

Pest Exclusion, 2018

Project Leader(s):

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Cooperator(s):

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Abstract:

Pest exclusion has long been recognized as an important component of integrated pest management (IPM) programs. However, similar to the importance of sanitation, for hire pest professionals do not often sell pest exclusion services. There are several possible explanations for why adoption of exclusion by the pest management industry remains low, including the effectiveness of chemical and mechanical control tactics currently used, an unwillingness of customers to pay for preventative services, and a lack of expertise to select the appropriate materials and perform the work. Therefore, the Scientific Coalition on Pest Exclusion was formed by academic and industry professionals with the mission of advancing the science of pest exclusion through research and education, and providing professionals and homeowners with the tools needed to keep pests out of the indoor environment. In 2018, a website dedicated to SCOPE was created on the NYS IPM website that describes the effort and provides resources for developing and implementing a pest exclusion program. Articles about exclusion were published in a trade magazine, and hands-on workshops were delivered.

Background and justification:

The Scientific Coalition on Pest Exclusion (SCOPE) was formed in 2013 and led by Dr. Stephen Kells and Dr. Bobby Corrigan. A 2017 report (<https://hdl.handle.net/1813/57152>) describes the creation of two working groups and objectives that were previously proposed and completed by the group. Since then, the New York State IPM Program has continued to promote exclusion and provide education to facilitate adoption of this practice by pest professionals, building maintenance personnel and homeowners.

Objectives:

- Create a website that collates resources for individuals to develop a pest exclusion program
- Generate new resources that facilitate adoption and implementation of pest exclusion
- Advance adoption of pest exclusion through articles in trade magazines, public presentations and collaboration

Activities:

Create a website that collates resources for individuals to develop a pest exclusion program.

In January 2014, a webpage domain was purchased for SCOPE and is currently maintained by collaborators at the University of Minnesota. This page, www.pestexclusion.org, currently hosts an interest form for individuals interested in learning more about pest exclusion to sign up. To date, the list of interested individuals has not been utilized, but the list continues to grow. In the future, NYS IPM hopes to gain access to this page and redirect it to the Cornell University SCOPE page described below.

In June 2018, a SCOPE website was launched under the Homes and Other Buildings page of the Community IPM Program [<https://nysipm.cornell.edu/community/homes-and-other-buildings/scientific-coalition-pest-exclusion/>]. This site includes a mission statement, a list of individuals that have participated in SCOPE, and most important, a side bar with useful resources. These links are separated into five categories:

- *General Resources*: the philosophy of pest exclusion and SCOPE.
- *Material Selection*: recommendations for specific materials used in pest exclusion.
- *Tool Selection*: tools that are needed to implement exclusion.
- *Conducive Conditions*: describes why pests are attracted to specific areas and how to reduce these conditions.
- *Inspection Forms*: three forms and an instructions sheet on how to use one of the forms. These resources were created by NYS IPM staff to facilitate adoption and implementation of pest exclusion practices, and are highlighted in presentations provided by IPM staff.

Generate new resources that facilitate adoption and implementation of pest exclusion.

As described in the *Inspection Forms* section above, three forms and one instructional document were generated by NYS IPM staff to facilitate adoption of pest exclusion and record keeping.

- *Exterior Inspection Instruction Form* [Figures 1 & 2]: describes the process of completing an exterior inspection for pest entry points around a building. The goal of this document is to train people how to use the *Exterior Inspection Form* to record observations and mark a facility map
- *Exterior Inspection Form* [Figure 3]: the starting point for a pest exclusion program. This form is based on an overall building assessment created by Dr. Bobby Corrigan. However, unlike the original document that tallies openings to give a graded building assessment, this form is used to record entry point locations and generate possible solutions. Specifically, the form considers the *Largest Permissible Pest* (an indicator of opening size), which can be used to determine what materials should be used to seal the gap. A column about the presence of pest evidence is an indicator of pest pressure, which influences the priority ranking to seal that opening. Information about the *Cause of Opening* can help practitioners determine if a specific material they have used is effective. If performed by a third party, this form provides a way to communicate information about the location and type of opening to building personnel.
- *General Inspection Form* [Figure 4]: the most important feature of this form is the ability to prioritize (*High, Medium, Low*) and categorize (*Pest Management, Sanitation, or Exclusion*) observations related to pest problems. This facilitates communication and especially cooperation by all parties involved in the program. It

also addresses a comment by facility directors or site staff who can be overwhelmed by long lists of issues reported by a pest professional. Using this form, items that are listed as high priority can be addressed first, and responsibility can be assigned based on the category of the issue (for example, pest management versus sanitation that is the responsibility of site management).

