

The Scientific Coalition on Pest Exclusion Project Report 2017

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Abstract:

Effective IPM plans for buildings and structures should rely upon the exclusion of pests through good design and maintenance as a prerequisite to sustainable pest control and prevention. Unfortunately, this critical tenet of IPM is often ignored or overlooked, especially in aging structures. Teaching pest management personnel, landlords, residents and others how to exclude pests more effectively requires a better understanding of pest behavior. However, there are many knowledge gaps regarding dispersal behavior of urban pests, and how they establish infestations. There is a need for better understanding of different building structures and problems related to deterioration that allows pest access. There is also a need for understanding how exclusion relates to other programs for building improvements, such as weatherization efforts.

The SCOPE 2020 (Scientific Coalition of Pest Exclusion) working group has begun to study and promote the use of exclusion methods in existing buildings for improved urban IPM. This group has engaged with urban IPM stakeholders in a project to develop the foundations of known and needed pest exclusion research and training effort. Working with members from the Northeast, North Central and Southeastern regions, this coalition has established a plan for project development, a list of interested supporters, a website and Facebook page. A robust network of partners from various industries and states are included in the development of a strategic plan for SCOPE, a literature review of pest dispersal and exclusion research, development of priorities for research and outreach, developing pest exclusion recommendations and managing social media outreach. Although this is a Northeastern IPM Center-funded working group (2015-2017) the work precedes this funding and will continue far beyond the termination of the grant.

Objectives:

1. Assemble the SCOPE 2020 working group and begin annual meetings to network among various fields, including academia, pest management, building maintenance and WAP program staff. *This group coordinates with a proposed North Central IPM Working Group of the same name, but with the objective of addressing pest exclusion in commercial buildings. Membership is overlapping.*

2. Continue to build a database of current and future collaborators and stakeholders through outreach using an established online “interest form” at www.pestexclusion.org.
3. Develop a pest exclusion checklist for multi-family housing (indoor and outer perimeter) that categorizes and prioritizes deficiencies in construction and from deterioration.
4. Publish a review of literature and scientific information on pest suppression and exclusion to identify verified knowledge, research gaps and potential projects for the evaluation of techniques and materials for pest exclusion in aging buildings, and to examine ways that weatherization and pest exclusion overlap and/or conflict.
5. Prepare written outputs, including a strategic plan for SCOPE 2020 for multi-family housing, a list of urban IPM priorities for the IPM Centers, research and outreach priorities for pest exclusion, and recommendations for the pest management industry as well as other building services, including weatherization programs.
6. Develop extension outreach materials, network (including social media) to promote pest exclusion as a critical action in pest management. Evaluate our work through networking and feedback.

Procedures and Results:

The SCOPE working group was formed in 2013 by Drs. Stephen Kells and Bobby Corrigan with the intention of highlighting the need for and gaps in knowledge on pest exclusion. The SCOPE 2020 coalition has held frequent conference calls since January 2014 to organize the mission, scope, and direction of this project. The group initially included Matt Frye, Jody Gangloff-Kaufmann, Claudia Riegel, and Allison Taisey. With a need to pursue funding, Jody Gangloff-Kaufmann proposed a SCOPE Working Group to the Northeastern IPM Center and Stephen Kells proposed a Commercial/Industrial SCOPE Working Group to the North Central IPM Center. Both projects were funded with the knowledge that they had overlapping membership and goals. Before this funding, the group had been meeting for two years and developed an interest form, posted online. The Pest Exclusion interest form (www.pestexclusion.org) has, to date, amassed nearly 200 associates from the fields of pest management, academia, building management, vector control and weatherization in the United States and other countries. This interest form has been used to populate the Google Groups messaging forum of about 190 members. This e-list is not very active, but serves as a conduit for sending announcements and information. The Pest Exclusion Facebook page has 78 followers and administrators post relevant articles about rodents, bed bugs and other pests and issues when articles are available.

Objective 1.) Assemble the SCOPE 2020 working group and begin annual meetings to network among various fields, including academia, pest management, building maintenance and WAP program staff. *This group coordinates with a proposed North Central IPM Working Group of the same name, but with the objective of addressing pest exclusion in commercial buildings. Membership is overlapping.*

The SCOPE project began in 2013 with core members (Corrigan, Kells, Hymel, Riegel, Taisey, Frye and Gangloff-Kaufmann) and conference calls for planning an approach to studying and promoting the use of pest exclusion in pest management. Since that time, this grant was funded and several key members have been added to the group. Membership now includes the pest control industry, the Pennsylvania State University, Harvard University, Rutgers University, and The City of Philadelphia Dept. of Public Health. An effort was made to reach out and include a

representative in the Weatherization Assistance Program (WAP) both locally and at a higher level with no success. Instead we connected with Ellen Tohn, of Tohn Environmental Strategies, who conducted a weatherization/IPM project in New Hampshire titled “Rodent Exclusion During Weatherization Projects”. Ellen Tohn attended the SCOPE meeting in Cambridge, MA to discuss strategies for integrating IPM and weatherization projects. Dr. Richard Pollack hosted the Cambridge, MA meeting at Harvard University, where a large dormitory renovation project was underway. After our meeting, we toured the building under construction and learned about the pest exclusion efforts being incorporated into the building plan. This was a truly remarkable and well-thought out pest exclusion endeavor that will be described in a presentation at the 9th International IPM Symposium.

Members of the Residential SCOPE Working Group (*member added during grant period):

- Gil Bloom, Standard Pest Management, Astoria, NY
- Bobby Corrigan, RMC Consulting, Ossining, NY
- Raymond Delaney, City of Philadelphia Department of Public Health
- Matthew Frye, NYSIPM
- Jody Gangloff-Kaufmann, NYSIPM
- Lyn Garling, Penn State IPM Program (retired)
- Chris Geiger, City of San Francisco Department of the Environment*
- Jill Gordon, Mantis Consulting, Budd Lake, NJ*
- Sabrina Hymel, Dept. of Entomology, Univ. of Minnesota
- Stephen Kells, Dept. of Entomology, Univ. of Minnesota
- Dion Lerman, Penn State IPM Program*
- Martin Overline, Aardvark Pest Management, Philadelphia, PA
- Richard Pollack, Harvard University*
- Claudia Riegel, City of New Orleans, Termite and Mosquito Control Board
- Ellen Tohn, Tohn Environmental Strategies, Boston, MA*
- Changlu Wang, Dept. of Entomology, Rutgers University

Meetings of the Residential SCOPE Working Group were held on:

- December 18th, 2015 – Elmsford, NY
- July 28-29, 2016 – Tarrytown, NY
- February 21-22, 2017 – Cambridge, MA

Objective 2.) Continue to build a database of current and future collaborators and stakeholders through outreach using an established online “interest form”.

The website www.pestexclusion.org currently houses a form for individuals who are interested in the SCOPE 2020 project. Five core members of the coalition have solicited interest among peers during the past year and thus far nearly 200 people from the United States and other countries have signed up to receive updates. Further advertising of the SCOPE 2020 project by members and through social media will build this network of colleagues wishing to stay informed. We will ask for inputs (ideas, priorities, editing and feedback) on project outputs. A Google Groups email list has been created for this group to facilitate discussion and disseminate information among its nearly 200 members.

