

Michael J. Brewer

Texas A&M AgriLife Research, 10345 State Hwy 44, Corpus Christi, TX 78406-1412

Work Ph: 361-265-9201, Cell: 361-244-7043, Email: mjbrewer@ag.tamu.edu

Web: Project <http://ccag.tamu.edu/entomology/>, Collaboration <https://stexcropinsect.agrilife.org/>

Affiliation:

Duty Location: Texas A&M AgriLife Research and Extension Center at Corpus Christi

Academic Affiliation: Department of Entomology, Texas A&M, College Station

Current Title: Professor of Entomology/Field Crops Entomologist

Appointment: Expectation and Effort: 75% Research & Program Outreach, 15% Teaching, and 10% Service

Research & Program Outreach. Conduct research and supporting outreach in collaboration with entomology and agricultural research, extension, education, grower, and industry partners on pest management issues relevant to fiber and grain crops and regional and national goals in pest management. Apply research findings to the development of IPM approaches for field crop pest and beneficial insects, with special emphasis on invasive species disruptions and pest regulation in large-scale agroecosystems. Pests targeted and research approaches used are guided by a combination of assessment of pest status, appropriateness of management techniques in low-input field crops, and input from grower and other stakeholders. Publish in regional, national, and international outlets. Provide research and technology support for technology transfer and outreach education.

Teaching. Develop and sponsor student learning experiences such as graduate assistantships, undergraduate internships, and other outside of the classroom experiences. Provide lectures in entomology and related disciplines.

Service. Provide professional service, including editorial services, committee work on program and personnel guidance and review, external program and personnel reviews, and other service to societies, institutions, and agencies.

Educational Background

Aug. 1990	Ph. D. Entomology, University of California, Riverside, California
Dec. 1986	Master of Applied Statistics, Louisiana State University, Baton Rouge
Aug. 1985	Master of Science, Entomology, Louisiana State University, Baton Rouge
Dec. 1981	B.S. Entomology, University of California, Davis, California.
July 1979	A.A., San Joaquin Delta College, Stockton, California.

Relevant Employment:

2009-current. Field Crops Entomologist/Assistant Professor (2009), Associate Professor (2015) Professor (2019), Texas A&M AgriLife Research, Department of Entomology, Texas A&M University. Duty breakout: 75% research & outreach, 15% teaching, and 10% service.

2002-2009. Integrated Pest Management Coordinator, Assoc. Professor, Entomology, Michigan State University. Duty breakout: 75% extension, 25% research.

1991-2002, Assistant/Associate Professor/ Extension Specialist, Entomology, University of Wyoming. Duty breakout: 60% extension, 30% research, 10% teaching.

Memberships and Affiliations:

Entomological Society of America, 1983-present

Society of Southwestern Entomologists, 1993-2000, 2010-present

South Carolina Entomological Society, 1995-2001
Central States (Kansas) Entomological Society, 1995-2001
International Organization of Biological Control, 1996-1999, 2005

Adjunct Affiliations: Dep. of Agriculture, Agribusiness, and Environmental Sci.,
Texas A&M, Kingsville; Department of Computing and Geospatial Sci., Texas A&M,
Corpus Christi.

Briefs of Experience, Skills, and Accomplishments

Recent Research and Programs (citations can be found in Publication section, p. 9):

Given the large-scale and low-input nature of field crop agroecosystems and ongoing pest invasions affecting U.S. agriculture, goals of my research program have been two-fold: developing sustainable and area-wide approaches to managing pests in agroecosystems, and increasing understanding of plant-insect-natural enemy interactions and pest regulation that affect pest outbreak, severity, and regulation. Developing sustainable pest management tools to address invasive and other major pest concerns provides near-term benefits and increases understanding of pest regulation resiliency in managed systems that serves to buffer impact of pest invasions. This approach is appropriate across pest taxa including arthropod pests within cropland, rangeland, and adjoining semi-natural and stewarded ecosystems.

Sugarcane aphid on sorghum is the most recent example of my special focus on invasive pest disruptions and regulation in large-scale agroecosystems. Experiences include invasive pest management in several large-scale cropland and rangeland systems including wheat, soybean, sorghum, and conservation grasslands from the southern to northern Great Plains, and from the intermountain region of the Rockies to the Mid-west. Research on sorghum susceptibility to sugarcane aphid (2017: JEE 110: 2109-18) and within-field aphid distribution (2017: Southwest Ent. 42: 27-35) have yielded research-based thresholds (2016: AgriLife pub ENTO-035; 2019: JEE 112: 1251-1259) and sampling and pest assessment strategies for growers (2015: AgriLife pub ENTO-043, Ecol. Modelling 399: 23-38, 2020: Inter. J. Precis. Agric. Aviat. 3: 89-96). Most recently, research on sorghum resistance to aphids and their compatibility with natural enemies benefitted from collaborations from sorghum breeders and fellow entomologists (2015: JEE 108: 576-82), insect systematists (2019: Proc. Wash. Ent. Soc. 121: 657-280; 2017: JEE 110: 2109-18), and geneticists (2017: Crop Sci: 57: 2064-72, 2018: Crop Sci. 58: 2533-2541). These findings are applicable nationally, as supported by commodity groups, industry, and several federal grants (USDA Southern IPM, USDA NIFA CPPM, USDA Risk Management). Transformation of this work continues for specific field crop applications, as exemplified by sugarcane aphid decision-making management (2016: J. Integr. Pest Manage. 7:12, doi.org/10.1093/jipm/pnw011), including information dissemination through web sites (<https://stexcropinsect.agrilife.org/>), webinars, and society and grower-sponsored presentations (2018: J. Integr. Pest Manage. 9: 2; doi:10.1093/jipm/pmx030). Continuing studies, augmented with a recent USDA ARS Areawide Pest Management Program cooperative agreement, are geared to research and application of the area-wide concept in managing sugarcane aphid and other invasive species (2019: Ann. Rev. Ent. 64: 73-93).

Agricultural impact of sugarcane aphid research and outreach is indicated by increasing grower success in managing sugarcane aphid. In my geographic area of primary effort where about 350,000 acres of sorghum are grown, there has been little grain sorghum acreage reduction since the first sugarcane aphid outbreaks of 2013, use of aphid-resistant hybrids has

increased to about 50% of the acreage, and remaining acreage is managed with research-based economic thresholds that result in no greater than one insecticide spray for this aphid needed on average annually.

Career-length scholarly impact includes research and review of aphid ecology and management, and IPM implementation, as synthesized in three Annual Review of Entomology articles (2004, 49: 219-42; 2012, 57: 41-59; 2019, 64: 73-93). These have contributed to the advancement of IPM and applied insect ecology through study of aphid invasions affecting cereal crops focusing on the North American Great Plains. Most recently this effort has been integrated with ecological modeling of sugarcane aphid population dynamics in the Great Plains as affected by weather-driven long-distance movement and local population growth moderated by natural enemy and host plant regulation (2020: *Annals ESA* 113: 79-87, and *Ecological Modelling* 399: 23-38, with Brewer as co-author).

Overall, I am pleased to report that the field crops entomology program has brought near-term IPM tools to the crop protection table while pursuing underpinning research to develop sustainable and area-wide pest management approaches with special attention to invasive pest management. Additionally, research has contributed to increased understanding of pest regulation resiliency in managed systems.

Recent Professional Leadership Roles (Supervision, Collaboration, and Mentoring):

I have led of the Field Crops Entomology Research Program for the Texas Gulf Coast area for the last ten years. I have supported projects with funding from internal University programs, external competitive federal programs, and industry contracts at an approximate external/internal support balance of 80:20 across my career. I continue to pursue a significant phase of a nationally recognized research program to address sugarcane aphid as an invasive pest of sorghum and sucking bug management in cotton. Over the last six years, the project has been sponsored externally by four USDA (NIFA and ARS) grants programs and two Texas Ag. Experiment Station (AgriLife) internal programs, five commodity groups, and several industry contracts. During this period, five Ph.D. students, two M.S. students, and two post-docs have completed or are finalizing their research and training under my supervision and mentoring. Research and outreach collaborations have been established with interdisciplinary teams of agricultural scientists and technical experts across Universities (Oklahoma State, U. Arkansas, U. Georgia), agencies (USDA NIFA, ARS; Texas Dep. Ag.), industry (Bayer Crop Science, Corteva, among others), and commodity groups (Cotton Inc., United Sorghum; Texas commodity groups in cotton, sorghum, and corn). As example within the sorghum pest management effort (see also above section 'Recent Research and Outreach'), 24 journal articles, 7 extension publications, and 2 web resources have been published, of which 5 articles were led by students and 2 articles were invited. Within cotton pest management, 14 journal articles have been published, which include 8 led by students. I have also worked closely with these interdisciplinary groups in planning and evaluating research programs and collaborations.

Recognition of projects, students and post-docs in my laboratory is also an indicator of program success and my interest in professional development of those I supervise and mentor. Since 2013, I have supervised and mentored two research associates, two post-docs, eight graduate students, and over a dozen undergraduate research interns. I have been most pleased with academic and research accomplishments (3 M.S. and 3 Ph.D. graduated, 1 Ph.D. scheduled to defend in 2020), awards (6 scholarships including two 3-yr TAMU/AgriLife Research-sponsored research assistantships, 11 meeting presentation awards, 2 professional awards including ESA's Larry Lawson Graduate Student Award in Applied Entomology and

2 students receiving the annual Ph.D. award given by the Texas Plant Protection Assn), and employment in industry (research/development), a state regulatory agency, and academics (two assistant professorships). Collaborative accomplishments across my career include moving forward the concept of area-wide pest management of invasive aphids and other sucking bugs in large-acreage cereal and cotton production systems. A synthesis of this approach is presented in an Annual Review of Entomology article on invasive aphid pests of cereal in North America serving as lead author (vol. 64: 73-93) and a cotton pest management chapter serving as junior author.

