

Insec(tc)ure*:

Are you insecure about your insect cures?

A UT Urban IPM Lab Newsletter for the Pest Management Industry

Can trapping alone eliminate brown recluse activity in a commercial building?

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The brown recluse spider, one of a few spiders of concern in the US, is common in Middle and West Tennessee, but less so in the state's eastern part. Although this spider's bite can cause skin necroses and rarely more extreme responses, a bite's risk is often exaggerated. According to Anderson (1998), "Almost all brown recluse spider bites heal nicely in two to three months without medical treatment at all." Regardless of the actual risk from these spiders, brown recluse spiders' pest status is elevated in the eyes of your clients, so you should address their presence in buildings.

Management of this species includes (1) accurate identification, (2) avoidance of spiders, (3) inspection and monitoring, (4) sanitation and habitat modification, and (5) pesticide applications to the areas of activity. The purpose of this article is not to describe the details of brown recluse management. For that, I recommend our UT Extension publication, PB1191 Brown recluse spiders (<https://extension.tennessee.edu/publications/Documents/pb1191.pdf>) or Vetter and Hedges (2017). Here, we will describe the results of an 8-year study to remove brown recluse from a commercial building through trapping alone.

A person complaining of multiple brown recluse bites at the same time may be experiencing a skin infection, such as MRSA (methicillin-resistant *Staphylococcus aureus*), and should seek medical attention.

Many spiders resemble brown recluse spiders, but few will have three pairs of eyes in a semicircular arrangement at the base of a violin-shaped marking on the cephalothorax (combined head and thorax), light brown/tan coloration without markings, a rounded cephalothorax, and a second pair of legs that are as long or longer than the first pair (Fig. 1). Males (Fig. 2) are easily distinguished from females (Fig. 3) by the male's bulbous, terminal portion of the pedipalps. The egg sac is flat (Fig. 4) and 2nd instar spiderlings are often seen nearby (Fig. 5). Females tend to remain in a dark, protected harborage and wait for prey to appear, whereas the males are more likely to be seen wandering, searching for a mate and thus found on glue boards or sticky traps.



Figure 1. Male (left) and female (right) brown recluse spiders. Note the second pair of legs as long or longer than the first. UT E&PP



Figure 2. Note the bulbous terminal portion of the male pedipalp which is used to transfer sperm to the female. UT E&PP



Figure 3. The terminal portion of the female pedipalp is slender. The three pair of eyes at the base of the violin-shaped marking on the round cephalothorax are obvious here. UT E&PP



Figure 4. 2nd instar spiderlings emerging from the egg sac. UT E&PP



Figure 5. Close-up of a 2nd instar spiderling. Note the three-pairs of eyes are red at this stage. UT E&PP

To estimate population size in a structure and to determine spider activity and areas to apply pesticides, glue boards are placed at the intersection of two surfaces, in dark, undisturbed locations (attics, basements, closets, water heaters, under beds and furniture, and along baseboards). Laying the glue board flat and not folded has trapped more spiders than folded traps (Parks et al. 2013), but pest management professionals (PMPs) find open glue boards get dustier, and dogs, children and even adults may step on these and subsequently move or throw away the traps. Thus, the traps are often folded.

During discussions in the General Pest and Rodent Control (GRC) licensing training, a PMP mentioned that he had controlled a brown recluse infestation in Middle Tennessee through trapping alone. Research has indicated that trapping was insufficient to eliminate brown recluse spiders, but this was a relatively short-term study (Schwartz and Whitworth 2015).

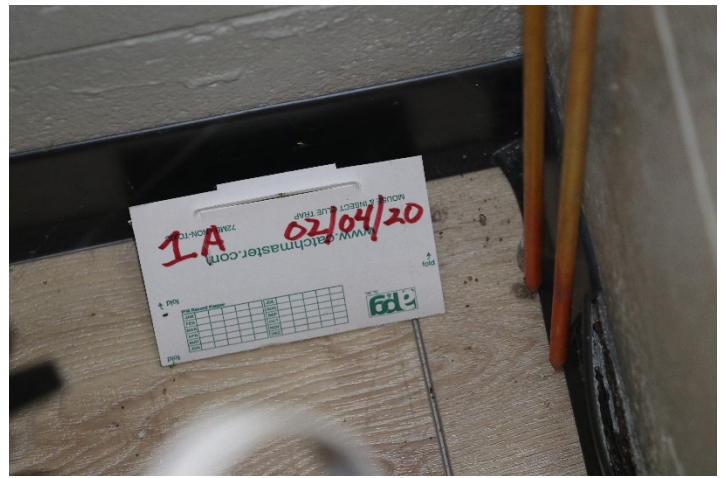


Figure 6. Folded glue board in the training room which had the greatest activity in the building. Alan Windham