Objective 3.) Develop a pest exclusion checklist for multi-family housing (indoor and outer perimeter) that categorizes and prioritizes deficiencies in construction and from deterioration.

The Pest Exclusion Checklist – (Copy attached at the end of this report)

In structural IPM, school IPM, food safety and many other fields related to pest management, checklists are used to foster compliance, identify areas for improvement, and enforce safe and sanitary practices. Pest inspection checklists can be found in many manuals and on state IPM program and pest management websites. However many of the available checklists combine all aspects of good pest management, such as pest sightings and evidence of activity, sanitation, availability of food, water and shelter, and conditions that encourage pests like lighting or landscapes. Pest exclusion is often a small part of such checklists and is not usually considered a main focus. We feel that pest exclusion, especially for rodents and cockroaches, but also for many other pests, should be a primary tool and subject of focus in progressive pest management programs. The activity of repairing buildings to exclude pests can reduce or eliminate the need for pest management inside buildings.

Beginning with a simple, “bare bones” version of the pest exclusion checklist developed by Dr. Corrigan, the working group worked together to expand and enhance the types of data to be collected in order to develop a more thorough understanding of factors important to pest entry and exclusion. This resulted in a five-page checklist that included characteristics of building construction, roof, foundation, siding materials, door types, numbers of doors and windows, landscape, sanitation, the number of exterior and interior line penetrations, interior building materials, a property/building sketch and pest activity. See attached checklist in appendix for reference.

This expanded checklist was piloted in several NY locations (Elmsford, Rockaway, Cedarhurst, Central Islip, Wyandanch, and Manhattan) to determine whether it provided adequate instruction and accounting of pest facilitative conditions. In all cases, and for various reasons, the expanded checklist was difficult for a research/extension specialist to use, except for potential collection of various data that may or may not be predictive of pest activity. Although data collection was a goal in the sister grant “Industrial-Commercial SCOPE Working Group” (funded by the North Central IPM Center), data collection was not the goal of this grant project. For Residential SCOPE, a practical and simple checklist or audit form would be more helpful to determine and communicate information about repairs, improvements and pest activity that could be put into immediate use. This checklist should also be easy enough for a pest management technician to use, as well, or it will never be implemented. A simpler version of a SCOPE checklist has also been tested and is included in the appendix.

Lessons learned from piloting a complex exclusion checklist:

- Building age and construction information may not be obtainable, but building age is a determinant of decay, which increases risk of pest activity.
- Pest exclusion audits are limited to the height of a 2-fly ladder (about 24 feet), when available. Otherwise they are limited to the first floor and accessible below-ground floors.
- Beyond 24 feet, only a visual inspection can be made in most cases, and binoculars help. As a result, the integrity of windows and eaves are difficult to assess on taller buildings.

- SCOPE may need to rely on wildlife management specialists to access higher floors and roofs for pest access.
- Penetrations through interior walls and floors are complex and not easily counted, as proposed on the complex checklist. A simpler assessment of whether an insect, mouse or rat could pass through and enter into the building is a better option.
- Assessment of four sides (west, north, east, south) of a building can be challenging in many residential settings where, to provide many windows for many apartments, buildings might have as many as 56 sides (Cedarhurst example).
- Remarks about deficiencies in a building are more useful than an assessment of all points, sealed and not sealed.
- Checklists for residential buildings will be very different than checklists for schools and commercial buildings, unless all are very generic. There is a need for the development of a checklist specific to schools and buildings of other uses.

In late spring of 2015, four members of the working group met and toured residential and commercial buildings in NYC to document pest activity, photograph and categorize pest entry points and decay in preparation for building a pest exclusion checklist. This documentation was prepared and discussed during the first working group meeting as a starting point for recommendations and the checklist of critical pest exclusion steps for multi-family buildings. We examined building perimeters, loading docks, trash compactor and boiler room spaces and common areas for evidence of pest activity and movement.

We visited the NYC Housing Authority-operated Lilian Wald Houses, Avenue D, NY, NY, where a tour of the ground floor doorways and garbage compactor rooms revealed many deficiencies. Steel doors were bent and rusted on interior building access and garbage compactor rooms. In one compactor room, we found evidence of both rats and mice, plus access to higher floors through the ceiling. The compactor room would be the highest priority repair recommended.

We toured the perimeter of the Harborside Financial Center, Jersey City, NJ, a location known for high rat activity. This structure is built on a pier and was the site of a food distribution warehouse, both conditions that favor rats. We discovered rat activity on the outer perimeter of the building, especially the loading dock area and many deficiencies that would (and probably did) allow rats to enter the first floor restaurants. This center is currently undergoing renovations and its anchor restaurant has closed permanently.

Multi-family Residential Housing SCOPE Inspections

I performed inspections of three residential multi-family buildings and one interesting commercial site with Michael Deutsch of Arrow Exterminating (Lynbrook, NY). These inspections helped to pilot the different inspection forms.

Cedarhurst, NY – A condominium building of 20 units with deficiencies that included gaps under doors, gaps at garage door corners and missing 2nd floor soffit covers. No major pest issues reported at this time. Pest vulnerability is moderate to high based on the ability of rodents to enter under doors. Pest activity in the area was low. This building had low to moderate vulnerability to pest intrusion.

Far Rockaway – A complex, 56-sided building with 148 units. This building is in good condition but we discovered termite activity in the basement. Again, garage doors, unsealed at the corners were a point of pest vulnerability, but there is low pest activity in this area. I would rate this building as a low to moderate pest vulnerability.

Great Neck – This building with 55 units, had experienced an American cockroach outbreak after nearby road and water main repairs and renovations inside that left sewer pipes uncapped. In addition, many residents have 2 bathrooms but use only one regularly, thus allowing the water trap to dry out and cockroaches to crawl up. After recommending some changes (superintendent should fill water traps regularly) we toured the outer and inner perimeter. I documented several vulnerabilities, including utility openings, gaps under doors and standing water in a below-grade (basement) door. This building is moderately vulnerable to rodents and was highly vulnerable to American cockroaches, although that issue has been addressed.

Commercial Site – Cintas, Central Islip, NY – This site was interesting because of the nature of the business. Cintas provides linen services, and in the process they launder uniforms, aprons and mops from restaurants, among other things. The used mop heads bring in cockroaches, which were concentrated in a small corner of the building near washing machines. The PMP constantly addresses cockroaches, but prevention is unlikely in this account. A byproduct of laundering linens is the production of lint, which litters the landscape. This might be attractive to mice and birds, but we saw no evidence of these pests inside or on the outer perimeter of the building.

Objective 4.) Publish a review of literature and scientific information on pest suppression and exclusion to identify verified knowledge, research gaps and potential projects for the evaluation of techniques and materials for pest exclusion in aging buildings, and to examine ways that weatherization and pest exclusion overlap and/or conflict.

