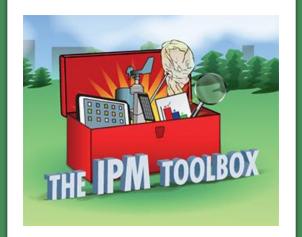


National Institute of Food and Agriculture







Reducing Pest Infestations in Multifamily Housing: Research Updates on Mice and Cockroaches

Webinar Details

- Welcome
- A recording of this webinar will be available within a week at http://www.neipmc.org/go/ipmtoolbox
- If you are from the state of Maine and seeking pesticide applicator credits, email Susannah at sck27@cornell.edu, with your name and license number
- Visit http://stoppests.org/go/IPMupdate for a certificate of completion and pdf of the slides.

We Welcome Your Questions

- Please submit a question at any time using the Q&A feature to your right at any time
- If you'd like to ask a question anonymously, please indicate that at the beginning of your query.



Webinar Presenters

Dr. Changlu Wang

&

Shannon Sked

Department of Entomology Rutgers University





Some Questions for You

CONTROLLING COCKROACH INFESTATIONS IN APARTMENT BUILDINGS

Changlu Wang, PhD, Rutgers University







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Importance of Cockroach IPM

- Prevalence of pests in homes
 - Cockroaches- 37%, mice- 16%, bed bugs- 9%
- Among the cockroach infestations
 - 98% are German cockroach
 - 2% are American cockroach and Oriental cockroach



