

## **DR. DANESHA SETH CARLEY**

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### **EDUCATION**

North Carolina State University, Raleigh, NC, Crop Science, Postdoctoral Fellow, 2006-2009  
North Carolina State University, Raleigh, NC, Co-Major, Plant Pathology and Crop Science, Ph.D., 2006  
The University of Tennessee, Knoxville, TN, Entomology and Plant Pathology, M.S., 2001  
Earlham College, Richmond, IN, Biology, B.S., 1998

### **ACADEMIC POSITIONS AND EMPLOYMENT**

Director, Center for Integrated Pest Management (CIPM), 2021-present  
Interim Co-Director, Center for Integrated Pest Management (CIPM), 2018-2020  
Director, Center of Excellence for Regulatory Science in Agriculture, NC State, 2017-present  
Director, Southern IPM Center, CIPM, NC State, 2015-2020  
IPM Coordinator, State of NC, NC State, 2013-present  
Associate Professor, Department of Horticultural Science, NC State University, 2016-present  
Assistant Professor, Department of Horticultural Science, NC State University, 2015-2016  
Assistant Professor, Department of Crop Science, NC State University, 2010-2015  
Coordinator for College Sustainability Programs, NC State University, 2010-2013  
Research Assistant, NC State University, 2009-2010  
Postdoctoral Scholar, NC State University 2006-2009

### **BOOKS**

Pollinator Gardening for the South: Creating Sustainable Habitats by Danesha Seth Carley and Anne Spafford. UNC Press, Chapel Hill, NC. 152pp. March 2021.

Sustainable Lawnscapeing for the South, by Danesha Seth Carley. UNC Press, Chapel Hill. *in progress*.

### **RECENT PEER-REVIEWED PUBLICATIONS**

Seth Carley, D., J. Cook, and S. Emerine. 2024. Agricultural issues with climate change - case studies with three corn pests: corn earworm, tar spot, and itchgrass. *Journal of IPM*. *in process*

Mueller, D.S., Iles, L.C., Pilcher, C., Sisson, A.J., Magarey, R., Adams, R., Almodovar, W.I., Alston, D., Beauzay P., Bessin, R., Bish, M., Burrows, M., Calixto, A., Chandran, R., Colquhoun, J.B., Concklin, M., Dreves, A.J., Ellsworth, P.C., Esker, P.D., Farrar, J., Fournier, A., Frank, D., Hamby, K., Hamilton, G., Hanson, A., Hazelrigg, A., Hein-Ferris, N., Held, D., Jaskinski, J., Kelly, H.M., Kerns, D., Kersten, M., Knodel, J., Koehler, G., Kratsch, H., Krupke, C.H., Leppla, N.C., Lizotte, E., Matney, C., Melanson, R.A., Miller, F., Murray, M., Owens, D., Plewa, D., Reay-Jones, F., Rondon, S.I., Royer, T.A., Rozeboom, P.A., Sandler, H., Schell, S.P., Schuh, M., Seipel, T., **Seth-Carley, D.**, Sial, A., Singh, R., Smith, D.L., Stock, T., Studebaker, G., Szczepanec, A., Tewksbury, L., Tooker,

- J., Varenhorst, A.J., Vinchesi-Vahl, A., Walsh, D., Wickwar, D., Wright, R.J., and Zebelo, S. 2024. Integrated Pest Management (IPM): State infrastructure status after 50 years of federal support (1973-2023). *Journal of Integrated Pest Management*. Submitted September 20, 2024
- Seth Carley, D., J. Cook, and S. Emerine. 2024. Agricultural issues with climate change - case studies with three soybean pests: Johnsongrass, kudzu bug, and charcoal rot. *Journal of IPM*. 15(1):3. <https://doi.org/10.1093/jipm/pmad029> DOI:10.1093/jipm/pmad029
- Ruzi, S., E. Youngsteadt, A. Hamblin Cherveney, J. Kettenbach, H. Levenson, D. Seth Carley, J. Collazo, and B. Irwin. 2023. Bee species richness through time in an urbanizing landscape of the southeastern USA. *Global Change Biology*. doi: <https://doi.org/10.1111/gcb.17060>
- Chen, Huajin, Seth Carley, Danesha; Muñoz-Carpena, Rafael; Ferruzzi, Giulio; Yuan, Yongping; Henry, Eric; Blankinship, Amy; Breckels, Ross; Fox, Garey; Luo, Yuzhou; Veith, Tamie; Osmond, Deanna; Preisendanz, Heather; Tang, Jane; Armbrust, Kevin; Costello, Kevin; McConnell, Laura; Rice, Patricia; Westgate, John; Whiteside, Melanie. 2023. Incorporating the Benefits of Vegetative Filter Strips into Risk Assessment and Risk Management of Pesticides. *Integrated Environmental Assessment and Management*. EAM-2022-374-WS.
- Seth Carley, D., L. A. Gragg, M. J. Taggart, T. W. Rufty. 2021 Estimation of water stress tolerance of six woody plant species. *Horticulture International Journal*. 5(2): 64-72.
- Seth Carley, D. and K. Armbrust. 2021. Making the Case for Regulatory Science in Agriculture. *ACS Agricultural Science & Technology*. Manuscript ID: as-2021-00011y.
- Billeisen, T.L., L.D. Kilpatrick, D. Seth Carley, R. L. Brandenburg. 2021. Presence of Pollinator-Friendly Habitat on Pollinator Communities in Managed Turfgrass Systems. *International Turfgrass Society Research Journal*. doi: <https://doi.org/10.1002/its2.56>.
- Levine, S.L., J. Giddings, T. Valenti, G.P. Cobb, D. Seth Carley, L.L. McConnell. 2019. Overcoming Challenges of Incorporating Higher-Tier Data in Ecological Risk Assessments and Risk Management of Pesticides in the United States: Findings and Recommendations from the 2017 Workshop on Regulation and Innovation in Agriculture. *Integrated Environmental Assessment and Management*. 15(5): 714–725. doi: [10.1002/ieam.4173](https://doi.org/10.1002/ieam.4173).
- Mata, M., D. Seth Carley, A. Hamblin, and J-J Dubois. 2019. Community Outreach as a Tool for Bee Conservation Efforts. *Journal of Extension*. 57:5 <https://joe.org/joe/2019october/tt5.php>
- Seth Carley, D., D.L. Jordan, C.L. Dharmasri, B.B. Shew, T.B. Sutton and R.L. Brandenburg. 2018. Examples of Differences in Red Edge Reflectance and Normalized Difference Vegetative Index caused by Stress in Peanut. *Crop, Forage, & Turfgrass Management* DOI: 10.2134/cftm2018.06.0042.
- Riar, M. D.S. Carley, C. Zhang, M.S. Schroeder-Moreno, D.L. Jordan, T.M. Webster, and T.W. Rufty. 2016. Environmental influences on growth and reproduction of invasive *Commelina benghalensis*. *International Journal of Agronomy*, vol. 2016, Article ID 5679249, 9 pages, 2016. doi:10.1155/2016/5679249. <http://www.hindawi.com/journals/ija/2016/5679249/>
- Shekoofa, A., P. Rosas-Anderson, D. Seth Carley, T.R. Sinclair, T.W. Rufty. 2016. Limited transpiration under high vapor pressure deficits of creeping bentgrass by application of Daconil-Action®. *Planta* 243: 421-427.
- Stalling, K.D., D. Seth Carley, and R. Richardson. 2015. Management of aquatic vegetation in the Southeastern United States. *Journal of Integrated Pest Management* 6:1-5.
- Dell, E., D. Seth Carley, T. Rufty, and W. Shi. 2012. Heat stress and N fertilization affect soil microbial and enzyme activities in the creeping bentgrass (*Agrostis stolonifera* L.) rhizosphere. *Applied Soil Ecology* 56:19-26.