Our group has and continues to collect and index scientific references on pest dispersal and exclusion. A literature review is being written by working group leaders and members with the intention of publication in a scientific journal (such as the *Journal of IPM*). This publication will describe current knowledge in urban pest exclusion, identify verified techniques for residential exclusion and highlight gaps in that understanding and barriers to adoption. The goal is to increase knowledge of pest exclusion research for readers and identify opportunities for research and demonstration. This publication will inform our other outputs, including a checklist and recommendations for pest exclusion. For residential SCOPE, I am currently writing a white paper that outlines what is known about pest exclusion and what works. In addition, the white paper will address knowledge gaps and possibilities for integrating pest exclusion into other home services, such as home inspection, weatherization, fire safety and renovations. I expect to have this white paper written before September 2017.

Objective 5.) Prepare written outputs, including a strategic plan for SCOPE 2020 for multi-family housing, a list of urban IPM priorities for the IPM Centers, research and outreach priorities for pest exclusion, and recommendations for the pest management industry as well as other building services, including weatherization programs.

A strategic plan for the SCOPE 2020 project outlining the future objectives of SCOPE has been developed. The strategic plan matrix was created using a logic model format and contains short and long-term desired outcomes and proposed pathways and tasks for achieving each goal. One of the most important aspects of a long term project that aims to change an entire industry is to have a strategy with achievable goals. This strategic plan was developed with the Residential SCOPE working group and reviewed by members of the Commercial SCOPE working group. A copy of the SCOPE Strategic Plan is included at the end of this report. In addition, the SCOPE 2020 Working Group has developed a set of updated Urban IPM Priorities for the IPM Centers to support future funding opportunities. These priorities have both a pest exclusion focused group and a non-pest exclusion list. These priorities are included at the end of this report.

Objective 6.) Develop extension outreach materials, network (including social media) to promote pest exclusion as a critical action in pest management. Evaluate our work through networking and feedback.

Our group currently owns the domain www.pestexclusion.com and plans to build a website that will serve as a clearinghouse of pest exclusion science and outreach in the future. This website will likely be housed at the NYSIPM Program website. Outreach materials will be developed by members, including recommendations and PowerPoint presentations and will be housed on our site. The Pest Exclusion Facebook page has 79 followers, which is a low number, but gains higher reach with popular posts. To elevate the awareness of SCOPE and our focus on pest exclusion, and to gather information about pest managers’ use of exclusion, I created a Facebook survey about pest exclusion. I deployed this survey on our own Pest Exclusion Facebook page and the Pest Cemetery Facebook page, a community of over 4,000, which is managed by a well-known pest management company owner. Results are included in the discussion section. In addition to these materials, members of the SCOPE working group have been invited to speak about pest exclusion at numerous conferences throughout the country and webinars.

Outreach on the Science and Adoption of Pest Exclusion

Articles on pest exclusion:

- Gangloff-Kaufmann, J.L. “Moving the Bar in Integrated Pest Management”. Newsletter of the NY Pest Management Association. October 2015.
- Frye, M. “[Exclusion: The Future of Pest Management](#)”, PCT Magazine, August 2016

Talks given by NYSIPM members:

4/5/2016	St. Croix, USVI	EPA Region 2 IPM Forum	“Reducing Pesticides in Restaurants, Schools and Hotels”	64
4/6/2016	San Juan, Puerto Rico	EPA Region 2 IPM Forum	“Reducing Pesticides in Restaurants, Schools and Hotels”	94
4/19/2016	Poughkeepsie, NY	Community IPM Council Meeting	“The Scientific Coalition of Pest Exclusion” – Dr. Bobby Corrigan	30
4/26/2016	Oakbrook, IL	McCloud Services Annual Pest Invasion Seminar	“Rodent Exclusion”	75
5/23/2016	Albuquerque, NM	National Conference of Urban Entomology	“The Scientific Coalition of Pest Exclusion”	53
10/6/2016	Los Angeles, CA	GreenBuild International	“Designing Pests and Pesticides out of	45

		Expo and Show (LEED)	Green Buildings"	
1/19/17	Atlantic City, NJ	NPMA Eastern Conference	"Pest Exclusion: And Old Concept with a New Life"	325
4/25/17	Oakbrook, IL	McCloud Training Workshop	"Exclusion: The Future of Pest Management"	350
10/27/17	Baltimore, MD	Pest World, NPMA	"Developing a Pest Exclusion Program for Cockroaches and Rodents"	129
10/27/17	Baltimore, MD	Pest World, NPMA	"Exclusion: The Future of Pest Management"	129

The SCOPE Working Group includes a variety of members who do trainings and give presentations all over the world. Although I have asked several times if Dr. Corrigan could share some of the examples of his presentations with me, he has not had the time to provide that information. It is accurate to say that the core members of this working group speak about SCOPE frequently and promote pest exclusion as the best IPM tool in many types of educational settings. We have proposed a 2-part session at the 9th International IPM Symposium titled "Partnerships to Strengthen the Role of Pest Exclusion in IPM" featuring Corrigan, Kells, Wang, Marc Lame, Gangloff-Kaufmann, Frye, Pollack, and Geiger as speakers.

Evaluation - Industry Survey Using Facebook Surveys

To gather a bit of information about individual and company use of and views on pest exclusion, I developed a survey on Facebook's survey app in January of 2017. I deployed this survey on the Facebook page of a popular company owner (Pest Cemetery) who agreed to pin it to the top of his page and let it run for a period of time. While response was fairly low compared to the number of members in that group, results were high enough to provide insights about real world use of exclusion by the pest management industry.

Highlights:

- 89% of respondents believe that pest exclusion is a valuable part of their work.
- 70% use some form of exclusion for blocking harborage and passageways for pests indoors.
- 84% use exclusion to control rodents inside buildings (although traps were more popular).
- Only 30% used exclusion to keep cockroaches out of buildings.
- 56% of respondents said that they need more information about both the right materials to use and training on how to use those materials.
- Almost half of respondents said that exclusion may not be used in their company because customers don't want to pay for it and not all technicians have the right skills.
- About half of the respondents work for a company that provides wildlife services (wildlife exclusion).
- A vast majority of respondents carry exclusion materials with them, though what they carry varies. 89% carry steel or copper wool. 84% carry sealants.

From these results, we can infer that pest exclusion is widely accepted in the pest management industry and is worth promoting as a viable tool in pest management. However, there is a need to address the barriers to adoption and use of exclusion, specifically that customers will not pay for it and technicians may not be skilled. Education of customers, homeowners and building

managers must stress the purchase and value of exclusion as a permanent solution to pest problems, especially for rodents. Training opportunities for pest managers that highlight the best and longest-lasting materials are in need. Hands-on training in building repair for technicians and building managers is also needed.

Future Projects - Dictionary of Exclusion

Training and skill building for pest management technicians is a high priority if pest exclusion is to be fully implemented. During meetings of both working groups, members decided that a pest exclusion reference book would be useful to those learning about pest exclusion. We have called this the “Dictionary of Exclusion”. Although this was not part of the work plans of either working group, members felt strongly that this kind of project could be a key training apparatus for both pest managers and building managers. An outline has been created for this resource and is shared on the Google Drive account for SCOPE. We envision this resource to contain definitions of terms relevant to building construction and improvements, as well as specific pest exclusion terms (escutcheon plate, for example). Additionally, instructions, illustrations and photographs and possibly videos will describe the correct materials, methods and specifications for repairs that keep pests out.