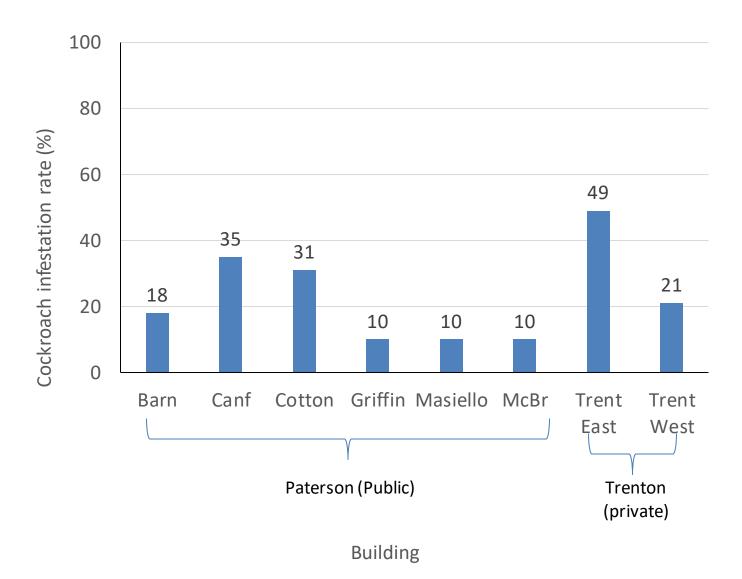
German cockroach



American cockroach



Oriental cockroach

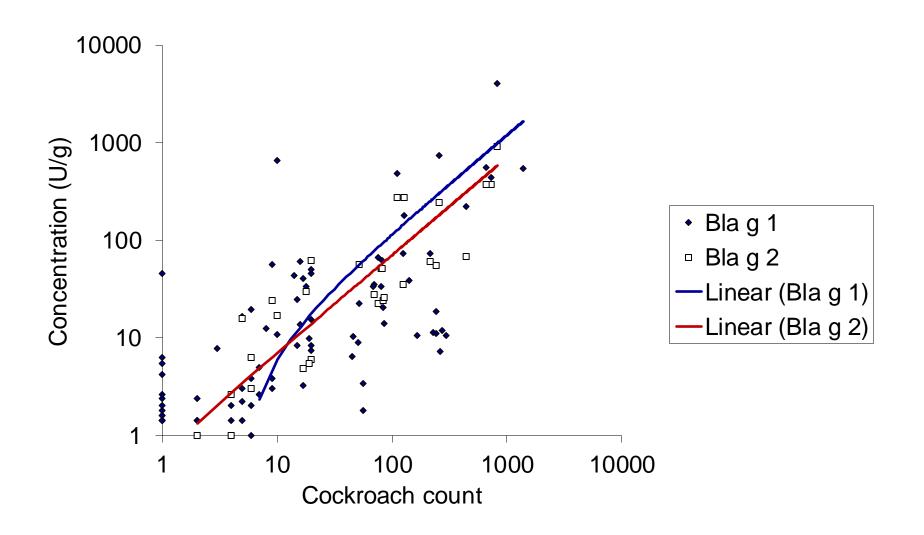








Cockroach Infestation and Cockroach Allergens





Insecticides and pest repeller found in apartments





Non-chemical Control Methods

- Sanitation
 - Remove food and water sources
- Decluttering
- Vacuuming
- Trapping













Inorganic Insecticides

- Boric acid
 - a stomach poison







Commonly Used Insecticides by Consumers

- Aerosol spray
- Foggers
 - Hot Shot No-Mess Fogger2 with Odor Neutralizer
 - Hot Shot No-Mess Fogger3 with Odor Neutralizer
 - Raid Max Concentrated Deep Reach Fogger
 - Raid Fumigator





Results:

- TRFs failed to reduce cockroach populations, whereas gel baits caused significant declines in the cockroach populations
- Use of TRFs resulted in significant pesticide deposits throughout the kitchen



















Insecticide Resistance Management

- Rotate chemicals with different mode of action (not different brands)
 - Different gel baits: fipronil, indoxacarb, dinotefuran
- Use a combination of different control methods
 - Boric acid, gel bait, insect growth regulator
- Use integrated pest management (IPM)

Integrated Pest Management (IPM)

Education

Keep clean, avoid using sprays

Monitoring cockroaches using glue boards

Use effective materials (baits, boric acid dust, etc.)

Evaluation



Questions



German cockroach



American cockroach



Oriental cockroach





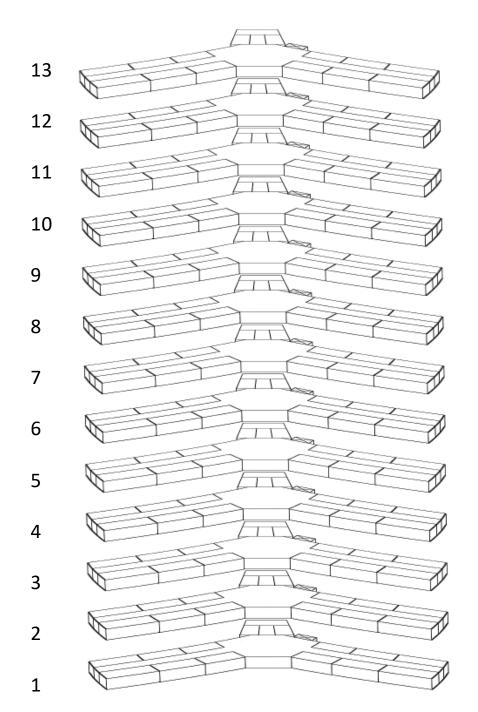


A Cockroach IPM Program (2016-2017)

- Paterson, New Jersey
- Evaluate the effectiveness of a building-wide cockroach IPM program

- 13 floors
- 15 apartments per floor
- Total 188

 apartments



- 14 floors
- 8 apartments per floor
- Total 112 apartments



Building-wide Cockroach Survey



Under the kitchen sink



Beside refrigerator



Beside stove



Beside toilet

- Traps were examined after 2 weeks
 - Median trap count 11, range: 1-484
 - 49% of the apartments were infested