- *Rodent Monitoring Log* [Figure 5]: Integrated rodent management for difficult situations requires detailed recording of observations. Knowing what rodent species is present, their movement patterns, the reproductive status of individuals, and other observations can provide insights that lead to more effective control. Therefore, this form was generated to help pest professionals gather and interpret the information for improved pest management.
- *Performing Exclusion*: This document is currently in draft form and is the follow-up to the Exterior Inspection. The document divides pest exclusion into categories based on the size of the pest, including 1/8 inch or less (arthropods), 3/8 inch or less (mice), 3/4 inch or less (rats and squirrels), and 1 to 4 inches or more (wildlife). For each category, the type of materials that are available and effective for exclusion are listed. The next section reviews this information in a different format, by listing various common entry points and how exclusion can be performed at each of those sites. When completed, this document will be reviewed by the SCOPE Advisory Board (see description below).

Advance adoption of pest exclusion through articles in trade magazines, public presentations and collaboration.

A primary goal of the Scientific Coalition on Pest Exclusion is to increase the adoption of exclusion by the professional pest management industry, building managers and the public. In 2018, an article was written for the *ThinkIPM* blog (NYS IPM Program) to promote and justify pest exclusion. In addition, three articles were written by PCT Magazine that summarized presentations given by Drs. Jody Gangloff-Kaufmann and Matt Frye at the 2017 Pest World Meeting run by the National Pest Management Association.

NYS IPM staff organized a session at the 9th International IPM Symposium entitled, *Partnerships to Strengthen the Role of Pest Exclusion in IPM*. This session included seven talks from core members of the Scientific Coalition on Pest Exclusion.



SCOPE members presenting at the International IPM Symposium in Baltimore, MD (left to right): Changlu Wang (Rutgers University), Marc Lame (Indiana University), Bobby Corrigan (RMC Consulting, Inc.) Stephen Kells (University of Minnesota), Chris Geiger (San Francisco Department of the Environment), Jody Gangloff-Kaufmann (NYS IPM Program, Cornell University), Matt Frye (NYS IPM Program, Cornell University)

Through its grants program, the Community IPM Program funded a project at Cornell Cooperative Extension of Albany County entitled IPM Exclusion Education and Training. An important deliverable from this project were two workshops held in the capital district. Each workshop included presentations by NYS IPM staff: *Pest Identification and Pest Health Risks* and *IPM Inspection Process and Exclusion Techniques*; followed by three hands-on stations to covered: *Exterior Inspections*; *Exclusion Products and Practices*; and *Pest Identification: Questions and Answers*.

A one-hour lecture entitled, "Design and Exclusion Principles," was created by IPM staff and will be used as part of an online course from Kansas State University and the Grain Elevator and Processing Society. This lecture is part of a full semester course, [GEAPS 525 Management of Pests in Stored Grains](#), which will be offered starting in May 2019.

A SCOPE Advisory Group was proposed that would serve to provide feedback on new materials, as well as successes and challenges from the field. A list of individuals has been proposed, but the group has not been formally assembled.

Results and discussion:

Create a website that collates resources for individuals to develop a pest exclusion program. As of January 2019, the SCOPE interest form includes a list of 228 individuals seeking more information about pest exclusion. Nineteen individuals signed up in 2018, which is surprising since this page has not been promoted or mentioned. This highlights the need to redirect this page to the current scope website.

A total of 329 people have accessed the main page of the SCOPE website, with 47 visitors to the membership page. The page has been mentioned in all presentations on pest exclusion, as well as presentations on rodent management.

Generate new resources that facilitate adoption and implementation of pest exclusion.

