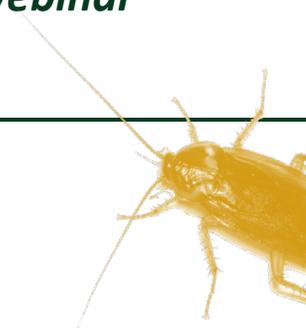




## **Asthma Self-Management Education:**

Recognizing Pests and Making  
Recommendations During Home Visits

*ASME Implementors Training Webinar  
April 28, 2023*



Hillary Peterson, Ph.D.

Maine Department of Agriculture,  
Conservation and Forestry

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[www.maine.gov/ipm](http://www.maine.gov/ipm)



## Today we will cover:

- Integrated Pest Management (IPM) & AS-ME
- Common pests triggering asthma
  - How to identify them
  - Biology & research
- Other pests and how they can indicate asthma-related triggering issues in homes
- Where to find good resources
- How to do a quick inspection for potential problems in a home
- Some solutions that residents can use
- Communication with residents



# What is integrated pest management? *Research based...*



## Identification & Action Thresholds

- Proper identification of pest
- Understanding the system where the pest exists

## Prevention, Cultural & Mechanical Control

- Prevent and control through physical means
- Set your location up for success

## Monitoring & Recordkeeping

- Scout in a tracked and systematic way
- Make it useful for the future!

## Action Thresholds

- What is the population level?
- What methods are needed at this level?

## Biological and Pesticide Control

- Dynamic and flexible as methods change

**IPM is the standard and many institutions are involved**



**MAINE DEPARTMENT OF AGRICULTURE CONSERVATION & FORESTRY**



**THE UNIVERSITY OF MAINE**  
Cooperative Extension

## Structural IPM & Healthy Homes



**Recognize Pests & Ensure Proper ID**



**Preventing Entry Into Structures**



**Removing Attractive Food & Conditions**



**Monitoring for Evidence**



**Using Baits & Traps**



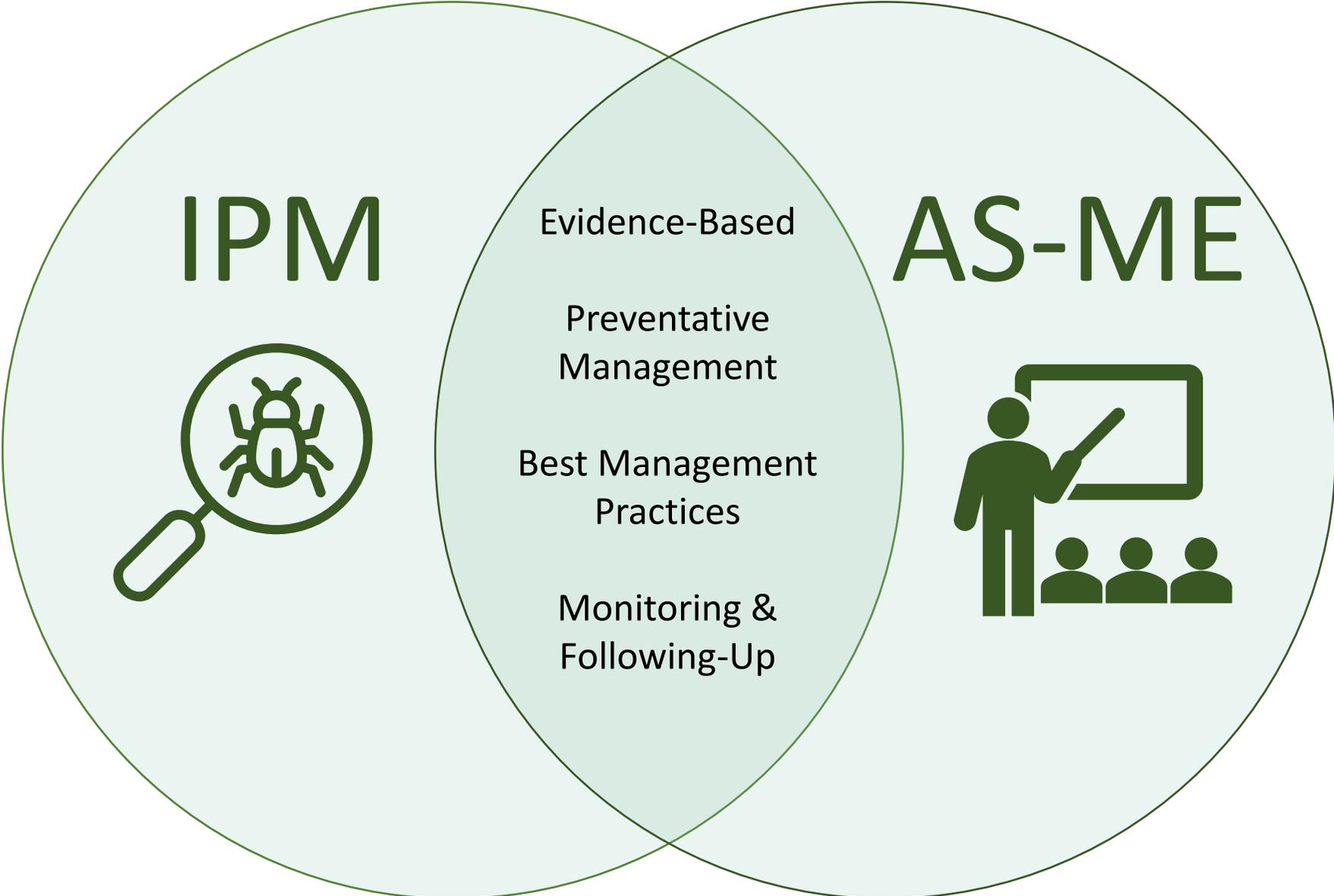
**Hiring a Licensed Pest Management Specialist Familiar With IPM**



## Integrated Pest Management

A system that combines several methods to prevent and mitigate pest related problems in an **integrated** and **biologically** based manner.

# Asthma Self-Management Education & IPM



# Common Pest Allergens & Asthma Triggers in Homes

## Biggest Concerns



Cockroaches



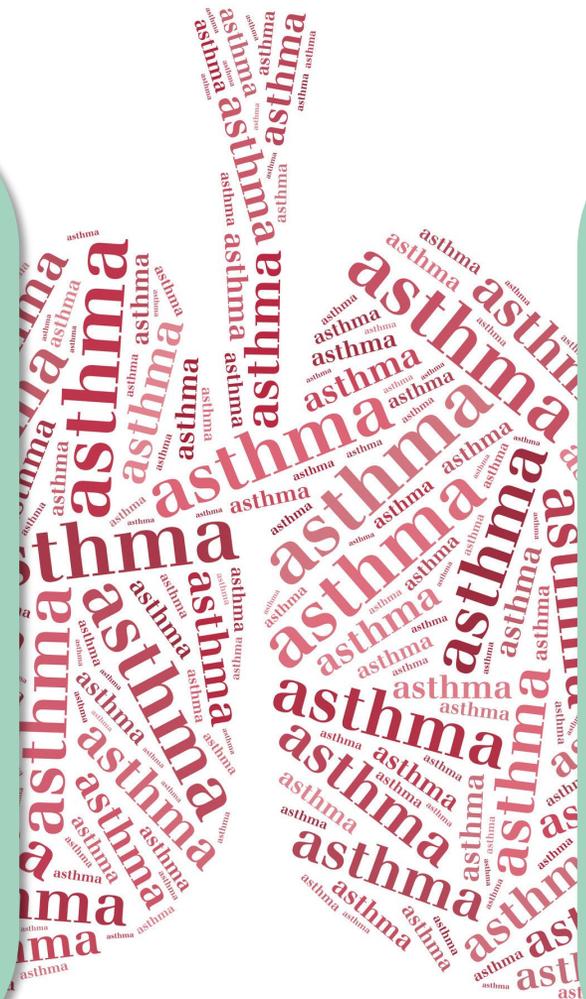
Dust Mites



Rodents



Mold



## Other Possible Culprits



Bed Bugs



Stinging Insects

# Cockroaches & Asthma

## Cockroaches in Maine

- Color – reddish brown, dark brown, tan, black
- German cockroach – most likely to infest homes
- Adults live an average of 20 weeks
- 6 weeks from egg to egg
- One female can generate 35,000 offspring