Under sink stove

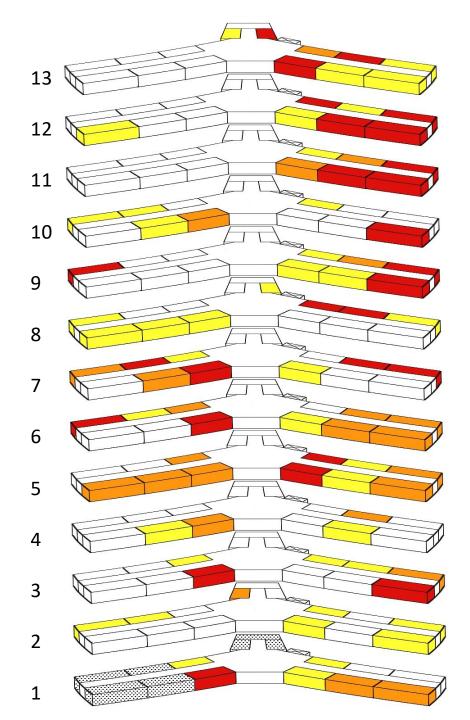
refrigerator toilet

Spatial distribution of German cockroach infestations



10-50 cockroaches

< 10 cockroaches



Initial Treatment

- Average of 16 g bait/apartment
- 6 g boric acid dust per apartment for those with more than 20 cockroaches



Educating Residents

- One page flyer
- Ask residents to keep the apartments clean, do not use sprays

Treating Common Areas

- Compactor room
 - Advion, Alpine, boric acid dust, Transport GHP
- Laundry room
 - Advion, Alpine
- Boiler room
 - Advion, boric acid dust
- Community room kitchen
 - Advion

Garbage disposal room



Fly pupae at corner of the floor



Bait Rotation

Period	of
use	

Product name

0-15 week

Advion® Cockroach Gel Bait

17-22 week

Alpine® Cockroach Gel Bait

24-28 week

Maxforce FC Select Gel Bait

32-38 week

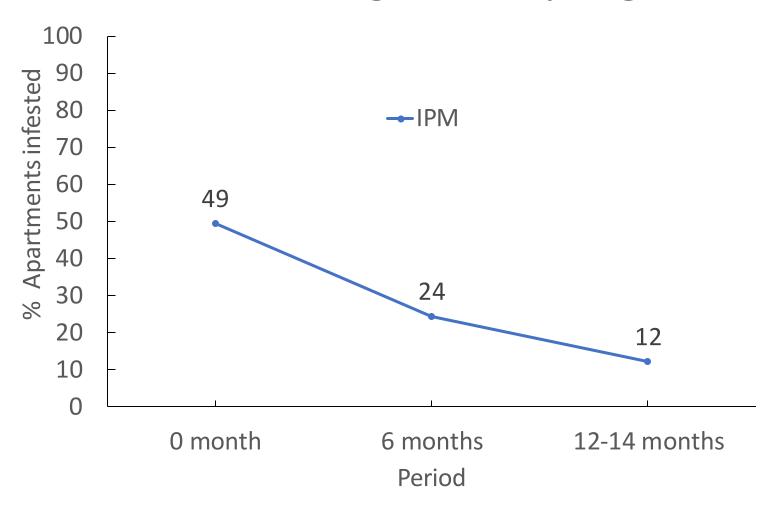
Avert® Dry Flowable Cockroach Bait

Bait Usage in Relation with Cockroach Population Level

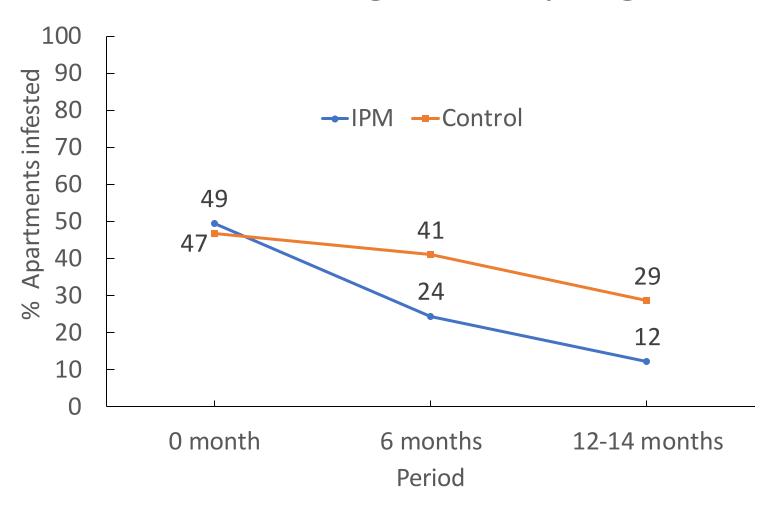
Infestation Level	Average amount of bait used per apartments before elimination (g)	Mean number of treatments before elimination
Low 1-9	12	2
Medium 10-50	20	3
High > 50	53	6