Future Projects – Website

We are planning to add a page to the NYSIPM website (www.nysipm.cornell.edu) devoted to pest exclusion in the upcoming year. This page will house all SCOPE educational materials as they become available. This report, the Residential SCOPE literature review, checklists and the Dictionary of Exclusion will be posted to this site. We may also redirect www.pestexclusion.com to this website for easy access.

Appendix:

A. Strategic Plan for the Scientific Coalition of Pest Exclusion

The support of the Northeastern and North-Central IPM Centers for SCOPE working groups has enabled members to meet and solidify a direction for this long-term industry-changing movement. Although the Commercial/Industrial SCOPE and the Residential SCOPE efforts have different objectives, they serve the same purpose – to verify and promote the use of pest exclusion as a primary management tactic. The Residential SCOPE working group has developed a strategic plan to guide our work into the future. We envision extending SCOPE to schools, child care centers, public housing and other sensitive places where IPM relationships already exist. This strategic plan will evolve as we move forward.

Strategic Plan for the Future of the Scientific Coalition of Pest Exclusion - 3/9/17

Objective	Pathway	Actions	Long Term Outcomes
Stakeholders understand the return on investments (ROI) for using pest	Identify and overcome barriers to the use of pest exclusion:	Return on investments in exclusion proven: -Document	1. The Pest Exclusion movement causes or

<p>exclusion.</p> <p>Stakeholders: -pest management industry -architects -building managers -food plant quality control - restaurant owners -Retailers -school building managers -</p>	<p>-lack of understanding, -lack of proof of ROI, -PMP business models prevent the use of exclusion, -building managers lack motivation/interest -</p>	<p>cost/benefits: cost of pest damage (loss of revenue, property value, disposed product, energy loss, or health costs); cost of pest exclusion materials and labor</p> <p>- Communication of benefits of pest exclusion to varied audiences with proof of ROI. Assumption: ROI is positive</p>	<p>facilitates the pest management industry to innovate better technology and materials.</p> <ol style="list-style-type: none"> 2. Healthier buildings 3. Lower asthma rates 4. Fewer insecticides and rodenticides used indoors 5. Better pest management
Objective	Pathway	Actions	Long Term Outcomes
<p>SCOPE creates the Dictionary of Exclusion website with terminology, basic recommendations, high performing products, and how-to videos, which serves as the go-to source of pest exclusion information. Website is useable for the public.</p>	<p>A University partner uses resources to create SCOPE dictionary as a hub of pest exclusion training and information.</p> <p>SCOPE working group develops “Dictionary of Exclusion” as a major collaborative project.</p>	<p>SCOPE members and cooperators create content in the form of written materials, videos, terminology ...</p> <p>More? Funding?</p>	<ol style="list-style-type: none"> 1. Home inspectors and WDO (wood destroying organism) inspectors understand pest exclusion and can identify points of entry and conduct home inspections that include pest exclusion recommendations 2. The Pest Exclusion movement causes or facilitates the pest management industry to

			innovate better technology and materials. 3. Healthier buildings 4. Lower asthma rates 5. Fewer insecticides and rodenticides used indoors 6. Better pest management 7. Greater food safety 8. Compliance with FSMA
Objective	Pathway	Actions	Long Term Outcomes
SCOPE works with Healthy Homes, Healthy Neighborhoods and asthma reduction programs to prevent pest entry, especially in low-income housing.	<p>Audiences of Healthy Homes etc become knowledgeable about pest entry and exclusion through trainings, demonstrations and written materials.</p> <p>Healthy Homes and Healthy Neighborhoods promote pest exclusion in more detail</p>	<p>Proven benefits of Pest Exclusion are discussed in Healthy Homes/Neighborhoods workshops and trainings.</p> <p>SCOPE members provide outreach to non-pest control audiences, such as social services providers and other in-home health and safety services</p>	1. Social service and home helpers (various agencies that perform home inspections) understand the importance of and promote pest exclusion in addition to pest treatment. 2. Healthier buildings 3. Lower asthma rates 4. Fewer insecticides and rodenticides used indoors 5. Better pest management

Objective	Pathway	Actions	Long Term Outcomes
Incorporation of Pest Exclusion into other building and management codes, such as fire code, LEED standards, WDO/housing inspections, weatherization, best practices for PMPs, food plant guidelines for FSMA	Developers and managers of such codes, experts in these related fields understand the benefits of pest exclusion and value their addition. Pest exclusion is incorporated into housing and commercial inspection standards	Reach out to other certifying and standards organizations as a group (SCOPE), engage with experts in these other fields to see how pest exclusion can fit in Communication of benefits of pest exclusion to varied audiences with proof of ROI. Assumption: ROI is positive.	<ol style="list-style-type: none"> 1. Healthier buildings 2. Lower asthma rates 3. Fewer insecticides and rodenticides used indoors 4. Better pest management 5. Greater food safety, fewer violations 6. Safer healthier schools
Objective	Pathway	Actions	Long Term Outcomes
Consumers and clients come to expect pest exclusion services in pest management, building management, and food safety.	SCOPE successfully demonstrates and promotes the ease and effectiveness of exclusion. Audiences include: <ul style="list-style-type: none"> - Homeowners - Restaurateurs - School facility managers - Food plant managers - Building managers - Renters/landlords 	Videos? How do we capture the public's attention? Layperson-targeted articles in newspapers, magazines, online articles. One article can be published in many places! Industry-targeted articles about benefits of pest exclusion. Increased awareness of pest exclusion, maybe a "Keep pests Out" campaign	<ol style="list-style-type: none"> 1. Healthier buildings 2. Lower asthma rates 3. Fewer insecticides and rodenticides used indoors 4. Better pest management 5. Greater food safety, fewer violations 6. Safer healthier schools
Objective	Pathway	Actions	Long Term Outcomes
Pest management	Training improves	SCOPE members	<ol style="list-style-type: none"> 1. Pest exclusion

<p>professionals overcome the barrier to exclusion performance (lack of skills) and can perform pest exclusion because they are well-trained or hired to perform exclusion</p>	<p>PMP construction skills</p> <p>Pest management business owners understand value of hiring employees with construction skills</p>	<p>provide video and hands-on training and demonstration.</p> <p>SCOPE promotes the idea of hiring workers with construction skills.</p> <p>Pest management business owners hire workers with building skills and pest control knowledge.</p>	<p>becomes a more common practice in pest control industry</p> <ol style="list-style-type: none"> 2. Healthier buildings 3. Lower asthma rates 4. Fewer insecticides and rodenticides used indoors 5. Better pest management 6. Cost of exclusion is incorporated into business model
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Long Term Future Outcomes – Promotion and adoption of Pest Exclusion results in:

1. The Pest Exclusion movement causes or facilitates the pest management industry to innovate better technology and materials.
2. Buildings are healthier for people.
3. Asthma rates are lowered.
4. Fewer insecticides and rodenticides are used indoors.
5. Better pest management and a stronger pest management industry emerges.