## Cockroaches & Asthma

- Asthma attacks are triggered if person is allergic to proteins in **cockroach body parts, saliva, and waste**
- Increased exposure to cockroach allergens increases the chances of an allergy developing, even in prenatal cases ([source](#)).



# German Cockroach Life Stages



Adults

Egg Capsule

Nymphs

**N** University of Nebraska  
Department of Entomology

# Home Pests Sometimes Confused with Cockroaches



Flour Beetles



Grain Beetles



Lesser Mealworm



Boxelder Bug



Earwig

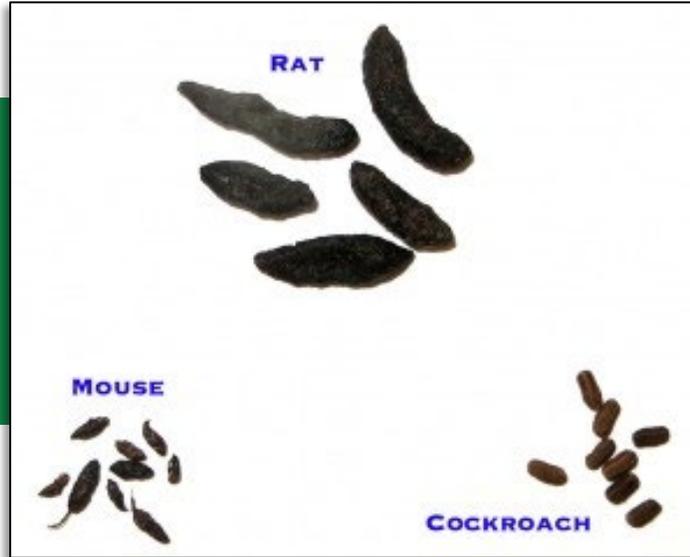


Seed Bugs

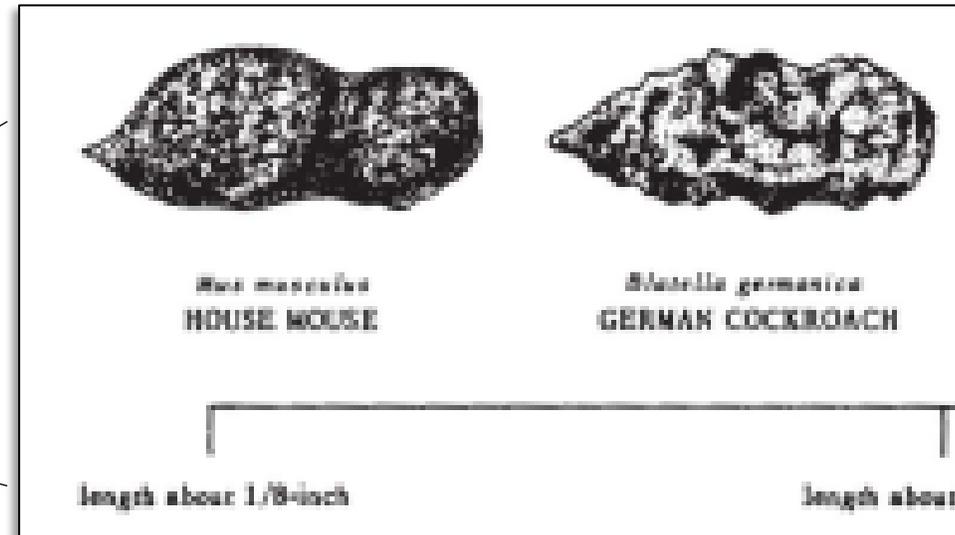
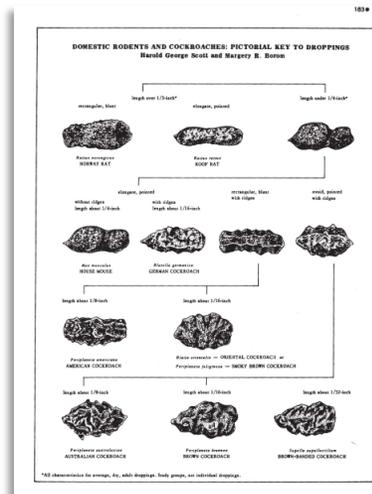
# Rodents & Cockroaches – Poop Can be Confusing!

It is possible to confuse mouse and cockroach droppings!

Cockroach droppings have ridges.

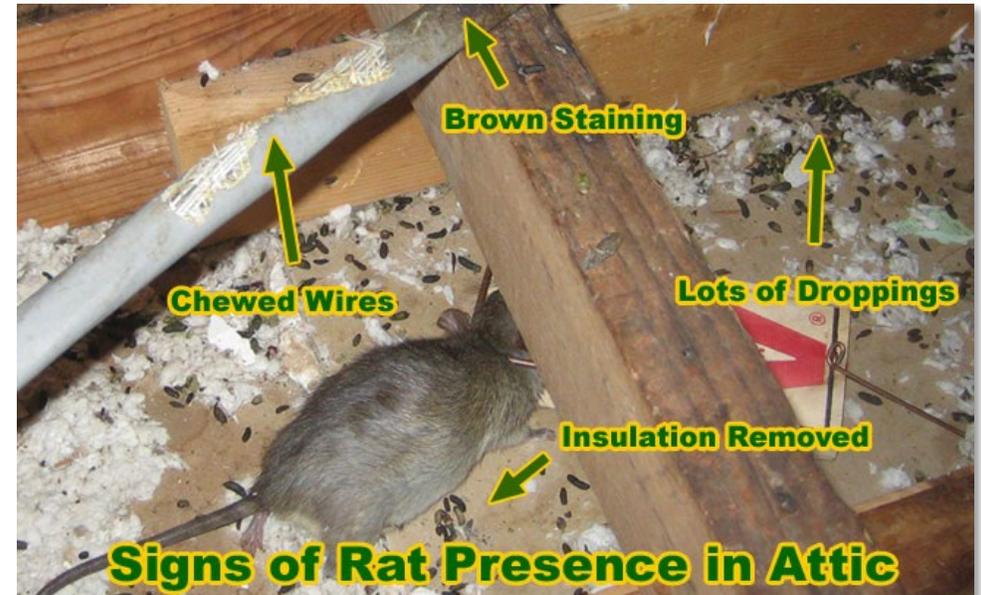


There's a key for that!



