

# Insec(tc)ure\*: Are you insecure about your insect cures?

A University of Tennessee Urban IPM Lab Newsletter for the Pest Management Industry

## Will You Be the One to Kick Off the UT Urban Entomology Chair Endowment?

*Karen Vail, UT Entomology & Plant Pathology*

As a University of Tennessee professor and Extension urban entomologist nearing the end of my career, I'm especially mindful of the strong partnership between UT and Tennessee's pest control industry and the opportunity to build on that collaboration for the future. The Tennessee pest control industry is a major contributor to the state's economy, with an estimated \$1.029 billion in annual contributions (Hughes and Vail 2024), and it ranks seventh nationally in revenue (Economic Census 2022, Table 1). To help ensure UT and Extension can attract the next Urban Entomology professor dedicated to providing research-based expertise, training, and support to this essential sector, one promising path is to establish an endowed chair. An endowed chair is a faculty position funded by a permanent gift (the "endowment"), which is invested so that annual earnings help support the professor's salary, research, Extension programming, and related graduate student or outreach activities over the long term.

Five of the six states with higher pest control revenue than Tennessee have endowed urban entomology positions (Table 1). What isn't shown in the table is that 8<sup>th</sup>-ranked Virginia, and 13<sup>th</sup>-ranked South Carolina each have an endowed chair or professorship, as does 18<sup>th</sup>-ranked Washington and 19<sup>th</sup>-ranked Louisiana. Indiana, home to Purdue University, is ranked 22nd and has two endowed chairs. Oklahoma, ranked 25<sup>th</sup>, has one. Those are the endowed positions I am aware of in which the pest control industry invested in future support for its industry.

Interested in learning more about how you can support the Urban Entomology Endowed Chair? Contact Madeline Shelly at [mshelly@utfi.org](mailto:mshelly@utfi.org) or 901-830-6222.

Table 1. State ranking of pest control revenue and number of endowed positions in urban entomology.

2022 NAICS Exterminating & Pest Control Ranking	Geographic Area Name	Number of firms	Number of establishments	Sales, value of shipments, or revenue (USD)	Number of Endowed Chairs or Professorships in Urban Entomology
1	California	1,704	1,963	2,665,090,000	1
2	Florida	1,946	2,269	2,299,309,000	2
3	Texas	1,323	1,495	1,779,177,000	1
4	Georgia	520	711	1,222,343,000	1
5	North Carolina	423	544	918,911,000	2
6	New York	740	791	770,002,000	0
7	Tennessee	345	411	649,881,000	0

## Pest IDs and Troubleshooting

One of the most critical contributions I make to the pest control industry is providing pest identifications. Although artificial intelligence and online pest identification apps are improving, it remains challenging to obtain photos with sufficient resolution to submit to online tools and receive accurate identifications. Often, a physical specimen is necessary for species ID. The pest management professional knows that correctly identifying a pest is the first step toward a successful program. My lab team and I have identified over 4,200 physical specimens, not counting those submitted via text or email. I'm available by phone, email, and text to discuss pest issues with PMPs and make site visits when needed.

## Training

I collaborate closely with the University of Tennessee Pesticide Safety Education Program. My support staff and I have developed two certification manuals and a supplemental manual: (1) PB1732 Industrial, Institutional, Structural, and Health-Related Pest Management Certification Manual (Category 7); a supplement to the Category 7 manual, PB1846 A Technician's Guide to Managing Pests in Schools; and (2) PB1733 Public Health Pest Control Pesticide Applicator Certification Training Manual (Category 8). We also produced three licensing manuals: PB1673, General Pest and Rodent Control Licensing Manual (GRC); PB1685, Public Health Pest Control (PHC); and PB1703, Wood-destroying Organisms (WDO). Quarterly half-day licensing training programs based on these manuals are offered to prepare attendees for the Tennessee Department of Agriculture's licensing exam. Additionally, I created the Category 7 subject matter video used in certification training, which is held several times each month. Many of these manuals are over 20 years old and will soon require updates.