- Seth Carley, D., D. Goodman, S. Sermons, D. Bowman, G. Miller, and T. Rufty. 2011. Organic matter accumulation in creeping bentgrass greens: A Chronosequence with implications for management and carbon sequestration. *Agronomy Journal* 103:604-610.
- Seth Carley, D., S. Davis, D. Bowman, L. Tredway, T. Rufty and C. Peacock. 2009. Effluent application to creeping bentgrass in the transition zone: Effluent analysis and potential negative effects from salinity and low oxygen. *International Turfgrass Society Research Journal*. 11:1023-1031.
- Seth Carley, D., D.L. Jordan, R.L. Brandenburg and C. Dharmasri. 2009. Factors influencing response of Virginia market type peanut (*Arachis hypogaea*) to paraquat under weed-free conditions. *Peanut Science* 36:180-189.
- Seth Carley, D., D.L. Jordan, B.B. Shew, T.B. Sutton, L.C. Dharmasri and R.L. Brandenburg. 2009. Influence of digging date and fungicide program on canopy defoliation and pod yield of peanut (*Arachis hypogaea* L.). *Peanut Science* 36:77-84.
- Seth Carley, D., S. Davis, D. Bowman, L. Tredway and T. Rufty. 2009. Physiological stress of bentgrass associated with effluent-application in the Southeastern U.S. *International Turfgrass Society Research Journal* 11:1023-1031.
- Seth Carley, D., D.L. Jordan, L.C. Dharmasri, T.B. Sutton, R.L. Brandenburg, and M.G. Burton. 2008. Peanut response to planting date and potential of canopy reflectance as an indicator of pod maturation. *Agronomy Journal* 100:376-380. 10.2134/agronjnl2006.0352
- Rufty, T., D. Bowman, G. Miller, M. Jennette, L. Warren, D. Seth Carley, C. Peacock and F. Yelverton. 2008. Surface water quality adjacent to golf courses in the Southern Appalachia. *Acta Horticulturae* 783:229-238.

## **EXTENSION AND POPULAR PRESS PUBLICATIONS**

- Seth Carley, D. and Billeisen, T. 2020. Creating a pollinator-friendly habitat in your home landscape. March/April Tennessee Nursery and Landscape Association Magazine
- Seth Carley, D. and Billeisen, T. 2019. 5 Steps to creating a pollinator-friendly habitat on your golf course. January/February North Carolina Turfgrass Magazine
- Seth Carley, D. and Adams, R. 2019. If weeds could talk: IPM Indicator weeds in home lawns. March/April North Carolina Turfgrass Magazine
- Seth Carley, D. and S. Klein. 2016. Got Pollinators? Get the buzz on establishing pollinator habitat on your golf course, in your yard, or almost anywhere! May/June North Carolina Turfgrass Magazine
- Seth Carley, D. 2016. Pollinator habitat for the bees, birds, and butterflies. Spring Issue, North Carolina Field and Family
- Burgner, G., and Seth Carley, D. 2015. Alternative Turfgrass for Out of Play Areas on Golf Courses September/October North Carolina Turfgrass Magazine
- Seth Carley, D. 2015. How to keep cockroaches out of your home using IPM. Southern IPM Center blog post. <http://ipmsouth.com/2015/01/07/how-to-keep-cockroaches-out-of-your-home/>
- Seth Carley, D. and Stallings, K. 2014. Natives in, Turfgrass Out – Recovering from back-to-back US Opens November/December North Carolina Turfgrass Magazine
- Seth Carley, D. and Stallings, K. 2014. Turfgrass out, Natives in! September/October North Carolina Turfgrass Magazine
- Bass, K., Burchell, M., Evans, R., Hunt, W., Line, D., and Seth Carley, D. 2013. Stormwater Wetlands for Golf Courses. North Carolina Extension Publication AG-765
- Seth Carley, D. and Hamon, L. 2012. Golf Courses as Good Environmental Stewards. January/February issue North Carolina Turfgrass Magazine
- Rufty, T., Seth-Carley, D., Tredway, L.P. 2009. Problems surface with effluent use on turf in the Southeast. *TurfGrass Trends*

- Rufty, T., Goodman, D., Seth-Carley, Bowman D. and Miller, G. 2008. Organic matter accumulation in bentgrass putting greens: How well can it be controlled? *North Carolina Turfgrass Magazine*
- Ownley, B.H., Pereira, R., Seth, D., Hamilton, C. and Dee, M. 2001. Growth promotion and early flowering of tomatoes with beneficial bacteria. *In 2000 Vegetable Initiative Progress Report, University of Tennessee* Pub. No. E11-6515-01-001-01. pp 175-177.
- Ownley, B.H., Pereira, R., Seth, D., Hamilton, C. and Dee, M. 2000. Growth promotion and early flowering of tomatoes with beneficial bacteria. *In 1999 Vegetable Initiative Progress Report, University of Tennessee* Pub. No. E11-6515-01-001-00. pp 256-260.

## **PUBLISHED ABSTRACTS AND POSTERS**

- Armbrust, K. L., Seth Carley, D., McConnell, L.L. Working the interface of science and regulatory policy. ACS Division of Agricultural and Food Chemistry (AGFD). San Diego, CA. October 2024.
- McConnell, L.L., Seth Carley, D., Tang, J.X. Results of a multi-stakeholder workshop on incorporating the benefits of vegetative filter strips into aquatic risk assessment and risk management of pesticides. IUPAC International Congress of Crop Protection Chemistry. P1.4, p. 27. Ghent, Belgium. May 2019.
- Seth Carley, D., Tang, J., Fox, G., Truman, C., and McConnell, L.L. Results of a Multi-Stakeholder Workshop on Incorporating the Benefits of Vegetative Filter Strips into Aquatic Risk Assessment & Risk Management. American Chemical Society Meeting. San Diego, CA. August 2019.
- Seth Carley, D., Mata, M., and Spafford, A. Urban gardens as a platform for experiential learning: Pollinator conservation, citizen science, and sustainability. International IPM Symposium. Baltimore, MD. March 2018.
- Kilpatrick, L., Seth Carley, D. and Billeisen, T. A Comparison of Pollinator Communities in Managed Turfgrass Systems in the Piedmont and Sandhills of North Carolina. Poster Presentation at the NC State Turfgrass Center's Education and Research Symposium. Raleigh, NC. December 2018.
- Mata, M., Seth Carley, D., Youngsteadt, E, and Rufty, T. Environmental Effects on Pollen in Five Insect-Pollinated Herbaceous Annuals. Annual Conference of the American Society for Horticultural Science <https://ashs.confex.com/ashs/2017/meetingapp.cgi/Paper/26798>. Waikoloa, HI. September 2017.
- Seth Carley, D., and Spafford, A. Experiential Learning for Students and the Community: Researching, Designing, and Building Pollinator Habitats. Green Cities International Symposium. Bologna, Italy. September 2017.
- Seth Carley, D., and McConnell, L.L. Overcoming the Higher Tier Challenges in Risk Assessment and Risk Management of Pesticides. Workshop on Higher Tier Challenges in Risk Assessment. Raleigh, NC. October 2017.
- Seth Carley, D., O'Brien, J., López-Uribe, M., Tарy, D., McLaughlin, R. and Rufty, T. Converting Marginal Land along Roadsides to Pollinator Habitat: Does it Make a Difference? ESA Presentation #106639 - 2016 Southeastern Branch Meeting. Raleigh, NC. March 2016.
- Seth Carley, D., O'Brien, J. Assessment of pollinator habitat along roadsides in the Piedmont of North Carolina. 2016. 6<sup>th</sup> International Conference on Landscape & Urban Horticulture. Athens, Greece. June 2016.
- Gragg, L., Fair, B., Seth-Carley, D. Assessment of root ball planting treatments of two species of container grown trees. 2016. 6th International Conference on Landscape & Urban Horticulture. Athens, Greece. June 2016.
- O'Brien, J., Seth Carley, D., Lopez-Uribe, M., McLaughlin, R., Tарy, D. and Rufty, T. Survey of Anthophilous Insects in Wildflower Habitat and Wildflower-free Habitat Along Interstates in North Carolina. Entomological Society of America, Minneapolis, MN. November 2015.
- O'Brien, J., Seth Carley, D., Lopez-Uribe, M., McLaughlin, R., Tарy, D. and Rufty, T. Initial Research on Anthophilous Insects in Wildflower Habitat and Wildflower-free Habitat Along Interstates in North Carolina. Protecting Pollinators in Ornamental Landscapes Conference. Raleigh, NC. October 2015.