# Rodents & Asthma

- Rodent allergens are likely from rodent saliva, urine, or skin.
- Allergens can remain in homes even after the rodents have been removed
- **Increased exposure to rodent allergens increases the chances of an allergy developing, [even in prenatal cases](#).**
  - A [study](#) from inner-city Baltimore showed children with mouse allergy and high levels of home mouse allergen exposure were more likely to have unscheduled physician visits, emergency department visits, and hospitalizations.
  - Same found in another study on [exposure to rats](#).



# Rodents in Maine: Mice & Rats Biggest Issue in Homes

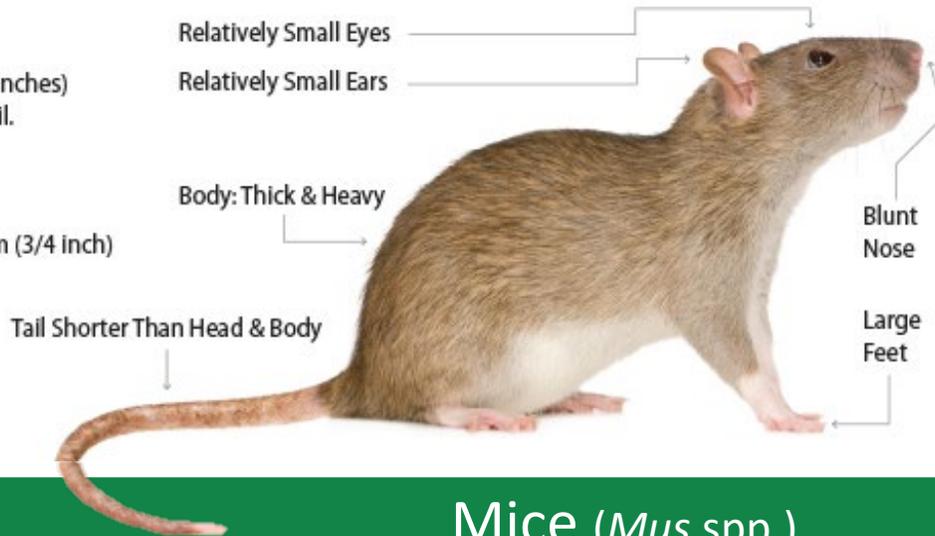
## Norway Rat / Brown Rat (*Rattus norvegicus*)

### Norway Rat

Size: 30-45 cm (12-18 inches)  
from nose to end of tail.

#### DROPPINGS:

Long, Rounded Ends  
Avg. Length: 15-20 mm (3/4 inch)



### Types of Damage:

- Large gnaw marks (1/8<sup>th</sup> in.)

### Location:

- Tunnels in soil disguised, 3-inch diameter

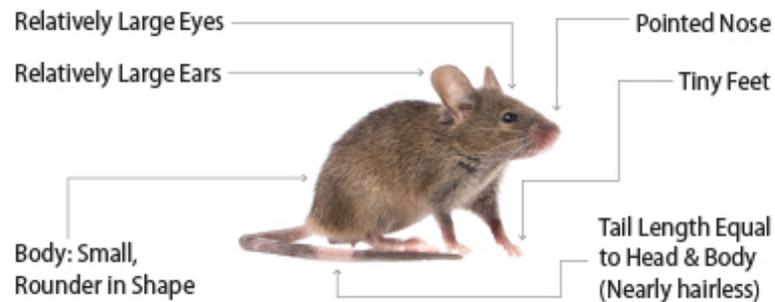
## Mice (*Mus* spp.)

### House Mouse

Size: 15-17 cm (6-7 inches)  
from nose to end of tail.

#### DROPPINGS:

Small with Pointed Ends  
Avg. Length: 4-7 mm (1/4 inch)



### Types of Damage:

- Small gnaw marks
- Insulation, wiring, baseboards

### Location:

- Squeeze easily behind walls

Mice



Norway Rats



Voles



New England Cottontail



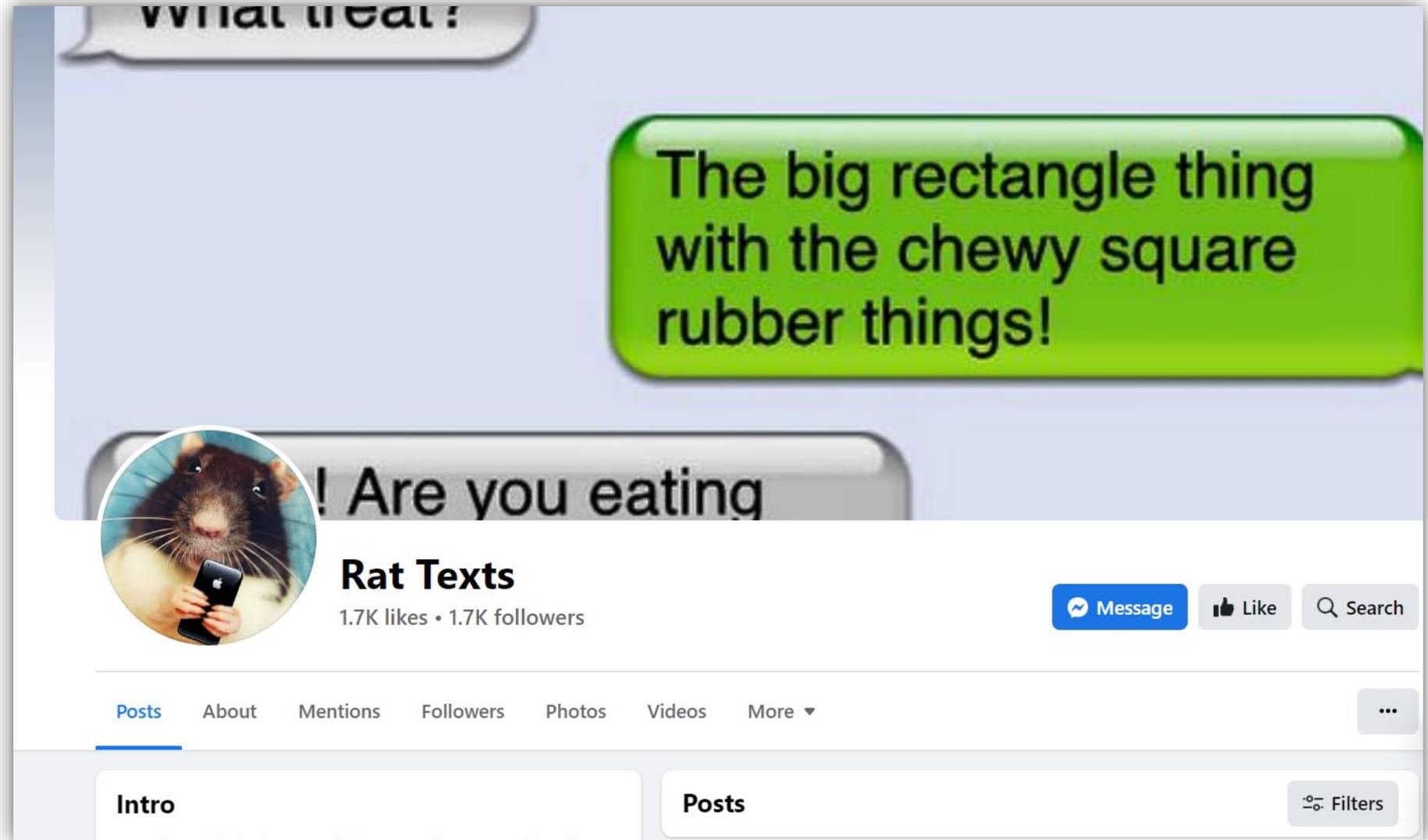
Groundhogs



Sources: [Purdue Orchard Factsheet](#); [UVM Factsheet](#); [Purdue Poultry Factsheet](#); [Mouse](#); [Rat](#); [Vole](#); [Rabbit](#); [Groundhog](#); [Structure Damage](#); [Wire Damage](#); [Cattle](#); [Poultry](#); [Potatoes](#); [Blueberry](#); [Apples](#); [Corn](#)

# Rodents are not always considered a pest!

A reminder that rodents also are often pets and this should be looked for during inspections.