The Tennessee Department of Agriculture's (TDA) Apprentice Termite Technician School is a collaborative effort involving TDA, the University of Tennessee, and industry partners to train pest control technicians to manage termites and other wood-destroying organisms. I offer two sessions at this school, held twice a year: one on termite biology and identification, and the other on wood-destroying insects and their associated damage.

We organize a unique one-day meeting on the first Wednesday in August that brings together many different stakeholders, including pest management technicians, social workers, and housing personnel, to address major pest problems in housing. Attendees earn one another's respect as they work through problems and learn to see them from different perspectives. Although initially developed to focus on the three most significant pests in housing—bed bugs, cockroaches, and rodents—the meeting's topics have now expanded to include other urban pests. In 2026, we will hold the 12th annual meeting.

I offer an Associate Certified Entomologist (ACE) Prep Class every fall, held on Monday evenings from September through December. The Entomological Society of America's ACE exam is very challenging, so passing it is a notable achievement that shows the new ACE is knowledgeable and ethical. A company can advertise having an ACE on staff, which helps it stand out from competitors. Initially offered in person, the ACE class is now virtual, allowing anyone to join upon registration. After completing our course, 25 PMPs earned their ACE. Currently, only 16 ACEs reside in TN.

In the past, my 100% Extension appointment did not allow me to have sole responsibility for teaching college-level classes. Still, I did give guest lectures in several, exposing undergraduate and graduate students to urban pests and their management, advocating for the industry, and providing them with a better understanding of the pest control industry.

In fall 2026, to strengthen the [Tennessee Pest Control Workforce Pipeline](#), I am creating a new course that will fuse the ACE training with an undergraduate class, *Entomology in the Built Environment & Related Careers*. Here, undergraduates will learn alongside pest management professionals and hear from industry

experts. If the future proposed UT EPP *Entomology in the Built Environment* certificate (12 credits) is approved, it will require internships and further strengthen the workforce pipeline.

Ants are the top revenue generator in this industry and are challenging to identify because of their small size. We offer hands-on ant identification workshops for pest management professionals, providing them with experience working with both live and preserved specimens and the knowledge to identify these significant pests.

## Membership

I support the state's pest control associations by serving on educational committees and delivering presentations to support their meetings and member engagement. As the urban entomologist, I also present to PMPs and other urban entomologists within the southern region, as well as across the country (National Conference on Urban Entomology [NCUE], National Pest Management Association [NPMA], Entomological Society of America [ESA]) and internationally (International Conference on Urban Pests [ICUP]), for pest management associations and scientific societies. I am the current chair of the Tennessee Department of Agriculture's Pest Control Advisory Board, which sets standards for pesticide applicator licensing categories and advises TDA on issues related to the pest control industry.

## Media

Significant efforts have been made to keep stakeholders informed about current urban pest management issues, including the production of newsletter articles, web posts, and publications. I have authored articles for UT EPP's *What's Happening* newsletter (2008-2012, 121 articles), TPCA's *Quarterly Bulletin* (2007-2012, 17 articles), *Pests and Pesticides in Child-Serving Facilities: An IPM Newsletter* (2008-present, 146 articles in 94 issues), and most recently, *Insec(tc)ure\*: Are you insecure about your insect cures?* A UT Urban IPM Lab Newsletter for the Pest Management Industry (2020-present, 54 issues).

Along with the PSEP program certification and licensing manuals, my staff and I have produced over 50 Extension publications on pests found in and around structures, most of which are available at <https://epp.tennessee.edu/urban-ipm/> or <https://utextension.tennessee.edu/publications/>. We have created and maintained four websites: *Fire Ants in Tennessee* (<https://fireants.tennessee.edu/>), Child-Serving Facility IPM (<https://schoolipm.tennessee.edu/>), Bed Bugs in Tennessee (<https://bedbugs.tennessee.edu/>), and Urban Integrated Pest Management (<https://epp.tennessee.edu/urban-ipm/>).