Additional indicators of success are establishment of collaborations and peer recognition. *Collaborations have been established* with crop breeders and geneticists, fellow entomologists including insect systematists, biological control specialists, and geneticists, and landscape and environmental modelling ecologists. *State, regional, and national recognition* includes recent local (Texas A&M AgriLife Extension), regional (USDA Southern IPM Center, USDA Southern Risk Management Center), and national (2019 Entomological Society of America, PIE section, Integrated Pest Management) team awards. I also received the *2019 SW Branch Entomological Society of America Excellence in IPM award* for the work on sugarcane aphid and was recognized by the Entomology Graduate Students Assn. as the *2017 Outstanding Mentor in Research* (mentoring six graduate students, three undergraduate interns, and one post-doc at the time).

Recent Committee and Team Roles:

I have experiences at the regional Research and Extension Center level (Field Crops Entomology Research Program for south Texas), state University level (Faculty Advisory Committee, Council of Principle Investigators, Promotion and Tenure Peer Review committees, both Department and College, and diversity and inclusion efforts in recruitment), and national level (National IPM committee sponsored by USDA NIFA and EPA, ad-hoc committee on IPM policy and agency interaction among USDA NIFA, NRCS, and EPA, and Co-Editor-in-Chief service for a journal of the Entomological Society of America). These experiences are inclusive of project research planning and review, developing collaborations, seeking stakeholder input and maintaining effective communications, participating in research initiatives across institutions and agencies, and evaluating program, project, and personnel impact. I believe that these team and partner activities are essential and important professional services. The interactions also provide opportunities to link focused activities to national agricultural initiatives and needs, including response to pest invasions.

I have served two terms during the last ten years (six years total) as a member (elected by peer departmental faculty) of the Faculty Advisory Committee that advises the Unit Head of the TAMU Entomology Department. The role is to provide advice on departmental policy involving personnel assessment, evaluation, and hires (including service as ad-hoc search committee member for special hires), on departmental special initiatives, and on time-sensitive matters involving opportunities and challenges presented to the Department Head. From 2012-2017, meetings occurred monthly and on a need basis. Related to recruitment, I have served on eight faculty searches (one serving as chair) and the recent Department of Entomology Head search. I have recently been elected by my peers to serve as co-Chair (2020) and Chair (2021) of the Promotion and Tenure Committee of the Department of Entomology (TAMU). The Chairs coordinate with promotion candidates in preparation of their promotion dossiers and facilitates the evaluation committee's assessment of external reviews and candidate dossiers. I was appointed to the Peer Review Committee of the

College of Agriculture and Life Sciences / AgriLife at TAMU as member to review promotion dossiers across the College, Extension Service, and Ag. Experiment Station. I also was appointed by the TAMU graduate office in 2019 to serve as team leader of a Plant Protection subgroup of faculty in their 'Pathways to the Ph.D.' program. As part of the TAMU diversity and inclusion effort, we focus on recruitment and retention of graduate students attending regional TAMU campuses to a Ph.D. program at TAMU College Station. Our initial small team is concentrating on south Texas TAMU campuses that enroll many first generation and Hispanic students that currently are under-represented on the College Station campus.

University committee service work spans my career. I have completed service as member (elected by peer Texas Ag. Experiment Station [AgriLife] faculty) on the Council of Principle Investigators. This is a University-wide body that represents faculty who are principle investigators of external contracts and grants. This body serves as a sounding-board to administrative units that support principle investigator functions, such a Contract/Grant services, Library services, and University and agency research offices. These interests have spanned my career: I served on the Faculty Senate of the University of Wyoming as a junior faculty member, and the University Computer Committee at the U. California, Riverside campus, as a graduate student member.

I have also participated in national engagement in integrated pest management research, collaboration, and policy discussion. I have been a member of the National IPM committee sponsored by USDA NIFA and EPA and an ad-hoc committee on IPM policy and agency interaction among USDA NIFA, NRCS, and EPA. I have prepared reports and published articles reviewing USDA NRCS and European Union policies and programs to incentivize use of integrated pest management to address conservation (land, water, air, and wildlife) concerns (2012: *Ann. Rev. Entomol.* 57:41-59). I have co-authored a book chapter on cotton insect pest management (Luttrell, Teague, and Brewer 2015). I also participated in a team addressing sugarcane aphid insecticide registration issues for the state of Texas, which focused on application of EPA Section 18 allowances for insecticide use while minimizing pest regulation by natural enemies in the system.

Service also extends to professional societies. Most recently in my involvement with the Entomological Society of America, I was recommended by the Editorial Board and appointed by the Publication Council to serve as co-Editor-in-Chief of the *Journal of Economic Entomology*. The *Journal* is an international publication enterprise that is the primary outlet for primary research in economic entomology published by Oxford University Press in cooperation with the Entomological Society of America. The *Journal* ranks as the most cited journal in entomology, and it publishes more articles annually than all other entomology journals. Beginning in spring 2019, I have worked within a co-Editor-in-Chief team of three along with journal staff to maintain and improve journal standards and policy (ensure article quality) and propose and launch initiatives (increase impact and service to our readership). Under a new Editorial Board structure, the co-Editor-in-Chief team seeks advice on standards and initiatives, followed by the team working with journal staff on implementation and subsequent evaluation and assessment. *Journal* evaluation and assessment occur annually as performance metrics are compared to annual goals. During 2019, we have launched a new section of the journal and several Special Collections of articles. Working as part of the co-Editors-in-Chief team along with a subject editor team of 50 and the Editorial Board has been productive and essential to maintain and grow the quality of this publication enterprise.

Awards and Honors

Awards (since 2013, with selected previous awards, see p. 22 for awards to students I have mentored):

Entomological Soc. of America, PIE section, Integrated Pest Management team award, 2019.
SW Branch Entomological Society of America Excellence in IPM, 2019.

Outstanding Mentorship in Research. Entomology Graduate Student Organization. 2017.

Project of Excellence, team member. Risk management and economic thresholds for sugarcane aphid on sorghum. USDA NIFA Southern Region Risk Management Education Center, 2017.

Pulling Together Award, Sugarcane Aphid team member. Southern IPM Center. 2016.

Superior Service Team Award, Sugarcane aphid. Texas A&M AgriLife Extension. 2015.

Grower Incentives for IPM Team Project, International IPM Recognition Award, 2009.

EPA Region VIII Outstanding Achievement Team Award, 1995.

National FFA Organization, Distinguished Service Award, 1995.

New Employee Cooperative Extension Award, U. Wyoming, 1994.

Elected and Appointed Positions:

Co-chair, Promotion and Tenure Committee, Department of Entomology, Texas A&M, College Station (department faculty elected, 2020, 2021 assume Chair role).

Member. Peer Review Committee (Promotion and Tenure), College of Agriculture and Life Sciences & AgriLife, Texas A&M, College Station (Dean appointed, 2020, 2021).

Co-Editor-in-Chief of the *Journal of Economic Entomology*, Entomological Society of America (Board appointed, 2019-current).

Council of Principle Investigators, Texas A&M, Texas A&M AgriLife Research representative (AgriLife faculty elected, 2017-2020).

Editorial Boards

Journal of Integrated Pest Management. 2014-2017. re-elected 2017-2019 (chair 2017)
(Entomol. Soc. Amer. PI-E section elected)

Journal of Economic Entomology. 2012-2018 (appointed subject editor).

Insects, 2020-current (appointed).

Faculty Advisory Committee, Entomology, Texas A&M, elected (2012-14), re-elected (2015-17).

Faculty Senate, U. Wyoming, Department of Plant, Soil, & Insect Sciences rep (1997-1998) (department faculty elected).

Professional Service

Professional Societies

Meeting service (moderator and judging) since 2013 moderated 7 student paper competitions at Entomological Society of America meetings (branch and national), judged 3 student poster competitions at ESA and TAMU meetings.

Organizer of symposia (selected)

Pest invasions post-establishment: understanding range expansion and mitigating impact on protected plants, for upcoming International Congress of Entomology 2020, Helsinki, Finland (co-organized with K.Giles) (postponed to 2021 due to CoVid-19).

Ecology and management of cereal aphid invasions, crossing the Great Plains borders from Mexico to Canada. Entomol. Soc. Amer. Annual Meeting, 2018 (co-organized with F. Peairs).

An Integrated Regional Response to an Invasive Aphid Pest of Sorghum, Symposium, SW Branch Entomological Society of America meeting, 2015 (organizer).

Making it work on-the-ground: increased sponsorship of IPM adoption in USDA conservation programs. 5th National IPM Symposium, St. Louis, 2006 (organizer).

Implementing IPM through Conservation Programs: Opportunities, Experiences, and Strategies to Move Forward. Entomological Society of America Annual Meeting, 2007 (organizer).

Editorial service: See Elected and Appointed Positions (page 6/7)

Texas A&M

Committee service: member of 37 committees prior to 2013, Since 2013: 13 with 2 elected.

Member: Awards and Scholarships Committee, Department of Entomology (2017-2020).

Member: Eight faculty searches (chair of one). Dep. Entomology, Texas A&M (2012-2020).

Member: Dep. Entomology Head search. College of Ag. & Life Sciences, Texas A&M (2019).

Team lead. Plant Protection subgroup for student recruitment in the 'Pathways to the Ph.D.' program in the TAMU Office of Graduate Studies.

Elected Positions: see page 6, Awards and Honors, Elected and Appointed Positions.