- Lewis, J. O'Brien, D. Seth Carley, R. McLaughlin, D. Tarpay, J. Heitman and T. Rufty. Incorporating Multiple Ecosystem Services into the Design of Low Impact Development Strategies. 70th Soil and Water Conservation Society International Annual Conference, Greensboro, NC. July 2015.
- Seth Carley, D., R.D. Hallberg, and H.Y. Fadamiro. The Southern IPM Center's 2015 Friends of IPM Awards. The 8th International IPM Symposium. March 2015.
- Seth Carley D., R.D. Hallberg, and J.R. VanKirk. The IPM eAcademy: online presentations and webinars addressing important IPM-related issues. The 8th International IPM Symposium. March 2015.
- Seth Carley, D., R.D. Hallberg, J.R. VanKirk, J. LaForest, H.Y. Fadamiro, R. Boudwin, and A. Belskis. The Southern IPM Center's Signature Programs. The 8th International IPM Symposium. March 2015.
- Stallings, K, T. Rufty, R. Richardson, and D. Seth-Carley. 2013. Sustainable managed ecosystems: A case study. 2013 North Carolina State University Graduate Student Research Symposium, Raleigh, NC. March 2013.
- Vance, L., W. Robarge, D. Carley, T. Rufty. Biotic and abiotic factors controlling nitrous oxide emissions from agricultural soil. ASA Annual Meeting Abstracts 140-27. 2010.
- Riar, M., J. Spears, J. Burns, T. Webster, D. Carley, T. Rufty. Benghal dayflower seed viability and impact on dispersal. ASA Annual Meeting Abstracts 194-3. 2010.
- Carley D., T. Rufty, S. Sermons, L. Vance, D. Bowman and W. Shi. Carbon storage under bermudagrass fairways in the southeast. ASA Annual Meeting Abstracts 202-212. 2010.
- Seth Carley, D., D. Goodman, L. Tredway and T. Rufty. Organic matter accumulation in bentgrass greens: Temporal and spatial characterizations. Agronomy Society Abstracts. Pittsburg, PA. 2009
- Seth Carley, D., L. Tredway and T. Rufty. Warm-season grass diseases. 24th Australian Golf Course Superintendents Association Conference. v. 13 pp 30-33. Proceedings of 24th Australian Turfgrass Conference. Sydney, Australia. July 2008.
- Seth Carley, D., L. Tredway, and T. Rufty. Summer decline in bentgrass. 24th Australian Golf Course Superintendents Association Conference. v. 13 pp 53-55. Proceedings of 24th Australian Turfgrass Conference. Sydney, Australia. July 2008.
- Seth Carley, D., L. Tredway and T. Rufty. Impact of heat on shoot and root function in bentgrass. Agronomy Society Meeting Abstracts. Houston, TX. October 2008.
- Seth Carley, D., J. Cappy, L. Tredway and T. Rufty. Heat and nutritional interactions in bentgrass. Agronomy Society Meeting Abstracts. New Orleans, LA. November 2007.
- Seth Carley, D., D. Jordan, M. Burton, C. Dharmasri, T. Sutton and R. Brandenburg. Using hyper spectral imaging to predict peanut pod maturity. Proc. Am. Peanut Res. and Ed. Soc. 37:34-35. 2005.
- Jordan, D., Seth Carley, D. and Johnson, D. Influence of planting date on peanut response to paraquat, 2,4-DB, and plant removal. Proc. Am. Peanut Res. and Educ. Soc. 37:62. 2005.
- Pearce, J., Jordan, D., Johnson, P., Seth Carley, D. Alston, J., Callis, D. and Corbett, T. Accuracy of using heat units to predict peanut maturity during 2003 and 2004 in North Carolina. Proc. Am. Peanut Res. and Educ. Soc. 37:65. 2005.
- Dharmasri, C., Seth Carley, D., Jordan, D., Burton, M., Sutton, T. and Brandenburg, R. Preliminary evaluation of diseased and non-diseased peanut leaves using hyper spectral imaging. Proc. Am. Peanut Res. and Educ. Soc. 37:92. 2005.
- Seth Carley, D., Jordan, D.L., Burton, M.G., Sutton, T.B., Brandenburg, R.L., Johnson, P.D. and Dharmasri, C. Varying inputs to evaluate peanut maturity using hyperspectral imaging. Proc. South. Weed Sci. Soc. 58:3. 2005.

### **HIGHLIGHTED INVITED EXTERNAL PRESENTATIONS**

- 10th International IPM Symposium. "Outline for the Center of IPM". Denver, CO, 2022
- The IPM Hour. "Let's Talk Pollinator Gardening: Plan, plant, and IPM your way to successful and beautiful pollinator gardens". (Virtually for the Western IPM Center, January 13, 2021, 27 participants)
- International Plant Protection Conference (IPPC) "Tracking Invasive Species in the Southern United States". Hyderabad, India. November 12-16, 2019

(keynote speaker) RISE. Regulatory Conference opening remarks for general session. Alexandria, VA. April 2019

Plant Protection & Nutrition Conference “NC State’s Center of Excellence: Advancing Regulatory Science in Agriculture”. Raleigh, NC. May 2019

International Network for Urban Biodiversity and Design Conference (URBIO). “The Urban Pollinator Habitat Imperative: What We’ve Learned Through Research, Teaching, and Outreach”. Cape Town, South Africa. September 11-14, 2018

Spafford, A., Carley, D. Experiential Learning for Students and the Community: Researching, Designing, Building and Managing Urban Pollinator Habitats. GREENCITIES 2017; Bologna, Italy. September 12-15, 2017

Cactus and Pine GCSA “Mitigating Heat- and Water-stress in Turfgrass”. Scottsdale, AZ. July 2017

Annual GCSAA Education Conference/Golf Industry Show “Sustainable Ecology at Pinehurst: Balls in the Rough at Course No. 2”. San Diego, CA, February 2016

6th annual Farm Bureau Symposium “IPM in your Home Landscape”. UNC Pembroke Seminar series. Pembroke, NC. April 2016

6<sup>th</sup> International Landscape & Urban Horticulture Conference, “Assessment of pollinator habitat along roadsides in the Piedmont of North Carolina” Athens, Greece. June 2016

The University of Florida “IPM Engagement Across the South” Gainesville, FL. December 2015

The Pete Dye Golf Club “Turf Talk: Bringing Sustainability into the Conversation” Bridgeport, WV. October 2010

The Australian Golf Course Superintendents National Conference. “Summer Bentgrass Decline” Melbourne, Australia. July 2008

The Australian Golf Course Superintendents National Conference. “Warm-Season Grass Diseases” Melbourne, Australia. July 2008

## **PRESENTATIONS**

3-hour workshop “Planning, Planting, and Promoting Pollinator Friendly Landscapes”. Orange County Extension Master Gardener Volunteers (EMGVs). 5 out of 5 rating. (October 2024. 45 participants).

Montgomery County Extension Master Gardener Volunteers (EMGVs). “Protecting and Promoting Pollinators in Your Home Landscape” Troy, NC. (September 16, 2024. 12 participants)

Gardening Association of North Carolina. “Pollinator Gardening for the South”. (Virtually, September 10, 2024. 58 participants)

EMGV Gaston County Master Gardeners. “Plan, Plant, and Maintain Successful and Beautiful Pollinator Gardens”. Stanley, NC. (June 20, 2024. 65 participants)

BPIA. “NC State’s Center of Excellence for Regulatory Science in Agriculture”. (Virtually, January 30, 2024. 102 participants)

EMGV Knowledge is Pollinator Power: Information and Inspiration for the Great Southeast Pollinator Census. “Pollinator Plants of Awesomeness”. (August 10, 2023. 170 participants; 577 views as of November 2023)

Quail Ridge Books. “Gardening for Pollinators in the South”. (September 29, 2022. 6 participants)

Pollinator week at NC State “Let’s talk pollinator gardening!” (June 23, 2022. 44 participants)

Ralston Blooms at the JC Raulston Arboretum “Let’s Talk Pollinators”. (April 30, 2022. 8 participants)

Regional Public Library’s Education and Learning Series. Northeast Regional Library “Protecting and Promoting Pollinators in Your Home Landscape”. (March 22, 2022. 15 participants)

Duke Gardener's Forum. “Native Plant Selections to Support Pollinator Protection”. Durham, NC. (March 15, 2022. 35 participants)

Regional Public Library's Education and Learning Series. West Regional Library "Protecting and Promoting Pollinators in Your Home Landscape". (January 24, 2022. 12 participants)

Regional Public Library's Education and Learning Series. East Regional Library "Promoting Pollinators in Your Home Landscape". Knightdale, NC (January 12, 2022. 17 participants)

Regional Public Library's Education and Learning Series. Eva Perry Regional Library "Promoting Pollinators in Your Home Landscape". Apex, NC (January 8, 2022. 15 participants)

Friends of the Arboretum Lecture. "Let's Talk Pollinator Gardening: Plan, Plant, and Maintain Successful and Beautiful Pollinator Gardens". Raleigh, NC October 14, 2021. (Hybrid, 25 in person, 65 on-line participants.)

Central Carolina Chrysanthemum Society. "Plan, Plant, and Maintain Beautiful Pollinator Gardens" (Virtually, July 19, 2021. Raleigh, NC, 23 participants).

Center for Integrated Pest Management Showcase Event. "Center overview and introduction" (Virtually, Raleigh, NC, September 15, 2021. 74 participants).

