

HOW THROWING IN THE TOWEL CAN HELP WIN THE BATTLE AGAINST BED BUGS

INTRODUCING

 **CIRKIL[®]**
RAG IN A BAG[™]

This new bed bug treatment protocol from Terramera shows tremendous promise for dealing with hard-to-treat items such as infested books and electronics. CIRKIL[®] RAG IN A BAG[™] has been optimized to achieve total efficacy, killing 100% of bed bugs and bed bug eggs in possessions sealed in a plastic bag along with CIRKIL RTU sprayed on a rag. This innovative technique addresses a longstanding need of all pest management professionals – delivering an effective way to deal with hard to treat personal items which have the potential to re-infest treated locations, leading to costly & time-consuming repeat visits.

 **CIRKIL[®]**
RAG IN A BAG[™]

Typically, when we say that something is “in the bag” we mean there is nothing to worry about. This has not historically been the case when it comes to customer belongings from homes and apartments infested with bed bugs.

The current options to treat these possessions all have challenges. Discarded items are expensive to replace. Use of water-based emulsions can damage books or electronics. Treatment with dichlorvos organophosphate strips can expose your staff and customers to toxic vapors. On-site heat and off-site fumigation treatments are costly and complex. Simply leaving items untreated can lead to re-infestation.

“PMPs can avoid callbacks caused by re-infestation and residents can save the items they would otherwise have to get rid of.”

– Shannon Lentz, Technical Support Manager, Terramera

Plastic bags filled with personal belongings are common to every treatment site. The vast majority of clothing can be washed, or even simply dried at high heat to effectively deal with bed bug infestations. The balance of items, such as hard cover and soft cover books, video game consoles, stereos, videotapes and VCRs, etc. can't be sprayed down with conventional chemical pesticides.

Terramera has discovered a unique characteristic of CIRKIL[®]: it is 100% effective, even without spraying infested materials directly. All you need to do is apply about an ounce of RTU to a cloth or rag, put the customer's belongings into a nonporous bag (like a heavy-duty garbage bag), throw the CIRKIL-treated rag into the bag, tie up the bag and leave it do the job.

“It addresses a concern all PMPs have.” – Shannon Lentz, Technical Support Manager, Terramera

“Even if a PMP uses a different pesticide for their broadcast treatment, CIRKIL® RAG IN A BAG™ is a must-have complement to that treatment. It gives PMPs an important tool to complete their total bed bug protocol.”

– Shannon Lentz, Technical Support Manager, Terramera

This has led to the development of the CIRKIL® RAG IN A BAG™ protocol, something that Shannon Lentz, Senior Analytical Chemist and Technical Support Manager at Terramera Inc. describes as “A dead simple solution to a common concern for all PMPs.”

“Just spray an ounce of CIRKIL® RTU onto a rag (or paper towels), place one to three rags inside a plastic bag along with items that need ‘de-bugging’. Seal the bag and leave it closed for 3-7 days, and any bed bugs or eggs that are in these items will be killed.”

The benefits are significant. First, it not only works... it works very well. Secondly, it is fast and very easy. PMPs can do it, or they can leave their clients to do it by selling them CIRKIL RTU leave-behinds. Finally, it’s a botanical product with a non-toxic mode of action, which means lower risk to PMPs and customers. It’s a product PMPs and customers can feel good about using.

The protocol is highly effective. It addresses another major concern of pest management professionals: potential re-infestation from infested items that have been bagged, left untreated, and reintroduced into the home environment. It is a grey zone that requires many pest management companies to foot the bill for costly re-treatment – an operating cost typically associated with bed bug treatment.

“CIRKIL penetrates into cracks & crevices. It kills not only bed bug adults, but eggs as well.”

– Nate Woodbury, Senior Entomologist, Terramera

CIRKIL® RAG IN A BAG™ can be used as a complementary treatment in conjunction with any other broadcast treatment – including heat treatment.

According to Lentz, the key is putting effective treatment choices in the hands of the PMP. “They’re the ones in the field who know what works and what doesn’t. I think they’re going to love this product just because it addresses a concern that they all have. And it works.”

