

Nicole L. Waterland

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Education

Ph.D., Horticulture and Crop Science, The Ohio State University, Wooster, OH, 2010.
M.S., Horticulture, Iowa State University, Ames, IA, 2004.
B.S., Horticulture with specialization in Greenhouse Production and Management and minor in Genetics, Iowa State University, Ames, IA, 2002.

Professional Experience

2010–Current Assistant Professor of Horticulture, Division of Plant and Soil Sciences, West Virginia University
2005–2010 The Ohio State University, Wooster, OH, *Graduate Research Associate*
2002-2004 Iowa State University, Ames, IA, *Graduate Research/Teaching Assistant*
2001 Reiman Gardens, Ames, IA, *Facility Manager*
1999-2002 Iowa State University, Ames, IA, *Undergraduate Research Assistant*

Awards and Honors

Research -West Virginia University Division of Plant and Soil Sciences Outstanding Faculty Service in 2013
-American Society for Horticultural Science Outstanding Extension Publication Award in 2011
-Graduate Student Poster Abstract Award NCERA-101, 2006

Teaching University Teaching Excellence Award at ISU in 2004

Honor Societies Phi Kappa Phi, 2008 to present
Pi Alpha Xi, 2006 to present
Gamma Sigma Delta, 2004 to present

Scholarships & Academic Awards -American Floral Endowment Mike and Flo Novovesky Scholarship at The OSU in 2009
-American Floral Endowment Seed Companies Scholarship at The OSU in 2008
-Gladys Wittmeyer Knox Gene Wittmeyer Scholarship at The OSU in 2008
-OFA Scholar at The OSU in 2007
-Recipient of Iowa Master Gardeners Scholarship at ISU in 2002, 2003, and 2004
-Hattie Traviss Scholarship at ISU in 2001
-Dean's List at ISU; Spring 2000, Spring 2001, Fall 2001, and Spring 2002

-Academic Recognition Awards at ISU Fall 1998 through Spring 2002

Research Grants

Gu, Y., Park, Y.-L., **N.L. Waterland**, J. Gross, X. Li, and G. Marani Precision robotic pollinator USDA NRI, External Competitive Grant, (\$1,065,010).

Verlinden, S., **N.L. Waterland**, L. Jett, Y. Moon, J. Skousen, L. McDonald and E.M. Pena-Yewtukhiw, Comprehensive strategy for maximizing high tunnel efficiency and profit for growers in West Virginia. USDA NRCS. Cooperative Agreement with USDA-NRCS Grant, (Pending, \$232,415).

Waterland, N.L., Miracle-Gro potting mix project. The Scotts Miracle-Gro Company. External Competitive Grant, \$17,270.66.

Waterland, N.L. and C. Heubner, Invasive plant response to environmental change. U.S. Forest Service Grant. External Noncompetitive Grant, \$35,565.20.

Waterland, N.L., Miracle-Gro potting mix project. The Scotts Miracle-Gro Company. External Competitive Grant, \$22,191.98.

Waterland, N.L., Miracle-Gro potting mix project. The Scotts Miracle-Gro Company. External Competitive Grant, \$25,599.64.

Waterland, N.L. and Y. Moon, Development of petunia with enhanced drought stress tolerance. AFE, American Floral Endowment. External Competitive Grant, \$41,065.

Waterland, N.L., Miracle-Gro potting mix project. The Scotts Miracle-Gro Company. External Competitive Grant, \$6,000.

Park, Y.-L., **N.L. Waterland**, S. Gururajan and E. Lee, Effect of climate change on multitrophic interactions among solitary pollinator bees and associated pests and crops. USDA AFRI. External Competitive Grant, \$148,955.

N.L. Waterland, Deciphering the drought stress tolerance mechanism in ornamental plants. WVU Senate Grant. Internal Competitive Grant, \$14,800.

Lin, L. S., **N.L. Waterland** and K. Semmens, Flow-through aquaponics to improve water quality and generate income. USDA NRCS CIG, External Competitive Grant, \$134,974.

N.L. Waterland, K. Buzby and K. Semmens, Aquaponic plant production and nutrient removal: pond management and value-added income. USDA Special Research Grants Program \$94,612.

Publications

E.M. Pena-Yewtukhiw, E. Romano, **N.L. Waterland** and J. Grove, 2016, Benefits of composted manure application and sod component on soil health within one cycle of long-term organic crop rotations (submitted).