Turfgrass Field Day. "How to Select Pollinator-Friendly Easy-to-Maintain Landscape Plants that Offer Multiple Ecosystem Benefits to Golf Courses and Landscapes" (Raleigh, NC, August 2021. 60 participants)

NC State's Sustainability Office Celebrates Pollinator Week with Danesha Seth Carley and Anne Spafford's "Let's Talk Pollinator Gardening". (Virtually, Raleigh, NC, June 24, 2021. 46 participants). <https://ncsu.zoom.us/rec/share/GfUEUiatYOd07IfYlbaJ2MWOwdsIF7kmWULaU4Y2eIzZh7E2ZX119inQaLwzn-Y.lyBPYYB8ZsWJCpTt>

Triangle Research Libraries Network (TRLN). "TRLN Remote Rap: Pollinator Gardening for the South". (Virtually, Raleigh, NC, June 14, 2021. 61 participants).

Hollows Community Garden Group's Plant & Can Exchange. "Pollinator Plantings for Bees and Butterflies" (April 18, 2021. 30 participants).

Apiculture Online. "Pollinator Friendly Gardening". (Live streamed May 27, 2021 on You-Tube 92 live participants. 294 views to-date [https://www.youtube.com/watch?v=PQfSV\\_hl0gg](https://www.youtube.com/watch?v=PQfSV_hl0gg)).

NC Arboretum Adult Education. "Let's Talk about Pollinator Gardening". (Virtually, Raleigh, NC, April 12, 2021. 35 participants).

Flyleaf Books. "Pollinator Gardening in the South". (Virtually, Chapel Hill, NC, March 18, 2021. 55 participants).

NC Arboretum. "Pollinator Gardening in the South". (Virtually, Asheville, NC, March 11, 2021. 72 participants).

Hollows Community Gardeners. "Protecting Pollinators in Your NC Landscape". (Virtually, Raleigh, NC, March 10, 2021. 12 participants).

JC Raulston Arboretum's Gardening Series Gardening in the South. "Let's Talk Pollinator Gardening: Plan, plant, and maintain your way to successful and beautiful pollinator gardens". (Live streamed on Youtube for the JC Raulston Arboretum, February 6, 2021. 670+ participants)

Syngenta's coffee hour presentation. "NC State's New Center of Excellence for Regulatory Science in Agriculture" (virtually Raleigh, NC. October 2020. 53 participants).

Genetic Engineering and Society Center Presentation. "NC State's New Center of Excellence for Regulatory Science in Agriculture". (Raleigh, NC, April 2019. 25 participants).

NC Ag Biotech Summit. "Advancing Regulatory Science in Agriculture to Facilitate Sustainable Innovation Pathways". (RTP, NC, February 2018. 100 participants).

Eisenhower School for National Security and Resource Strategy. "NC State's New Center of Excellence for Regulatory Science in Agriculture". (Raleigh, NC, March 2018. 35 participants).

NC Irrigation Society Conference "Sustainable Re-Design at Historic Pinehurst No. 2". (Ellerbe, NC, April 2019. 45 participants).

Wake County Bee Keepers Association. "Planting for Pollinators in NC". (Raleigh, NC, June 2018. 60 participants).

Green Industry “Green n’ Growin’” Conference “Understanding the Environmental Benefits of Turfgrass”. (Greensboro, NC, January 2017. 43 participants).

NC Irrigation Society Conference. “Reducing Golf’s Footprint; Less Turf, More Natives”. (Aberdeen, NC, March 2017. 27 participants).

Eisenhower School for National Security and Resource Strategy. “NC State’s Center for Integrated Pest Management; Stopping Pests & Protecting Borders”. (Raleigh, NC, March 2017. 35 participants).

Wake County Bee Keepers Association. “Native Plants to Enhance Bee Forage Habitat”. (Raleigh, NC, April 2017. 58 participants).

Turfgrass Field Day. “Creating Pollinator Habitat on Your Golf Course” (Raleigh, NC, August 2017. )

Annual Conference of the American Society for Horticultural Science. “Researching, Designing, and Building Urban Pollinator-Friendly Gardens: A Hands-on Learning Tool for Urban Pollinator Protection and Conservation”. (Seth Carley, D. and Spafford, A.) (Waikoloa, HI, September 2017. 25 participants).

Green Industry “Green n’ Growin’” Conference. “Incorporating Pollinator Habitat into Your Landscape”. (Greensboro, NC, January 2016. 400+ participants)

Green Industry “Green n’ Growin’” Conference. “Understanding the Environmental Benefits of Turfgrass”. (Greensboro, NC, January 2016. 35 participants)

Eisenhower School for National Security and Resource Strategy. “NC State’s Hidden Gem: Center for Integrated Pest Management”. (Raleigh, NC, March 2016. 25 participants)

ESA’s Southern Branch Entomology Society Association. “NC’s IPM Programs” (Raleigh, NC, March 2016. 23 participants)

Bayer Crop Science Green Tour. “What is a Sustainable Turfgrass System?” (Raleigh, NC, September 2015. 25 participants)

Turfgrass Field Day. “Habitat for Pollinator Protection and Conservation” (Raleigh, NC, August 2015. 100+ participants)

NC Bee Pollinator Stewardship Workshop. “Pollinator Habitat: Research Update” (Raleigh, NC, June 2015. 64 participants)

Groundwater Professionals of NC conference “Sustainability in the Golf Industry” (Aberdeen, NC, June 2015. 44 participants)

Triad Landscape Professionals Workshop. “IPM in NC and the New IPM Portal” (Greensboro, NC, June 2015. 55 participants)

Oxford Master Gardeners. “IPM in your Home Landscape” (Oxford, NC, April 2015. 27 participants)

Green Industry “Green n’ Growin’” Conference. “Understanding the Environmental Benefits of Turfgrass”. (Greensboro, NC, January 2015. 24 participants)

Green Industry “Green n’ Growin’” Conference. “Benefits of Turfgrass in a Managed Urban Landscape” (Greensboro, NC, January 2014. 32 participants)

Bayer Crop Science Green Tour. “Plant Health as a Piece in Sustainable Turfgrass Systems” (Raleigh, NC, September, 2014. 28 participants)

NC State Turfgrass Regional Conference. “Helping to Define Sustainability in the Golf Industry” (Fletcher, NC, March 2014. 40+ participants)

South Eastern Golf Course Superintendents’ Association. “Balls in the Rough at Pinehurst No. 2: Bermudagrass “OUT” and Native Plants “IN”. (Pinehurst, NC, April 2014. 150+ participants)

Urban Design Center. “The City of the Future: Importance of Sustainable Managed Landscapes” (Raleigh, NC, April 2014. 40+ participants)

Bayer Crop Science’s Plant Health Summit. “Sustainability and Turfgrass” (Pinehurst, NC, May 2014. 30+ participants)

Southern IPM Center Advisory Board. “Insect Pollinator Health Initiative” (Atlanta, GA, October 2014. 25 participants)

Leadership Triangle. “Advocating for Local Foods at Your College or University” (Durham, NC, February 2013. 18 participants)

Leadership Triangle. “NC State’s Place in the Sustainable and Local Foods Movement” (Raleigh, NC, April 2013. 23 participants)



Bayer Crop Science Green Tour. “Plant Health as a Piece in Sustainable Turfgrass Systems” (Raleigh, NC, June 2013. 20 participants)

Bayer Crop Science Green Tour. “Pinehurst No. 2 Goes Native” (Pinehurst, NC, June, 2013. 25 participants)

Syngenta Turf and Landscape Professionals Tour. “Sustainable Turfgrass Systems” (Raleigh, NC, July 2012. 40 participants)

Bayer Crop Science Green Tour. “Plant Health as a Piece in Sustainable Turfgrass Systems” (Raleigh, NC, June 2012. 25 participants)

Special presentation for the Chancellor. “Increasing Food Security through New Food Initiatives” (Raleigh, NC, November 2012. 20 participants)

NC Farm Bureau. “The Importance of the Green Industry: Hidden Benefits and Future Challenges” (Raleigh, NC, December 2012. 27 participants)

Green Industry “Green n’ Growin’” Conference. “The Benefits of Turfgrass”. (Greensboro, NC, January 2012. 25 participants)

Turfgrass Field Day. “Carbon Sequestration in Turfgrass Systems”. (Sandhills Research Station Jackson Springs, NC, August 2011. 100+ participants)

Farms of the Future Conference. “Sustainability and Agriculture: A Global Perspective” (Raleigh, NC, June 2011. 80 participants)

Center for Innovation Management Studies (CIMS). “Global Climate Change, Sustainability, and Agriculture” (Raleigh, NC, April 2011. 30 participants)

Turfgrass Field Day. “Nitrogen Management to Off-Set Heat-Stress on Creeping Bentgrass Greens” (Raleigh, NC, August 2010. 100+ participants)

Garden’s Writes Conference. “Managed Ecologies: Are They Sustainable?” (Raleigh, NC, February 2010. 30 participants)

## **INTERNATIONAL PROGRAMS**

Speaker and panelist for Sustainability session. CORESTA Congress 2024 Edinburgh, Scotland, October 13-17, 2024.