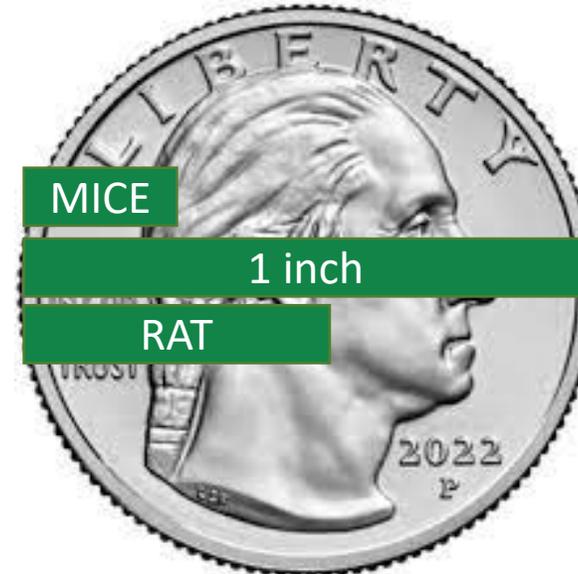
# Prevention & Cultural Control: Rodent Behavior

- Most rodents have a “home range” – 80% time spent in one location
- Rats are **powerhouses**
  - Intelligent and wary
  - Can tread water for three days straight
  - Can jump vertically 3 feet and survive a 50-foot drop
- Rodents will go through if they cannot go around
  - Can gnaw lead sheathing, cinder-block, aluminum siding, glass



Rats are intelligent

Rodents can *squeeze*:



MICE

1 inch

RAT

ELIMINATE entry points

## IPM Concepts



Identification

Prevention & Cultural Control



Monitoring & Record Keeping

Action Thresholds

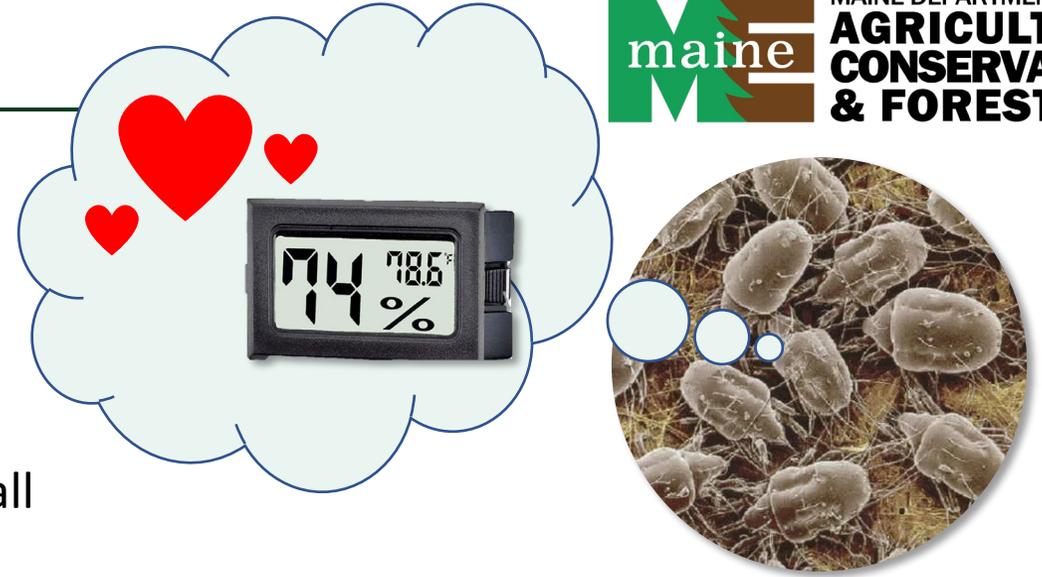


Biological & Chemical Control

# Dust Mites & Asthma

## Dust Mites

- Microscopic cousins of spiders and ticks (arachnids)
- Prefer humidity levels of 70-80%
- Feed on the tiny flakes of human skin we all shed that fall into furniture, carpets, and stuffed toys.



## Dust Mites & Asthma

- Asthma attacks are triggered if person is **allergic to body parts or waste from dust mites**



# Mold & Asthma (yep, mold is a “pest”!)

- Mold is fungus – spores float in the air
- **Some** species of mold can trigger allergy symptoms including:
  - Alternaria
  - Aspergillus
  - Cladosporium
  - Penicillium
- Inhaling spores can trigger asthma as both an **irritant and an allergen**
- Homes with dampness, roof leaks, unclean roof gutters, and high indoor humidity are more likely to have mold issues



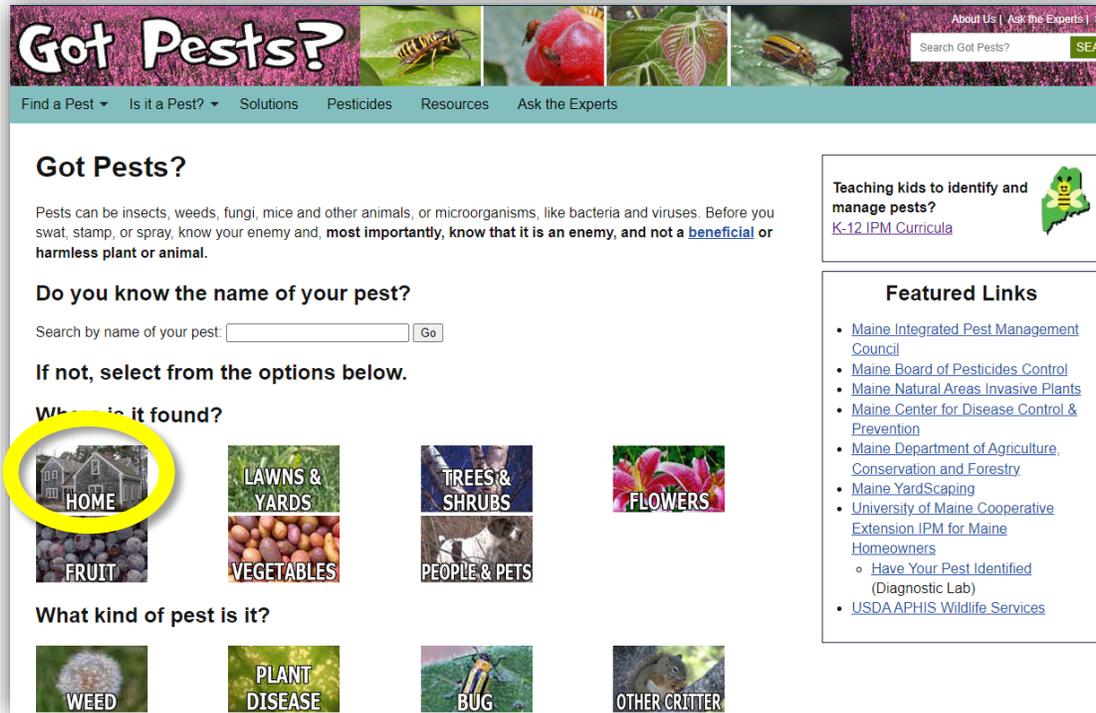
# Other Potential Asthma Trigger & Associated Pests