State and National Advisory Panels, Committees, and Boards. Since 2013.

Texas Department of Agriculture & USDA EPA, Part of team addressing sugarcane aphid insecticide registration issues for the state of Texas.

Periodic reviewer of University Hatch projects and national USDA ARS CRIS projects.

Periodic external peer reviewer of USDA ARS and University faculty.

Selected activities prior to 2013.

Panel Member. USDA NIFA CAR/RAMP grant review (2007).

Member, National IPM committee sponsored by USDA NIFA and EPA (2003-2008).

Ad-hoc committee on IPM policy and agency interaction among USDA NIFA, NRCS, and EPA (2005-2006).

International service/special activities

Educational materials in Spanish on Management of Sugarcane Aphid on Sorghum. Print and video, special focus on sorghum pest managers in South Texas and Mexico.

TAMU College of Agriculture/Life Science representative on site visit to discuss research and education collaboration with Instituto Federal Goiano & Embrapa, Goiano, Brazil.

Selected activities prior to 2013.

Host of two visiting scientists (Brazil and China).

Host of one graduate student trainee (France).

Sabbatical USDA NIFA grant for professional development. Three months training and research at Wageningen University in the Netherlands (J. van Lenteren host) & three months training at USDA ARS, Stillwater, OK (N. Elliott host).

Extramurally Supported Projects (augmenting a USDA NIFA Hatch project for 10 years in current appointment, and a previous 17 years at other Land-Grant Universities)

Overview of Competitive grants and awards: Career total: 112 funded, 59 as PI and 53 as co-I. Career cumulative across awards, \$ 3,633,837 directed to my program effort, as part of multi-investigator awards totally \$ 10,186,570.

Since 2013: 46 funded, 25 as PI and 21 as a co-I. Cumulative of \$ 1,287,393 directed to my program, as part of a multi-investigator awards totally \$ 3,076,522.

Overview of non-competitive funding: Career total: 74 agreements, 65 as PI and 9 as co-I.

Career cumulative across awards, \$ 1,301,695 directed to my program effort, as part of multi-investigator awards totally \$ 1,391,865.

Since 2013: 37 funded, 32 as PI and 5 as a co-I. Cumulative of \$ 602,582 directed to my program, as part of a multi-investigator awards totally \$ 705,082.

Competitive Grants/Contracts listing since 2013 (selected and related to economic entomology, invasive species management, and applied insect ecology, not including industry contracts):

My contribution in multi-investigator support: ¹ led investigation, primary role in writing/experiments or outreach, ² primary role in supporting student, ³ secondary role in writing, primary role in conducted an experiment or outreach, ⁴ secondary role in writing/experiments or outreach, ⁵ minor role in writing/ experiments or outreach. Grants with outreach component indicated parenthetically.

Elkins, B.H., and **M.J. Brewer**². 2020-2021. Relationship between water features in the landscape and abundance of sugarcane aphids and natural enemies on sorghum plants. Texas Ecological Laboratory (external competitive, \$5,837, \$5,837 allocated to Elkins/Brewer).

Brewer, M.J.², and I.L. Esquivel. 2019-2020. Reciprocal benefits to cotton yield and bee pollinators in a cotton/sorghum agroecosystem. Southern IPM Center Emerging Issues Program. USDA NIFA (external competitive, \$30,000, \$30,000 allocated to Brewer).

Brewer, M.¹ 2016-2021. Areawide pest management of the invasive sugarcane aphid in grain sorghum, Texas, areawide pest management demonstration, first four years. USDA ARS Areawide IPM Program (with outreach) (\$508,233, allocated to Brewer \$508,233)

Brewer, M.¹, R. Bowling, A. Knutson et al. 2016-2018. Sugarcane aphid management on sorghum. Texas Grain Sorghum Producers Board (\$72,000, allocated to Brewer \$57,250).

Bowling, R., **M. Brewer**¹, S. Vyavhare, M. Parajulee, S. Biles, and D. Kerns (leadership rotates). 2015-2020. Seed treatments, cotton cultivars, and pyrethroid resistance affecting cotton insect pests in the southwest region. Cotton Inc. (external, combined competitive and noncompetitive, \$284,943, allocated to Brewer \$ 95,703).

Peterson, G., **M. Brewer**³, and B. Rooney. 2015-2017. Technology to mitigate loss in sorghum to sugarcane aphid. Texas A&M AgriLife Research Monocot Improvement (\$80,000, allocated to Brewer \$20,000).

Brewer, M.¹, M. Young, et al. 2016-2019. Insect injury, yield, and economic return of Bt and drought tolerant corn under different water availability. Texas Corn Producers Board Grants Program (external competitive, \$41,102, allocated to Brewer \$35,323).

Brewer, M.¹, D. Kerns, G. Peterson, J. Woolley, R. Villanueva, and W. Rooney. 2014-2017. An IPM response to the invasive sugarcane aphid on sorghum: developing and integrating thresholds, plant resistance, and biocontrol tactics. USDA NIFA Crop protection and pest

management CGP, Applied Research and Development (\$250,000, allocated to Brewer \$58,591).

Murray, S., W. Xu, **M. Brewer**³, T. Isakeit, P. Williams, and M. Warburton. 2014-2018. Reducing pre-harvest losses from aflatoxin in maize production through integrated breeding and pest management strategies. USDA NIFA, AFRI Food Security Program (external competitive, \$1,425,536, allocation to Brewer \$312,000).

Brewer, M.¹, M. Way, R. Villanueva, and J. Woolley. 2014. Initiation of an integrated regional response to an invasive aphid pest of sorghum. Southern Region IPM Enhancement Grant (with outreach) (\$30,000, allocated to Brewer \$8,190).

Brewer, M.¹ 2014-2019. Partnership in graduate education: addressing the need for cotton entomologists. Cotton Inc. (external noncompetitive, \$95,989, allocated to Brewer \$95,989).

Brewer, M.¹, R. Bowling, M. Young, and M. Way. 2013-2018. Management of sugarcane aphid on sorghum in Texas. Texas Grain Sorghum Producers Board (with outreach) (competitive, \$176,247, allocated to Brewer \$110,430).

Publications

Overview

Publication Type	Career	Since 2013
Journal article (peer reviewed)	116	63
Chapters in Books	7	1
Abstracts and proceedings papers	67	26
University Pubs	50	8

Refereed journal articles (since 2013 and selected prior publications). Listings are in reverse chronological order, Superscripts are used to identify my contribution: ¹ led investigation and writing, ² provided guidance for lead graduate student, ³ conducted a component experiment, ⁴ data collection, organization, and/or analyses, ⁵ consulted on project, input on design, data management and/or analyses, ⁶ guidance for lead post-doc, ⁷ guidance for lead undergraduate student, ⁸ shared writing. + indicates student or post-doc in my program. Et al. used when authorship is extensive.

Esquivel, I.L., **M.J. Brewer**², and R.N. Coulson. 2020. A native bee, *Melissodes tepaneca* (Hymenoptera: Apidae), benefits cotton production. *Insects*. In press.

Esquivel, I.L., **M.J. Brewer**², and R.N. Coulson. 2020. Field edge and field-to-field ecotone-type influences on two cotton herbivores: cotton fleahopper, *Pseudatomoscelis seriatus* (Hemiptera: Miridae), and verde plant bug, *Creontiades signatus* (Hemiptera: Miridae). *J. Econ. Entomol.* doi.org/10.1093/jee/toaa137.

Park, J. J.A. Thomasson, Z. Gorman, **M.J. Brewer**², W.L. Rooney, and M.V. Kolomies, 2020. Multivariate analysis of sorghum volatiles for the fast screening of sugarcane aphid infestation. *J. Asia-Pacific Entomol.* in press.

Deng, X., J.A. Thomasson, N.A. Pugh, J. Chen, W.L. Rooney, **M.J. Brewer**⁴, and Y. Shi. 2020. Estimating the severity of sugarcane aphid infestation on sorghum with machine vision. *Inter. J. Precis. Agric. Aviat.* 3: 89-96.

Glover, J.P.⁺, and **M.J. Brewer**². 2020. Comparisons of cotton boll injury caused by four species of boll-feeding Insects (Hemiptera: Pentatomidae and Miridae). *J. Cotton Sci.* 24:27-33.

Pruter, L.S., M. Weaver, and **M.J. Brewer**⁸. 2020. Overview of risk factors and strategies for management of insect-derived ear injury and aflatoxin accumulation for maize grown in subtropical areas of North America. *J. Integ. Pest Manage.* 11:8 (doi: 10.1093/jipm/pmaa005).

Parys, K.A., I. Esquivel, K.W. Wright, T. Griswold, and **M.J. Brewer**⁵. 2020. Native pollinators (Hymenoptera: Apoidea) in cotton grown in the Gulf South, United States. *Agronomy* 10: 698 (doi:10.3390/agronomy10050698).

Esquivel, J. F., J. P. Glover, **M. J. Brewer**⁴, A. M. Helms, W. O. Ree, X. A. Shirley, and A. A. Bell. 2020. Expansion of geographical range and plant associations of *Leptoglossus clypealis*: a potential invasive pest of sorghum along the Texas Gulf Coast. *Southwest. Entomol.* 45: 1-15.

Lindenmayer, J.C., K.L. Giles, N.C. Elliott, A.E. Knutson, R. Bowling, **M.J. Brewer**⁴, N.J. Seiter, B. McCornack, S.A. Brown, A.L. Catchot, and T.A. Royer. 2020. Development of binomial sequential sampling plans for sugarcane aphid *Melanaphis sacchari* Zehntner (Hemiptera: Aphididae) in commercial grain sorghum. *J. Econ. Entomol.* 113: toaa064, <https://doi.org/10.1093/jee/toaa064>.