Although the pest management industry has access to electronic monitoring (the ability to scan individual devices and record capture data, etc.), small, local companies rely on written reports to communicate with clients. Therefore, forms such as those posted on the SCOPE website to improve the inspection process for pest professionals and to facilitate adoption of exclusion are likely to be useful. Screenshots of these forms are included in presentations on pest exclusion and rodent management, and several requests for direct email of forms have been received for their use by pest management companies. To date, forms have been downloaded the following number of times: Exterior Inspection Instruction Form-25; Exterior Inspection Form-24; General Inspection Form-19; Rodent Monitoring Log-14. In 2019, forms will be posted to Facebook groups that are likely to reach interested parties, including pest professionals. In addition, the *Performing Exclusion* document will be completed.

Advance adoption of pest exclusion through articles in trade magazines, public presentations and collaboration.

In 2018, three articles based on exclusion presentations delivered at Pest World 2017 were publishes in PCT Magazine. Furthermore, a post about exclusion was written for the

ThinkIPM blog, which highlighted the role of Dr. Bobby Corrigan bringing new life to an old concept.

- Benefits and Opportunities with Exclusion Programs: www.pctonline.com/article/benefits-opportunities-exclusion-program/
- The Inspection: The Critical First Step: www.pctonline.com/article/inspectioncritical-first-step/
- Factors to Consider When Selecting Materials: www.pctonline.com/article/factors-consider-select-exclusion-materials/
- Frye, Matt. "Pest Exclusion: An Old Concept with New Life" New York State IPM Program Blog. Cornell University, 22 August 2018. Web. URL: <http://blogs.cornell.edu/nysipm/2018/08/22/pest-exclusion-an-old-concept-with-new-life/>

A number of presentations were delivered that focused on pest exclusion. This includes the workshops offered by CCE Albany County [note: one of these workshops was recorded with the expectation of using footage for an online video in the future.] The session at the 9th International IPM Symposium (Figures 6 & 7) had up to 45 attendees for the 7 presentations.

Date	Location	Conference/ Meeting Name	Presentation Title	Contact Hours
2/23/2018	Elmsford/ Westchester	Target Specialty Products Seminar	Adding Exclusion Services to Your Company Profile	65
3/22/2018	Baltimore, MD	9th International IPM Symposium	"Pest Exclusion: The Future of Pest Management"	8
9/12/2018	Webinar	StopPests Webinars	Developing an Exclusion Program for Cockroaches and Rodents	142
11/7/2018	Lexington, KY	Kentucky Short Course	Pest Entry and Exclusion	174
11/28/2018	Albany/Albany	IPM: Identification and Exclusion Best Practices Workshop	Pest Entry and Exclusion	176
12/12/2018	East Greenbush/ Rensselaer	IPM: Identification and Exclusion Best Practices Workshop	Pest Entry and Exclusion	148

Interest in pest exclusion continues to grow for several reasons, highlighting the need for ongoing effort in this field. First, regulations continue to change that affect the availability of pesticide products. While current restrictions impose limitations on the use of [pyrethroid insecticides](#) and [rodenticides](#), proposed legislation in the state of California calls for a complete ban of rodenticides. This change would necessitate a major shift in rodent management practices, and would rely heavily on trapping and exclusion. Additional regulatory changes, such as the [Food Safety Modernization Act](#), impose preventative controls that include exclusion as a way to minimize risks to contamination. On a local scale, regulations such as [Local Law 55](#) in New York City call upon landlords to implement exclusion in their buildings to reduce exposure to allergens. In addition to regulations, clients of pest management firms and residents of buildings desire long-term, effective solutions to pest problems – not just management of ongoing problems. With interest

increasing in exclusion, it is therefore critical that accurate information be available to the public on the best practices for exclusion, including material selection and implementation.

Project Location(s):

Albany, NY: Pest Exclusion Workshops

Baltimore, MD: 9th International IPM Symposium

Samples of Resources Developed:



Exterior Inspection Form Instructions

The goal of the Exclusion Inspection Form is to help you find and document openings that could allow pest entry into a building. This form applies to commercial and residential buildings.

Inspection: The instructions below will help you complete a thorough inspection.