Improperly Stored Food or Available Crumbs	Accumulated dust in cracks or crevices	Unclean & dusty stored fabrics	Openings in home needing to be repaired (openings, screen rips, etc.)	Areas with moisture in the home (bathrooms, dripping pipes, etc.)	Overwatered house plants (which can contribute to symptoms)	Presence of a dead rodent or bird nest in the home	Harborage outside close to the home (overgrown plants, wood piles, mulch)
<ul style="list-style-type: none"> <li>• Carpet beetles</li> <li>• Ants</li> <li>• Silverfish</li> </ul>	<ul style="list-style-type: none"> <li>• Carpet beetles</li> <li>• Silverfish</li> </ul>	<ul style="list-style-type: none"> <li>• Carpet beetles</li> </ul>	<ul style="list-style-type: none"> <li>• Ants</li> <li>• Boxelder bugs</li> <li>• Stink bugs</li> <li>• Squash bugs</li> <li>• Cluster flies</li> <li>• Earwigs</li> <li>• Silverfish</li> <li>• Spiders</li> </ul>	<ul style="list-style-type: none"> <li>• Fruit flies</li> <li>• Drain flies</li> <li>• Powder post beetles</li> <li>• Round-headed borers</li> <li>• Ladybugs &amp; Asian Lady Beetles</li> <li>• Silverfish</li> <li>• Spiders</li> </ul>	<ul style="list-style-type: none"> <li>• Fungus gnats</li> </ul>	<ul style="list-style-type: none"> <li>• Larder beetle</li> </ul>	<ul style="list-style-type: none"> <li>• Millipedes</li> <li>• Spiders</li> <li>• Ants</li> </ul>



**General recommendation:** If you see several insects indoors, it likely indicates an issue that could allow asthma triggering pests and problems to be present as well. Investigate the source and eliminate. Do not panic and needlessly use pesticides!

# Common Other Home Pests & What they Indicate



**Got Pests?**

Find a Pest ▾ Is it a Pest? ▾ Solutions Pesticides Resources Ask the Experts

Search Got Pests?

**Got Pests?**

Pests can be insects, weeds, fungi, mice and other animals, or microorganisms, like bacteria and viruses. Before you swat, stamp, or spray, know your enemy and, **most importantly, know that it is an enemy, and not a beneficial or harmless plant or animal.**

**Do you know the name of your pest?**

Search by name of your pest:

**If not, select from the options below.**

**Where is it found?**

**HOME** (circled in yellow)

FRUIT LAWNS & YARDS TREES & SHRUBS FLOWERS

VEGETABLES PEOPLE & PETS

**What kind of pest is it?**

WEED PLANT DISEASE BUG OTHER CRITTER

Teaching kids to identify and manage pests?  
[K-12 IPM Curricula](#)

**Featured Links**

- [Maine Integrated Pest Management Council](#)
- [Maine Board of Pesticides Control](#)
- [Maine Natural Areas Invasive Plants](#)
- [Maine Center for Disease Control & Prevention](#)
- [Maine Department of Agriculture, Conservation and Forestry](#)
- [Maine YardScaping](#)
- [University of Maine Cooperative Extension IPM for Maine Homeowners](#)
  - [Have Your Pest Identified](#) (Diagnostic Lab)
- [USDAAPHIS Wildlife Services](#)

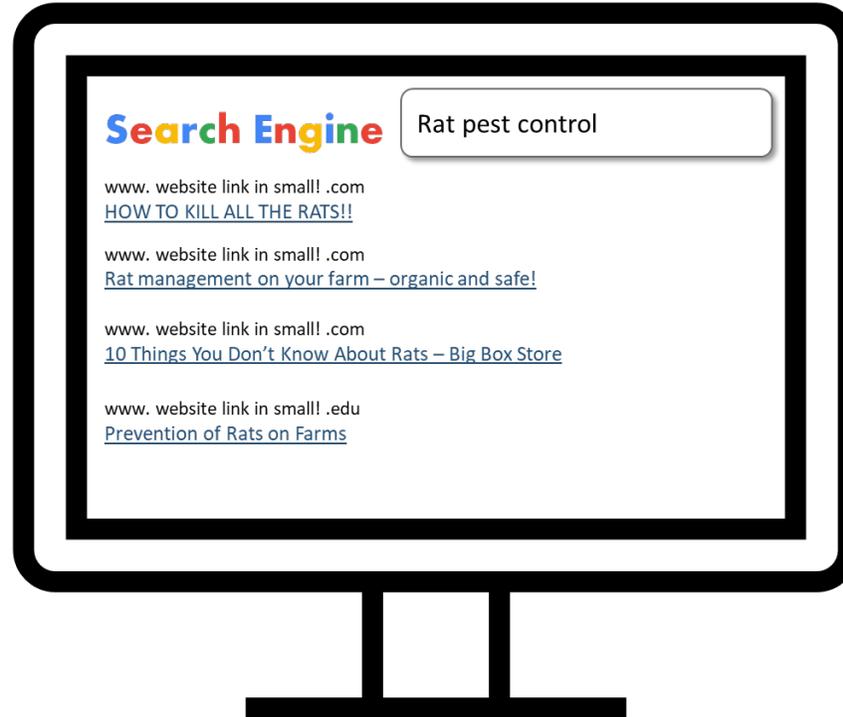
### Common Destructive Bugs

 <a href="#">Carpet Beetles</a>	 <a href="#">Carpenter Ants</a>	 <a href="#">Clothes Moths</a>
 <a href="#">Flour Beetles</a>	 <a href="#">Fruit Flies/Vinegar Flies</a>	 <a href="#">Fungus Gnats</a>
 <a href="#">Grain Beetles</a>	 <a href="#">Indian Meal Moth</a>	 <a href="#">Larder Beetle</a>



**General recommendation:** If you see several insects indoors, it likely indicates an issue that could allow asthma triggering pests and problems to be present as well. Investigate the source and eliminate. Do not panic and needlessly use pesticides!

# If you do venture beyond GotPests for answers...



**General recommendation:** If you see several insects indoors, it likely indicates an issue that could allow asthma triggering pests and problems to be present as well. Investigate the source and eliminate. Do not panic and needlessly use pesticides!