This new protocol addresses a gap in the current Integrated Pest Management protocol and significantly reduces the likelihood of re-infestation and costly re-treatment.

The Study was designed to assess efficacy (killing bed bugs and eggs in books and electronics) using paper towels or cloth rags treated with CIRKIL® RTU spray and placed inside sealed plastic bags. The bed bugs and eggs were never sprayed directly or exposed to the treated substrate. The protocol was optimized with the final procedure after five days. 100% bug and egg mortality was observed for all conditions.

Previous laboratory studies conducted at Terramera BioProducts have demonstrated bed bugs exposed to CIRKIL RTU and CIRKIL CX without direct contact exhibit 100% mortality in 1-5 days. The idea behind using an impregnated substrate is to create a solid protocol for treating delicate items (such as electronics, books, etc.) that cannot be directly sprayed with an insecticide, even a plant-based product such as CIRKIL RTU.

INFESTED COMPUTER: Bed bugs were placed in a housing consisting of nylon stocking stretched taut over the ring of a Mason jar lid or a piece of cardboard of a similar size (**Figure 1 and 2**). A similar housing containing filter paper mounted with eggs was placed within a Mason jar lid ring inside a stretched nylon stocking. The computer housing was removed and the bed bug and egg samples were placed within the computer.

INFESTED BOOK: An entire book was encased in a nylon stocking along with 10 bed bugs (**Figure 4**). The infested book was then placed inside a 31” x 42” clear plastic bag along with 35 other books of random shapes and sizes. Eggs were mounted on filter paper and placed on the outside of a book, within a stretched nylon stocking (**Figure 3**).

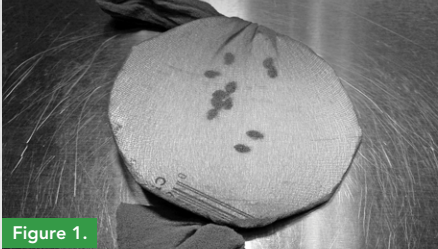


Figure 1.



Figure 2.



Figure 3.

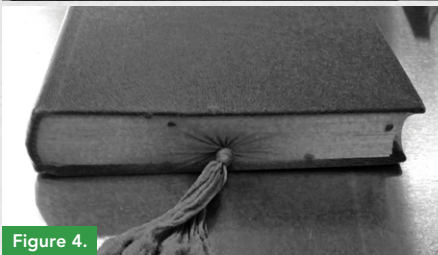


Figure 4.



Figure 5.

PROTOCOL: Cotton facecloths¹ were treated with CIRKIL spray. Approximately 1 ounce of CIRKIL was applied to each rag. This translated to about 40 pumps of the current CIRKIL RTU bottle. One to three rags were placed inside the sealed plastic bags for up to 5 days.²

Each bag of electronics contained one desktop computer, one keyboard and one desktop telephone. (Figure 5) Each bag of books contained the infested book as well as 34 randomly selected books (both hard and soft cover.)

35 books (34 un-infested and 1 infested with 10 bugs and 5 live eggs) were placed inside a sealed bag for five days. This served as the untreated control group.

RESULTS: After 5 days the bags were opened and the bugs and eggs were transferred to petri dishes lined with filter paper for observation. All variations of the CIRKIL® RAG IN A BAG™ protocol exhibited 100% mortality for both eggs and bed bugs over the course of five days. Materials were also inspected for residual odor of the product with very minimal odor noted on the books or electronics one day after opening the bag.

DISCUSSION: By treating rags or paper towels with CIRKIL and placing them into a sealed plastic bag with infested books and electronics, we have demonstrated 100% efficacy at killing bed bugs and eggs. This was accomplished strictly through proximity to CIRKIL® RTU and no direct or residual product coming into contact with the bugs, eggs, or infested materials.

Please Note: To account for variations in tolerance levels in field strains, we recommend bags be left unopened for at least two days longer than the minimum time required for efficacy. Also, in order to avoid damage of delicate materials such as books or electronic wiring from contact with a wet rag, it is recommended the treated substrate (rag or paper towels) be placed on top of a plastic bag or similar material to provide a barrier between the damp product and any delicate items.