B. Urban IPM Priorities from SCOPE Working Group

<p>Urban IPM Priorities – from the perspective of pest exclusion and structures</p>	
<p>11-2-16</p>	
<p>These priorities were developed in two meetings of the SCOPE IPM Working Group, which consists of extension and research entomologists, public health officials and pest management professionals.</p> <p>Please feel free to add, edit or provide comments about these possible priorities and return them to Jody Gangloff-Kaufmann (jlg23@cornell.edu) so they can be finalized and provided to the Northeastern IPM Center.</p>	
<p>Determine whether interior sealing of gaps (along moldings, walls, floors, cabinets, outlets) help mitigate populations of bed bugs, cockroaches and/or other indoor</p>	

pests.	
Identify the top priority pest exclusion points for ensuring rodent exclusion in multi-family housing. This might be door sweeps, foundation openings, vent screens, utility chases or any other opening.	
Identify the environmental and human health impacts of pest management practices, both positive and negative. (John Carlson Felicia Rabido)	
Conduct a cost/benefit analysis of pest exclusion in a setting that helps determine the value of exclusion versus monthly pest control costs or another conventional program.	
Develop a scientifically-validated pest proofing “report card” system for multi-family housing. The intent of which would be to inform residents and potential renters about a building’s pest safety risks and encourage better practices among residents, landlords and managers.	
Study the biology and ecology of urban pests with the intention of finding vulnerabilities for use in lower-risk control options.	
Develop a building-wide pest management program for private multi-family housing, including model policy and plan, educational resources, best materials and methods. Provide plans for adoption of such a program.	
Investigate better methods of monitoring and treating sanitary (sewer) systems and underground infrastructure for pests such as American cockroaches, Norway rats, or flies.	
Determine what the most common sources of pest and pest management information are for the general public today, for example the internet, pest management companies, neighbors, family and friends, or the library.	
Develop model IPM programs (policy, plan, contract) for underserved types of pest management contracts, such as child care, public housing, private rentals, restaurants, office buildings, hospitals, or nursing homes using improved IPM criteria.	
Design and conduct IPM outreach using an interdisciplinary approach involving sociologists, psychologists, community health workers and others who specialize in human behavior change.	
Develop more effective communication for a wider audience to prevent the use of dichlorvos strips and rodent tracking powder in illegal settings (such as in restaurants and bars).	

Find innovative strategies to improve urban IPM awareness and adoption. Develop an alternative to the agricultural IPM model (7 steps of IPM).	
Define target audiences among “the general public” and shape urban IPM messaging to those audiences. (renters, homeowners, property managers, travelers, pet owners, cooks, gardeners, construction experts, architects, etc.).	
Work with agencies responsible for health (food service) and housing inspection to assure that pest monitoring is included, adequate and that inspectors are well trained.	
Develop and enhance access to multilingual outreach materials including and beyond Spanish, especially for public health pests.	
Develop in-depth IPM skills training for prospective and current pest management professionals, that includes hands-on pest exclusion (building repair) training and communication skills.	
Develop ways to incorporate IPM plans into other health, safety and energy efficiency programs such as LEED, HACCP, or the Food Safety Modernization Act.	

C. Complex and Simple Pest Exclusion forms included as PDFs

D. Survey results in PDF- Two similar surveys were conducted at different times. Both are included.

SCOPE Pest Exclusion and Harborage Index Assessment—Residential

Date: / / Address: _____ UTM Locator
 Inspector: _____ City: _____ State: _____ Northing: _____
 Postal Code: _____ Country: _____ Easting: _____
 Housing Type: P/O _____ P/R _____ Sec8 _____ PHD _____ Commercial Food: Y / N

People Involved

_____ Number of Units Senior Housing? Y / N
 _____ Number of residents (approx.)

Building and Area Characteristics *(Check all that apply)*

Building

- Standalone Residential
 - Attached to Other Residential
 - Attached to Commercial
 - Multi use building
 - Multi-floor
- _____ # of floors

Anything unique?

Foundation

- Basement
- Slab on grade
- Crawl space
- Dirt floor
- Combination

Foundation Type

- Brick
- Stone
- Concrete hollow block
- Metal Sheath
- Poured concrete
- Pilings
- Other

Roofing type

- Asphalt
- Shakes
- Tile
- Slate
- Spanish
- Flat
- Solar panels
- Membrane
- with gravel
- Metal
- Other
- Parapet
- Garden

Siding and wall type

- Brick veneer
- Concrete
- Hollow block
- Precast
- Poured
- Wood
- Ornamental Façade
- Other
- Balloon vs
- Climbing plants?
- Other plants touching or overhanging building?
How much?
- Metal cladding
- Insulated metal panels
- Stucco
- Mortar
- Synthetic
- Vinyl
- Composite concrete
- Contacting grade?
- Fire Stop

Location of HVAC and Vents


- Roof
- Windows
- Active air
- Walls
- On ground
- Passive air

Data Entered: / / Entered By: _____ Entry Number (from database): _____

Sketch of property

Est. Structural Area (or Dimensions) : _____ Est. Property area: _____

Please sketch the foot print of the property –OR– attach documentation (fire suppression documentation or blueprints).
Indicate location of possible exclusion faults, pest activity, conducive conditions, landscape or green scape features



Indicate
North

Legend and other notes:



Aerial Image File: _____

Data Entered: __ / __ / __

Entered By: _____

Entry Number (from database): _____

Pest Observations

Rodents	Live	Dead	Burrow or Nest	Runways	Rubmarks	Drop-pings	Gnawing	How detected O/M/C/R (see below)	Assoc. w Interior Fault Y/N	Assoc. w. Exterior Fault Y/N
Norway Rat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Roof Rat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
House Mouse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Deer Mouse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>

Pest (Please be specific as possible)	Live	Other signs	How detected O/M/C/R (see below)	Assoc. w Interior Fault Y/N	Assoc. w. Exterior Fault Y/N
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>

Other Details (Specify pest)

Codes:

- O: Observed during inspection
- M: In Monitoring traps
- C: Complaints from pests noted
- R: Mentioned in records

Data Entered: __ / __ / __

Entered By: _____

Entry Number (from database): _____

Field Worksheet

Address _____

Building Type _____

Inspector _____

Estimated Age _____

Date _____

Estimated Square ft _____

Time In _____ Time Out _____

Foundation Type _____

Basement Type _____

#	Structure (Door, Roof, Soffit, Foundation, Exterior line, Interior line, Wall, Window, Drain)	Type (see codes below)	Size of Gap/Penetration (not pest proof)	Within 100ft of Food Zone?	Largest Permissible Pest (Insect, Mouse, Rat)	Code Value
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

Building Type

Independent (unattached)
Attached

Foundation Type

Concrete Hollow Block
Metal Sheathing over Studs
Poured Concrete; Solid
Brick
Stone

Basement Type

Conventional
Crawl

Door Type

Front
Side
Delivery (St. Level)
Delivery (Sidewalk/Stairs)