Trap count is based on total of 4 traps per apartment and **14 days placement**

Comparison of IPM and conventional cockroach management programs

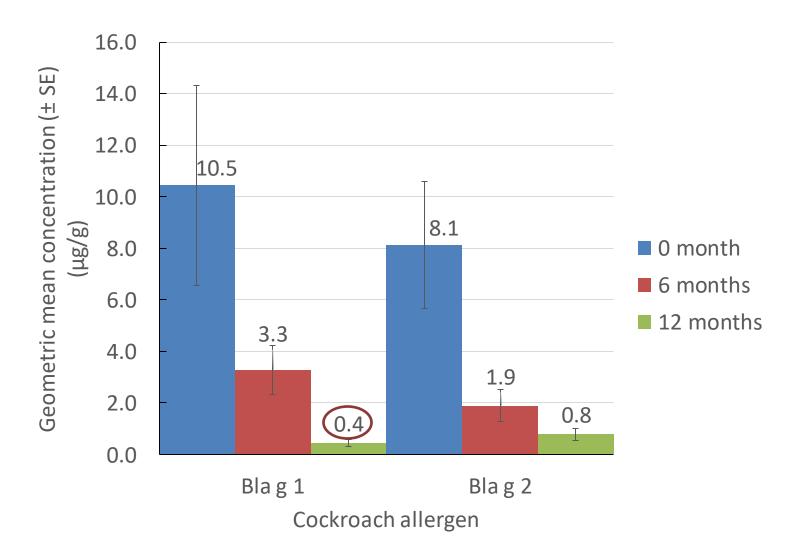


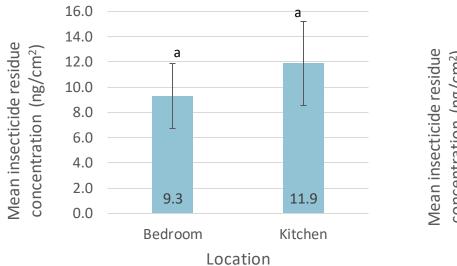
Comparison of IPM and conventional cockroach management programs

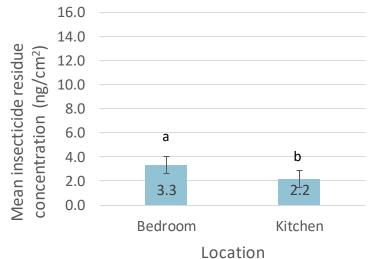


Resident Awareness of Cockroaches

- At 6-month, 54% of resident were unaware of the presence of cockroaches while their apartments were infested with cockroaches
- At 12-month, 88% were unaware of presence of cockroaches







The mean insecticide residue concentration per apartment decreased by 74% after 12 months

MEDICAL ENTOMOLOGY

Cost and Effectiveness of Community-Wide Integrated Pest Management for German Cockroach, Cockroach Allergen, and Insecticide Use Reduction in Low-Income Housing

