**Ryan Dickson**

Department of Horticulture

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**EDUCATION**

2016 Ph.D. in Environmental Horticulture, Dept. of Environmental Horticulture, University of Florida. ‘Evaluation of floriculture and edible plant species effects on root zone pH’

2009Bachelor of Science in Environmental Horticulture, University of Florida, Degree Specialization: Horticultural Operations

**PROFESSIONAL EXPERIENCE**

October 2018 – Present Assistant Professor for Greenhouse Management and Controlled Environment Horticulture (80% research/20%teaching), University of Arkansas, Department of Horticulture.

Sept 2016 – September 2018 Extension State Specialist for Greenhouse Management and Technologies (60% extension/30% research/10% teaching), University of New Hampshire Cooperative Extension, Dept. of Agriculture, Nutrition, and Food Systems. *Research and extension:* pH and nutrient management, water quality, sensor-based and wireless irrigation technology, propagation, evapotranspiration, soilless substrates, post-production, online training videos, controlled-environment factors (light, temperature, CO2, humidity). *Teaching:* Undergraduate (SAFS 689) and graduate level (ANFS 895) Greenhouse Operations and Management

July 2012 – July 2016 Research Assistant (previously greenhouse technician and biologist), Department of Environmental Horticulture, University of Florida. Quantifying hydroponic and floriculture crop species acidic and basic root responses. Also worked on irrigation scheduling in stock plants, water treatment technology/agrichemicals, crop scheduling for greenhouse blueberry, soilless substrates, propagation, organic fertilizer strategies, online training videos for hydroponics and floriculture.

Dec 2009 – Jun 2012 Head Grower at Propagation Facility, Welby Gardens, CO. Lead grower for hydroponic basil, arugula, lettuce, and mint and organic basil. Lead propagator and grower for annual and perennial bedding plants. Responsible for greenhouse facility fertilizer, irrigation, pest control, and crop scheduling decisions. Responsible for environmental control computer decisions. Oversaw harvesting and quality control. Managed a grower and labor staff.

Jan 2008 – May 2009 Plant Tissue Culture Technician, Dept. of Environmental Horticulture, University of Florida. Maintained *in vitro* cultures of sea oats, blueberries, strawberry, and various aquatic plants. Conducted research on allelopathy of invasive aquatic fern *Salvinia molesta*.

**PUBLICATIONS**

**Refereed Journal and Proceedings Articles**

1. Gomez, C. C.J. Currey, R.W. Dickson, H. Kim, R. Hernandez, N.C. Sabeth, R.E. Raudales, R.G. Brumfield, C. Singer, A. Laury-Shaw, A.K. Wilke, R.G. Lopez, S.E. Burnett. *Submitted 2019.* Controlled environment food production for urban agricultlure. HortScience.
2. Dickson, R.W. and Fisher, P.R. *In press*. Quantifying the acidity-basicity of leafy greens and herb species in peat substrate and hydroponics. HortScience.
3. Dickson, R.W. and Fisher, P.R. *In press*. Quantifying pH effect of fifteen floriculture species in peat substrate. Proc. IS on Growing Media and Soilless Cultivation. Acta Hort.
4. Dickson, R.W., Fisher, P.R., and Argo, W.R. 2017. Quantifying acidity and basicity of fifteen floriculture species in peat substrate. HortScience 52 (8): 1065-1072.
5. Dickson, R.W, and Fisher, P.R. 2017. Ammonium-nitrate ration and cation/anion uptake affect the acidity or basicity of floriculture species. Proc. IS on Growing Media and Soilless Cultivation. Acta Hort. 1168, ISHS
6. Dickson, R.W., Fisher, P.R., Padhye, S.R., and Argo, W.R. 2016. Evaluating calibrachoa (*Calibrachoa* × *hybrida* Cerv.) genotype sensitivity to iron deficiency at high substrate pH. HortScience. 200: 1452-1457.
7. Fisher, P.R. and Dickson, R.W. 2016. Improving irrigation practices in container stock plant production of herbaceous plant cuttings. International Symposium on Protected Cultivation in Tropical and Temperate Climates. Acta Hort. *In press*.
8. Dickson, R. W., Fisher, P. R., Argo, W. R., Jacques, D. J., Sartain, J. B., Trenholm, L. E., and Yeager, T. H. 2016. Solution ammonium: nitrate ratio and cation/anion uptake affect acidity or basicity with floriculture species in hydroponics. Scientia Horticulturae, 200, 36-44.
9. Fisher, P.R., Dickson, R.W., Mohammad-pour, G.S., Huang, J. 2014. Effect of solution electrical conductivity (EC) and pre-plant nutrient form on the pH of a peat-perlite substrate. Proc. IS on Growing Media and Soilless Cultivation. Acta Hort. 1034, ISHS