Johnson, G.E., K.M. Buzby, S. Park, K.J. Semmens and **N.L. Waterland**, 2016, Comparison of two harvest methods for lettuce (*Lactuca sativa* L.) production in a flow-through aquaponics system. (submitted)

Johnson, G.E., K.M. Buzby, S. Park, K.J. Semmens and **N.L. Waterland**, 2016, Evaluation of lettuce (*Lactuca sativa* L.) types and cultivars for performance in a flow-through aquaponics system. (submitted)

Johnson, G.E., K.M. Buzby, S. Park, K.J. Semmens and **N.L. Waterland**, 2016, Year-round lettuce (*Lactuca sativa* L.) production in a flow-through aquaponic system (submitted)

Waterland, N.L., J.C. Tou, M.J. Kim, S. Park and Y. Moon, 2016, Phytochemical content in three varieties of kale (*Brassica oleracea* v. *acephala* and *Brassica napus*) differed depending on cultivar, growth stage and leaf color. (submitted)

Waterland, N.L., J.C. Tou, M.J. Kim, E.M. Pena-Yewtukhiw, S. Park and Y. Moon, 2016, Dietary mineral content in three varieties of kale (*Brassica oleracea* v. *acephala* and *Brassica napus*) among microgreen, baby leaf and adult stages. (submitted)

Kim, M.J., Y. Moon, D.A. Kopsell, S. Park, J.C. Tou, and **N.L. Waterland**, 2016, Nutritional value of crisphead 'Iceberg' and romaine lettuces (*Lactuca sativa* L.); Red or green? (submitted)

Buzby, K.M., T.P. West, **N.L. Waterland**, and L.-S. Lin, 2016, Remediation of flow-through trout raceway effluent via aquaponics. *North American Journal of Aquaculture* (In press).

Park, S., S.A. Mills, Y. Moon and **N.L. Waterland**, 2016, Evaluation of antitranspirants for enhancing temporary water stress tolerance in bedding plants. *HortTechnology*. (In press).

Kim, M.J., Y. Moon, J.C. Tou, B. Mou and **N.L. Waterland**, 2016, Nutritional value, bioactive compounds and health benefits of lettuce (*Lactuca sativa* L.). *J. of Food Composition and Analysis* 49:19-34.

Buzby, K.M., **N.L. Waterland**, K.J. Semmens and L.-S. Lin, 2016, Evaluating aquaponic crops in a freshwater flow-through fish culture system. *Aquaculture* 460:15-24.

Waterland, N.L. and M.L. Jones, 2013, Exogenous ABA applications delay drought-induced wilting but cause leaf and flower abscission in fuchsia. *Acta Horticulturae* 970:29-35.

Waterland, N.L., J.J. Finer and M.L. Jones, 2010, Abscisic acid applications decrease stomatal conductance and delay wilting in drought-stressed chrysanthemums. *HortTechnology*. 20:896-901.

Waterland, N.L., J.J. Finer and M.L. Jones, 2010, Benzyladenine and gibberellic acid application prevents abscisic acid-induced leaf chlorosis in pansy and viola. *HortScience*. 45:925-933.

Waterland, N.L., C.A. Campbell, J.J. Finer and M.L. Jones, 2010, Abscisic acid application enhances drought stress tolerance in bedding plants. *HortScience*. 45:409-413.

Waterland, N.L. and R.J. Gladon, 2009, Hypoxia controls hypocotyl and radicle growth in germinated impatiens seeds. *HortScience* 44:125-129.

In preparation

Park S., A. Wijeratne, Y. Moon and **N.L. Waterland** Transcriptome analysis of *Petunia ×hybrida* under water deficit stress

Park S., Y. Moon, A. Wijeratne and **N.L. Waterland** Comparison between genome mapping and transcriptome mapping of RNA sequencing using *Petunia ×hybrida* transcriptome under water deficit stress

Park S., Y. Moon, and **N.L. Waterland** Effect of pre-treatment of calcium to enhance water deficit stress tolerance in bedding plants

Mills, S.A., Y-L. Park and **N.L. Waterland** Effect of temperature on floral development of blueberries (*Vaccinium corymbosum* L.)

Extension and Trade Publications

N.L. Waterland and M.L. Jones, 2011, ABA applications enhance temporary drought stress in six bedding plant species. Floribyte Floriculture Newsletter. Volume 6, Issue 3, September 2011.

M. L. Jones and **N.L. Waterland**, 2011, s-ABA: A new PGR to extend shelf life and increase sell-through. OFA Bulletin, 929:20-22.