University of Costa Rica. “Professional Skills for Scientists” San Jose, Costa Rica. (April 10, 2024. 11 participants)

GRCBI - Building Regulatory Capacity through Research, Engagement, and Communication. Training, workshops, and capacity building in Western Hemisphere (Central and South America), Southeast Asia, and Africa. 2020-2024.

Hosted session on Regulatory Challenges in Agriculture for 9 delegates from the Turkish government. April, 2018.

Hosted 17 Japanese Golf Course Managers for “Drought and Heat Stress Tolerance in Cool-Season Turfgrass” Workshop and Tour – Raleigh, NC. March, 2015.

Hosted 15 Japanese Golf Course Managers for “Sustainable Landscapes – What Role Does Plant Health Play” Workshop and Tour – Pinehurst, NC. June, 2013.

Delegation Member – Student/Faculty research exchange program: University of Tennessee and Kasetsart University, Thailand. Summer 2000.

## **SYMPOSIA AND WORKSHOPS ORGANIZED**

Hosted Agricultural Bioregulatory Program. 5 participants from Mexico, Brazil, Namibia, and Gambia. August 2024. 5-day program.

Hosted USDA Cochran Fellowship Program (<https://fas.usda.gov/programs/cochran-fellowship-program>) 13 Fellows from Thailand August 2024. 12-day program.

Precision Application of Pesticides: Workshop to discuss the State of Technology, Opportunities, Challenges, Regulatory Needs, and Grower Acceptance. 50 participants. Washington, DC. September 18-19, 2023.

Outlining Foundational Studies to Address Key Uncertainties for Genome-Edited Microbes Workshop. 35 participants. Raleigh, NC. June 6-7, 2023.

Futuristic Approaches towards Seed to Market Strategies Symposium. Promotion of Sustainable Agriculture (SPSA), in association with ICAR-Indian Agricultural Research Institute in conjunction with the 15th IUPAC International Congress of Crop Protection Chemistry. Inderpuri, New Delhi 16th March, 2023.

Strategic Partnerships to Build Capacity for Maximum Residue Limits (MRLs) Workshop. Baton Rouge, LA. 25 participants. November 30 - December 2, 2022.

US Regulatory Policy Workshop: Genome-Edited Microbial Products for Agricultural Use Workshop. 60 participants. National Academy of Sciences, Washington, DC. 60 participants. September 25-27, 2022

Let's talk about Mental Health! Workshop. Raleigh, NC. 10 participants. March 10, 2022.

Predicting, Monitoring, and Responding to New Plant Pests. International IPM Symposium, Denver, CO. 54 participants. March 2, 2022.

Center for Integrated Pest Management Showcase Event. 74 participants. Held *virtually* September 15, 2021.

CERSA's Advances in Regulatory Risk Assessment of Pesticide Drift from Unmanned Application Systems (UAS) and Manned Aerial Application Workshop. 50 participants. Held *virtually*, December 1-3, 2020.

CERSA's Workshop on Vegetative Filter Strips in Pesticide Risk Assessment - Part 2. 55 participants. Held *virtually* September 8-9, 2020.

Pest Management Strategic Plan (PMSP) Workshop for Coffee and Grower Tour in Hawaii. 29 participants. Hilo, HI. January 20-22, 2020.

Extension IPM Programs in the South. Held at the South Eastern Branch meeting for the Entomology Society of America. 23 participants. 4 hours. Mobile, AL. March 5, 2019.

Coffee & Tea Pest Management Strategic Plan Workshop and Grower Tour (honoring Dr. Robert "Robbie" G. Hollingsworth). Between 25-45 participants (day-dependent). San Juan, PR. May 27- May 30, 2019.

CERSA Vegetative Filter Strip Workshop. 35 participants. Raleigh, NC. December 8-9, 2018.

CERSA Launch Workshop. 45 participants. 4 hours. NC Biotech Center. RTP, NC. July 24, 2018.

Workshop on Innovation and Regulation in Agriculture. 48 participants. Overcoming the Higher Tier Challenges in Risk Assessment and Risk Management of Pesticides. Raleigh, NC. October 23-24, 2017.

Integrated Pest Management Programs in the Southern Region. 29 participants. 4 hours. Held at the South Eastern Branch meeting for Entomology Society of America. Raleigh, NC. March 17, 2016.

NC State CALS Office of Sustainability Programs. Executive Course on Agricultural Sustainability: exclusively for Bayer VIP guests. 30 participants. Raleigh, NC. January 28-30, 2013.

NCSU CALS Office of Sustainability Programs / PCOMM. Bayer Executive Course on Agricultural Sustainability. 25 participants. Raleigh, NC. March 19-21, 2012.

## **PODCASTS, YOUTUBE, PRESS RELEASES, AND NEWS INTERVIEWS**

Podcast. North Carolina Turfgrass Magazine. “5 steps to creating a pollinator friendly habitat on your golf course” <https://zencastr.com/turfzone/north-carolina-episode-1> January 2019

YouTube. GES Center Presentation. <https://www.youtube.com/watch?v=1B7gFXvJ8Ak> April 2019

YouTube. NC State’s Sustainable Landscapes. [https://www.youtube.com/watch?v=vW0z0nM\\_aRw](https://www.youtube.com/watch?v=vW0z0nM_aRw) May 2019

Technician Magazine. “Talley Gets a Green Roof”. [http://www.technicianonline.com/news/article\\_e0dde8a4-ed22-11e8-b05f-3758f40eb758.html](http://www.technicianonline.com/news/article_e0dde8a4-ed22-11e8-b05f-3758f40eb758.html) November 2018

Podcast. The Native Plant Podcast “Sustainable Design on the LP golf Course” November 2017  
<https://www.nativeplantpodcast.com/podcasts-1/2017/11/8/danesha-smith-carley-on-sustainable-design>

WRAL Interview. “Having a hard time at Pinehurst No. 2? Blame N.C. State”. WRAL Sports Fan  
<https://www.facebook.com/NCSUTurfgrass/posts/danesha-seth-carley-on-wral-httpwwwwralsportsfancomgolfvideo13736012ncsuturfgras/10152295142193141/> June 2014

NC State News Release. “Return of the Native”. <https://news.ncsu.edu/2014/06/return-of-the-native/> June 2014

NC State’s Technician online. “An NCSU connection to the US Open”  
[http://www.technicianonline.com/news/article\\_a992d438-fce3-11e3-a642-0017a43b2370.html](http://www.technicianonline.com/news/article_a992d438-fce3-11e3-a642-0017a43b2370.html) June 2014

USA Today. “Pinehurst's revamp give course a rougher look”  
<https://www.usatoday.com/story/sports/golf/2014/06/11/pinehursts-revamp-give-course-a-rougher-look/10347553/> June 2014

FoxSports.com. “Weeds could be factor at Pinehurst No. 2 after revamp”  
<https://www.foxsports.com/golf/story/pinehurst-revamp-gives-us-open-course-a-rougher-look1-061114>  
June 2014

The Gadsden Times. “Pinehurst takes on rougher look”  
<https://www.gadsdentimes.com/news/20140611/pinehurst-takes-on-rougher-look> June 2014

PRNewswire.com. "Pinehurst, North Carolina State University and Bayer CropScience Create a New Model for Sustainable Golf Course Management" <https://www.prnewswire.com/news-releases/pinehurst-north-carolina-state-university-and-bayer-cropscience-create-a-new-model-for-sustainable-golf-course-management-262701141.html> June 2014

Fayetteville Observer. "Pinehurst's sandy sidelines to play central role in U.S. Open" <https://www.fayobserver.com/902f1cc9-d39e-5aca-849b-c7d36c3dcf9c.html> June 2014

Golfdom. "Pinehurst No. 2 in good hands as it hosts back-to-back U.S. Opens" <https://www.golfdom.com/pinehurst-no-2-in-good-hands-as-it-hosts-back-to-back-u-s-opens/> June 2014

KSL.com. "Pinehurst's revamp give course a rougher look" <https://www.ksl.com/article/30274510/pinehursts-revamp-give-course-a-rougher-look> June 2014