Glover, J.P.⁺, E.G. Medrano, T. Isakeit, and **M.J. Brewer**². 2020. Transmission of cotton seed and boll rotting bacteria by the verde plant bug (Hemiptera: Miridae). *J. Econ. Entomol.* 113: 793-799.

Koralewski, T. E., H.-H. Wang, W. E. Grant, **M. J. Brewer**⁵, N. C. Elliott, J. K. Westbrook, A. Szczepanec, Knutson, K. G. Giles, and J. P. Michaud. 2020. Integrating models of atmospheric dispersion and crop-pest dynamics: linking detection of local aphid infestations to forecasts of region-wide invasion of cereal crops. *Ann. Entomol. Soc. Amer.* 113: 79-87.

Brewer, M. J.¹, L. Deleon⁺, and I. L. Esquivel.⁺ 2020. Geographic information system (GIS)-based mapping and spatial analyses applied to risk assessment and resource allocation for boll weevil (Coleoptera: Curculionidae) detection. *Ann. Entomol. Soc. Amer.* 113: 71-78.

Pruter, L.S.⁺, **M.J. Brewer**², M.A. Weaver, S.C. Murray, T.S. Isakeit, and J.S. Bernal. 2019. Association of insect-derived ear injury with yield and aflatoxin of maize hybrids varying in Bt transgenes. *Environ. Entomol.* 48: 1401-1411.

Maxson, E.L.⁺, **M.J. Brewer**², W.L. Rooney, and J.B. Woolley. 2019. Species composition and abundance of the natural enemies of sugarcane aphid, *Melanaphis sacchari* (Zehntner) (Hemiptera: Aphididae), on sorghum in Texas. *Proc. Wash. Entomol. Soc.* 121:657-680.

Glover, J.P.⁺, G.A. Sword, and **M.J. Brewer**². 2019. Photoperiod-specific within-plant distribution of the green stink bug (Hemiptera: Pentatomidae) on cotton. *Environ. Entomol.* 48: 1234-1240.

Wang, H.-H., W.E. Grant, N.C. Elliott, **M.J. Brewer**⁵, T.E. Koralewski, J.K. Westbrook, T.M. Alves, and G.A. Sword. 2019. Integrated modelling of the life cycle and aeroecology of wind-borne pests in temporally variable spatially heterogeneous environment. *Ecol. Modelling* 399: 23-38.

Gordy, J.W.⁺, **M.J. Brewer**², R.D. Bowling, G.D. Buntin, N.J. Seiter, D.L. Kerns, F.P.F. Reay-Jones, and M.O. Way. 2019. Development of economic thresholds for sugarcane aphid (Hemiptera: Aphididae) in susceptible grain sorghum hybrids. *J. Econ. Entomol.* 112: 1251-1259.

Glover, J.P.⁺, **M.J. Brewer**², M.N. Parajulee, and G.A. Sword. 2019. Plant response and economic injury levels for a boll feeding sucking bug complex on cotton. *J. Econ. Entomol.* 112: 1227-1236.

Brewer, M.J.⁸, and J.P. Glover⁺. 2019. Boll injury caused by leaf-footed bug in late-season cotton. *Crop Protect.* 119: 214-218.

Brewer, M.J.⁸, F.B. Peairs, and N.C. Elliott. 2019. Invasive cereal aphids of North America: ecology and pest management. *Ann. Rev. Entomol.* 64: 73-93.

Backoulou, G.F., N.C. Elliott, L.L. Giles, **M.J. Brewer**⁴, et al. 2018. Detecting change in a sorghum field infested by sugarcane aphid. *Southwest. Entomol.* 43: 823-832.

Thomas, J.L.⁺, R. Bowling, and **M.J. Brewer**². 2018. Learning experiences in IPM through concise demonstrational training videos. *J. Integrated Pest Manage.* 9(1): 2; 1–6; doi: 10.1093/jipm/pmx030.

Pugh, N.A., D.W. Horne, S.C. Murray, et al., **M.J. Brewer**³, and W.L. Rooney. 2018. Temporal estimates of crop growth in sorghum and maize breeding enabled by unmanned aerial systems. *Plant Phenome J.* 1:170006; doi:10.2135/tppj2017.08.0006.

Elliott, N.C., **M.J. Brewer**⁵, and K.L. Giles. 2018. Landscape context affects aphid parasitism by *Lysiphlebus testaceipes* in wheat fields. *Environ. Entomol.* 47: 803-811.

Backoulou, G.F., N.C. Elliott, L.L. Giles, T.M. Alves⁺, **M.J. Brewer**⁴, et al. 2018. Using multispectral imagery to map spatially variable sugarcane aphid infestations in sorghum. *Southwest. Entomol.* 43: 37-44.

Chu, T., M. J. Starek, **M. J. Brewer**³, S.C. Murray, and L. S. Pruter⁺. 2018. Characterizing canopy height with UAS structure-from-motion photogrammetry—results analysis over multiple factors in a maize field trial. *Remote Sensing Letters* 9: 753-762.

Peterson, G.C., J.S. Armstrong, B.B. Pendleton, M. Stelter, and **M.J. Brewer**⁴. 2018. Registration of Tx3410 through Tx3428 sorghum germplasm resistant to sugarcane aphid [*Melanaphis sacchari* (Zehntner)]. *J. Plant Registrations* 12: 391-398

Karp, D.S., et al. (including **M. Brewer**⁴ among multiple authors). 2018. Crop pests and predators exhibit inconsistent responses to surrounding landscape composition. *Proc. Nat. Acad. Sci.* 201800042; doi: 10.1073/pnas.1800042115.

Anderson, D.J., **M.J. Brewer**², R.D. Bowling, and J.A. Landivar. 2018. Recording within cotton distribution of plant bug injury using plant mapping computer-based tools. *Crop Protect.* 112: 220-226.

Harris-Shultz, K.R., **M.J. Brewer**⁴, P.A. Wadl, X. Ni, and H. Wang. 2018. A sugarcane aphid ‘super-clone’ predominates on sorghum and johnsongrass for four US States. *Crop Sci.* 58: 2533-2541.

Elliott, N., **M. Brewer**³, N. Seiter, et al. 2017. Sugarcane aphid spatial distribution in grain sorghum fields. *Southwestern Entomologist* 42: 27-35.

Stanton, C.⁺, M. J. Starek, N. Elliott, **M. Brewer**², et al. 2017. Unmanned aircraft system-derived crop height and normalized difference vegetation index metrics for sorghum yield and aphid stress assessment. *J. Applied Remote Sensing* 11: 026035, doi:10.1117/1.JRS.11.026035.

Weaver, M.A., H.K. Abbas, **M.J. Brewer**³, L.S. Pruter⁺, et al. 2017. Integration of biological control and transgenic insect protection for mitigation of aflatoxin in corn. *Crop Protect.* 98:108-115.

Harris-Shultz, K., X. Ni, P.A. Wadl, et al., **M.J. Brewer**³, and X. Yang. 2017. Microsatellite markers reveal; a predominant sugarcane aphid (Homoptera: Aphididae) clone is found on sorghum in seven states and one territory of the USA and one territory of the USA. *Crop Sci.* 57: 2064-2072.

Deleon, L.⁺, **M. J. Brewer**⁷, I. L. Esquivel⁺, and J. Halcomb. 2017. Use of a geographic information system to produce pest monitoring maps for south Texas cotton and sorghum land managers. *Crop Protect.* 101: 50-57.

Brewer, M.J.¹, J.W. Gordy⁺, D.L. Kerns, J.B. Woolley, W.L. Rooney, and R.D. Bowling. 2017. Sugarcane aphid population growth, plant injury, and natural enemies on selected grain sorghum hybrids in Texas and Louisiana. *J. Econ. Entomol.* 110: 2109-2118.

Chu, T., M. J. Starek, **M. J. Brewer**³, S.C. Murray, and L.S. Pruter⁺. 2017. Assessing crop lodging over an experimental maize (*Zea mays* L.) field using UAS images. *Remote Sensing* 9: 923; doi:10.3390/rs9090923.

McCloud, L.A., S. Hague, A. Knutson, C. W. Smith, and **M. Brewer**⁵. 2016. Cotton square morphology offers new insights into host plant resistance to cotton fleahopper (Hemiptera: Miridae) in upland cotton. *J Econ Entomol*: 109: 392-398.

Brewer, M.J.¹, D.J. Anderson, and M.N. Parajulee. 2016. Cotton water-deficit stress, age, and cultivars as moderating factors of cotton fleahopper abundance and yield loss. *Crop Protect*: 86: 56-61.

Reay-Jones, F.P.F., R.T. Bessin, **M.J. Brewer**³, et al. 2016. Impact of Lepidoptera (Crambidae, Noctuidae, and Pyralidae) pests on corn containing pyramided Bt traits and a blended refuge in the southern United States. *J. Econ. Entomol.* 109: 1859-1871.

Bowling, R., **M.J. Brewer**⁵, D.L. Kerns, et al. 2016. Sugarcane aphid (Homoptera: Aphididae): a new pest on sorghum in North America. *J. Integr. Pest Manage.* 7: 12; doi.org/10.1093/jipm/pmw011.

Reisig, D.D., D.S. Akin, R.T. Bessin, **M.J. Brewer**³, et al. 2015. Lepidoptera (Crambidae, Noctuidae, and Pyralidae) injury to corn containing single and pyramided Bt traits, and blended or refuge, in the southern United States. *J. Econ. Entomol.* 108: 157-165.