¹ 4 sheets of heavy-duty paper towel can be used instead of a rag

² To account for variations in tolerance levels in field strains, we recommend bags be left unopened for at least two days longer than the minimum time required for efficacy.

SUMMARY OF DATA WITH OPTIMIZED PROTOCOL

SUBSTRATES	VOLUME OF CIRKIL® (FL OZ)	BAG CONTENTS	LENGTH OF STUDIES	MORTALITY	STUDY SUMMARIES
Paper Towels or Cotton Rag	1.4	Books	5 Days	100%	Books were infested with adult bed bugs and their eggs. Each bag contained 35 assorted books. A cotton rag (or paper towels) were treated with CIRKIL and placed on top of the books and the bag was sealed for 5 days.
Paper Towels or Cotton Rag	1.2	Electronics	5 Days	100%	A computer was infested with adult bed bugs and eggs and placed in a bag with a keyboard and desktop telephone. Bugs were placed inside the computer case and inside the disk drive. Rags (or paper towels) treated with CIRKIL were placed on top of the electronics and the bag was sealed for 5 days.
Cotton Rag	3	Clothing	5 Days	100%	3 rags were treated each with 1oz of CIRKIL. Rags were placed into the bag with the clothing at the bottom, middle and top of bag. Each bag contained 7 articles of clothing, 4 of these articles were infested. The bag was sealed for 5 days.
Cotton Rag	1	Shoes	5 Days	100%	10 pairs of footwear were placed in a bag. 5 articles of footwear were infested with adult bed bugs and eggs. A cotton rag was treated with 1oz of CIRKIL and placed on top of footwear inside a sealed plastic bag for 5 days.

CIRKIL® RAG IN A BAG™ GIVES THE IDEA OF THROWING IN THE TOWEL AGAINST BED BUGS A WHOLE NEW MEANING.

HOW TO USE CIRKIL® RAG IN A BAG™

1. Place delicate items including electronics or up to 35 books in a non-porous plastic bag (such as a heavy-duty garbage bag or contractor bag)
2. Spray each rag³ with approx. 1oz CIRKIL RTU⁴
3. Place damp rag or paper towel sprayed with CIRKIL RTU in bag (if the items in the bag are delicate or will be damaged from contact with a wet cloth, you may put the treated rag on/in a piece of plastic, such as a grocery bag, to avoid contact with delicate items)
4. Close and seal bag by tying a knot or using twist ties
5. Leave for 3-7 days so all bed bugs and bed bug eggs are dead
6. Open bag. Remove treated items. Dispose rag or paper towel (or re-use) as required

³ Any cheap cotton rag or face cloth is fine. A rag can be substituted with 4 sheets of heavy-duty paper towel.

⁴ About 40 pumps using CIRKIL RTU 32oz spray bottle = approx. 1oz



CIRKIL PLANT-BASED BIO-PESTICIDES ARE EPA APPROVED AND DESIGNED TO MEET THE HIGHEST STANDARDS FOR SAFETY AND EFFICACY.

- CONTACT KILL OF BED BUGS & EGGS
- RESIDUAL KILL OF ADULT BED BUGS
- RESIDUAL KILL OF BED BUG EGGS FOR UP TO 3 WEEKS
- EFFECTIVE AGAINST PYRETHROID-RESISTANT STRAINS
- BROAD AND FLEXIBLE INDOOR APPLICATION
- WORKS FAST
- BOTANICALLY-DERIVED ACTIVE INGREDIENT
- NON-TOXIC MODE OF ACTION
- ONLY EPA-APPROVED BIOPESTICIDE FOR INDOOR USE THAT KILLS BED BUGS AND EGGS
- RAG IN A BAG™ TO KILL BED BUGS & EGGS
- NO CONTACT REQUIRED

If you are interested in learning more, or to order CIRKIL® RTU, please contact your local Target/Ehrlich or Univar representative.