Escutcheon Plate Type

(1) Present and Sealed
(2) Present, Unsealed; allows insects, not rodents
(3) Present, Unsealed; allows insects and rodents
(3) No plate; Sealed to closure
(4) No plate, Foam Fill Around Pipe.
(5) No plate; Open ; allows for insects, but not rodents
(6) No plate Open; allows insects and rodents

Exterior Line Penetration/Type

Roof (R)
Foundation (FD)
Floor (FL)
Ceiling (C)
Wall (W)
Utility Elect. (UE)
Utility Plumb (UP)
Utility Gas (UG)
Utility (?) (UU)

Interior Line Penetration/Type

Floor (FL)
Ceiling (C)
Wall (Sheetrock Conventional)
Wall Poured Concrete Solid (W)
Wall : Concrete Hollow Brick (CHB)
Ceiling (Solid Pour)
Ceiling (Suspended)
Ceiling (other)
Utility Elect. (UE)
Utility Plumb (UP)
Utility Gas (UG)
Utility (?) (UU)

Summary Sheet

Address _____

Building Type _____

Inspector _____

Estimated Age _____

Date _____

Estimated Square ft _____

Time In _____ Time Out _____

Foundation Type _____

Basement Type _____

Value	Doors	Calculations
A	Total # Doors	
B	# Doors Pest Proof	
C	# Doors Not Pest Proof	
	Percentage Pest Proof	$B/A * 100 =$
	Percentage Not Pest Proof	$C/A * 100 =$

Value	Exterior Penetrations	Calculations
J	Total # Ext. Penetrations	
K	# Ext. Penetrations Pest Proof	
L	# Ext. Penetrations Not Pest Proof	
	Percentage Pest Proof	$K/J * 100 =$
	Percentage Not Pest Proof	$L/J * 100 =$

Value	Windows	Calculations
D	Total # Windows	
E	# Windows Pest Proof	
F	# Windows Not Pest Proof	
	Percentage Pest Proof	$E/D * 100 =$
	Percentage Not Pest Proof	$F/D * 100 =$

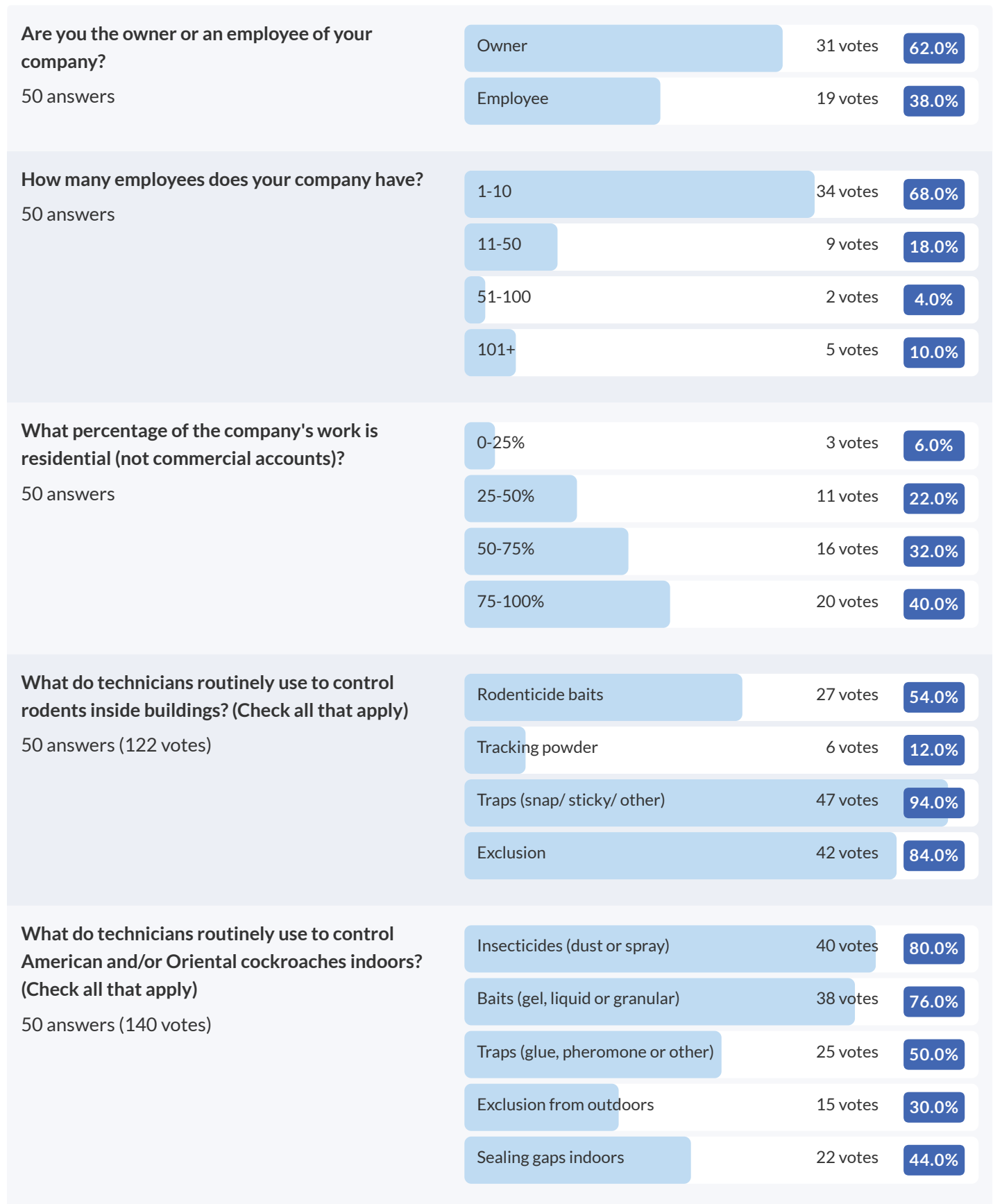
Value	Interior Penetrations	Calculations
M	Total # Int. Penetrations	
N	# Int. Penetrations Pest Proof	
O	# Int. Penetrations Not Pest Proof	
	Percentage Pest Proof	$N/M * 100 =$
	Percentage Not Pest Proof	$O/M * 100 =$

Value	Floor Drains	Calculations
G	Total # Drains	
H	# Drains Pest Proof	
I	# Drains Not Pest Proof	
	Percentage Pest Proof	$H/G * 100 =$
	Percentage Not Pest Proof	$I/G * 100 =$

Structure	Totals and Values	Pest Vulnerability Index	Harborage Index
Doors			
Windows			
Exterior Penetrations			
Interior Penetrations			
Floor Drains			

What do you think of Pest Exclusion? Let us know!