1. **Pick a starting point.** Typically, a front door or main entrance is a good place to start.
2. **Right or Left-Hand Lead.** The best way to see all parts of a building is to follow the walls in one direction, as if your hand was on that wall as you walked around. Your inspection is complete when you have gone around the entire building and end up back at your starting point.
3. **Stay in Contact.** During your inspection, you must be close enough to the building to touch it at all times. This might mean you are behind or on top of landscape plantings.
4. **Look From Every Angle.** As you move along the wall, look up and down for openings. You might have to get low to check for openings at the sill plate (where the foundation meets the siding) or other hard to see areas. Remember that most pests are crawling at ground level and have a different perspective than you.

Pay Special Attention. Common areas of pest entry include:

- Doors: under doors, between double doors, loading docks
 - Utility Penetrations: gaps around pipes and wires
 - Sill Plate: gaps between construction materials
 - Windows: loose or torn screens, weep holes, water damage
 - Roof Line: soffits, water damage at gutters
5. **Test Openings.** Pests can enter through openings of different sizes. During your inspection you'll want to record the size of the largest animal that can pass through. Size references are listed on the form [insect 1/8" (business card width), mouse 3/8" (pencil), rat 3/4" (quarter, 25¢), raccoon 4" (softball)]. This information will help you decide what type of exclusion material and technique to use.
 6. **Record Pest Observations.** Look for pests, pest evidence and conditions conducive to pests: food, water and shelter. Openings near "conducive conditions" are a higher exclusion priority.
 7. **Record on a Map.** A facility blueprint, a Google map of the building footprint, a fire escape map, or a hand-drawn map are necessary to record where openings were found. If no official map is available, use the form on the back of this page to draw one. Each time you identify an opening, it should be recorded on the map.

Prioritize Exclusion: After completing your inspection, you will want to prioritize which openings are critical for exclusion. It is possible that your budget will allow you to seal all openings at once. If not, consider which openings are most likely to allow pest entry. These may be the openings closest to sources of food, water and shelter, areas with easy access to the building (e.g. loading dock), or where you observed pest evidence.

Figure 1. Page 1 of the *Exterior Inspection Form Instructions*



Sketch of Property

Sketch the footprint (outline) of the building to indicate the location of exclusion faults, pest activity, conducive conditions and other features.

<p style="text-align: right;">Indicate North</p>
<p>Legend & Notes</p>

Figure 2. Page 2 of the *Exterior Inspection Form Instructions*

programs. In sub-tropical export horticulture, we outline how new certification standards provide the basis for greater human health protection when pesticide management standards are merged within an IPM requirement.

47 • Partnerships to Strengthen the Role of Pest Exclusion in IPM

Homeland

Proponents of IPM in urban/structural pest management have long recognized the importance of exclusion as a pest prevention technique. As an industry, pest management professionals are poised to provide exclusion services based on knowledge of conditions that are conducive to, and supportive of pest entry. To date, however, adoption of exclusion remains low. To combat this, the Scientific Coalition on Pest Exclusion (SCOPE) initiated the SCOPE 2020 campaign to raise awareness and prompt adoption of exclusion. An additional route to adoption of exclusion is by incorporating pest prevention principles into efforts of other organizations and trades. In this session, we will explore adoption of pest exclusion as it relates to weatherization, fire prevention, new construction, building certification, and food safety. The session will also include a history of exclusion, current research on pest movement in buildings, benefits of exclusion for asthma and allergy reduction, and a discussion on future research needs for adoption. The goal of this session is to empower attendees with ways to engage non-traditional partners in promoting exclusion to reduce pest populations and associated problems.

Organizers: Jody L. Gangloff-Kaufmann, jlg23@cornell.edu, NY State IPM Program, Cornell University, Babylon, NY; Matthew J. Frye, mjf267@cornell.edu, NY State IPM Program, Cornell University, Elmsford, NY

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- 8:30 47.1 Open Doors: An Overview of Pest Exclusion's Past and Present, Robert M. Corrigan, cityrats@icloud.com, RMC Pest Management Consulting, Ossining, NY

An introduction and history of structural pest exclusion and why exclusion is finally having its day. There are four highly utilized structural routes of entry by pests into our buildings, but of which none are highly difficult to alter to achieve pest exclusion. Yet, for nearly a century, and despite the advice of early urban pest experts, holes in walls and gaps beneath everyday doors remained unattended to. With the advent of chemical pesticides, the expectation perhaps was residual exterior insecticidal sprays and rodenticidal baits could replace the need for common-sense structural repairs. But in a full circle pest exclusion is gaining attention and thus momentum for being re-instated into its proper scientific and intellectual spot: the truest corner-stone of urban IPM programs.

