not happen and this year’s Proceedings would not be published.

Special thanks are extended to the sponsors of the 2019 SNA Research Conference, Bennett’s Creek Nursery and Lancaster Farms. Without the financial contributions of these sponsors, the conference could not be held.

We extend our gratitude to all the researchers and nurserymen who attended the 63rd Annual SNA Research Conference and/or contributed to these Proceedings. You make this annual event a success.

Notice

Mention of a trademark name on a proprietary product does not constitute a guarantee and/or warranty of the product by the researcher(s) or their respective universities or the Southern Nursery Association and does not imply its approval to the exclusion of other products that may also be suitable.

Permission to reprint articles and quotations of portions of this publication is hereby granted on condition that full credit be given to both the author(s) and the publication, Proceedings of the SNA Research Conference, along with the date of the publication.

The Southern Nursery Association is not responsible for the statements and opinions printed in the Proceedings of the SNA Research Conference; they represent the views of the author(s).
Using Research Data Safely and Effectively

Good research is conducted under an exact set of controlled conditions, varying only the specific treatments which are to be evaluated. Results from the specific treatments are directly applicable to your operations only if all the conditions in your operation are controlled the same as in the research. Unfortunately, this seldom happens. However, this does not mean that you cannot benefit from the research. What it does mean is that you should use the research information on a trial basis if your plant species, soil type, watering method, size and age of plant, climatic region, etc. is different than that described by the researcher.

What an alert grower should expect to gain from these research reports is ideas – ideas as to the best control for insects, disease, nematodes and weeds – labor saving ideas such as chemical pruning and using growth regulators to minimize maintenance. Also, ideas on water management, nutrition, alternative growing media, new plants for landscaping and guides for improving profits and marketing skills can also be found.

Should you desire additional information on any report, please contact the author.
THE PORTER HENEGAR MEMORIAL AWARD

for

HORTICULTURAL RESEARCH

Allen Owings

The Southern Nursery Association honored
Dr. Allen Owings with the Porter Henegar Memorial Award during the 62nd Annual SNA Research Conference.

Originally known as the Research Award of Merit, the recognition was created in 1968 to honor those individuals who have made outstanding contributions to ornamental horticulture research and specifically to members of the association. In 1972, the award was renamed the Porter Henegar Memorial Award in honor of one of SNA’s former Executive Secretaries. Nominations are made each year by the SNA’s Director of Research and past award winners.

Dr. Owings was born and raised in Hammond, LA. He holds a BS degree (plant science) from Southeastern Louisiana University, MS degree (Horticulture) from LSU and PhD (Horticulture) from Mississippi State University.

Dr. Owings began his career as professor at the LSU AgCenter - Calhoun Research Station in 1992 and continued as resident coordinator at the LSU AgCenter – Hammond Research Station before retiring in 2017 after 25 years of service. He provided statewide extension service programming for nursery growers, landscapers, garden centers and secondarily to master gardeners and home gardeners. Dr. Owings coordinated the LSU AgCenter Louisiana Super Plant program and conducted research in the area of ornamental horticulture plant trials and evaluation programs.

Since October 2017, Dr. Owings has been employed as senior horticulturist at Bracy’s Nursery in Amite, LA and horticulturist at Clegg’s Nursery in Baton Rouge, LA. In this role he works in the area of new plant recommendations, social media education, horticulture outreach and customer relations.

Dr. Owings has participated annually in the SNA research conference since 1987 and has published over 70 articles in the proceedings. He was an inaugural recipient of SNA’s Sidney B. Meadows Scholarship.

In his free time, Allen enjoys gardening, golf, and LSU sports.
The Bryson L. James
Student Research Competition
2019 Awards

This long-standing program was renamed in August 1989, in honor of Dr. Bryson L. James, longtime Director of Horticultural Research for the Southern Nursery Association. As Dr. James has been an active participant and leader in the annual Research Conference for more than 50 years, the award, named in his honor, is a tribute to his tireless efforts on behalf of the researchers, the association and the industry. Listed below are guidelines for the Student Competition as well as this year’s winners:

1. Any student of a university or a college having researchers that participate in the Southern Nursery Association Research Conference, are not more than one (1) academic year removed from graduation and whose research was completed prior to graduation are eligible to compete.

2. Research is to be that of the presenter and a part of his/her educational studies. Contract work, unless a part of a thesis or classroom report (credit given), is not acceptable, as it may provide unlimited funding and an unfair advantage.

3. The number of student papers from a single university or college may be limited, should time restraints dictate.

4. The student must have submitted a title to the SNA Conference Editor by the deadline specified in the Call For Titles. The paper should then be submitted to the Section Editor for the Student Competition no later than the specified deadline.