**Industry Publications**

1. Dickson, R. Avoid tip burn in hydroponic lettuce. e-GRO Edible Alert. March 2019.
2. Dickson, R. Overview of pH and electrical conductivity meters. GrowerTalks. January 2019.
3. Dickson, R. Magnesium or micronutrient deficiency in basil? Don’t be fooled. e-GRO Edible Alert. May 2018.
4. Dickson, R. and R. Raudales. Avoiding ammonium toxicity. GrowerTalks. January 2019.
5. Dickson, R. and R. Raudales. Trays too dry? GrowerTalks. January 2019.
6. Raudales, R, and R. Dickson. Save Water, Save Time. GrowerTalks. November 2018.
7. Dickson, R. Dealing with salty irrigation water. e-GRO Alert. May 2018.
8. DeGenring, L., Dickson, R., and Poleatewich, A. What is swimming around your roots? e-GRO Edible Alert. April 2018.
9. Kacira, M., Mattson, N., Dickson, R. and Lopez, R. 2018. Urban crop production in vertical farms. Greenhouse Management.
10. Dickson, R. Having success with container edibles. GrowerTalks. September 2017.
11. Dickson, R. and P. Fisher. Understanding the pH personality of your crops. GrowerTalks. August 2017.
12. Dickson, R. and P. Fisher. Why do geraniums drop pH? GrowerTalks. May 2017.
13. Dickson, R. Control plant growth and height for potted herbs. e-GRO Edible Alert. May 2017.
14. Dickson, R. and P. Fisher. Edible crop species differ in their pH effect in hydroponics. Produce Grower. July 2017.
15. Dickson, R. and P. Fisher. High pH is often caused by excessive leaching. Greenhouse Management. June 2017.
16. Dickson, R. High pH caused by excessive leaching. e-GRO Alert. June 2017.
17. Dickson, R. Manage pH using water soluble fertilizers. e-GRO Alert. February 2017.
18. Fisher, Paul, Jinsheng Huang, Maria Paz, and Ryan Dickson. Having success with organic growing mixes. GrowerTalks. February 2016.
19. Fisher, Paul, Rosanna Freyre, Javier Lopez, Ryan Dickson, and Bruce Mackay. Avoiding the inflight video. GrowerTalks. Vol 79:3, January 2015
20. Fisher, P., Huang, J., Freyre, R., and Dickson, R. Too wet or too dry? GrowerTalks. February 2015.
21. Fisher, P., Dickson, R., Argo, B., and Mackay, B. Advanced pH Management. GrowerTalks. July 2014

