

US EPA ARCHIVE DOCUMENT

Non-Chemical Interventions and Do-It-Yourself Approaches

Changlu Wang

Department of Entomology

Rutgers University

Why Use Non-chemical Control?

- Chemical control alone is seldom effective to eliminate an infestation
- Incorporating non-chemical methods reduces chemical use and increases control efficacy

Effective Non-chemical Control Methods and Tools

- Physical removal (by hand, vacuum machine, etc)
- Laundering/drying
- Reducing clutter, disposal infested items, sealing harborages
- Mattress encasements

- Heat
 - Whole house heat treatment; heat chambers; hot steam
- Cold
 - Freezer; liquid CO₂

Ineffective Non-chemical Control Methods

- Placing items under the hot sun in summer or outside in the winter
- Placing items in garbage bags and “suffocate” them or “starve them”
- Leave the room

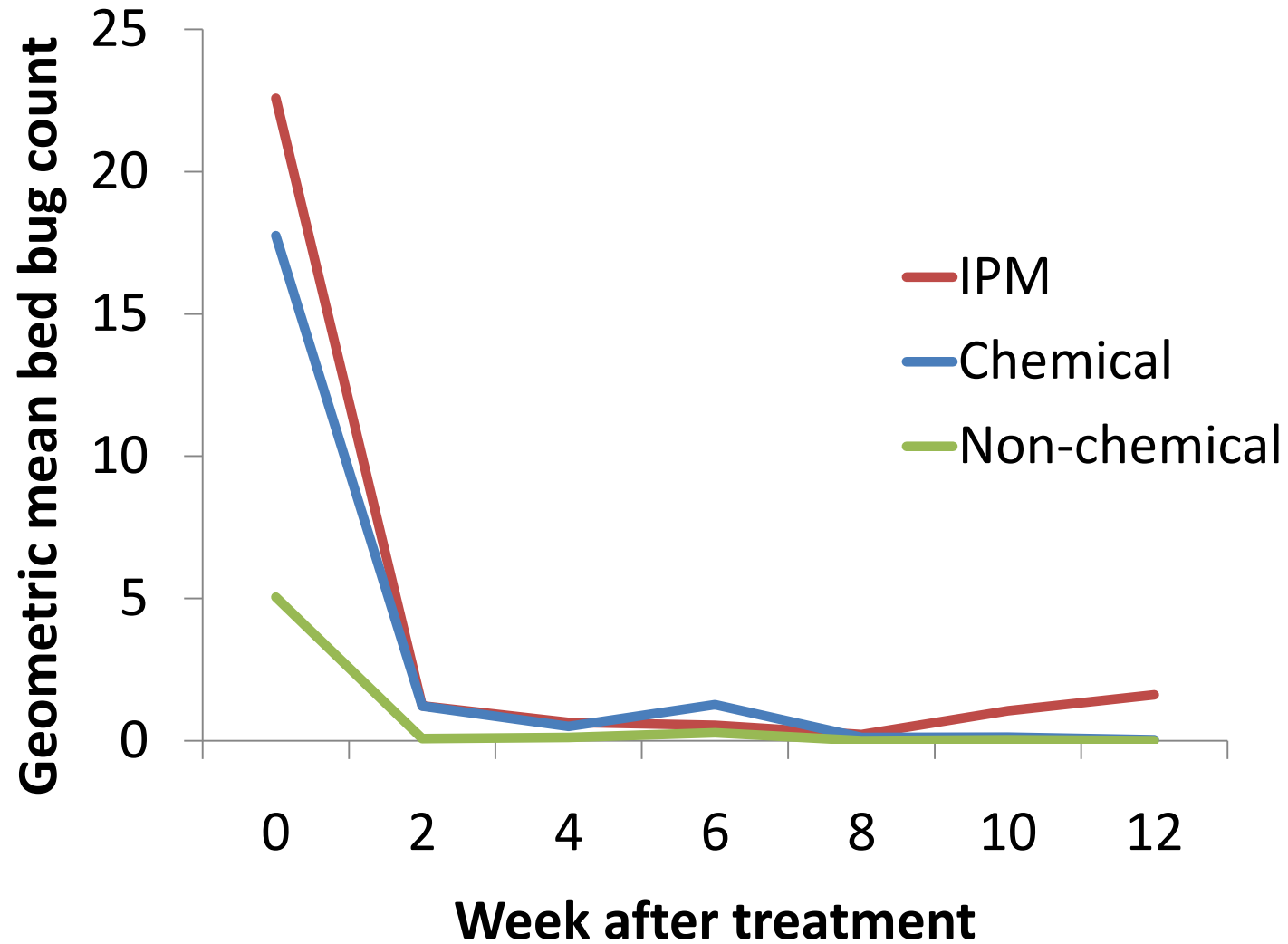
Effective Use of Non-chemical Methods

1. First, estimate the bed bug numbers and their distribution
2. Select control strategies
3. Treat as thoroughly as possible using a combination of several methods
4. Follow up weekly or biweekly until elimination

A Case Study Comparing Three Control Strategies

- 27 apartments occupied by seniors
- Three treatment groups
 - Chemical: insecticide dust and spray.
 - Non-chemical
 - Encasements, ClimbUp Interceptors, hot steam, weekly laundering
 - Integrated pest management: non-chemical and chemical methods.

Comparison of Three Control Strategies in Apartments



Non-chemical Treatment Group

- Visual count: 1-57 bed bugs per apartment
- 7 apartments (with 1-12 bed bugs at beginning) were bed bug free after 8 weeks

Safe and Effective Do-It-Yourself Control Strategy

- Physical removal (hand picking, vacuuming, disposing hard-to-treat items)
- Frequent laundering/drying
- Reducing clutter around the sleeping area and the sofa.
- Installing mattress encasements
- Installing barriers (such as ClimbUp interceptors) under bed and sofa legs
- Placing small infested items in a freezer for > 4 days
- Applying hot steam

Challenges of DIY Bed Bug Control

- Use restricted or ineffective chemicals
- Over-apply pesticides or apply them to wrong places
- Do not know where to find bed bugs
- Do not know how to effectively use non-chemical methods
- Lack of motivation to conduct DIY

Chemical Control Methods Used by Residents (January 2009)

Chemical	% of surveyed residents
Pyrethroid	20
Bleach	7.5
Alcohol	7.5
Professional products	2.5
Boric acid	2.5

Ineffective Control Methods



Real Kill® Indoor fogger





Rusted bed frame resulting from insecticide spray

Dangerous Control Methods



Diatomaceous earth dust on sofa

Improper Application of Diatomaceous Earth Dust



Summary

- A combination of several simple non-chemical methods can eliminate bed bug infestations.
- DIY bed bug control can be both affordable and effective for eliminating low level infestations.
- Educating the public is necessary to maximize the non-chemical control efficacy, reduce cost, and minimize pesticide misuse.