Armstrong, J.S., W.L. Rooney, G.C. Peterson, R.T. Villanueva, **M.J. Brewer**³, et al. 2015. Sugarcane aphid (Hemiptera: Aphididae): host range and sorghum resistance including cross-resistance from greenbug sources *J. Econ. Entomol.* 108: 576-582.

Elliott, N.C., G.F. Backoulou, **M.J. Brewer**⁵, and K.L. Giles. 2015. NDVI to detect sugarcane aphid injury to grain sorghum. *J. Econ. Entomol.* 108: 1452–1455; DOI: 10.1093/jee/tov080.

Elliott, N., **M.J. Brewer**³, K.L. Giles, et al. 2014. Sequential sampling for panicle worms (Lepidoptera: Noctuidae) in grain sorghum. *J. Econ. Entomol.* 107: 846-853.

Brewer, M.J.¹, G.N. Odvody, D.J. Anderson, and J.C. Remmers. 2014. A comparison of Bt transgene, hybrid background, water stress, and insect stress effects on corn leaf and ear injury and subsequent yield. *Environ. Entomol.* 43: 828-839.

Farias, C.A.⁺, **M.J. Brewer**², D.J. Anderson, et al. 2014. Native corn resistance to corn earworm, *Helicoverpa zea*, and fall armyworm, *Spodoptera frugiperda*. *Southwest. Entomol.* 39: 411-425.

Backoulou, G.F., N.C. Elliott, T.A. Royer, et al., and **M.J. Brewer**⁵. 2014. Web-based decision support system for managing panicle caterpillars in sorghum. *Crop Management* 13:1-6.

Armstrong, J.S., **M.J. Brewer**³, R.D. Parker, and J.J. Adamczyk, Jr. 2013. Verde plant bug (Hemiptera: Miridae) feeding injury to cotton bolls characterized by boll age, size, and damage ratings. *J. Econ. Entomol.* 106: 189-195.

Brewer, M.J.¹, J.S. Armstrong, and R.D. Parker. 2013. Single and multiple in-season measurements as indicators of at-harvest cotton boll damage caused by verde plant bug (Hemiptera: Miridae). *J. Econ. Entomol.* 106: 1310-1316.

Brewer, M.J.¹, D.J. Anderson, and J.S. Armstrong. 2013. Plant growth stage-specific injury and economic injury level for verde plant bug, *Creontiades signatus* (Hemiptera: Miridae), on cotton: effect of bloom period of infestation. *J Econ. Entomol.* 106: 2077-2083.

Selected relevant journal articles prior to 2013:

Brewer, M.J.¹, and P.B. Goodell. 2012. Approaches and incentives to implement integrated pest management that address regional and environmental issues. *Ann. Rev. Entomol.* 57: 41-59.

Brewer, M.J.¹, and T. Noma⁺. 2010. Habitat affinity of resident natural enemies of the invasive *Aphis glycines* on soybean, with comments on biological control. *J. Econ. Entomol.* 103: 583-596.

Noma, T.⁺, C. Gratton, M. Colunga-Garcia, **M.J. Brewer**⁶, et al. 2010. Relationship of soybean aphid (Hemiptera: Aphididae) to soybean plant nutrients, landscape structure, and natural enemies. *Environ. Entomol.* 39: 31-41.

Noma, T.⁺, and **M.J. Brewer**⁷. 2008. Fungal pathogens infecting soybean aphid and aphids on other crops grown in soybean production areas of Michigan. *Great Lakes Entomol.* 40: 41-49.

Brewer, M.J.¹, T. Noma⁺, N.C. Elliott, et al. 2008. A landscape view of cereal aphid parasitoid dynamics reveals sensitivity to farm- and region-scale vegetation. *Eur. J. Entomol.* 105: 503-511.

Kaiser, M.E.⁺, T. Noma⁺, **M. J. Brewer**², et al. 2007. Hymenopteran parasitoids and dipteran predators found utilizing soybean aphid after its midwestern United States invasion. *Ann. Entomol. Soc. Amer.* 100: 196-205.

Hoard, R. J., and **M. J. Brewer**⁷. 2006. Adoption of pest, nutrient, and conservation vegetation management using financial incentives provided by a U.S. Department of Agriculture conservation program. *HortTechnology* 16: 306-311.

Noma, T.⁺, **M. J. Brewer**⁶, K. S. Pike, and S. D. Gaimari. 2005. Hymenopteran parasitoids and dipteran predators of *Diuraphis noxia* in the west-central Great Plains of North America: species records and geographic range. *BioControl* 50: 97-111.

Brewer, M. J.¹, T. Noma⁺, and N. C. Elliott. 2005. Hymenopteran parasitoids and dipteran predators of the invasive aphid *Diuraphis noxia* after enemy introductions: temporal variation and implication for future aphid invasions. *Biol. Control* 33:315-323.

Brewer, M. J.¹, R. J. Hoard, J. N. Landis, and L. E. Elworth. 2004. The case and opportunity for public-supported financial incentives to implement integrated pest management (Forum article). *J. Econ. Entomol.* 97: 1782-1789.

Brewer, M. J.¹ and N. C. Elliott. 2004. Biological control of cereal aphids in North America and mediating effects of host plant and habitat manipulations. *Ann. Rev. Entomol.* 49: 219-242.

Ahern, R. G.⁺ and **M. J. Brewer**². 2002. Effect of different wheat production systems on the presence of two parasitoids (Hymenoptera: Aphelinidae; Braconidae) of the Russian wheat aphid in the North American Great Plains. *Agric., Ecosys. & Environ.* 92: 201-210.

Brewer, M. J.¹, D. J. Nelson, R. G. Ahern⁺, et al. 2001. Recovery and range expansion of parasitoids (Hymenoptera: Aphelinidae and Braconidae) released for biological control of *Diuraphis noxia* (Homoptera: Aphididae) in Wyoming. *Environ. Entomol.* 30: 578-588.

Chapters in Books (selected, all economic entomology and applied insect ecology themed):

Luttrell, R. G., T. G. Teague, and **M. J. Brewer**⁸. 2015. Cotton insect pest management, pp. 509-546. In D. D. Fang and R. G. Percy (Eds.) *Cotton*, 2nd Edition, Monograph 57. Madison, WI.

Brewer, M. J.⁸, and M. Ishii-Eiteman. 2009. Integrated pest management, with special focus on sustainability and risk: Principles, policy and practice, p. 33-52. In: L. Phoenix (ed.). *Critical food issues: problems and state-of-the-art solutions worldwide*, Vol. 1: Environment, agriculture, and health concerns. Praeger, Santa Barbara, CA.

Brewer, M. J.⁸, T. Noma⁺, and N. C. Elliott. 2008. A landscape perspective in managing vegetation for beneficial plant-pest-natural enemy interactions: a foundation for area-wide pest management, p. 81-96. In: Koul, O., G.W. Cuperus, and N.C. Elliott. *Area-wide pest management: theory to implementation*. CABI Pub., Oxfordshire, UK.

Elliott, N. C., D. W. Onstad, and **M. J. Brewer**⁸. 2008. History and ecological basis for areawide pest management, p. 15-33. In: Koul, O., G. W. Cuperus, and N. C. Elliott. Area-wide pest management: theory to implementation. CABI Pub., Oxfordshire, UK.

Brewer, M. J.⁸, and M. Ishii-Eiteman. 2009. Integrated pest management, with special focus on sustainability and risk: Principles, policy and practice, p. 33-52. In: L. Phoenix (ed.). Critical food issues: problems and state-of-the-art solutions worldwide, Vol. 1: Environment, agriculture, and health concerns. Praeger, Santa Barbara, CA (refereed).

Extension publications since 2013

Faris, A.M.⁺, and **M. J. Brewer**⁶. 2019. Natural enemies of the sugarcane aphid on sorghum in south Texas, 6 pp. ENTO-091. Texas A&M AgriLife Ext., College Station.

Vyavhare, S.S., D. Kerns, C. Allen, R. Bowling, **M. Brewer**⁸, and M. Parajulee. 2018. Managing cotton insects in Texas, 38 pp. ENTO-075. Texas A&M AgriLife Ext., College Station.

Bowling, R., J. Thomas⁺, and **M. Brewer**⁸. 2017. Common aphid identification in Texas grains, 2 pp. ENTO-070. Texas A&M AgriLife Extension, College Station.

Bowling, R., **M. Brewer**⁸, A. Knutson, S. Biles, M. Way, and D. Sekula-Ortiz. 2016. Scouting sugarcane aphids in south, central, and west Texas, 2 pp. ENTO-043/ENTO-043S (Spanish), Texas A&M AgriLife Extension, College Station.

Knutson, A., R. Bowling, **M. Brewer**⁸, E. Bynum, and P. Porter, 2016. The sugarcane aphid: management guidelines for grain and forage sorghum in Texas, 6 pp. ENTO-035. Texas A&M AgriLife Extension, College Station.

Brewer, M.J.⁸, R. Bowling, J.P. Michaud, and A.L. Jacobson. 2016. Sugarcane aphid: a new sorghum pest in North America, 2 pp. ENTO-056. Texas A&M AgriLife Extension, College Station, TX.

Bowling, R., **M. Brewer**⁸, A. Knutson, M. Way, P. Porter, E. Bynum, C. Allen, and R. Villanueva. 2015. Scouting sugarcane aphids. ENTO-043, Texas A&M AgriLife Extension, College Station.

Bowling, R., **M. Brewer**⁸, and S. Biles. 2015. The sugarcane aphid: a review and scouting recommendations. Texas A&M AgriLife Extension, Corpus Christi.