Although two social media sites, <https://www.facebook.com/UrbanIPMTN> and <https://www.instagram.com/urbanipmtn>, were created, they are not maintained as effectively as they could be. Engaging with the media is essential for this role, and I am called upon to conduct interviews with newspapers, trade journals, television, and radio outlets on urban pests. Often, I indicate when it is suggested to use a pest management professional.

## Research/Demonstrations

My research often supports the pest control industry and product registrations. Over the years, we have conducted field studies on traditional and limited interior liquid termiticide applications as well as termite baiting products. We have evaluated pest management products and strategies around homes and at simulated field sites for odorous house ants (OHAs). In the laboratory, we have assessed the effectiveness of gel and granular ant baits, as well as residual insecticides, on various surfaces against odorous house ants. We have studied the diversity of ants around homes and documented the proximity of OHAs to structures, as well as the need for moisture-retaining objects during hot, dry summers. In addition to OHA, we have confirmed that Asian needle ants, *Brachyponera chinensis*, are widespread in East Tennessee and can be controlled for 2 months following application of select granular baits. We have participated in the early

introduction of biological control agents for imported fire ants and annually provide demonstrations of broadcast bait applications against this pest, especially on school properties.

We work closely with housing and school communities. Since 1996, we have promoted IPM in schools. Additionally, since 2021, we have conducted tick surveys on more than 70 school properties to identify the presence, abundance, and seasonal activity of tick species, as well as the bacterial pathogens associated with these ticks. This information helps facility directors make informed decisions to protect students, staff, and visitors from tick bites.

In housing, we have refined bed bug monitoring techniques, including building-wide inspections, to detect infestations early and enable simultaneous treatment. In our studies, bed bugs primarily fed on humans (69%), occasionally on dogs (3%), and rarely on cats (0.4%). Our highly resistant Knoxville bed bug strain (291,626 times more resistant to deltamethrin than a susceptible strain) is used to evaluate the viability of products intended for the bed bug market. Funding through the endowment would support the maintenance of this valuable strain.

One final research project we'll mention is that monitoring brown recluse spiders for more than 11 years in a commercial Nashville building demonstrated that they cannot be controlled solely with glue boards.

I have led a Tennessee and a southern region working group to address delusional infestation (DI), a condition in which an individual strongly believes they have insects, parasites, or fibers in or on their body or environment, despite the lack of supporting evidence. Non-healthcare professionals, such as pest management professionals and Extension agents, often spend more time with these individuals and have more interactions with them than with those who have general inquiries. Healthcare providers play a crucial role in helping individuals achieve remission, and we have developed publications and protocols to support non-healthcare professionals in encouraging patients to seek care from these essential partners.

Although we don't expect my replacement to cover all these areas, I highlight my activities and responsibilities to emphasize the importance of filling my position. Faculty expectations have changed over the years. While I was discouraged from mentoring graduate students early in my 100% Extension career, new faculty members are now required to mentor students. There is a greater emphasis on securing grants, contracts, or other financial support to maintain a program's viability. Due to the consolidation of pesticide manufacturers and tighter budgets at granting agencies, obtaining extramural funding for graduate students has become more difficult. Supporting a graduate student costs about \$60,000 annually. Master's students usually take around 2.5 years, while PhD students typically require about 4 years. Consequently, supporting a graduate student through to graduation can cost between \$150,000 (for an MS) and \$240,000 (for a PhD). An endowment of \$1.5 million could generate about \$67,500 annually to support a graduate student, with some funds remaining for undergraduate support, bed bug rearing and other related items. Ideally, we would like to set the goal for this endowment at \$5 million. Having a steady flow of graduate students would enable this endowed chair to address industry needs and further strengthen the pest control workforce pipeline. An endowment like this would allow us to attract the best and brightest to fill this position.