Created on November 11, 2016 by Jody Gangloff-Kaufmann



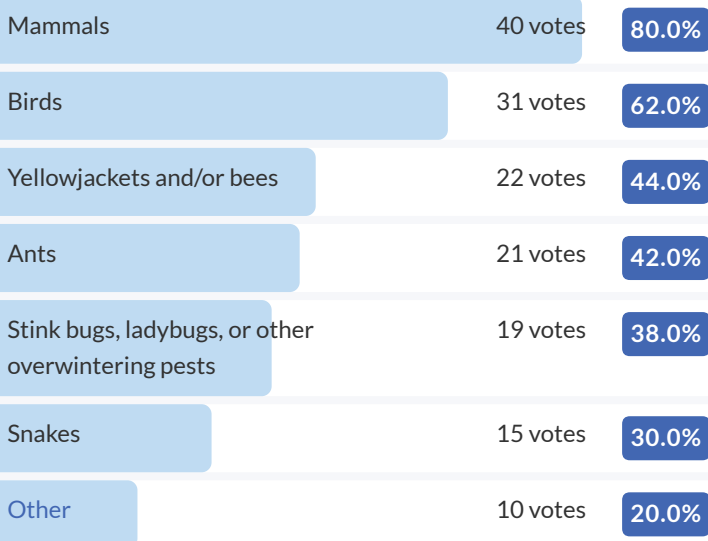
Does your company offer wildlife control services?

50 answers



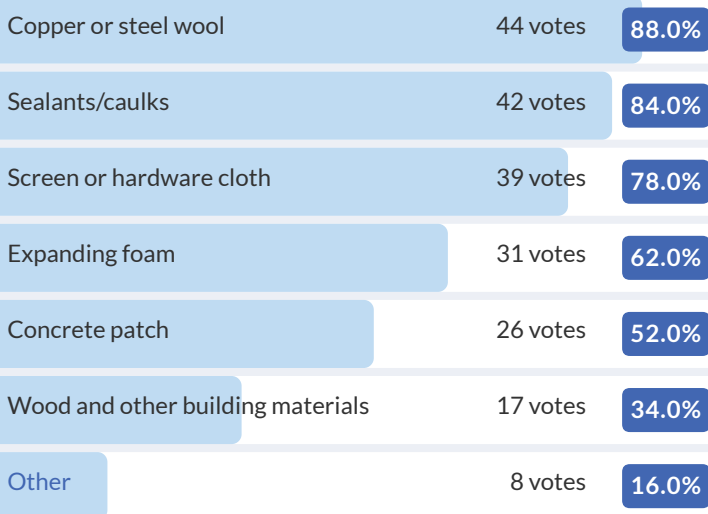
For which other pests is exclusion used in your company? (Check all that apply)

50 answers (158 votes)



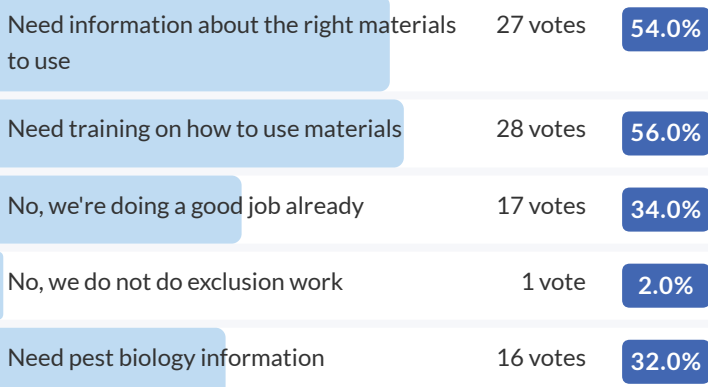
What exclusion materials do techs typically carry to job sites? (Check all that apply)

50 answers (207 votes)



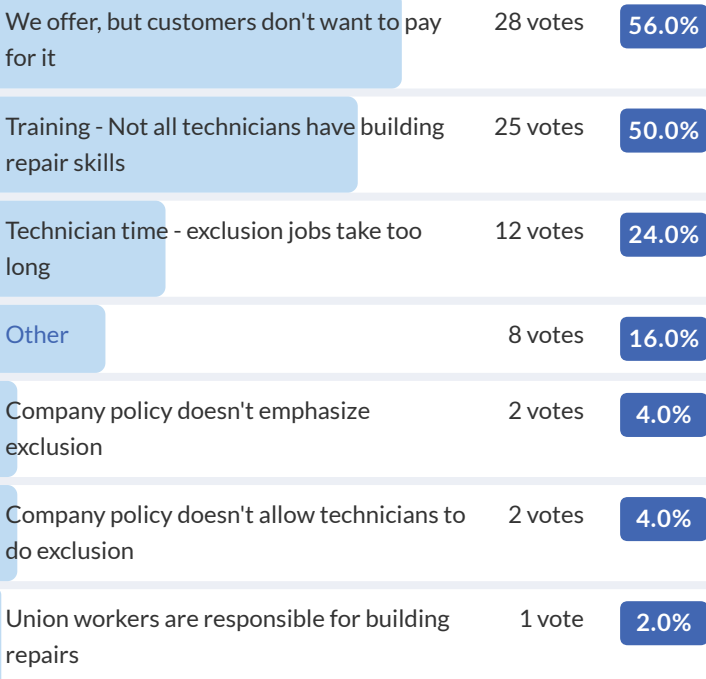
Do you (or your workers) have a need for more information or training in pest exclusion?

50 answers (89 votes)



What are some of the reasons that pest exclusion may not be used in your company? (Check all that apply)

50 answers (78 votes)



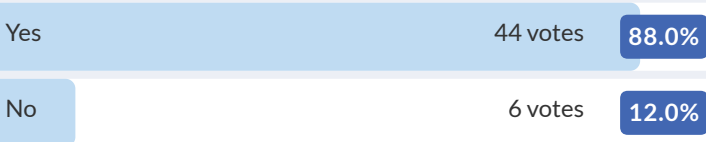
Do you use exclusion for interior work (sealing gaps and blocking passageways inside and between parts of buildings)?

50 answers



Overall, is pest exclusion a valuable part of your work in pest management?

50 answers

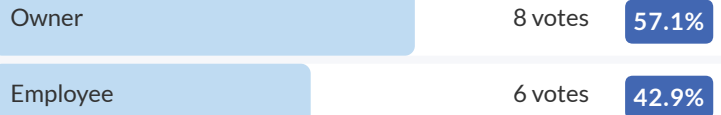


Pest exclusion survey for pest management professionals

Created on September 27, 2016 by Jody Gangloff-Kaufmann

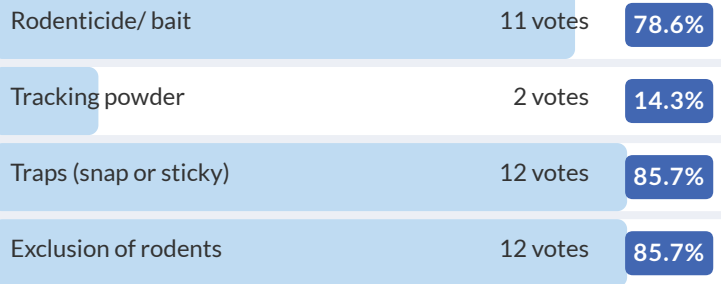
Are you the owner or an employee of your company?