M.L. Jones and **N.L. Waterland**, 2011, ABA applications delay drought-induced wilting in garden mums. Floribyte Floriculture Newsletter. Volume 6. Issue 1, March 2011.

M.L. Jones and **N.L. Waterland**, 2011, ABA applications delay drought-induced wilting in garden mums. Purdue Extension E-bulletin, The Indiana Flower Grower. 5(1): 7-8.

Two of my peer-reviewed publications were summarized in “Ask the Doctor” by Dr. Steve Carver, (November/December 2011 Number 930) OFA. OFA Bulletin is a grower oriented publication.

Conference Presentations/Papers

Mills, S.A., Y. Moon, and **N.L. Waterland**, 2016, The interactive effect of elevated carbon dioxide, temperature, and water deficit stress on growth and flower development of petunia (*Petunia ×hybrida*). 113th Annual Meeting, American Society of Horticultural Science (poster)

Park, S., Y. Moon, and **N.L. Waterland**, 2016, The effect of exogenous calcium and osmotic stress on temporary water stress tolerance in bedding plant seedlings. 113th Annual Meeting, American Society of Horticultural Science (poster)

Waterland, N.L., S.A. Mills and Y-L Park, 2016, The impact of temperature on the floral development of blueberries. 43rd Annual Meeting, Plant Growth Regulation Society of America (oral)

Park S., Y. Moon and **N.L. Waterland**, 2015, Transcriptome analysis of *Petunia ×hybrida* under water stress using RNA sequencing. 112th Annual Meeting, American Society for Horticultural Science (oral)

Park, S., S.A. Mills, Y. Moon, and **N.L. Waterland**, 2014, Effects of antitranspirants of enhancing temporary drought tolerance in bedding plants. 111th Annual Meeting, American Society of Horticultural Science (poster)

Harwell, M., J. Tou, Y. Moon and **N.L. Waterland**, 2014, Lettuce is more than just a salad: An analysis of antioxidants and phylogenetics. 2014 Summer Undergraduate Research Symposium (poster)

Buzby, K., **N.L. Waterland**, K. Semmens and L.-S. Lin, 2014, Evaluating aquaponic crops in a flow-through fish culture system. Aquaculture America 2014 (oral)

Waterland, N.L., 2013, Plant production in a cold water flow-through aquaponics system. Aquaponics Workshop, West Virginia University, Reymann Memorial Farm, September 27 and October 18, 2013 (oral)

Waterland, N.L. and G. Johnson, 2012, Horticultural evaluation of lettuce types in flow-through aquaponics system. Aquaculture Research and Extension Project Meeting, West Virginia University (oral)

Dugan, H., Y. Moon, and **N.L. Waterland**, 2012, Characterization of ethylene-responsive transcription factors (ERFs) in *Petunia ×hybrida* 2012 Summer Undergraduate Research Symposium (poster)

Waterland, N.L., C.A. Campbell, J.J. Finer and M.L. Jones, 2009, Application of benzyladenine and gibberellic acid prevents abscisic acid induced leaf chlorosis in pansy and viola. 106th Annual Meeting, American Society of Horticultural Science (oral)

Waterland, N.L., J.J. Finer, and M.L. Jones, 2008, Characterization of senescence-specific cysteine protease, *PhCP10*, in *Petunia ×hybrida*. 105th Annual Meeting, American Society for Horticultural Science (poster, number 006)

Waterland, N.L. and R.J. Gladon, 2006, Hypoxia controlled radicle growth in germinated impatiens seedlings. NCR-101 Annual Conference (poster)

Courses Developed/Taught

- General Horticulture
- Crop Physiology
- Advanced Crop Physiology
- Plant Growth and Development
- Advanced Plant Growth and Development

Professional Service

- The North Central Extension and Research Activity (NCERA)-101 Committee on Controlled Environment Technology and Use representation for West Virginia University
- Associate Editor of Journal of Ginseng Research
- Peer reviewer for American Society for Horticultural Science HortScience, HortTechnology, Plant Growth Regulation and In Vitro Cellular and Developmental Biology-Plant
- Davis College Diversity Committee
- Division of Plant and Soil Sciences Greenhouse committee (Chair)
- Division of Plant and Soil Sciences Graduate Admissions committee
- Division of Plant and Soil Sciences New Agricultural Sciences Building committee
- Evansdale Greenhouse Building committee

Professional Organizations

- International Society of Horticultural Science
- Plant Growth Regulation Society of America
- American Society of Horticultural Science
- AmericanHort