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- 8:40 47.2 Pests All Over: Distribution of German Cockroaches and Bed Bugs in Apartments, Changlu Wang, changlu.wang@rutgers.edu, Department of Entomology, Rutgers University, New Brunswick, NJ

Cockroaches and bed bugs are prevalent pests of multifamily housing communities. Both of these pests have the ability to move between apartments contributing to high infestation rates and chronic pest activity. Understanding distribution of cockroaches and bed bugs is essential in effectively managing these pests on a building-wide basis and can provide important information for exclusion efforts.

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- 8:50 47.3 Reducing Asthma and Allergies with Pest Exclusion, Marc L. Lame, mlame@indiana.edu, School of Public and Environmental Affairs, Indiana University, Bloomington, IN

This talk will concentrate on our mantra from School IPM "do what you are doing now, just think pests." My logic for sealing buildings with regard to pests and pesticides is 1) you have to manage/design airflow to keep the building and occupants healthy AND conserve energy 2) a monitoring system is the backbone of such a system and 3) continuous maintenance makes it work. All of these basic but fundamental activities require political will as a resource. The same such fundamentals and resource align perfectly with a good IPM system.

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- 9:00 47.4 Exclusion: The Future of Pest Management, Jody L. Gangloff-Kaufmann, jlg23@cornell.edu, NY State IPM Program, Cornell University, Babylon, NY

Keeping pests out of buildings is common sense. Pest exclusion is one of the pillars of an integrated pest management program, but it is often overlooked or neglected due to costs or lack of skills. This presentation will cover barriers to the adoption of pest exclusion as an IPM tool and strategies for encouraging pest managers to do more of it.

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- 9:10 47.5 IC SCOPE: What We Have Learned So Far about Pest Exclusion in Industrial and Commercial Habitats, Stephen Kells, kells002@umn.edu, Department of Entomology, University of Minnesota, St. Paul, MN

Insect and rodent pests are very able to use structural faults in residential and commercial buildings. When pests invade structures, their activity causes substantial health problems and costs for people and companies. The best way to deal with infestations is to prevent their entry and stop them from spreading within buildings. However, for several reasons this common-sense approach has struggled to become a common-used approach. The Scientific Coalition On Pest Exclusion (SCOPE) is a group of scientists, pest managers and facility managers who have the goal to bring scientific study to exclusion practices. The ultimate goal is to provide the end-user

practical guidance for, and resulting confidence in, identifying building faults and deploying exclusion methods. This presentation will discuss the challenges found in industrial and commercial habitats (IC) that interfere with increasing practical pest exclusion as a critical IPM component in these buildings.

9:20 47.6 Lessons learned from building pest prevention into 3,500 low-income housing units, Chris Geiger, chris.geiger@sfgov.org, Department of the Environment, City of San Francisco, San Francisco, CA

Dr. Geiger will summarize lessons learned during the Rental Assistance Demonstration (RAD) project in San Francisco, a massive public housing rehabilitation project that incorporated pest preventive design elements.

9:30 47.7 Regulating holes: Enhancing the exclusion and containment envelope, Richard Pollack, richard_pollack@harvard.edu, Department of Immunology and Infectious Diseases, T.H. Chan School of Public Health, Cambridge, MA

Penetrations for mechanical, electrical, plumbing, communications systems provide portals to networks of pest friendly superhighways throughout our dwellings. Designers and contractors tend to be woefully ignorant of the significance of penetrations, and the operational managers who assume control of the structures inherit perpetual costly and difficult pest management burdens that could largely be averted. Proactive exclusion practices can be impressively effective, sustainable, environmentally-appropriate, and can dramatically reduce risks and costs associated with pests. New fire code regulations, building standards and best management practices that prescribe plugging holes for firestopping purposes, for example, serve as useful 'hooks' to encourage and compel architects and contractors to consider enhancing pest security as well. This presentation will highlight specific exclusion opportunities and solutions. Although such elements are ideally adopted during initial facility design and construction, they can be applied—albeit with more difficulty and cost—later to mitigate ongoing pest problems.