



Pests and Pesticides in Child-serving Facilities: An IPM Newsletter

Bed Bug Resource Boxes to be Delivered to School Systems at the Tennessee School Plant Management Association (TSPMA) Meeting Next Week

Karen M. Vail

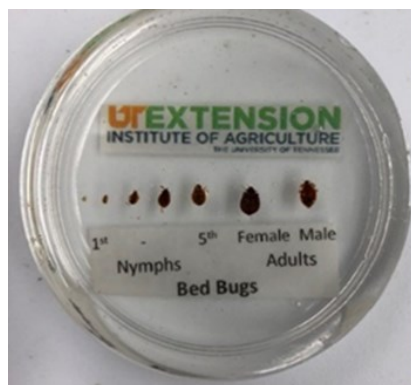
Bed bugs are ectoparasites that feed on human blood and are excellent hitchhikers that may make their way into schools, although they rarely establish a breeding population. We are providing Tennessee public school systems a box of bed bug resources to help resolve bed bug issues. Each resource box contains a resin display of the bed bug stages to aid school personnel in identification of these pests, 20 copies of our six UT Extension bed bug publications (SP761, SP788, SP825, PB1763, PB1807, PB1894) and a BlackOut Bed Bug Detector. While only PB1807 directly relates to bed bug management in schools, the other publications should be helpful to the parents of the school children and their pest management professionals.

For those of you attending the TSPMA meeting, we will distribute the bed bug resource box after my presentation, *Bait Spreading and Tick Dragging: What the UT Urban IPM Team Can Do for You!* The presentation is from 12:40—1:15, Wednesday June 8th. For the rest of you, we will try to coordinate box distribution through the TSPMA district directors.

And, should you desire someone to make a bed bug management presentation for your school system, please contact Karen Vail or your local Extension agent (<https://utextension.tennessee.edu/office-locations-departments-centers/>).

For more information on managing pests in schools, see schoolipm.tennessee.edu.

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Special Points of Interest

UT Extension Bed Bug Pubs
<https://bedbugs.tennessee.edu/resources/>

SP 761 Affordable Bed Bug Management?

SP 788 Detecting Low-level Bed Bug Infestations in Multifamily Housing

SP 825 Bed Bugs – They suck your blood but don't spread disease

PB 1763 Bed Bugs: Prevention and Management

PB 1807 Bed Bugs: What Schools Need to Know

PB 1894 Time and Cost Estimates of Building-wide Bed Bug Inspection Techniques in Multi-unit Housing

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Hammerhead Worms or Land Planarians

Karen Vail

Modified from *Insecture* 3(6): 1-2

Planarians or flatworms are worm-like organisms, flattened from top to bottom, bilaterally symmetrical (the left side is nearly identical to the right), often with stripes down the back, and a spade or arrow-shaped head similar to a hammerhead shark (Figure 1). (Some species are entirely darkened, lack the hammerhead, and taper at the ends.) Many species are aquatic, but land planarians are found in soil and areas closely associated with moisture, including areas under rocks, shrubs, debris, and logs. After heavy rains, land planarians may be found on the soil surface.



Figure 1. Hammerhead worms submission from middle Tennessee, May 2022. Credit: Suzanne Brokamp

So why am I writing about land planarians? They've been in the news lately but have been referred to as one of their more attention-seeking names of hammerhead worms (<https://www.wkrn.com/special-reports/hammerhead-worms-pose-threat-to-tn-native-earthworms/>). In addition to land planarians and hammerhead worms, these are also called terrestrial flatworms. Television segments or social media postings may have generated some interest, so I thought I would follow up with more information.

I'm uncertain of the number of planarian species in Tennessee or their distribution. An exotic, *Bipalium kewense*, was well established in Rutherford and Sumner counties in the mid-1970s and was assumed to be introduced to temperate regions of the US through the movement of containerized plants and other nursery stock. In a research study from 1973-74, most *B. kewense* were sited from May to October in Murfreesboro, TN, with a peak in observations occurring in June. *Bipalium kewense* is identified by the five lines running the organism's length with a dark, discontinuous band around the area behind the spade-shaped head. The flatworm in Figure 1 is not *B. kewense*, but it could be *Bipalium pennsylvanicum* or *Diversibipalium multilineatum*, depending on if there are three or five dark lines present.

The hammerhead shape of the flatworm's head combined with its long body (up to 1 foot) may cause fear in humans. Some species produce tetrodotoxin (pufferfish toxin) to overcome prey or protect their eggs and themselves from predators. It's unclear how dangerous this toxin is to people, so avoid handling these flatworms with bare hands. Hammerhead worms move and feed at night. Mucous or slime covers the body, gives it a shiny appearance, helps the animal move, and protects it from desiccating. Land planarians feed on earthworms, slugs, snails, insect larvae, and other terrestrial invertebrates, including other land planarians!

Although hammerhead worms feed on earthworms and thus may be considered detrimental, management of land planarians may not be needed because of the limited size of the hammerhead worm populations encountered in Tennessee. These flatworms should be considered interesting wildlife to observe unless you are raising earthworms.

We need more research on flatworm management before providing more valuable recommendations. However, one option for homeowners is to kill each hammerhead worm as encountered, one flatworm at a time. Using gloved hands or forceps, place the flatworm into a plastic bag of salt, alcohol, vinegar or similar substance to kill the worm. Don't apply salt or these other substances directly to the planarian in the landscape because these substances can injure or kill plants. A pest management professional should NOT use this salt, alcohol or vinegar approach because they would be applying unregistered pesticides while charging a fee for services.