GCI Video Interview. Golf Course Industry.com. Danesha Seth Carley discusses the wide range of biodiversity found not only on Pinehurst No. 2, but on all golf courses. She also discusses the prospects of an average golf course facility replicating and managing their own version of Pinehurst No. 2's native roughs. <https://www.golfcourseindustry.com/video/golf-video-pinehurst-native-roughs/> June 2014

PBS Video Interview. PBS's Greening the Golf Course. The restoration of historic Pinehurst #2 golf course to its original design is a model of golf going green. The course matches the Sandhills environment, using less water and chemicals, filled with native plants needing less care. PGA says it's a model of golf going back to nature. NC State's Danesha Seth Carley discusses how Pinehurst No. 2 manages this new sustainable golf course design. <https://www.pbs.org/video/unc-tv-science-greening-golf-course2/> June 2014

Podcast. Superintendent Radio Network "Going Native". <http://www.golfcourseindustry.com/srn-011215-native-turfgrass-golf.aspx>. December 2014

CALS Perspectives Magazine. College Profile: Danesha Seth Carley. <https://issuu.com/deeshore/docs/perspicitves-summer2013>. Summer 2013

KQED. "Improving Golf's Environmental Scorecard" <https://www.kqed.org/quest/54675/improving-golfs-environmental-scorecard>. October 2013

USGA. "Uncovering Pinehurst No.2" <https://www.usga.org/content/dam/usga/images/course-care/water-resource-center/watersummitarticles/214429%20Farren,%20Bob%20-%20Uncovering%20Pinehurst%20No.pdf>. Summer 2012

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## **SELECT RECENT GRANTS**

<b>Title</b>	<b>Principal Director/Investigator(s)</b>	<b>Department</b>	<b>Sponsoring Agency</b>	<b>\$ Total</b>	<b>Active Dates</b>
Addressing Stakeholder Needs for IPM Programming in NC	Seth Carley, D., et al.	Center for Integrated Pest Management	US Dept. of Agriculture - National Institute of Food and Agriculture (USDA NIFA)	\$675,000	9/1/2024 - through 8/31/2027
Increasing IPM Coordination, Efficiency, and Collaboration in the South	Seth-Carley, Danesha Magarey, Roger	Center for Integrated Pest Management	US Dept. of Agriculture - National Institute of Food and Agriculture (USDA NIFA)	\$4,600,000	09/01/2018 through 08/31/2023
Reducing the Environmental Impact of Road Construction	McLaughlin, Richard A. Seth-Carley, Danesha Heitman, Joshua	Crop and Soil Sciences	NC Department of Transportation	\$408,444	08/01/2019 through 04/15/2023
Alignment of Pesticide Regulations	Seth-Carley, Danesha Baron, Jerry J	Center for Integrated Pest Management	US Dept. of Agriculture - Foreign Agricultural Service (USDA FAS) (Prime - US Dept. of Agriculture (USDA))	\$1,658,000	09/01/2020 through 09/01/2024

Modernizing North Carolina IPM Extension Programs to Address Stakeholder Needs	Seth-Carley, Danesha Buhler, Wayne G. Bradley, Lucy K Reisig, Dominic Duane Richardson, Robert J Meadows, Inga Marie Frank, Steven D Crawley, Sydney Elaine Leon, Ramon Gonzalo	Center for Integrated Pest Management	US Dept. of Agriculture - National Institute of Food and Agriculture (USDA NIFA)	\$330,000	09/01/2021 through 08/31/2024
Microwave Thermal Eradication of Deep-Seated Plant Parasitic Nematodes	Seth-Carley, Danesha Gorny, Adrienne Marie	Center for Integrated Pest Management	US Dept. of Agriculture - Animal and Plant Health Inspection Service (USDA APHIS)	\$272,000	09/30/2021 through 09/29/2023
Southern IPM Center: A Regional Approach to Networking, Collaboration and Services	Magarey, Roger Seth-Carley, Danesha	Center for Integrated Pest Management	US Dept. of Agriculture - National Institute of Food and Agriculture (USDA NIFA)	\$1,150,000	09/01/2022 through 02/29/2024
Facilitating the Importation of Fresh Blackberries (Rubus spp.) From Colombia Into the United States Through Evaluation of Pest Risk	Quevillon, Lauren Elise Seth-Carley, Danesha Pallipparambil, Godshen	Center for Integrated Pest Management	Pairwise	\$32,078	01/01/2023 through 04/30/2023

Mitigation Measures					
<b>Total external funding: \$26,492,950</b>					

Investigating the Impacts and Adaptation Strategies to Current and Emerging Agricultural Pests in the Face of Climate Change	Takeuchi, Yu Seth-Carley, Danesha Saia, Sheila Marie	Center for Integrated Pest Management	NCSU Research and Innovation Seed Funding Program	\$25,000	02/01/2022 through 01/31/2023
Modernizing Pollinator and IPM Extension Materials for North Carolina Blueberry Growers.	Seth Carley, D. and Burrack, H.	Center for Integrated Pest Management	NC Blueberry Council & NC Agricultural Foundation.	\$1,860	06/01/2020-05/31/2021
Integrated Pest Management training for Extension Agents.	Seth-Carley, Danesha	Center for Integrated Pest Management	NC SARE	\$3,845	2019-2020
An Online Pollinator Garden Planner to Foster Insect-Friendly Landscaping: Part I.	Youngsteadt, E., Seth Carley, D. and Heckman, S.	Applied Ecology	NCSU Office of Outreach & Engagement Research and Innovation Seed Funding (RISF) Program.	\$24,960	2019-2021
Influence of Pollinator-Friendly Habitat on Pollinator Communities in Managed Turfgrass Systems	Seth Carley, D. and Billiesen, T.	Crop and Soil Sciences	Center for Turfgrass Environmental Research and Education.	\$43,250	06/01/2019-05/31/2020
Open Forum: Pre-competitive Collaboration in Pest Management R&D	Magarey, R. and Seth Carley, D.	Center for Integrated Pest Management	CALS Big Ideas Grant	\$500	2018

Open Forum: Open Forum: Long-Term Use of Thresholds in Integrated Pest Management	Ojiambo, P. and Seth Carley, D.	Plant Pathology	CALS Big Ideas Grant	\$500	2018
Pollinators, Citizen Science, and Design: Supporting Sustainable Pollinator Habitat Design in Community Greenspace	Spafford, A. and Seth Carley, D.	Horticultural Science	NC State Sustainability Programs	\$9,955	05/01/2016-04/30/2017
Sustainability In Turfgrass Systems: Assessment Of New Strategies For Weed Control And Species Selection	Gannon, Travis Seth-Carley, Danesha Rufty, Thomas W. Yelverton, Fred H.	Crop and Soil Sciences	Southern Region IPM Center	\$29,969	05/01/2013 through 02/28/2014
<b>Total internal funding: \$139,839</b>					

<b>Gift Donor</b>	<b>Supporting</b>	<b>\$ Total</b>	<b>Awardee(s)</b>
JTI	Regulatory Science in Agriculture programming at NC State	\$50,000 (first year of funding)	Seth Carley, Danesha
Bayer CropScience	Regulatory Science in Agriculture Programming	\$225,000	Seth Carley, Danesha
Syngenta	Endowment to Support CERSA's Internship Programs	\$300,000	Seth Carley, Danesha
Bayer CropScience	Supporting CERSA's Education and Outreach Programs	\$180,000	Seth Carley, Danesha
BASF	Support for CERSA's VFS Workshop	\$3,500	Seth Carley, Danesha



Syngenta	Plant health mitigation during heat and drought stress	\$185,000	Rufty, Tom and Seth Carley, Danesha
Syngenta	Increasing Pollinator Habitat on Marginal Lands for Ecosystem Benefits and Pollinator Conservation.	\$150,000	Seth Carley, Danesha and Tarpy, David
Bayer Environmental Science	Carbon sequestration beneath turfgrass systems.	\$300,000	Seth Carley, D. and Rufty, T.
Bayer Environmental Science	Managing the ecology at historic Pinehurst No. 2.	\$100,000	Seth Carley, Danesha
<b>Total internal funding: \$1,443,500</b>			

## **AWARDS**

Team Award, CIPM “Excellence in Regulatory Affairs and Crop Security” Award from the American Phytopathological Society, 2016  
 Pathways Leadership Achievement Award, NC State, 2015  
 Excellence in Campus Sustainability “Green Brick” Award, NC State Office of Sustainability Programs, 2015  
 NC State’s Student Government Outstanding Teaching Assistant Award, 2004 and 2005  
 “Phenomenal Teaching Assistant” Award, NC State, 2004