Villanueva, R.T., **M. Brewer**⁸, M.O. Way, S. Biles, D. Sekula, E. Bynum, J. Swart, C. Crumley, A. Knutson, P. Porter, R. Parker, G. Odvody, C. Allen, D. Ragsdale, W. Rooney, G. Peterson, D. Kerns, T. Royer, and S. Armstrong. 2014. Sugarcane aphid: a new pest of sorghum, 4 pp. Texas A&M AgriLife Extension, College Station.

Additional Outreach Educational Products

Collaborative Web Site (outreach function). The web site ‘South Texas Field Crop Entomology’ provides access to field crop insect pest management resources (<https://stexcropinsect.agrilife.org/>). The web site is led by a team of AgriLife Entomologists and staff that work together to bring news, fact sheets, and research to improve insect pest management on South Texas field crops. we provide an archive of pubs/fact sheets, applied research and reports, presentations, and training aids including videos. A past focus was on sorghum with special attention to sugarcane aphid. Cotton insect pest management has been the most recent addition. Concise educational videos are a growing outreach tool, and example videos on sugarcane aphid are accessible at this web site.

Project Web Site. An archive of pubs/fact sheets and presentations can be found at the Field Crops Research Entomology project page (<https://ccag.tamu.edu/entomology/>)

Presentations (Oral and Posters)

Overview:

Type	Career		Since 2013	
	Invited	Submitted	Invited	Submitted
Seminars/key notes:				
International	3		1	
National	17		4	
State	15		6	
Symposium papers				
International	10		6	
National	24		11	
Research papers/poster				
International	9	12	2	11
National	28	124	10	65
State	30	32	14	19
Total	135	167	53	95

Seminars since 2013.

Brewer, M.J. 2019. Association of insect-derived ear injury with aflatoxin and yield in Bt-corn grown in warm environments. Department of Entomology, North Carolina State University (lunch seminar).

Brewer, M.J. 2019. Use of current and developing technologies and strategies to improve IPM: sorghum and cotton. Instituto Federal Goiano, Rio Verde, GO, Brazil.

Brewer, M.J. 2018. Toward contemporary sugarcane aphid management, based on integrated tactics. Department of Entomology, Texas A&M.

Brewer, M.J. 2018. Insect injury, yield, and aflatoxin taken from corn of diverse genetic backgrounds. Texas A&M R&E Center, Dallas.

Esquivel, I. ⁺, and **M. Brewer**. 2017. Spatial ecology of cotton pests: relevance of edge, ecotone, biodiversity, and deliverables for managers. USDA ARS, Stoneville, MS.

Brewer, M. 2017. Toward contemporary sugarcane aphid management, based on integrated tactics and monitoring. Department Entomology and Plant Pathology, Oklahoma State.

Brewer, M. 2015. Response to an invasive aphid pest of sorghum: first steps to management and an eye to the future. Department of Agricultural and Environmental Sciences, Clemson.

Brewer, M. 2014. Outbreak of sugarcane aphid on sorghum. Texas A&M AgriLife R&E Center, Corpus Christi.

Symposium presentations since 2013, ⁺ indicates student or post-doc:

Brewer, M.J., T. M. Alves⁺ J. Gordy⁺, A. Faris⁺, et al. 2018. The latest cereal aphid invader of the Great Plains: Sugarcane aphid on sorghum. Entomol. Soc. Amer./Entomol. Soc. Canada/Entomol. Soc. British Columbia Joint Annual Meeting. Vancouver, Canada.

Elliott, N., **M. Brewer** and K. Giles. 2018. Area-wide cereal aphid management: Appropriate and essential to large-scale cereal production systems. Entomol. Soc. Amer./Entomol. Soc. Canada/Entomol. Soc. British Columbia Joint Annual Meeting. Vancouver, Canada.

Brewer, M., and R. Bowling. 2016. Variation in sorghum hybrid sensitivity and yield response: opportunities for integrated management. Sugarcane aphid management symposium. Entomol. Soc. Amer., SW Branch, Tyler, TX.

Woolley, J., E. Maxson⁺, and **M. Brewer**. 2016. Natural enemies of sugarcane aphid on sorghum in Texas: the most important species. Sugarcane aphid management symposium. Entomol. Soc. Amer., SW Branch, Tyler, TX.

Brewer, M., J.P. Michaud, and E. Maxson⁺. 2016. Natural enemy activity in sorghum hybrids varying in susceptibility to sugarcane aphid: opportunities for integrated management of sugarcane aphid on sorghum. Invasion biology and biological control symposium. Entomol. Soc. Amer., NC Branch.

Kerns, D.L., **M.J. Brewer**, R.D. Bowling, et al. 2016. Sugarcane aphid on grain sorghum. Joint Internat. Congress of Entomol./Entomol. Soc. Amer Annual Meeting, Orlando, FL.

Elliott, N., T.A. Royer, **M.J. Brewer**, N.J. Seiter et al. 2016. Towards efficient multi-scale methods for monitoring sugarcane aphid infestations in sorghum. Joint Internat. Congress of Entomol./Entomol. Soc. Amer Annual Meeting, Orlando, FL.

Brewer, M.J. E. Maxson⁺, J. Gordy⁺, et al. 2016. Variation in sorghum hybrid sensitivity and natural enemy activity provides opportunities for integrated management of sugarcane aphid. Joint Internat. Congress of Entomol./Entomol. Soc. Amer Annual Meeting, Orlando, FL.

Brewer, M. 2015. Initiation of an integrated regional response to an invasive aphid pest of sorghum: from near-term control to long-term management. National Invasive Species Awareness Week. Regional IPM Centers.

Brewer, M. and D. Kerns. 2015. Regional thresholds for IPM decision-making: balancing aphid control, costs, and natural enemy potential. Entomol. Soc. Amer. SW Branch, Tulsa.

Bowling, R., and **M. Brewer**. 2015. Identification, spread, and region-wide perspective on sorghum damage to sugarcane aphid. Entomol. Soc. Amer. SW Branch, Tulsa.

Brewer, M. 2015. Sampling strategies and economic thresholds for sugarcane aphid on grain sorghum. Entomol. Soc. Amer. SE Branch, Gulfport, MS.

Brewer, M., M. Way, D. Ragsdale, et al. 2014. Outbreak of sorghum/sugarcane aphid on sorghum, first detections, distribution, and notes on management. Entomol. Soc. Amer. SW Branch Meeting.

Elliott, N., G. Backoulou, **M. Brewer**, and K. Giles. 2014. Preliminary evaluation of parasitic wasps parasitizing the sugarcane aphid. Entomol. Soc. Amer. SW Branch.

Brewer, M., D. Kerns, M.O. Way, et al. 2014. An integrated regional response to an invasive aphid pest of sorghum. Entomol. Soc. Amer. Annual meeting.

Other selected oral/poster presentations since 2013, ⁺ indicates student:

Esquivel, I.L.⁺, Parys, K., Wright, K., M.J. Brewer, and R.N. Coulson. 2020. Reciprocal benefits to cotton and bee pollinators in the cotton agroecosystem. Entomol. Soc. Amer. NCB/SWB Joint Meeting. Oklahoma City, OK (3rd place virtual student poster competition due to COVID-19) (submitted, oral, national).

Elkins, B.H.⁺ M.D. Eubanks, and **M.J. Brewer**. 2020. Landscape effects on sugarcane aphids and natural enemies in sorghum may be more complicated than they appear. Ecological Integration Symposium (Texas A&M) Student Poster (1st place student competition) (submitted, oral, national).

Elkins, B.H.⁺ **M.J. Brewer**, A.M. Faris, and J.B. Woolley. 2019. Spatial variation in natural enemy responses to sugarcane aphid in sorghum across Texas. Texas Plant Protection Conf., Bryan, TX (submitted, oral, state).

Glover, J.⁺, **M.J. Brewer**, and G.A. Sword. 2019. Photoperiod-specific within-cotton distribution of the green stink bug (Hemiptera: Pentatomidae): implications for detection and sampling. Beltwide Cotton Conf., New Orleans, LA (submitted, oral, national).