5. The paper must follow the guidelines for format and subject matter as stated in the Call For Titles for the SNA Research Conference.

6. Student and advisor should be listed as co-authors.

7. Oral presentation must be limited to seven (7) minutes. An additional three (3) minutes will be allotted for questions. A penalty of two (2) points per minute or part thereof for every minute over seven (7) minutes will be assessed.

8. Judging shall be based on preparation of the paper (50 points) and oral presentation (100 points) for a total of 150 points.

2019 Bryson L. James Student Competition Award Winners

M.S. Candidates
1. Mary Lewis  
University of Georgia
2. Ian Howard  
University of Maryland

Ph.D. Candidates
1. Jenny B. Ryals  
Mississippi State University
2. Lauren Garcia Chance  
Clemson University
3. Kaitlin Barrios  
University of Georgia
<table>
<thead>
<tr>
<th>Origin</th>
<th>Page(s)</th>
<th>Title and Author(s)</th>
</tr>
</thead>
</table>
| GA      | 2-6     | Hybridization of Native Asclepias Species for the Creation of Novel Cultivars  
Mary Lewis, Matthew Chappell*, Paul Thomas, Donglin Zhang |
| OR      | 7-10    | Two SNPs Identified Using GBS are Associated with Reblooming in Dwarf Lilacs  
Ryan Contreras, Hsuan Chen, Jason Lattier, and Kelly Vining |
| KY      | 11-14   | Harnessing the Power of Epigenetic Priming to Improve Stress Tolerance in Vegetative Propagated Perennial Crops  
Carlos M. Rodríguez López |
| GA      | 15-17   | ‘Formosan Gold’ Sweetgum  
John M. Ruter and Kaitlin Barrios |
| TN      | 18-27   | Genetic Diversity of Cultivated Hydrangea Using Genotyping-by-Sequencing (GBS)  
Xingbo Wu and Lisa W. Alexander |
| NJ      | 29-36   | Diagnosing Aesthetic and Growth Disorders in Hydrangea Plants under Commercial Nursery Production  
Raul I. Cabrera, Eric Petit and Brad Moran |
| AL      | 37-43   | Effects of Lime and Fertilizer Rate on Growth of Citrus Rootstock, *Poncirus trifoliata* var. monstrosa 'Flying Dragon'  
Jeremy M. Pickens and John W. Olive |
| TN      | 44-50   | Effects of Compost Substrates on Root Zone Temperature and Growth of ‘Green Giant’ Arborvitae  
Anthony L. Witcher and Jeremy M. Pickens |
| AL      | 51-56   | Greenhouse Gas Emissions as Impacted by High Wood Fiber Substrate in the Production of Three Annual Crops  
Anna-Marie Murphy, Stephen A. Prior, G. Brett Runion, H. Allen Torbert, Jeffrey L. Sibley, Glenn B. Fain and Jeremy M. Pickens |
| KS      | 57-63   | Response of Spiraea and Buddleia to Controlled-release Fertilizer With or Without Phosphorus  
Danielle Haynos and Tom Yeager |
| MX      | 64-69   | Root Colonization with Arbuscular Mycorrhizal Fungi and Supplementary P Improves Nutrient Status, Growth and Physiological Performance of the Flamingo Flower (*Anthurium pedata-radiatum* Schott. ssp. *pedata-radiatum*: Araceae)  
Aurora Genoveva Palafox Arroyo, Andrés Adolfo Estrada-Luna, Victor Olalde-Portugal, César Daniel Estrada-De La Rosa, Feliza Ramón Farías, Martha Elena Pedraza Santos |
<table>
<thead>
<tr>
<th>Origin</th>
<th>Page(s)</th>
<th>Title and Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economics and Marketing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| KY           | 71-77   | Engaging Elementary Students into Horticulture with Cooperation of Master Gardeners Through Multidisciplinary Approaches in Rural Kentucky  
Zenaida Viloria, Winston Dunwell, Ric Bessin, Edwin Ritchey, Raul Villanueva, Daniel Becker, Amanda Martin |
| FL           | 78-86   | Consumer and Producer Preferences for Neonicotinoid Pesticide Labeling in the U.S. Green Industry  
Hayk Khachatryan, Xuan Wei, and Alicia Rihn                                                                                                                     |
| TN           | 87-93   | Tennessee Home Gardener Preferences for Environmental Attributes in Gardening Supplies: A Multiple Indicators Multiple Causation Analysis  
McKenzie Thomas, Kimberly Jensen, Christopher Clark, Burton English, Dayton Lambert, and Forbes Walker                                                      |
| Growth Regulators                                    |         |                                                                                                                                                                                                                     |
| GA           | 95-100  | Flurprimidol and Paclobutrazol Drench Applications Influence Growth of *Helianthus simulans*  
Kaitlin Barrios and John M. Ruter                                                                               |
| Landscape    |         |                                                                                                                                                                                                                     |
| GA           | 102-108 | Perennial Wheat on Georgia Roadsides: A Pilot Study  
Brad E. Davis, Matthew J. Quirey                                                                                                                                     |
| Plant Pathology and Nematology                       |         |                                                                                                                                                                                                                     |
| AL           | 110-114 | Research Updates on Bacterial Gall of Loropetalum  
Jeremy M. Pickens, Kassie N. Conner and John W. Olive                                                                                                            |
| VA           | 115-117 | Utilization of Plant Endophytes for Control of Boxwood Blight  
Ping Kong and Chuanxue Hong                                                                                                                                     |
| TN           | 118-121 | Management of Cercospora Leaf Spot of Hydrangea with Fungicides and Biorational Products  
Fulya Baysal-Gurel and Terri Simmons                                                                                |
| TN           | 122-124 | Evaluation of Fungicide Rotations at Different Application Intervals for the Control of Powdery Mildew of Dogwood  
Fulya Baysal-Gurel and Terri Simmons                                                                                |
| Plant Propagation                                    |         |                                                                                                                                                                                                                     |
| MS           | 126-130 | Softwood and Semi-Hardwood Cutting Propagation of Shumaka™ Crape Myrtle  
Jenny B. Ryals, Patricia R. Knight, Scott Langlois, Eugene K. Blythe, J. Skylar Baldwin, Christine Coker, Gary Bachman, Jim DelPrince, and Anthony T. Bowden |