## **HIGHLIGHTED PROFESSIONAL SERVICE**

Refuge Lawn Advisory Board, 2020-2023  
 American Chemical Society Editorial Board Member and Editor, 2020-present  
 Journal of Integrated Pest Management Editorial Board Member, 2019-present  
 Grant Panel Manager Southern IPM Center Grants, 2016, 2017, 2018, 2019, 2020, 2021  
 Journal of Integrated Pest Management, Subject Editor - 2010-present  
 Western IPM Center Director Interview Committee - February 2016  
 USAID Bureau for Food Security Jun 18, 2013 - June 19, 2013 Grant Panel Member  
 USAID MERC M31 Agricultural Grants Review Panel Member - 2010

## **PROFESSIONAL ACTIVITIES ON CAMPUS**

Moderator for “Reducing Greenhouse Gasses in Food PRoduction” panel and discussion for the 2024 Climate Symposium, KIETS Leadership Conference. September 20, 2024  
 KIETS Climate Leaders Program Mentor, 2023-2024  
 Speaker for the Horticultural Science Club, February, 2022  
 Peer Teaching Review Lead for Professor Bryce Lane, Horticultural Science, - 2021  
 Council on the Status of Women, Professional Development Workgroup Lead - 2021-2022

Council on the Status of Women, Appointed Member, 2020-present  
 Committee for Lifelong Faculty Involvement, NC State, 2020-present (Chair for this committee 2022-2023)

Director - Center of Excellence for Regulatory Science in Agriculture (established program in 2018, formal Center proposal in process)

Director - Center for Integrated Pest Management (2021-present)

CALS organizing committee for teaching activities on Centennial Campus Faculty Member - 2013-2014

Chancellor Appointed- NC State Sustainability Council – Academics -2016 - 2018

Coordination LeadEarth Day at NCSU “From Barn to Brick”, Sustainable Ag. at NCSU – 2013

NC State University Lonnie Poole Golf Course Advisory Committee Member - 2013-2016

Historic Yates Mill Advisory Board Member - 2012-2019

CALS/Poole College of Management Coordinator for Executive Education - 2012-2015

NC State University's Office of Professional Development: How to Be a Highly Effective Project Manager, 2012

Campus Environmental Sustainability Team (CEST) Advisory Council member for the Academics and Research and the Buildings and Land Use Working Groups - 2009-2012

Education and Outreach Coordinator for Environmental Activities and Research in Managed Ecologies, in conjunction with the Lonnie Poole Golf Course and the Centennial Campus Middle School - 2009-2015

EnvironMentor - 2009-2012

Ecology Advisor for the Lonnie Poole Golf Course - 2009-2017

NC State’s Student Government Teaching Effectiveness Committee - 2005

Crop Science Graduate Student Representative to NC State’s Student Government- 2004-2005

Crop Science Graduate Student Association President - 2004-2005

Crop Science Graduate Student Association Community Service Coordinator - 2004-2005

### **UNDERGRADUATE STUDENT INDEPENDENT RESEARCH MENTORING**

<b>Student</b>	<b>Degree Program and Year</b>	<b>Project</b>
Heidi Schouten	Crop and Soil Sciences 2025	How agriculture, regulatory science, and communications intersect to address global challenges
Rachel Tarkington	Crop and Soil Sciences 2025	New Pesticide Spray Drift Protection Plan proposed by the EPA
Emma Wilson	Wildlife Science and Plant Biology 2022	Green Terrace Project at the Talley Student Union
Layla Tallent	Horticultural Science 2020	Benefits of Biodiversity of the Average Rural Lawn in the Foothills of North Carolina
Jillian Tate	Plant and Microbial Biology 2019	North Carolina Wildflowers: Temperature Impacts on Pollinator Habitat
John Connors	Environmental Science 2012	Biodiversity on the Lonnie Poole Golf Course

**GRADUATE STUDENTS (\*Indicates major advisor)**

<b>Student</b>	<b>Program and Year Completed/Anticipated Completion</b>	<b>Degree</b>	<b>Thesis Title</b>
Islam,Md Mahfuz	Crop and Soil Sciences, 2024	PhD	EFFECT OF GROUND COVER ON VEGETATIVE GROWTH (GRASS-WILDFLOWERS) AND SEDIMENT RUN-OFF IN AN ACTIVE ROAD CONSTRUCTION SITE
*Love, Madison	Horticultural Science, 2025	MS	TBD
*Lockett, Maegan	Horticultural Science, 2025	MSHS	TBD
*Moore, Aaron	Horticultural Science, 2025	MS	TBD
Black, Travis	Horticultural Science, 2021	MSHS	Non-thesis
Feng, Sophia	Food, Bioprocessing and Nutrition Sciences, 2015	PhD	Current Research Advances in Micronutrient Fortification on Sweet Potato Flour and Development of an Affordable Nutrition Product
*Mata, Marisol	Horticultural Science, 2018	MS	Two Approaches to Protecting Bees: Bee Nutrition in a Changing Climate and Community Outreach as a Tool for Bee Conservation
Haselton, Abigail	Crop and Soil Sciences, 2018	MS	The Effects of Soil Conditions on Wildflower Growth in Roadside Environments
Nawrocki, Justin	Crop Science, 2018	PhD	Factors Influencing Native Aquatic Plant Revegetation Success for Enhanced Sport Fish Habitat in North Carolina Piedmont Reservoirs
*O'Brien, Jen	Crop Science, 2016	MS	The Contribution of Roadside Wildflower Plantings for Enhancing Pollinator Habitat in the Piedmont of North Carolina.
*Gragg, Lauren	Horticultural Science, 2016	MS	Assessment of Woody Plant Growth and Sustainability in Urban Landscapes: Evaluation of Different Root Ball Treatments on Growth of <i>Acer rubrum</i> L.

			'Brandywine' and <i>Nyssa sylvatica</i> Marsh. 'Wildfire' and Estimation of Water Stress Tolerance of Six Woody Plant Species
*Stallings, Kevin	Crop Science, 2014	MS	Evaluation of Plant Populations Affected by Human Induced Disturbance in Aquatic and Terrestrial Ecosystems
Goodman, David	Crop Science, 2009	MS	Organic matter accumulation beneath maintained turfgrass systems
Davis, Sarah	Crop Science, 2008	MS	The Analysis of Effluent and the Impact of Salinity and Anaerobic Stress on Creeping Bentgrass

### **PROFESSIONAL ACTIVITIES OFF CAMPUS**

2025 International IPM Symposium Planning Committee, 2020-2025  
2025 International IPM Symposium Poster Reviewer, 2024  
IPM Dialogue Task Force (Steering Committee), 2021-2023  
2022 International IPM Symposium Poster Reviewer, 2021  
NIFA's Tactical Sciences Coordination Network Executive Committee, 2020-present  
National Integrated Pest Management Coordinating Committee (NIPMCC) Executive Member, 2019-2022  
National Integrated Pest Management Coordinating Committee (NIPMCC) Chair, 2020-2021  
ACS Agricultural Science & Technology, Editorial Board, 2020-present  
Journal of IPM, subject Editor, 2010-present  
Journal of IPM, Editorial Board, 2020-present  
Journal of IPM Editor Mentor, 2020-present  
Southern SARE Graduate Student Research Competition Grant Panel member, 2020  
Grant Panel Member, Western IPM Center, 2017, 2018, 2019, 2020, 2021, 2022  
Watson Fellowship Application Grant Panel – Environmental Institute for Golf, December 2015  
Grant Panel Member - North Central IPM Center Regional Grant January, 2015  
Grant Panel Member - North Central IPM Center Regional Grant June, 2013  
Visiting lecturer Centennial Middle School “How do Scientists Test Water Quality?”, 2010 – 2013  
Making Science Make Sense Panel Member and Teacher Resource, 2010-2012  
“Expanding Your Horizons” workshop presenter and panelist, March 2007  
“Scientist in the Classroom” annual guest lecturer in public schools, 2004-2009

### **PROFESSIONAL DEVELOPMENT TRAININGS/WORKSHOPS/CERTIFICATES**

Leading Collaborative and Productive Meetings at NC State. Raleigh, NC. 2023.  
IRB Certified. 2018, 2022.  
Diversity: Inclusion in the Modern Workplace. 2021.  
Communicating with Confidence, Raleigh, NC. 2021.  
Leading Collaborative and Productive Meetings at NC State. Raleigh, NC. 2021.  
Navigating Personal and Administrative Challenges in 2021. Hosted by UW, Madison. 2021.  
Management Essentials: An Orientation for Managing at NC State. Raleigh, NC. 2021.