- Brewer, M.**, and J. Glover⁺. 2019. Boll injury caused by leaffooted bug in late-season cotton. Beltwide Cotton Conf., New Orleans, LA (submitted, oral, national).
- Esquivel, I.L. ⁺, M.J. Arcenaux⁺, K.W. Wright, **M.J. Brewer**, and R.N. Coulson. 2019. Interplay between cotton, native bees, and the surrounding landscape: reciprocal benefits to cotton and bee pollinators. Beltwide Cotton Conf., New Orleans, LA (submitted, oral, national).
- Brewer, M.**, and J. Glover ⁺. 2019. Leaffooted bug joins the complex of sucking bugs that injure cotton bolls if the timing is right. Southwest Branch Entomol. Soc. Amer. Annual meeting, Tulsa, OK (submitted, oral, national).
- Pruter, P. ⁺, **M. Brewer**, M. Weaver, S. Murray, and T. Isakeit. 2019. Association of insect-derived ear injury to aflatoxin and yield of maize that varied in incorporation of Bt transgenes and was grown in the southern U.S. Great Plains. Entomol. Soc. Amer. Annual meeting (volunteer, oral, national).
- Faris, A.M. ⁺, D.G. Olsovsky, and **M.J. Brewer**. 2019. Remnant sorghum and johnson grass as Sources for parasitoids and predators of the sugarcane aphid, *Melanaphis sacchari* Zehntner (Hemiptera: Aphididae) Entomol. Soc. Amer. Annual meeting (volunteer, oral, national).
- Esquivel, I.L. ⁺, **M.J. Brewer**, and R.N. 2019. Reciprocal benefits to cotton and bee pollinators in the cotton agroecosystem. Entomol. Soc. Amer. Annual meeting (volunteer, oral, national).
- Elkins, B.H. ⁺ M.D. Eubanks, and **M.J. Brewer**. 2019. Landscape diversity as an indicator of pest and natural enemy dynamics for sugarcane aphid in sorghum. Entomol. Soc. Amer. Annual meeting (volunteer, oral, national, 2nd place biocontrol, PIE student competition).
- Wang, H.-H., W.E. Grant, J.K. Westbrook, **M.J. Brewer**, et al. 2018. Modeling the life cycle and aeroecology of wind-borne crop pests in temporally-variable spatially-heterogeneous environments. Internat. Congress Environ. Modelling & Software. Ft. Collins (invited, oral)
- Garcia, I. ⁺, M. J. Starek, and **M. J. Brewer**. 2018. Assessing separability of UAS-derived vegetation indices for detecting plant stress due to iron chlorosis. American Geophysical Union, Washington, DC, December 2018 (oral, submitted, national).
- Esquivel, I. ⁺, **M. Brewer**, and R. Coulson¹, 2018. Spatial relationships of cotton fleahopper and verde plant bug: implications for management. Entomol. Soc. Amer./Entomol. Soc. Canada/Entomol. (submitted, oral, international).
- Esquivel, I. ⁺, R. Coulson¹ and **M. Brewer**. 2018. Biodiversity, ecosystem services, and pollinator benefits associated with native bees in a cotton agroecosystem. Entomol. Soc. Amer./Entomol. Soc. Canada/Entomol. (submitted, poster, international).
- Glover, J. ⁺, **M. Brewer**, T. Isakeit³ and Enrique Medrano. 2018. Pathogenicity and transmission of cotton seed and boll rotting bacteria vectored by the verde plant bug. Entomol. Soc. Amer./Entomol. Soc. Canada/Entomol. (submitted, oral, international).
- Park, J. ⁺, J. A. Thomasson, Z. Gorman, **M. Brewer**, et al. 2018. Analysis of sorghum volatiles in response to sugarcane aphid herbivory. Texas Plant Protection Conf., Bryan, TX.
- Brewer, M.J.**, and T.M. Alves⁺. 2018. Areawide pest management of the sugarcane aphid in grain sorghum. USDA ARS annual project meeting, Dallas, TX (invited, oral).
- Brewer, M.J.**, R. Bowling, and J. Gordy⁺. 2018. Outbreak risk factors and factors reducing outbreak risk. United Sorghum Sugarcane Aphid Workshop, St. Louis, MO (invited, oral).
- Wang, H.-H., W.E. Grant, J.K. Westbrook, **M.J. Brewer**, et al. 2018. Modeling the life cycle and aeroecology of wind-borne crop pests in temporally-variable spatially heterogeneous environments. Internat. Congress Environ. Modelling & Software. Ft. Collins (invited, oral).
- Faris, A. ⁺, N. Elliott and **M. Brewer** 2018. Relative parasitoid and predator suppression of sugarcane aphid on susceptible and resistant sorghum hybrids. Entomol. Soc. Amer./Entomol.

Soc. Canada/Entomol. Soc. British Columbia Joint Annual Meeting. Vancouver, Canada (submitted, oral).

Gordy, J.⁺, **M. Brewer** and M. Way. 2018. Comparison of tally-based thresholds and density-based thresholds for sugarcane aphid management. Entomol. Soc. Amer./Entomol. Soc. Canada/Entomol. Soc. British Columbia Joint Annual Meeting. Vancouver, Canada (submitted, oral).

Elliott, N., **M. Brewer**, K. Giles, and M. Phoofolo. 2017. Modeling effects of landscape context on parasitism of cereal aphids in wheat by *Lysephlebus testaceipes*. Entomol. Soc. Amer., SW Branch. April, Austin, TX (submitted, oral).

Masiane, T.⁺, M. J. Starek, and **M. J. Brewer**. 2017. UAS-derived pest management solution to sorghum crop production. Ann meeting of the Amer. Soc. Photogrammetry and Remote Sensing: Imaging Geo-spatial Technology Forum. Mar. 12-16, Baltimore (submitted, poster).

Harris-Shultz, K., **M. Brewer**, P. Wadl, and X. Ni. 2017. Sugarcane aphid diversity on sorghum and johnsongrass. Ann. Meeting, Georgia Entomol. Soc. (submitted, oral).

Gordy, J.⁺, **M. Brewer**, D. Kerns, et al. 2017. Development of thresholds for management of sugarcane aphid on sorghum. Entomol. Soc. Amer Annual (submitted, poster).

Alves, T.⁺, W. Ahrens, **M. Brewer**, and N. Elliott. 2017. Host plant and winter survival affects sugarcane aphid overwintering. Entomol. Soc. Amer Annual. Denver (submitted, poster).

Elliott, N., **M. Brewer**, and K. Giles. 2017. Parasitism of cereal aphids by *Lysiphlebus testaceipes* in wheat field edges and interiors. Entomol. Soc. Amer Annual meeting. Denver (submitted, oral).

Garcia, I.⁺, M. J. Starek, and **M. J. Brewer**. 2017. UAS-Based multispectral imaging for detecting plant stress due to iron chlorosis in grain sorghum. American Society of Photogrammetry and Remote Sensing and International Lidar Mapping Forum Conf. & Society for the advancement of Chicanos/Hispanics and Native Americans in Science Conf. Salt Lake City (submitted, oral).

Brewer, M. J. Gordy⁺, D. Kerns, et al. 2016. Sorghum-sugarcane aphid research exchange meeting, New Orleans, LA (invited, oral).

Thomas, J.⁺, R. Bowling, and **M. Brewer**. 2016. Entomology extension learning methods: competency differences between video and slide show presentations. Entomol. Soc. Amer., SW Branch, Tyler, TX (submitted, poster).

Gordy, J.⁺, **M. Brewer**, D. Anderson, et al. 2016. Development of thresholds for management of sugarcane aphid on sorghum. Entomol. Soc. Amer., SW Branch. Tyler, TX (submitted, poster).

Elliott, N., K. Giles, **M. Brewer**, and G. Backoulou. 2016. Parasitism of cereal aphids in wheat by *Lysiphlebus testaceipes* is affected by landscape context. Entomol. Soc. Amer., SW Branch, Tyler, TX (submitted, oral).

Maxson, E.⁺, **M. Brewer**, and J. Woolley. 2016. Species composition and seasonality of the natural enemies of sugarcane aphid on susceptible and resistant sorghum. Entomol. Soc. Amer., SW Branch. Tyler, TX (submitted, poster, 2nd place student award).

Bowling, R. **M. Brewer**, S. Biles, and J. Gordy⁺. 2016. 2015 Occurrence of sugarcane aphid, *Melanaphis sacchari* (Zehntner), in the U.S. and Mexico with reference to occurrence in 2013 and 2014. Entomol. Soc. Amer., SW Branch Meeting. Tyler, TX (submitted, poster).

Russell, L., et al., **M. Brewer**, and J. McGinty. 2016. Economic decision aid for treating sugarcane aphid on sorghum. Entomol. Soc. Amer., SW Branch. Tyler, TX (submitted, poster).

Maxson, E.⁺, **M.J. Brewer**, and J. Woolley. 2016. Species composition and seasonality of the natural enemies of sugarcane aphid on susceptible and resistant sorghum. Joint Internat. Congress of Entomol./Entomol. Soc. Amer Annual Meeting, Orlando, FL (submitted, oral)

Thomas, J.L.⁺, R. Bowling, and **M.J. Brewer**. 2016. Entomology extension learning methods: competency differences between video and slideshow presentations. Joint Internat. Congress of Entomol./Entomol. Soc. Amer Annual Meeting. Orlando, FL (submitted, poster).

Gordy, J.⁺, **M. Brewer**, and D. Kerns. 2016. Environmental variables and observed field differences in aphid population change across geographic locations. Texas Plant Protection Conf., Bryan, TX. (submitted, poster, 1st place student award).

Brewer, M., and R. Bowling. 2016. Sugarcane aphid on grain sorghum: update and proposed work. Annual meeting of the Texas Grain Sorghum Producers Board, Dec. Amarillo, TX (invited, oral).

Brewer, M. 2016. Sugarcane aphid: damage, distribution, detection, and decision-making. Joint Annual Meeting: Texas Sorghum Assoc. and Texas Sorghum (invited, oral).

Brewer, M. 2015. Sugarcane aphid update: distribution, sampling strategies, thresholds, and impact. Texas Seed Trade Assn. Austin, TX (invited oral).

Brewer, M. 2015. Pest management strategies to control sugarcane aphid in grain and forage sorghum. Agriculture Technology Conf., Commerce, TX (oral paper, state, invited).

Brewer, M., and R. Bowling. 2015. Sugarcane aphid on grain sorghum: distribution, thresholds, and hybrid sensitivity. Texas Plant Protection Conf., Bryan, TX (invited, oral).

Gordy, J.⁺, **M. Brewer**, D. Anderson, et al. 2015. Development of thresholds for management of sugarcane aphid on sorghum. Texas Plant Protection Conf., Bryan, TX (submitted, poster).

Bowling, R., **M. Brewer**, S. Biles, and J. Gordy⁺. 2015. Occurrence of sugarcane aphid in the U.S. and Mexico. Texas Plant Protection Conf., Bryan, TX (submitted, poster).

Deleon, L.⁺, **M. Brewer**, I. Esquivel⁺, and J. Halcomb. 2015. Geographic information systems to produce pest risk maps for South Texas cotton and sorghum land managers. Society for Advancement of Chicanos/Hispanics and Native Americans in Science Conf, Washington D.C. (submitted, poster).