# INTERNET SEARCHES – a tool you need to know how to use



- The first few links are likely to be ads
- Careful trusting information written by those will profit from it (pest control companies, big box stores)
- Just because a website claims to be “natural” or “earth friendly”, information needs to be backed by research (references and citations)

## IPM Concepts



Identification

Prevention &  
Cultural Control



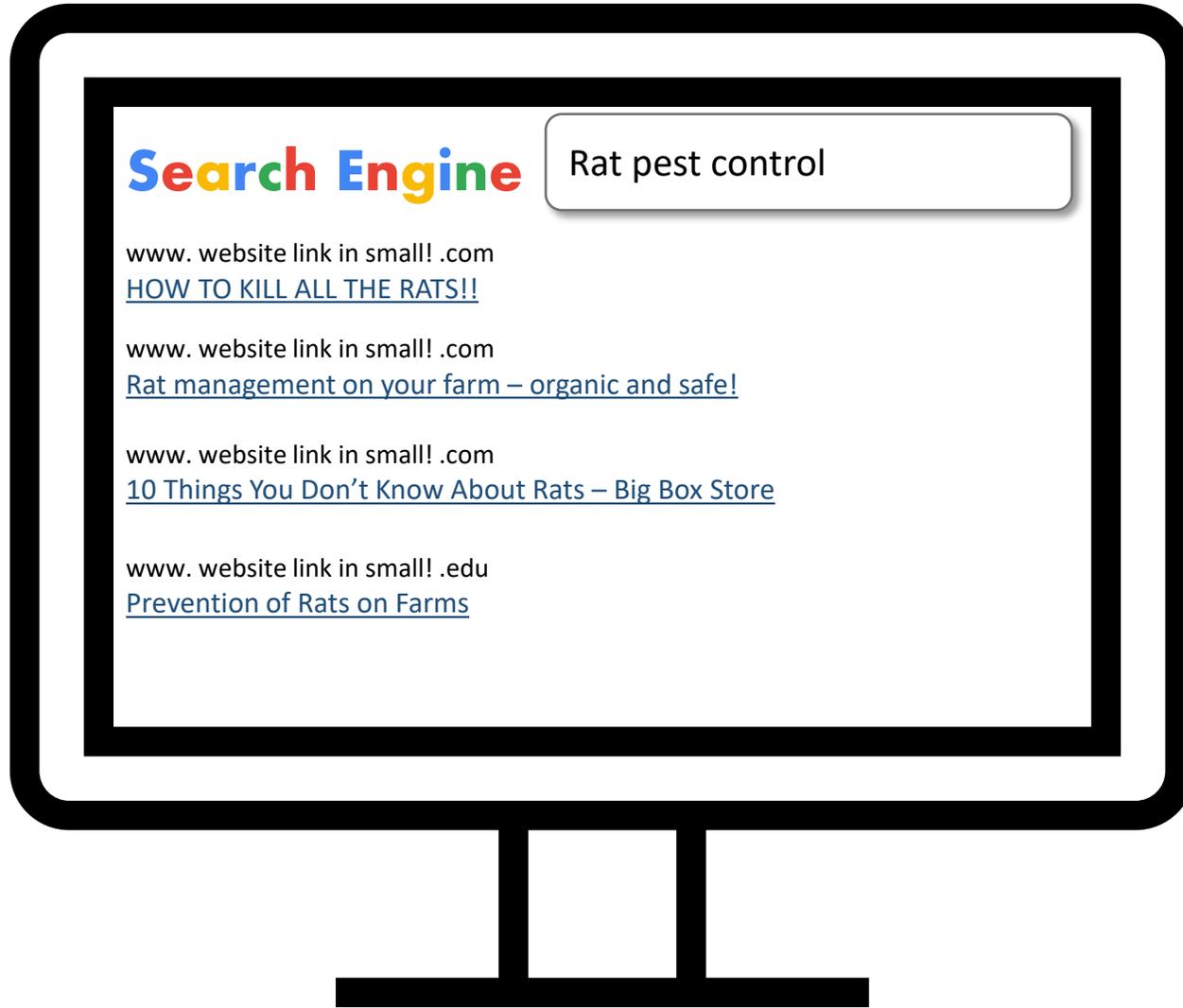
Monitoring &  
Record Keeping

Action  
Thresholds



Biological &  
Chemical Control

# INTERNET SEARCHES – a tool you need to know how to use



- Generally, better resources can be found under **.edu** and **.gov**
- Writing the question in a different way can help (instead of “kill rats”, search for “rat prevention” or “rodent IPM”)

## IPM Concepts



Identification

Prevention & Cultural Control



Monitoring & Record Keeping

Action Thresholds



Biological & Chemical Control

# A brief inspection while multitasking...

**IT ONLY TAKES A MOMENT** *Music and Lyrics by Jerry Herman*  
*from "HELLO, DOLLY!"*  
*(for jazz quintet)*  $\text{♩} = 69$

Arranged by  
Seth Heimsoth

*Heartfelt, molto rubato (conversational)*

B♭ Trumpet *mf*

Alto Saxophone *mf*

Alto Saxophone *f*

Tenor Saxophone *f*

Baritone Saxophone *f*

5  
B♭ Tpt.

A. Sax.

A. Sax.

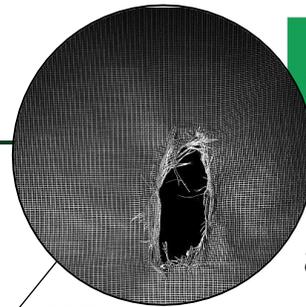
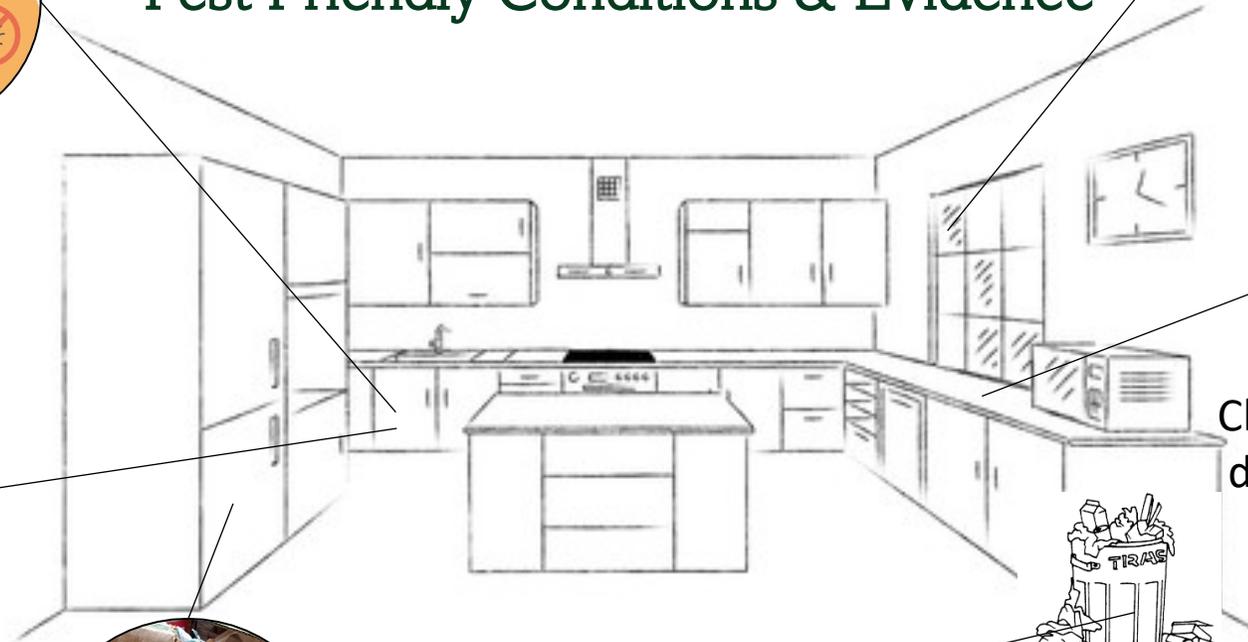
T. Sax.

Bar. Sax.