*ix*
<table>
<thead>
<tr>
<th>Origin</th>
<th>Page(s)</th>
<th>Title and Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>KY</td>
<td>131-135</td>
<td>Using a Modified Hydroponic System for Cutting Stock Plants Robert L. Geneve and Sharon T. Kester</td>
</tr>
<tr>
<td>MX</td>
<td>136-139</td>
<td>Plantlet Morphology and Fertilization Frequency Affect Growth and Productivity of Micropropagated <em>Turbinicarpus saueri</em> ssp. ysabelae (Schlange) (Cactaceae) after Transplanting Andrés Adolfo Estrada-Luna</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Water Management</strong></td>
</tr>
<tr>
<td>FL</td>
<td>141-146</td>
<td>Monitoring Container Water Loss and Gain with a Data-Logging Scale Jeff Million and Tom Yeager</td>
</tr>
<tr>
<td>SC</td>
<td>155-161</td>
<td>South Carolina Irrigation Water Source and Methods for the Specialty Crops Production Industry Lauren M. Garcia Chance, Natasha L. Bell, Megan E. Chase, W. Walker Spivey, Sarah A. White</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Engineering and Structures and Innovation</strong></td>
</tr>
<tr>
<td>MD</td>
<td>163-168</td>
<td>Modifying Green Roof Substrates for Nutrient Retention in Urban Farming Systems Ian Howard, Andrew Ristvey and John Lea-Cox</td>
</tr>
<tr>
<td>MD</td>
<td>169-174</td>
<td>Monitoring Urban Landscapes to Measure Ecosystem Services John Lea-Cox, Bruk Belayneh, Olyssa Starry, and Darren DeStefano</td>
</tr>
<tr>
<td>AL</td>
<td>175-178</td>
<td>Evaluation of Shade Cloth Color in Cooling Efficiency Jeremy M. Pickens, Raymond J. Kessler and Daniel E. Wells</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Entomology</strong></td>
</tr>
<tr>
<td>KY</td>
<td>180-186</td>
<td>Evaluation of Pyrethroids and New Strategies to Deter Ambrosia Beetle Attacks in Nurseries Zenaida Viloria, Ric Bessin, Win Dunwell, Ginny Travis, Christopher Ranger, and Raul T. Villanueva</td>
</tr>
<tr>
<td>AL</td>
<td>193-197</td>
<td>Time of day affects performance of spinosad for Chilli thrips (<em>Scirtothrips dorsalis</em> Hood) David Held, Jeremy Pickens, and Kyle Owsley</td>
</tr>
<tr>
<td>Origin</td>
<td>Page(s)</td>
<td>Title and Author(s)</td>
</tr>
<tr>
<td>--------</td>
<td>---------</td>
<td>---------------------</td>
</tr>
</tbody>
</table>
| TX     | 198-201 | Active Predators of Crapemyrtle Bark Scale  
Victoria Hicks, Kyle Gilder, and Kevin M. Heinz |
| AL     | 202-209 | Phenology and control of false oleander scale  
(Pseudaulacaspis cockerelli) on Aucuba japonica  
Kendra M. H. Carson and David Held |