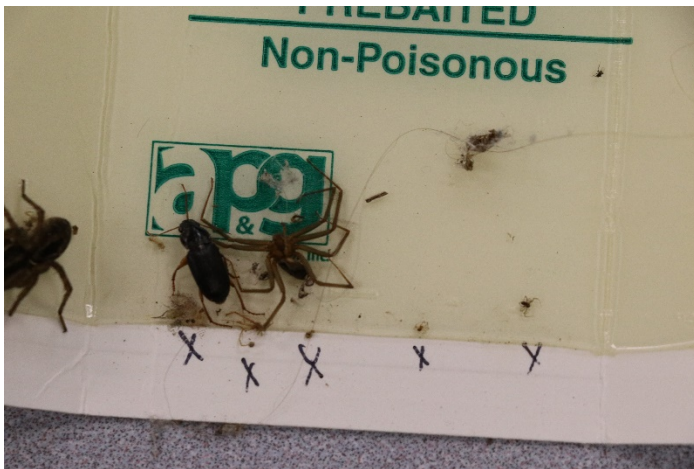


Figure 7. Brown recluse and potential prey on glue board. "X"s indicate a spider has been noted, but not necessarily a brown recluse. Alan Windham

Here I present an abbreviated version of a research study conducted in a ~15,000 sq. ft. commercial building in Middle TN. Our objectives were to document the spatial distribution and the number of brown recluse spiders throughout the building over time and to determine if trapping alone could eliminate the infestation. On September 11, 2012, 59 folded traps (Fig. 6) were placed throughout the building. We inspected the traps (Fig. 7) about twice a month through May of 2013, one to two times a month through October 2014, and about once a month through December 2020. (Thanks to Phil Hurst of the Tennessee Department of Agriculture for assisting in the initial trap placement.) Traps were added as opportunities arose, and as employees requested them. By December of 2020, 122 traps were dispersed throughout the structure. This study is still in progress; presented here are data through December 2020.

We intend to publish this study in a refereed journal, so we don't want to reveal all of our data here, but we thought some of the results were essential to share with you. From September to December 2012, 68 brown recluse adults or immatures were trapped. The next three full years, an average of 98 brown recluses were trapped per year, but from 2016 – 2019 the annual trap catch more than doubled and almost tripled that of the previous three years: An average of 267 brown recluses were trapped. Many renovations, such as moving ceiling tiles for wire replacement and replacing/repairing floor, roof, pipes, and drains, took place from June 2017 through December 2018, which could have disturbed the spiders, made them more active, and therefore more readily trapped. Carpet removal was correlated with an increase in trap catch in at least one area of the building. Multicolored lady beetles were an ongoing issue, and a peak of indoor activity occurred from fall 2016 to spring 2017, which was before the roof repair. After that renovation, the number of lady beetles did not reach the same high levels. From fall 2019 to spring 2020, we noted an increasing number of beetles compared to the years immediately following the roof renovation. Living and dead beetles may have served as a food source for the spiders. The total brown recluse trap catch for 2020 was 232, slightly less than 2019. We might be heading in the right direction, but trap catch was still more than two times higher than the initial trap catches.

Unfortunately, the decline in spider numbers is also correlated with a major reduction in foot traffic in the building due to the SARS-CoV-2 pandemic. Traps are present in most rooms of this building except for one men's and one women's restroom. I'm not going to discuss the spatial distribution of the brown recluse but will let you know that the most

significant activity was in a training room at the front of the building near outdoor lighting. Trainees sometimes opened the exterior door during breaks at night, which could have attracted flying insects. Less training in the building in 2020 could have led to fewer insects serving as a food source for the spiders and thus slowed growth and reduced activity.

This building could be considered an ideal habitat for brown recluse spiders. A drop ceiling, plenty of stored items, filing cabinets and cardboard boxes provide ample harborage for brown recluse. Also, many insects are present in the building year-round. Potentially thousands of dead lady beetles are hidden in voids and hundreds or thousands of live ones enter the building at the end of October almost every year.

Brown recluse are definitely thriving even with mass trapping. Thus, mass trapping might be more effective in a different type of building with a less constant food supply.

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Insec(tc)ure is edited by Jennifer Chandler and Pat Parkman and archived online at

<https://epp.tennessee.edu/urban-ipm-new/>

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