# What to look for during a brief inspection

## Kitchen & Pantry: Pest Friendly Conditions & Evidence



Cracks and openings around doors, windows, and foundation



Clutter on counters, tables, and floors, dirty dishes, crumbs, uncleaned spills



Pet food & water out overnight



Open or overflowing trash can



Food not stored in airtight containers



Plumbing leaks



Pesticides or cleaning products (VOC triggers) under sink

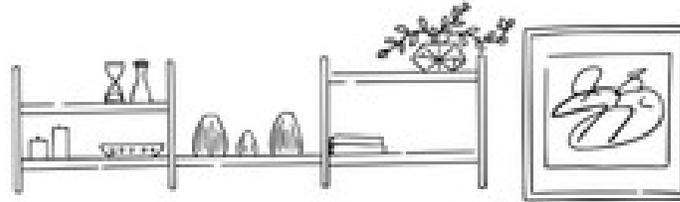
Includes "natural" remedies like essential oils

# What to look for during a brief inspection

## Living Areas (Living room, Bedrooms): Pest Friendly Conditions & Evidence



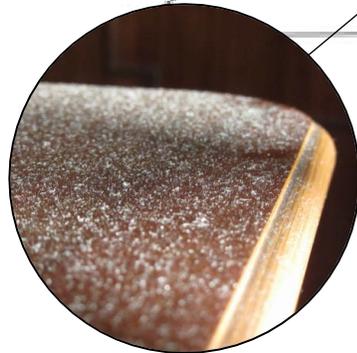
Unwashed stuffed toys



Blankets, couches, and bedding which has not been cleaned or fully dried



Overwatered house plants



Dusty surfaces & unvacuumed carpets

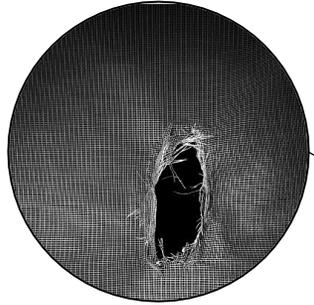


Cockroaches may be transported into homes on items coming from elsewhere. Items that are old and previously used are especially likely to carry the pests.

shutterstock.com · 1690659580

# What to look for during a brief inspection

## Bathrooms: Pest Friendly Conditions & Evidence



Cracks and openings  
around doors, windows,  
and foundation



Mold presence and high  
relative humidity



alamy

Image ID: 2C8GJAD  
www.alamy.com



Plumbing leaks



Presence of drain flies or  
other flies

# What to look for during a brief inspection

## Basement & Storage Areas: Pest Friendly Conditions & Evidence



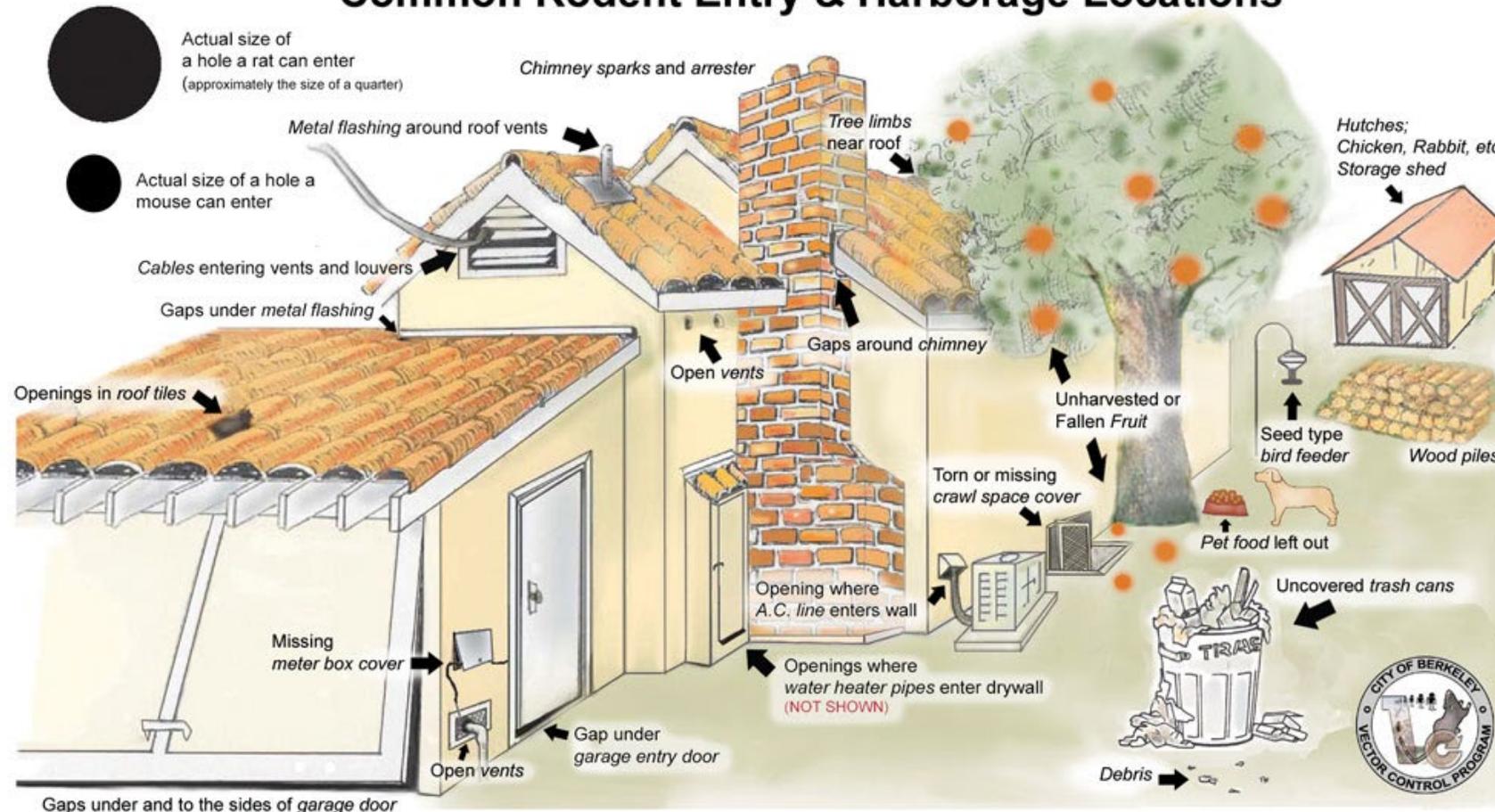
**Cluttered and damp basements**



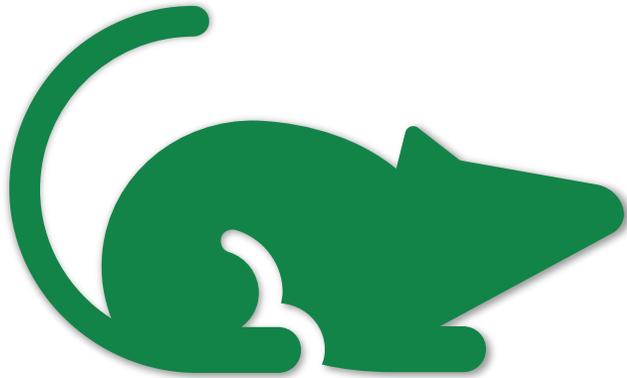
# What to look for during a brief inspection

## Home Exterior: Pest Friendly Conditions & Evidence

### Common Rodent Entry & Harborage Locations



## Monitor For Pest Evidence and Presence



Features of the  
organism



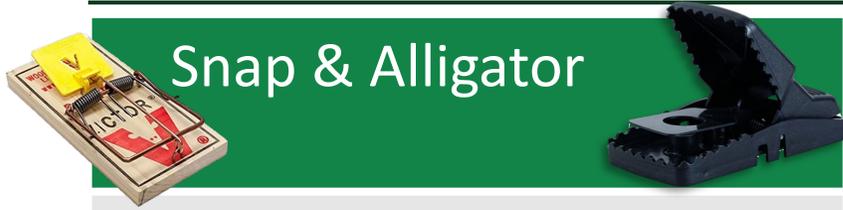
Droppings,  
Tunnels, Gnawings  
and Trails



Damage,  
Chewed Wires,  
etc.