CHANGLU WANG¹ AND GARY W. BENNETT

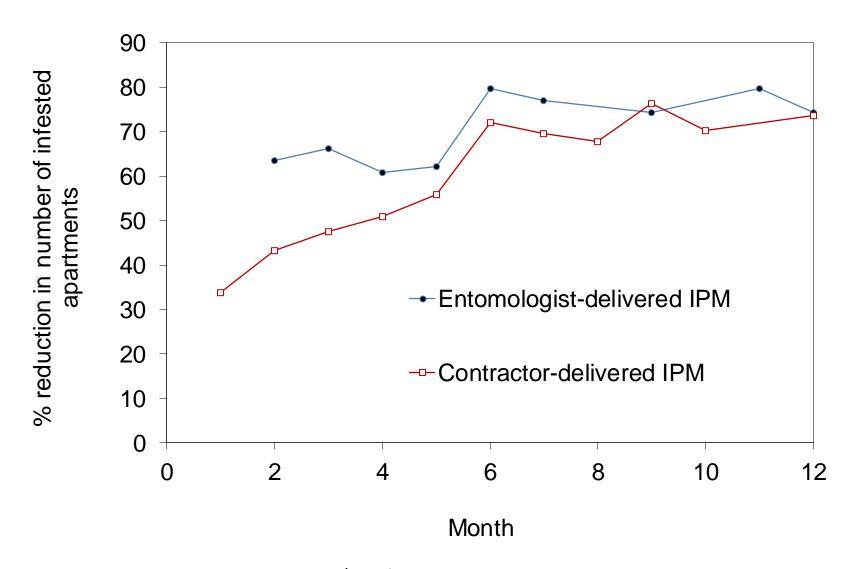
Center for Urban and Industrial Pest Management, Department of Entomology, Purdue University, West Lafayette, IN 47907

J. Econ. Entomol. 102(4): 1614–1623 (2009)









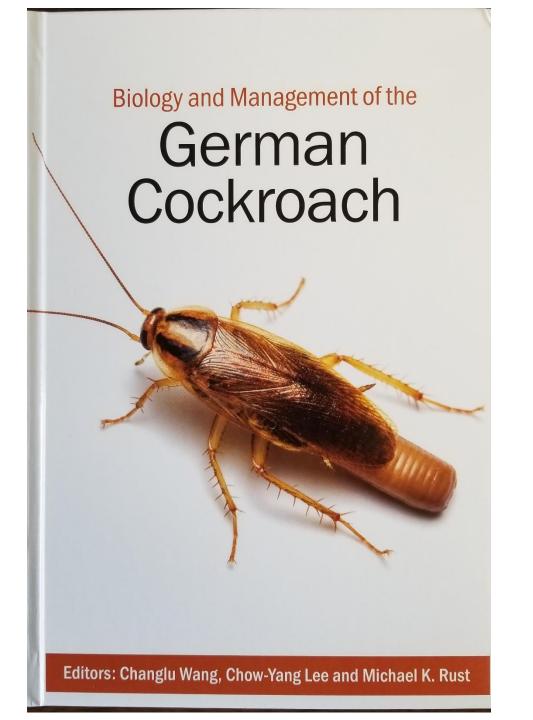
Assuming salary rates at \$60/h for PMPs, the mean monthly cockroach management (material and labor expenses) cost was \$7.5/apartment.

Summary

- IPM (Education + baits + traps) are highly effective in eliminating cockroach infestations
 - Thorough placement of bait and spending sufficient time based on infestation level is key to success in cockroach elimination

Summary (continued)

- Low cost cursory monthly service is not very effective in reducing infestation rates
 - Commit the necessary labor and materials to eliminate every infestation that is identified
- Building-wide monitoring using traps
- Elimination of infestations can still be achieved even with limited client cooperation



\$170

Thank you!

Contact:

Changluw@rutgers.edu



Questions



German cockroach



American cockroach



Oriental cockroach







United States Department of Agriculture National Institute of Food and Agriculture



Shannon Sked*1, Salehe Abbar1, Changlu Wang1, Rick Cooper1, Robert Corrigan2, Xioadan Pan1 and Sabita Ranabhat1

Department of Entomology; Rutgers, The State University of NJ
 RMC Pest Management Consulting, LLC
 * Shannon.Sked@rutgers.edu; 215-284-2562

Background: The Deme

- Deme: tight social network and can exist within a size as small as 2 m
 - Behaviors based on social position within the deme
- Dynamic Nest: constant movement through exploratory scouts (15-30 m)
 - Nest expansion due to high fecundity of females
 - Nest budding driving by nomadic scouts creating their own nesting sites 30 m out
- Mass Casualty: expansion continues based on carrying capacity (K) resources
 - Ultimately, once K is exceeded, mass illness will diminish populations
 - However, human driver resources often keep K very high