Conversations with industry leaders indicate strong support for creating an endowed urban entomology position at the University of Tennessee. These endowments are usually started with a significant pledge. Once the first pledge is made, the requirements of the position and the use of the endowment funds will be stipulated in writing, and modifications will be made until agreement is reached.

Will you be the one to make a significant pledge to kick off this campaign? Once the urban entomology chair endowment is established, I'll pledge a monthly contribution, but I can't do so until the fund is created.

## References

Hughes, D. and K. Vail. 2024. W1281 The Contribution of the Tennessee Pest Control Industry to the Tennessee Economy. UT Extension <https://utia.tennessee.edu/publications/wp-content/uploads/sites/269/2024/11/W1281.pdf>

Economic Census. 2022. EC2256 BASIC Administrative and Support and Waste Management and Remediation Services: Summary Statistics for the U.S., States, and Selected Geographies: 2022. [https://data.census.gov/table/ECNBASIC2022.EC2256BASIC?q=EC2256BASIC&g=010XX00US\\$0400000&codeset=naics-56171](https://data.census.gov/table/ECNBASIC2022.EC2256BASIC?q=EC2256BASIC&g=010XX00US$0400000&codeset=naics-56171) NAICS 56171= Exterminating and Pest Control Services

## Upcoming Category 7 PMP Educational Opportunities

Region 3 (Nashville) TPCA Spring School, <https://tpca.info/event-6540820>

Mar 18, 2026, 8:00 AM - 3:30 PM (CDT), Dave and Busters: 540 Opry Mills Drive, Nashville, TN 37214

Registration closes on March 10, 2026, or when all spots are sold.

### SCHEDULE:

7:15 SIGN IN BEGINS

7:50 Welcome from Region 3 TPCA President, Jay Dihonov

8:00 Rodents - Ernie Schoonover, Bell Labs

9:00 Ants in the MidSouth - Larry Stretz, Oldham Chemical Co.

10:00 Navigating Risk in Termite Management - Steven Dupuy, Rentokil

11:00 Cockroaches - Sean Jurecic, MGK

12:00 LUNCH Provided

12:30 IPM Bed Bugs, Mark Cavanaugh, BWI

1:30 Mosquitos - Dennis Adams, Target Specialty Products

2:30 Fleas & Ticks - Eric Ham, Amguard

TPCA's PestEd: Virtual CEUs - <https://tpca.info/Calendar>

April 29: Glue Boards Alone Will Not Solve a Brown Recluse Problem

May 27: What's Really Eating Away at Your Clients' Stuff?

June 24: Mosquito and Tick Surveillance in Areas with Limited Infrastructure

Pest Control Advisory Board to the Tennessee Department of Agriculture

April 7, July 15, October 28, 9:30 am

Typical location: Ellington Agricultural Center, Porter Building, 436 Hogan Road, Nashville, TN

<https://www.tn.gov/agriculture/news.html>

Wood-destroying Organisms (WDO) and General Pest and Rodent Control (GRC) Licensing Training, <sup>a</sup>April 14, <sup>b</sup>July 14 and <sup>b</sup>October 27, 2026

<https://psep.tennessee.edu/licensed-pest-control-operator/>

<sup>a</sup> Rutherford County Extension Office, 315 John R. Rice Blvd., Murfreesboro

<sup>b</sup> Central Region Extension Office, 5201 Marchant Dr., Nashville, TN 37211

Register:

[https://secure.touchnet.com/C21610\\_ustores/web/store\\_cat.jsp?STOREID=1&CATID=14&SINGLESTORE=true](https://secure.touchnet.com/C21610_ustores/web/store_cat.jsp?STOREID=1&CATID=14&SINGLESTORE=true)

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To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label and registered for use in your state.

### **Disclaimer**

This publication contains pesticide recommendations that are subject to change at any time. The recommendations in this publication are provided only as a guide. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. The label always takes precedence over the recommendations found in this publication.

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