**SCIENTIFIC PRESENTATIONS**

1. Quantifying the acidity-basicity of edible leafy greens and herbs grown in peat-based substrate and hydroponics. American Society for Horticultural Sciences Annual Conference. Washington D.C. 2018.
2. Quantifying the acidity and basicity of fifteen floriculture species grown in peat-based substrate. ISHS International Growing Media and Substrates Conference. Portland, OR 2017.
3. Quantifying the acidity and basicity of fifteen floriculture species. American Society for Horticultural Sciences Annual Conference. Kona, HA 2017.
4. Evaluating calibrachoa genotype sensitivity to iron deficiency at high substrate pH. American Society for Horticultural Sciences Annual Conference. Atlanta, GA 2016.
5. Solution ammonium:nitrate ratio and cation/anion uptake affect acidity or basicity with floriculture species in hydroponics. ISHS International Growing Media and Substrates Conference (SUSGRO 2015). Vienna, Austria, 2015.
6. Species Effects on Acidity or Basicity in Hydroponic Solutions. American Society for Horticultural Sciences Annual Conference. Orlando, FL 2014.
7. Species Effects on Acidity or Basicity in Hydroponic Solutions (Poster). National Floriculture Forum, Manitoba, 2014.

**HIGLIGHTED SKILLS**

Experience problem-solving production issues in commercial greenhouse operations

Experience developing training videos for growing and labor staff working in commercial greenhouse operations

Using *in vitro* methods for plant tissue culture and propagation

Modelling of chemical and fertilizer interactions in water systems using Visual Minteq

Knowledge of building and operating controlled environment agriculture systems

**PROFESSIONAL ORGANIZATIONS**

American Society for Horticultural Sciences, International Society for Horticultural Sciences

**TEACHING**

Currently developing online hydroponics course with collaborators from the Universities of Florida and Connecticut. Scheduled to run in January 2019. Responsibilities include leading curriculum development (course objectives, learning goals and activities), creating and delivering lectures on formulating and managing hydroponic nutrient solutions.

Worked on online training and educational videos for greenhouse production. Dept. of Environmental Horticulture, University of Florida. Topics on hydroponic systems, nutrient and irrigation management, sticking cuttings, pulling orders, *in vitro* propagation. Responsibilities included developing scripts, voicing/recording scripts, filming, editing video, production.

Guest lectures in undergraduate courses in the Depts. of Environmental Horticulture and Soil and Water Chemistry, University of Florida, on managing irrigation using sensor-based technology and modelling chemical equilibria in soil solutions using Visual Minteq 3.0.

**STUDENT MENTORING**

1. Josh Tebow, current undergraduate Bumpers College Honors Student, University of Arkansas
2. Crysta Harris, current M.Sc. student (major advisor). Department of Agriculture, Nutrition, and Food Systems, University of New Hampshire. Topic: Evaluating the potential of expanded wood fiber as a soilless substrate component in greenhouse production.
3. Jonathan Ebba, current M.Sc. student (major advisor). Department of Plant Biology, University of New Hampshire. Topic: Evaluating fertilizer strategies to improve post-production performance of container-grown crops.
4. Liza DeGenring, current M.Sc. student (graduate committee member). Department of Agriculture, Nutrition, and Food Systems, University of New Hampshire. Topic: Evaluating bio-pesticides for their efficacy in controlling *Pythium* in hydroponic tomato.
5. Anna DeVitto, current M.Sc. student (graduate committee member). Department of Agriculture, Nutrition, and Food Systems, University of New Hampshire. Topic: Nutrient management in de-coupled aquaponics systems using strawberry as a model crop.
6. Allison Lehoux, current Undergraduate Research Award recipient, University of New Hampshire. Provide mentoring, help conduct research and manage research budget. Project: Effects if wood fiber substrate and irrigation practices on rooting of blackberry.
7. Dan Birnstihl, former Undergraduate Research Award recipient, University of New Hampshire. Provided student mentoring, helped conduct research and manage research budget, write internal peer-review article. Project: Novel strategies to control height in hydroponic leafy greens and herbs.

**HONORS AND AWARDS**

* 2017 Kenneth Post Award for Graduate Research in Floriculture for ‘Evaluating calibrachoa (*Calibrachoa* × *hybrida* Cerv.) genotype sensitivity to iron deficiency at high substrate-pH’ published in HortScience 51(12):1452-1457.
* 2016 Gene and Barbara Batson Environmental Horticulture Scholarship. $2,000.
* 2015 Sidney B. Meadows Scholarship Endowment recipient. Southern Nursery Association. $1,500