Part 1 Objectives: Monitoring and Treatment

- Are residents' complaints a reliable indicator of infestations?
- Compare effectiveness of non-toxic food baits for detection
- Do mice visit specific "in-apartment" bait placement locations more often?
- What aspects of IPM have long term effects

Part 1 Materials and Methods

- 1. Building-wide Evaluation & Interviews (Trenton=246 and Linden=200)
 - a. Conduct resident questionnaire/interview
 - b. Install 2 monitors with blank baits (10.5 g) & chocolate (~1g dabs)
 - c. Return 1 week to determine presence / absence

Location_	Linden Moot Diy				Date 5/3/19							
	Page 2		or_ 8			Collectors SS + Sahastian						
1, 6, 7, 9 11						7	Dollop Consumed (Y / N)			Number Trap Kills		
210	NH	1-Stove	Questionaire	-	9.2		Y	-	-			
210	1	2-Sink	Questionaire	-	-		-	-	-		_	
210	•	3-HVAC	Questionaire	9,2	0.5		Y	Y	У			
215	HA	1-Stove	-Stove F	-	-		-	-	-			
215	-	2-Sink	OPPOSITE	-	-		-	-	-			
215	4	3-HVAC	Foun Pm	-	3.7		Y	Y	٧		_	
301	No	1-Stove	Questonaire	-	-		-	-	-			
301	1	2-Sink	Questonaire	-	-		-	-	-		_	
301	*	3-HVAC	Questionaire	-	-		-	-	-			
305	No	1-Stove	Questonaire	2	-		-	-	-		_	
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305	*	3-HVAC	Questionwire	-	v	-	-	-	-			
306	No	1-Stove		-	10.0	W	-	4	4			
306		2-Sink		-	-	1000	-	-	-			
306	J	3-HVAC		-	_		-	-0	-		-	



Part 1 Materials and Methods

- 2. Treatment: Start Week 4 (Trenton=19 and Linden=49 apartments)
 - a. Install 3 bait stations with rodenticide in apartments with activity
 - b. Return to service weeks 4 times (weeks 6, 7, 9, 11); weighed and replaced



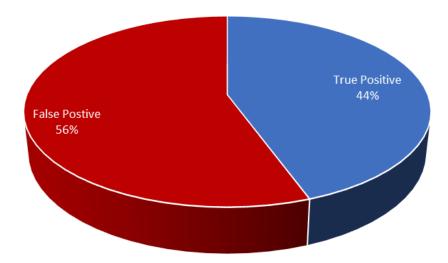


Part 1 Materials and Methods

- 3. Install 2 monitors with blank baits on week 11
 - a. Return the following week to evaluate treatment effectiveness
- 4. Repeat building wide inspections on months 6 and 12
 - a. Follow same process and protocols for initial inspection
 - b. Determine if IPM treatments had a long term effect

Part 1 Results: Residents' Complaints

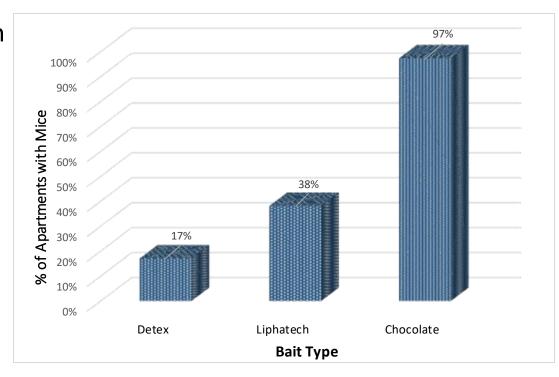
- Of 18 apartments with residents that thought they had mice,
 - 56% did not have mice.
- Among 19 apartments with mice
 - Only 42% were aware of it



Proportion of observed activities confirmed or not by feeding activity

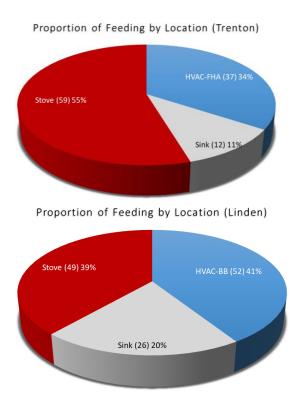
Part 1 Results: Effectiveness of Non-Toxic Baits