North Central Cooperative Extension Administrative Management Boot Camp. (by invitation only) Kansas City, MO. 2019.  
Pathways I and II Leadership Development Program. Raleigh, NC. 2014-2015  
NC State University's Office of Professional Development: How to Communicate, Influence, and Negotiate in Project Management. Raleigh, NC. 2013  
NC State University's Office of Professional Development: Leading Project Teams. Raleigh, NC. 2013.

## **PROFESSIONAL ASSOCIATIONS AND MEMBERSHIPS**

Agronomy Society Member (2003-2018)  
American Horticultural Society (2015-present)  
Carolinas Golf Course Superintendent Association (2007-present)  
Crop Science Society Member (2003-2018)  
Federal Pollinator Task Force (2015-2017)  
Golf Course Superintendents Association of America (2007-present)  
NC Pollinator Protection Task Force (2014-2016)  
Multistate Technical Committee for Chemical Ecology for Pest Control and Pollinator Protection (2014-2019)  
Multistate Technical Committee for Southeastern Turfgrass Research Association (2013-2017)  
Soil Science Society Member (2008 - 2018)  
W-4045 Multistate Technical Committee: Agrochemical Impacts on Human and Environmental Health: Mechanisms and Mitigation (2019-present)

## **MAJOR RESEARCH ACTIVITIES**

### How Does Pollinator Habitat Influence Pollinator Populations?

For the past 60 years the world has undergone major landscape transformation through urbanization. A majority of people across the world now live in urbanized areas, with the United States being one of the most urbanized locations and by 2050, urbanization is expected to increase as much as 66%. As urbanization and agricultural intensification increases, natural and semi-natural lands are replaced by buildings and impervious surfaces. Disturbed landscapes and the resultant habitat loss and fragmentation often negatively impacts biodiversity ultimately limiting the amount of ecosystem services an area can provide.

Pollination of flowering plants provided by insects such as bees (Hymenoptera), flies (Diptera), wasps (Hymenoptera), among others, is one such essential ecosystem service. Pollination of wildflowers increases aesthetic appeal of the landscape and increases habitat for wildlife. Insect pollinators are also responsible for assisting in the production of 75% of the world's food crops. Over the past few decades, insect pollinator populations, most notably *Apis mellifera* [European honey bee] and *Bombus* spp. [bumblebees] have been declining across the world. While no single factor is responsible, increasing threats from anthropogenic sources including habitat loss and fragmentation from urbanization, agricultural intensification, and pesticide exposure greatly contribute to the general decline.

Concerns about the global decline of pollinators have increased interest in investigating, promoting, and conserving habitat that can support pollinators. Incorporating suitable habitat for pollinators throughout urban landscapes is one way to potentially off-set the negative effects of urbanization on pollinators. In

highly human-impacted environments, marginal lands such as field buffers, utility rights-of-way, and roadsides become especially important for the conservation of plant and animal biodiversity. Roadside habitats, and "out of play" areas on golf courses under reduced management have been shown (in a limited number of studies) to increase insect species abundance. Unlike agricultural fields, these areas are generally undisturbed and therefore provide both nesting sites for ground-nesting bees, plant debris for cavity-nesting bees, and a variety of pollen and nectar sources to attract a wide range of insect pollinators.

Roadside vegetation management in the southern United States has included wildflower species plantings to help reduce long-term maintenance costs, enhance roadside wildlife habitat, provide an attractive roadside environment, and promote natural establishment of wildflowers. North Carolina's Department of Transportation (NCDOT) established their roadside flowering habitat initiative in 1985 in an effort to increase wildlife habitat and beautify roadsides, and annually plants over 1,500 acres of wildflowers across North Carolina interstates.

With the understanding that habitat plays an important role in the success of pollinators, and that pollinator-friendly plantings on marginal lands have the potential to increase bee species richness and abundance. With this in mind, our research program addresses the following questions 1) Does planting pollinator-friendly habitat (e.g. wildflowers along North Carolina interstates, on golf courses, in rights-of-way, etc.) increase insect pollinator abundance and richness? 2) Does percent flower cover impact pollinator species abundance? And 3) Does urbanization and land use around planted wildflower sites affect pollinator abundance and richness?

## **MAJOR EXTENSION ACTIVITIES**

### Increasing IPM Efforts across NC.

Extension program emphasis on managing a large federally funded multi-year IPM grant that funds faculty programs that provide in-service training for extension agents, and resource development including: pest ID guides, weed management fact sheets and bulletins, and powerpoint files. Through NC Cooperative Extension programs and diverse transdisciplinary team collaboration, we work to sustain and enhance environmental stewardship, reduce economic risks for growers and consumers, and protect human health by applying integrated pest management (IPM) in all appropriate settings, and to increase coordination and improve efficiency of translating IPM research through extension programming. By working to synergize efforts and leverage resources, we are better able to promote development and adoption of IPM through collaborative programs and broad-based stakeholder participation. With a strong team of experts, we are able to document the value of IPM strategies and programs and demonstrate to our stakeholders that IPM works. Through the outputs and outcomes from this program, NC Extension agents and stakeholders will become more knowledgeable about IPM and develop the skills necessary to implement IPM strategies in Agronomic Crops, Specialty Crops, and Communities, and increase knowledge of IPM principles and pesticide safety through IPM Education for Pesticide Applicators. This project is funded through a competitive NIFA-CPPM-EIP grant.

### Importance of pollinator habitat in urban landscapes.

This is a multi-year project to educate stakeholders on appropriate plant choices to protect pollinators, as well as best landscape practices that protect and promote pollinators across urban landscapes. This project includes three years of research on pollinator-plant preference, pollen quality, and impacts of climate change on pollen quality. We have written popular press articles, completed subject-specific presentations and webinars, and I have co-written a book on how to select plants for urban landscapes that promote and protect pollinators. We have installed numerous public demonstration gardens, and a Citizen Science portion of the outreach program reached just over 27 Citizen Scientists. This program, held at the JC

Raulston Arboretum, was followed by impact assessments and a publication in JOE. Additionally, annually, my team and I spend 6 hours working with STEM students at Centennial Campus Magnet Middle School teaching science classes that both support the Wake County Public School's educational objectives and teach students about pollinators, pollination, and pollinator protection (we reached over 350 6<sup>th</sup> grade students through this program). I have also taught over 20 workshops and trainings for Extension agents and Master Gardeners, reaching well over 1000 people, and countless presentations for our community stakeholders (with participant numbers over 3000; one presentation had over 600 *virtual* participants alone).

### **CURRENT POSITION RESPONSIBILITIES**

As the Director for the Center of Integrated Pest Management (CIPM), I provide direct oversight for and management for day-to-day operations and activities of CIPM, a Center at NC State University with roughly 60 professional staff members, and over 40 projects/programs. In my current role, I foster a team-based intra-Center environment, high level collaborations with a great many diverse stakeholders, and advance multidisciplinary research/outreach and service programs across departments, colleges and external partners. I have developed an excellent network including relationships with USDA agencies (APHIS, NIFA, AFRI, FAS, and ARS), other federal agencies (EPA, DOE, and Homeland Security), international agencies (USAID and non-USA overseas agencies), plant and animal commodity grower organizations, private industry, national/international University/Institute collaborators and other national and international invasive species/IPM stakeholders.

#### **Some key responsibilities of my role are:**

- Ensuring alignment of CIPM with NC State's overall mission, vision, core values and culture
- Developing and implementing a Center cohesive vision and strategic plan including an internal and external communication strategy and evaluation plan
- Providing recommendations to management on adjusting the strategy to adapt to changing conditions, especially as they relate to pest management and invasive pests
- Sustaining and enhancing a close working relationship with internal and external stakeholders, but especially, USDA-APHIS-PPQ, who are co-located on Centennial Campus
- Securing extramural funding to advance and support CIPM projects and programs including developing and implementing a plan to diversify funding
- Advancing the science and practice to mitigate the Global Challenge of losses due to invasive species for developing improved and innovative IPM principles and practices associated with invasive and domesticated plant pests
- Catalyzing the formation of collaborative disciplinary and transdisciplinary studies consistent with CIPM's mission and vision
- Exploring mechanisms to advance inter-departmental graduate student/professional educational training and programs
- Developing and implementing a strategy to increase the number of publication in peer-reviewed journals and other communication channels

Additionally, I hold a faculty appointment in the Department of Horticultural Science and uphold all typical faculty responsibilities for such a role including but not limited to, teaching or guest lecturing in classes, mentoring graduate students, publishing peer-reviewed research, providing extension programming, and securing extramural funding to support my programs.