# Rodent Trap-Types



## Snap & Alligator

### Pros:

Simple, inexpensive, effective

### Cons:

Ineffective alone in a large infestation; gruesome

### Styles:

- Wooden snap trap
- Plastic snap trap
- Plastic enclosed snap trap
- Plastic alligator trap

## Multiple-Capture



### Pros:

Catch several rodents, do not require bait

### Cons:

More expensive, live rodents to dispose of, monitor frequently

### Styles:

- Curiosity traps
- Winding or trap door
- Electronic instant kill

## Glue Boards



### Pros:

No snapping mechanism, inexpensive

### Cons:

Inhumane, off target capture, lose effectiveness if dirty

### Styles

- Different sizes
- Baited or unbaited
- Covered or open

**This does not constitute an endorsement or a recommendation by the State of Maine or the Board of Pesticides Control to use this product. Any products without an EPA registration number have not been reviewed or registered by the EPA. The label must be strictly followed.**

# Prevention & Cultural Control: Tips for Effective Trapping

## Set traps:

- Close to walls
- Behind objects
- Dark corners
- Warm spots (near motor, etc.)

## Bait traps with:

- Nesting materials (secured with floss)
- The food they are eating
- DO NOT over bait!

[Excellent video by Dr. Matt Frye](#)



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# Prevention & Cultural Control: Tips for Effective Trapping

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## *For rats:*

- Leave traps baited (“pre-bait”) but unset until bait taken at least once
- Space 10-15 feet apart
- SMART rats may need traps hidden (cover with sawdust, pet rodent bedding, etc.)

## *For mice:*

- Space snap traps 6-8ft apart



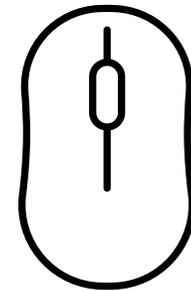
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# Prevention & Cultural Control: Cleaning Up

## HOW TO: CLEAN UP MOUSE URINE AND DROPPINGS



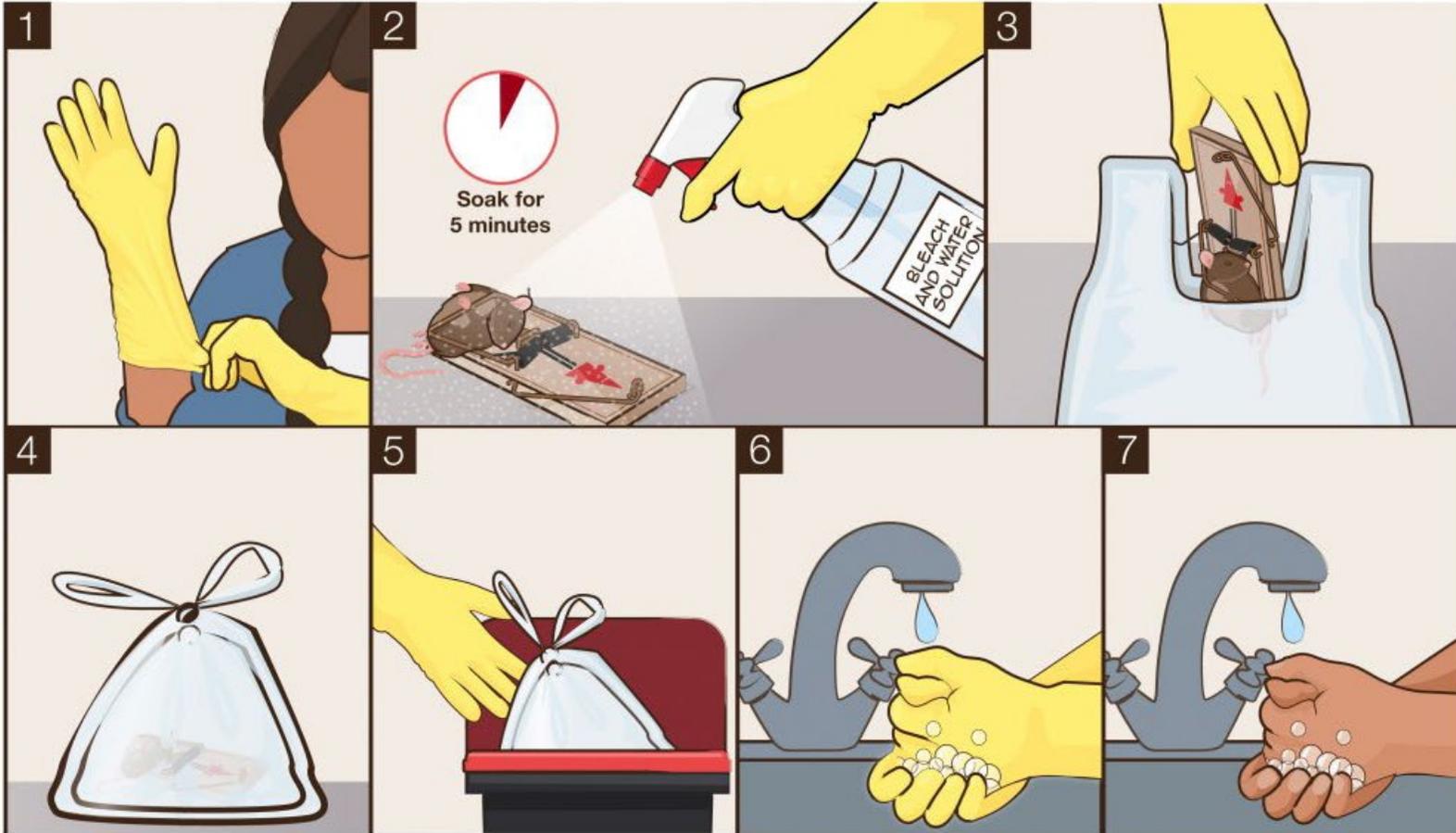
[Further details here!](#)



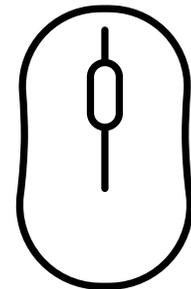
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# Prevention & Cultural Control: Cleaning Up

HOW TO: CLEAN UP A DEAD MOUSE IN A SNAP TRAP OR NEST



[Further details here!](#)



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# Steps Residents (or Landlords) Can Take



## Seek Professional Help if Infestation is Large

Communicate with pest management professional about IPM and preventative maintenance suggestions



<http://thinkfirstspraylast.org/>

# Communication with Residents

Please be calm and kind about pest infestations if found

- Remain calm about pest issues
- Listen to their concerns and perspective
- Explain the situation
- Offer solutions and provide pros and cons
- Be understanding
- Avoid judgement
- Be respectful
- Focus on some positive aspects of their living situation