Flatworms are hermaphroditic, meaning individuals have male and female reproductive organs used for sexual reproduction. However, they more commonly reproduce asexually when a portion of their body pinches off and regrows another entire flatworm. So **don't chop them with a hoe because each resulting piece could regenerate a new worm.** This asexual reproduction may account for the numerous flatworms found in an area.

References:

Bertone, M., S. Crawley, and M. Waldvogel. 2020. Terrestrial Flatworms, Land Planarians & Hammerhead Worms. NC Extension <https://content.ces.ncsu.edu/terrestrial-flatwormshammerhead-worms>

Chandler CM. 1974. The land planarian *Bipalium kewense* Moseley in middle Tennessee. Journal of the Tennessee Academy of Science 49: 128-129. <https://www.tennacadofsci.org/journal/articles/vol51/JTAS51-2-73.pdf>

Choate, P.M. and R. A. Dunn. 2020. Land planarians. UF Featured Creatures. https://entnemdept.ufl.edu/creatures/misc/land_planarians.htm

Vail, K. 2022. Hammerhead worms. Insec(tc)ure: Are you insecure about your insect cures? Volume 3, issue 6: 1-2.

Please send us photos when you encounter land planarians in Tennessee and include the location so the Tennessee species' distribution can be better understood.

Or, upload this data to [Inaturalist.org](https://www.inaturalist.org).

Lessons Learned from May's Fire Ant Bait Demonstration

Karen M. Vail

Scheduling fire ant bait demonstrations is challenging for us. Not only do we need to coordinate schedules with the school system, but we need to carefully watch the weather as it can't be too hot or likely to rain because the baiting will fail. Now we realize we'll need to add another precaution to Table 1, Getting the Most from your Baits.

It was a beautiful May day when we arrived at the scheduled location to demonstrate fire ant

broadcast baiting, except we didn't realize it was the elementary school's carnival day. Not a single flat piece of land wasn't occupied by students. Well this is a slight exaggeration, but you get the idea that we would need to find another location. A nearby school with dense fire ant mounds had already been treated. So after conferring with the school personnel, they remembered a space at a high school which had a good number of mounds because they had just mowed it. They were right. We located 71 active mounds in 0.9 acres.

We were behind and time was limited. One of the school personnel needed to leave shortly, so we discussed how to place a potato chip and bait next to a mound to determine if the bait was acceptable and the ants were foraging, but we couldn't wait the half hour to observe this. **THIS WAS A MISTAKE. Always do the potato chip test!** We were trying a battery powered hand-held spreader for the first time, and had some issues getting it calibrated. (Now that I think of it, we should have replaced the batteries and determined if the swath or bait delivery increased.) We switched to the Earthway 2750 chest spreader, calibrated it and the school staff made the application. The weather was perfect, but we didn't observe the ants picking up the bait. Two and a half weeks later, 81% of the mounds were still active. Based on previous research, we expected about 10% survival at 2 weeks after treatment. This field will be retreated at a later date.

So we plan to add, **"Do not apply bait immediately after mowing as the ants may be more interested in repairing their mounds than retrieving the bait."** to Table 1. In a way this warning is already listed, because the table indicates to avoid disturbing the mound right before applying the bait, but I think this will make it clearer.

Table 1. Getting the Most from Fire Ant Baits

- Baits should be applied between 70 and 85 degrees F when maximum fire ant-foraging occurs.
- In summer, apply baits in the evening. During the cooler evening, ants will quickly discover and carry off baits. If applied during the day, in extreme heat, baits quickly lose their effectiveness. Also, ants do not forage much during the day when it is too hot (>90 degrees F)
- Use only fresh bait, preferably from an unopened container. Once opened, baits should be used as soon as possible. Unopened containers may stay fresh for up to two years.
- To see if the ants are active and if the bait is fresh, place a small amount of bait and food (hot dog or potato chip) in separate locations next to a mound. If the bait is fresh and the ants are active, ants will begin removing it within 30 minutes. This is a good time to treat. If ants do not remove the bait, but feed on the hot dog or potato chip, then the bait is spoiled. If no ant activity is seen, it is not a good time to treat.
- Apply baits when no rain or dew is expected for at least five hours. Once the baits become soggy, they are not as attractive to the ants.
- Broadcast the bait, or apply it as directed around the mound.
- Avoid disturbing the ants or the mound right before applying the bait.
- Do not contaminate baits by storing them or applying them with fertilizer, other pesticides or odorous compounds.
- Follow the directions on the label. It is against the law to apply baits in areas not listed on the label.
- **Do not apply bait immediately after mowing as the ants may be more interested in repairing their mounds than retrieving the bait.**

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For more information about IPM in Tennessee schools and other facilities, or to view past issues of *Pests and Pesticides in Child-serving Facilities*, please visit <http://schoolipm.tennessee.edu>

NATIONAL IPM INFORMATION

eXtension's Pests in the Home
<https://pestsinthehome.extension.org/>

National School IPM
schoolipm.ifas.ufl.edu/

IPM in Schools Texas
<http://schoolipm.tamu.edu/>

IPM Institute of North America
www.ipminstitute.org/

School IPM PMSP—all schools IPM by 2020 [https://
 ipminstitute.org/projects/school-ipm-2020/](https://ipminstitute.org/projects/school-ipm-2020/)

EPA schools
<http://www2.epa.gov/managing-pests-schools>

For further information about the IPM program at your school or in your county, contact your county Extension Agent or the school IPM Coordinator. For county agent contact information, please visit <https://utextension.tennessee.edu/office-locations-departments-centers/>

Precautionary Statement

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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