14 answers (0 locked)



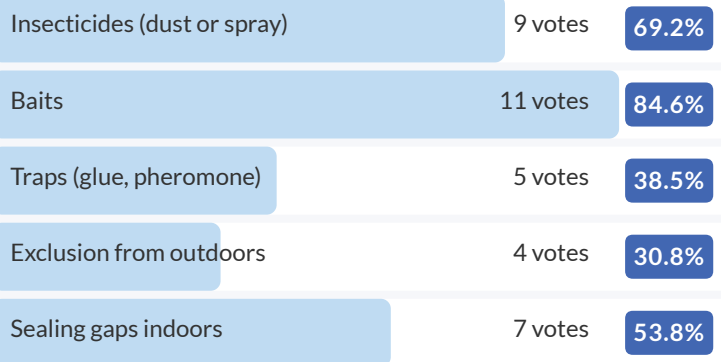
What do technicians routinely use to control rodents inside buildings? (Check all that apply)

14 answers (37 votes) (0 locked)



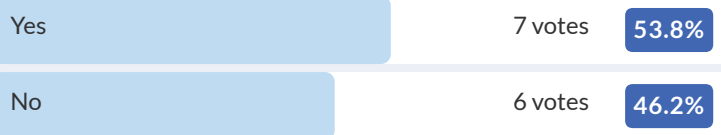
What do technicians routinely use to control American and Oriental cockroaches indoors? (Check all that apply)

13 answers (36 votes) (0 locked)



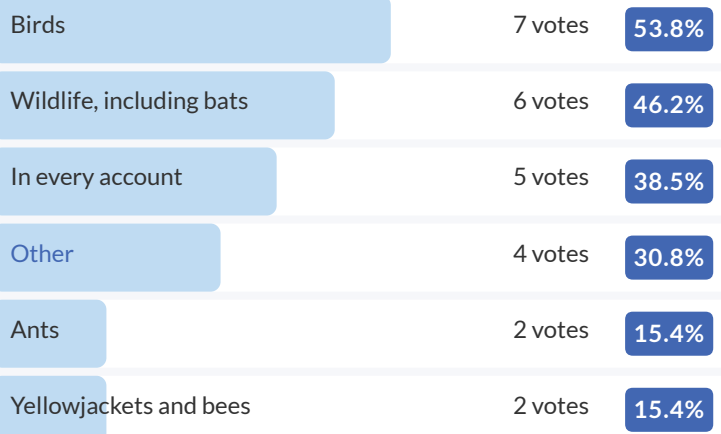
Does your company offer wildlife control services?

13 answers (0 locked)



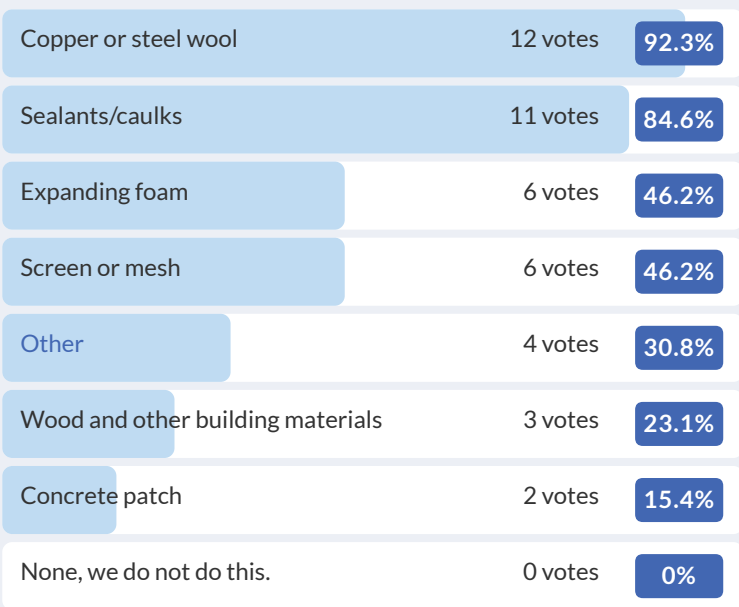
Does your company use exclusion for the following? (Check all that apply)

13 answers (26 votes) (0 locked)



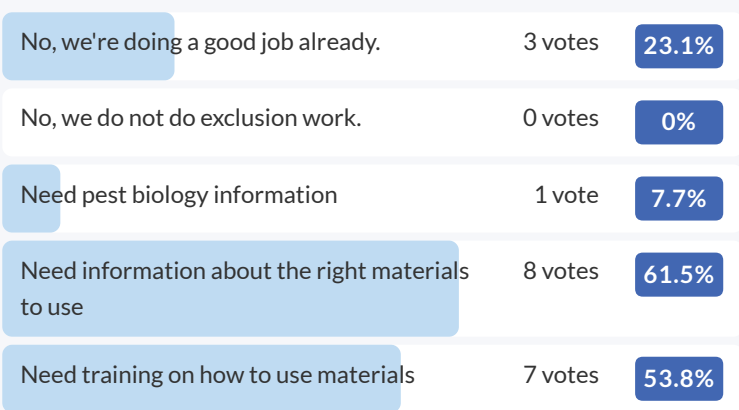
What exclusion materials do you typically carry to job sites?

13 answers (44 votes) (0 locked)



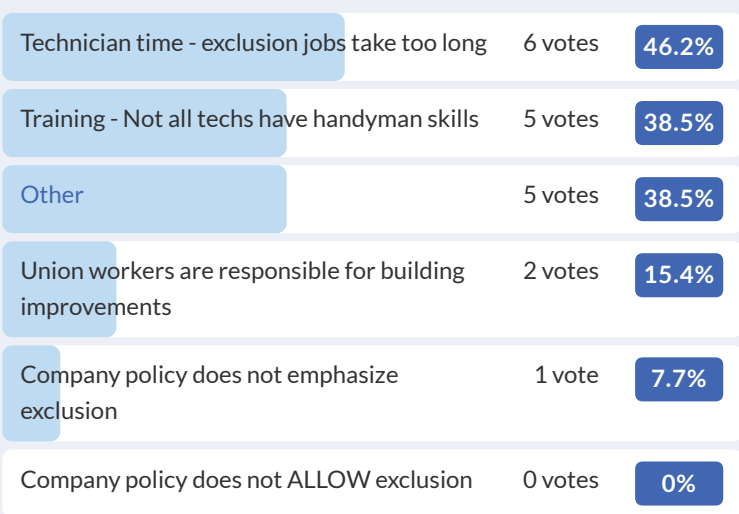
Do you or your company need more information or training in pest exclusion?

13 answers (19 votes) (0 locked)



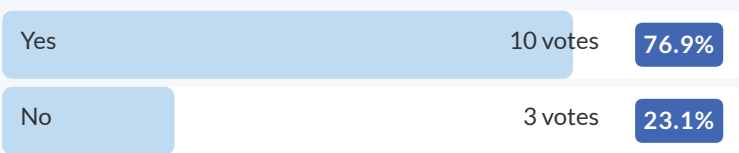
What are some of the reasons that pest exclusion is not the first option? (Check all that apply)

13 answers (19 votes) (0 locked)



Do you use exclusion for interior work (sealing gaps and blocking passageways inside and between parts of buildings)?

13 answers (0 locked)



Overall, is pest exclusion a valuable part of pest management?

13 answers (0 locked)