Bowling, R., **M. Brewer**, L. Russell, and M. Young. 2015. Evaluation and economic assessment of multiple insecticide strategies for managing pest complexes in sorghum. Entomol. Soc. Amer., Annual. Minneapolis, MN (submitted, poster).

Brewer, M., and R. Bowling. 2015 Sugarcane aphid on grain sorghum. Annual meeting of the Texas Grain Sorghum Producers Board, Nov. Amarillo, TX (invited, oral).

Brewer, M. 2014. Sugarcane aphid on sorghum: update on sampling & economic thresholds, with notes on IPM. Sorghum Improvement Conf. of North America. Corpus Christi, TX (invited, oral).

Ahrens, T.⁺, et al., **M. Brewer**, and M. Way. 2014. Efficacy of insecticides for management of sugarcane aphid on sorghum in Texas. Texas Plant Protection Conf., Bryan, TX (submitted, poster).

Brewer, M. 2014. Sugarcane aphid on sorghum: distribution, damage, thresholds, and insecticides. Texas Plant Protection Conf., Bryan, TX (paper, regional, invited).

Bowling, R., and **M. Brewer**. 2014. Occurrence of sugarcane aphid on sorghum in the United States. Texas Plant Protection Conf., Bryan, TX (submitted, poster).

Ahrens, W.T.⁺, et al., and **M. Brewer**. 2014. Setting an economic threshold for sugarcane aphid on sorghum. Texas Plant Protection Conf., Bryan, TX (poster, submitted).

Brewer, M., M. Way, S. Armstrong, et al. 2013. Outbreak of sorghum/sugarcane aphid on sorghum. Texas Plant Protection Conf., Bryan, TX (submitted, poster).

Extension/outreach selected presentations since 2013:

Brewer, M., and R. Bowling. 2017. Research and Extension working together to help manage sugarcane aphid in south Texas. AgriLife Advanced Leaders Program, Texas A&M AgriLife Research & Extension Center, Corpus Christi (invited, oral, administrative).

Brewer, M. 2017. Sugarcane aphid hybrid resistance. Texas A&M AgriLife Research and Extension Center, Corpus Christi (invited oral presentation, local).

Brewer, M. 2016. Sugarcane aphid: damage, distribution, detection, and decision-making. Milo Insulation Board meeting, Feb 27, Fort Worth, TX (invited oral presentation, state).

Brewer, M., and J. Gordy. 2016. Sugarcane aphid economic threshold and sampling update. Texas A&M AgriLife Research and Extension Center webinar series. Corpus Christi (invited, oral).

Bowling, R., **M. J. Brewer**, J. Gordy. 2016, Sugarcane aphid (Hemiptera: Aphididae): a new pest on sorghum in North America. Sugarcane Aphid Management Symposium. Guadalajara, Jalisco (invited, oral).

Brewer, M. 2015, 2016. Consultant update on sorghum and cotton insect pest management. Top Consultants Meeting, Seadrift, TX (invited, oral).

Brewer, M. 2015. Sampling strategies and economic thresholds for sugarcane aphid on grain sorghum. Jan. 12, 2015, Texas A&M AgriLife Research and Extension Center, Corpus Christi, Texas (webinar).

Brewer, M. 2014. Outbreak of sorghum/sugarcane aphid on sorghum. Feed Grain and Cotton Conference. Wharton, TX, Jan. (invited, oral).

Brewer, M. 2014. Outbreak of sorghum/sugarcane aphid on sorghum. Coastal Bend Crop Symposium. Corpus Christi, Jan. (invited, oral).

Teaching

Number of Graduate Students and Postdoctoral Associates Trained

Post-doctoral: 3 visiting scholar trainees (Sabbatical guest), 3 post-doctoral research associates.

Graduate Students as Advisor: 10 M.S. chair, 2 M.S. as co-chair, 6 Ph.D. chair, Since 2013, three M.S. and three Ph.D. students graduated, one Ph.D. scheduled to defend in 2020.

Graduate Student Committees as member: 24; currently 1 Ph.D., Bioengineering (TAMU, graduated Dec 2019), 1 M.S., Geospatial Computing (TAMUCC, graduated June 2019)

Courses

Directed studies courses (since 2013): 2.

Writing a scientific review. Taught for four graduate students (2 credits, 2016).

Ecology and Management of Sugarcane aphid on sorghum. Taught for five graduate students who are using sugarcane aphid in their research (2 credits, 2017-2019), offered for formal credit or as part of research hours at two Universities.

Other Teaching Activities

Guest classroom lectures: 24 related to IPM given at TAMU College Station and TAMU Kingsville.

Undergraduate Experiential Learning: 19 Internship projects at TAMU, 15 since 2013 from 4 colleges with 10 related to sugarcane aphid IPM.

Other short courses developed prior to 2013:

Current topics in entomology: advanced agricultural entomology (ENTO 5689, 2 credits graduate, 2000-2002, taught twice), University of Wyoming, approximate 6 students per term.

Insect-plant interactions (ENTO 4685/5685, 2 credits upper division/graduate level, offered biennially, 1996-2000, taught three times), University of Wyoming. Approximately 10 students per term.

Professional Improvement Grants: International travel award to improve student experiential learning, visit to agricultural university in Brazil to explore undergraduate and graduate student exchanges. Neuhaus-Shepardson Faculty Development Award for Teaching Improvement. 2018-2019 (\$2,000).

Seed grant (sabbatical support) for visitations to University of Wageningen, the Netherlands, and USDA ARS Stillwater, OK to conduct research and establish collaborations on insect-plant-natural enemy interaction and areawide pest management of invasive species.

Mentoring Evaluation. My mentoring is oriented toward undergraduate and graduate student experiential learning, consistent with my appointment expectation of 15% contribution to teaching inclusive of graduate and post-doc training. Therefore, evaluation primarily takes the form of student accomplishments. Graduate and undergraduate students I have mentored have gained recognition in the form of awards (8 meeting presentation awards, 3 professional awards including ESA's Larry Lawson Graduate Student Award in Applied Entomology and 2 students receiving the annual Ph.D. award given by the Texas Plant Protection Assn), scholarships (5 scholarships including two 3-yr TAMU Foundation and AgriLife Research-sponsored research assistantships), and employment in industry, a state regulatory agency, and academics.

Minicourses for outreach audience prior to 2013:

Insects on the farm and ranch (ENTO 2001), 1 credit undergraduate, team-taught, University of Wyoming Extended Studies program, 1993-1998), ca. 10 students per term.

Insects in the urban environment (ENTO 2000, 1 credit undergraduate, team-taught, University of Wyoming Extended Studies program, 1993-1998), ca. 12 students per term.

Scholarships, Fellowships, and Awards to Mentored Students and Post-docs

Ph.D. student. Everett Slayer Cotton Fellowship (2014-2017), mentors M. Brewer and R. Coulson.

M.S. student. Excellence Fellowship, College of Agriculture and Life Sciences (2015-2016), mentors J. Woolley and M. Brewer

M.S. student. Excellence Fellowship, College of Agriculture and Life Sciences (2015-2016), mentors R. Bowling and M. Brewer

Ph.D. student. Texas Plant Protection Conference, Bryan, TX. 1st place award in poster competition. 2015.

Undergraduate student. Del Mar Community College Board of Trustees Recognition. 2016.

Ph.D. student, Beltwide Cotton Conf., New Orleans. 1st place Ph.D. oral competition. 2016.

Ph.D. student. Entomological Society of America, Southwest Branch Meeting. Feb 24, Tyler, TX 2nd place Ph.D. poster competition, 2016

M.S. student, Entomological Society of America, Southwest Branch Meeting. Feb 24, Tyler, TX 2nd place M.S. poster competition, 2016

- Ph.D. student. Texas Plant Protection Conference, Bryan, TX. 1st place award in poster competition. 2016.
- Post-doc. SPIE—Autonomous Air and Ground Sensing Systems, Agriculture Section, Best paper award, 2017 (lead mentor is M. Starek, I am co-author).
- Ph.D. student. Southwest Branch Ento. Soc. Amer. annual meeting, Austin, TX. 1st place award in poster competition. 2017.
- Ph.D. student. Larry Lawson Graduate Student Award for Leadership in Applied Entomology. Entomological Society of America. 2017.
- Ph.D. student. Ph.D Annual Graduate Student Award. Texas Plant Protection Assoc. 2017.
- Ph.D. student, Beltwide Cotton Conf., New Orleans. 1st place Ph.D. oral competition. 2018.
- Ph.D. student. Texas A&M AgriLife Research Strategic Initiative Assistantship (2018-2021), mentors M. Brewer and M. Eubanks
- Ph.D. student. J.H. Benedict Memorial Graduate Student Scholarship (2018-2019), mentors M. Brewer and R. Coulson.
- Ph.D. student. Ph.D, Annual Graduate Student Award. Texas Plant Protection Assoc. 2018.
- Ph.D. student. Entomological Society of America Annual Meeting Student Oral Presentation (2nd place biocontrol, PIE student competition), mentors M. Brewer and M. Eubanks.
- Ph.D. student Texas A&M AgriLife Research Strategic Initiative Assistantship (2018-2021), mentors M. Brewer and M. Eubanks.
- Ph.D. student. 2020. Ecological Integration Symposium (Texas A&M) Student Poster Presentation (1st place), mentors M. Brewer and M. Eubanks.
- Ph.D. student. 2020. Entomol. Soc. Amer. NCB/SWB Joint Meeting. Student Poster Presentation (3rd place), mentors M. Brewer and R. Coulson.

I acknowledge that this CV is the most current and is correct as of July, 2020.



Michael Brewer