- Chocolate spread was fed upon more often than commercial baits
 - 69.5% of the feeding occurrences had only chocolate spread consumption
- Liphatech was consumed more than Detex soft bait



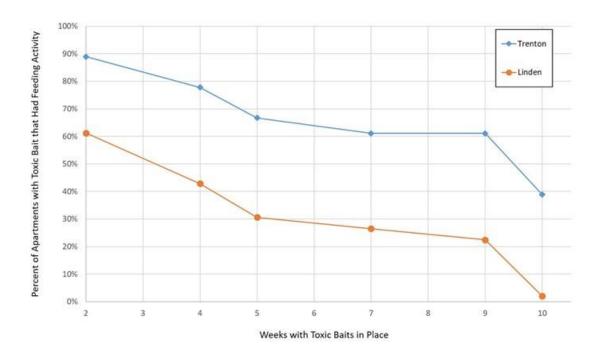
Part 1 Results: Location Effect

- Location preference was found among 3 locations
- However, this was different based on building construction
 - Trenton: Stove
 - Linden: HVAC & Stove



Part 1 Results: Impacts of IPM Treatments

• During the weeks the IPM was in place, there was a reduction in infestations



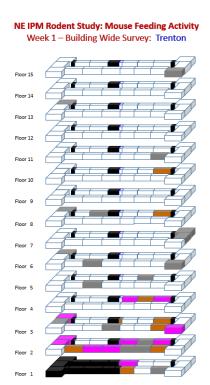
Part 1 Results: Effect of Sanitation/Clutter

- Individual apartment sanitation and clutter did not impact mouse activity during treatments
 - Separate or combined



Part 1 Results: Impacts of IPM Treatments

- Lower 3 floors were more likely to have feeding activity
- Exclusion has a significant impact
 - Building wide aspect



Part 1 Conclusions

- 1. Are residents' complaints a reliable indicator of infestations?
 - Resident complaints are not a reliable way to identify activity
 - Building wide monitoring should be implemented
- 2. Comparative effectiveness of non-toxic food baits for detection
 - Chocolate Spread > Liphatech > Detex (soft)
 - Bait preference is very complex, based on pheromones, behavior and genetics
 - Bait preference is also not stable; alternatives should be investigated

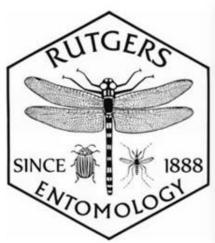
Part 1 Conclusions

- 3. Mice may occur more often in certain locations in an apartment
 - Understanding building construction for within-envelop navigation is important
 - Based on runway routes
- 4. Building wide exclusion is important for long term management
 - Building wide aspects are more important than individual resident conditions
 - Outer envelope exclusion is of primary importance

Thank you!

Northeastern IDIVICenter

IPM Partnership Grant Program





Rutgers Entomology, Urban IPM Laboratory

Questions









United States Department of Agriculture National Institute of Food and Agriculture



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News You Can Use

April 7, 2021 Reducing Pest Infestations in Multifamily Housing Join the Northeastern IPM Center's StopPests in Housing Program on May 6th, 2021 from 2 p.m. to 3 p.m. Eastern for a webinar on using integrated pest management (IPM) strategies to manage two of the most troublesome and notorious pests of multifamily housing: cockroaches and mice.

More blog entries here.

New resources! IPM guides for property managers on cockroaches and bed bugs (HERE) and picture-based guides for residents on cockroaches, rodents, and bed bugs (HERE).

Looking for training on rodents? Find resources and recorded rodent webinars HERE, including Developing a Pest Exclusion Program for Cockroaches and Rodents and Tools for Eliminating Mice from Multifamily Housing, Find more training opportunities HERE.

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 Past recordings and today's webinar will be available to view on demand in a few business days.

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You can watch as often as you like.

Acknowledgments





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