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## Get Rodents Out of Your Place

There are many species of rodents, including ground squirrels, rock squirrels, chipmunks, muskrats, beavers, prairie dogs, gophers, packrats, roof rats and a variety of different mice. But do you know that rats and mice are considered the most successful mammals on Earth? In natural environments native rodents play an important role in the health of the environment, and are a major source of food for many predators and scavengers, including hawks, fox, bobcats, coyotes, snakes and even wolves.

However, some rodents become pests when they infest buildings, threaten public health, and destroy property. The house mouse is one of the most troublesome and economically important rodents in the United States. They feed on and damage food, as well as contaminate food with droppings and urine. They cause structural damage to buildings by building nests and gnawing; they chew on furniture and electrical wires. In addition, house mice can spread disease transmitting pathogens or parasites to humans and pets, including the bacterium *Salmonella* causing salmonellosis (food poisoning), ringworm, mites, tapeworm and ticks. They generate allergens, which are asthma triggers and should not be tolerated inside homes and schools.



The house mouse breeds rapidly and consumes a variety of food. Photo: Milos Andera (Stock et al. 2013).

### Exclude mice from buildings

To reduce the threat of rodent-borne diseases, allergens, and other health threats, prevent mice from becoming established inside buildings by finding and sealing up potential access points.

1. Seal gaps of 1/4-inch or more with silicone or polyurethane sealant products that stretch, because gaps and cracks in buildings expand and contract due to temperature changes and other factors. Steel wool, or foam fillers alone are not recommended for larger holes and cracks beyond serving as a temporary fix. They should be filled with good quality concrete, or stuffed with Xcluder cloth or Stuf-fit copper mesh, then sealed.
2. Seal around water, gas, electric, and other pipes and conduits going through walls.
3. Make all external doors mouse-proof using the high-quality, brush-type (e.g. Sealeze) or baffle (e.g. Xcluder) style door sweeps that seal the gap between the threshold and the door base.

4. Maintain and repair all ventilation screens, louvers used in attic spaces, and furnace closets. All gaps around the frames of screens and louvers should also be kept tightly sealed.
5. Mouse-proof the crawl space skirt around portable classrooms. To prevent moisture damage, mold, mildew, and dry rot, the crawl space skirt should not touch the ground. Dig a 6-inch trench below the skirt, attach 1/4-inch hardware cloth to the bottom of the skirt so that it goes to the bottom of the trench, then fill in the trench with dirt or crushed rock. This will also help deny entry to other mammal pests, such as rats, raccoons, feral cats, and skunks.
6. Ensure that the above pest-proofing practices are an integral part of the planning and contracting process for building construction or renovation.

### **Do not attract mice**

1. Do not allow trash to accumulate along exterior walls, as this will attract mice. Remove old boards and junk cars. Discourage contractors or workers from throwing food or food containers into crawl spaces and wall voids during construction or renovation of buildings.
2. Do not place trash receptacles close to exterior doorways.
3. Keep dumpsters clean, with lids closed (especially at night). Keep garbage in tightly covered cans. Drainage holes can be screened.
4. Clean up food scraps and store foods appropriately to prevent easy access to food. All pet foods, bird seed and human food should be stored off the floor and in airtight containers. Adult mice can chew through zip-lock bags.
5. Clear tall weeds close to buildings since weeds and seeds serve as food and shelter for mice during warm weather. Mice like to hide in such places.
6. Do not pile wood against buildings. Store wood and other materials at least one foot off the ground and away from buildings.

### **Do not harbor mice**

Reduce cluttered storage areas and classrooms. It is best to use transparent plastic totes for storage. If cardboard boxes have not been opened in 2 years, the box and contents may be contaminated with mouse urine and feces and should be recycled or discarded.

### **Eliminate mice with snap traps**

Use traps, not poison baits, inside schools or homes. If young children or pets are around consider placing traps inside locked box stations to avoid accidents. Snap trapping results in the fast elimination of mice, but trapping is useless in a cluttered environment. You have to de-clutter if you want to de-mouse. Mice typically do not venture more than 30 feet from their nest (unless food is sparse).

Traps are very effective control devices for mice. They take advantage of their curiosity. Mice will be trapped easily the first night, but they can become trap-shy. On the first night, set six traps in areas of mouse activity (droppings found), positioning each trap 3 feet apart or closer. Remove the traps in the morning before students arrive at school or kids emerge from

bedrooms at home. Set the traps again a week later in slightly different locations. This technique will help overcome trap-shyness. Handle dead mice and their fecal pellets with caution (see guidance in later sections).

Plastic snap traps (e.g., the Kness Snap-E, J.T. Eaton JAWZ, Bell Trapper Mini Rex, Woodstream Quick Kill, etc.) are more durable and can be cleaned with disinfectants more easily than the disposable traps. The disposable wooden-based traps are an option when all the traps will be collected and disposed of completely.

Traps can be baited with small smudges of chocolate syrup or a few drops of vanilla, orange, or any other extract oils. Despite common myths, there is no one “favorite” bait for mice. Mice are opportunists and will sample most foods they bump into. They forage for nesting materials as well as food, so cotton balls, dental floss, and string may also be used as bait. We don’t recommend peanut butter or anything with nuts in due to possibility of children with tree nut allergies being present. Mice mainly travel along walls to floor junctures, so place traps up against walls with the snap end facing the wall.

### **Use poison-free bait (e.g. Detex Blox) to monitor building exteriors and storage sheds**

Detex Blox contains no poison and is often used by professionals to monitor for mouse activity. Detex Blox is safe and made from 16 human food-grade ingredients, making it ideal for monitoring rat and mouse activity without concern of harming children, pets, or other non-target animals.

The use of poison baits (rodenticides) in schools is a complicated issue, and is best left in the hands of the professionals. As humans are mammals there may be more significant risks and/or liability involved.

**Rodenticides around children – only with the greatest of care, when absolutely necessary, and when all else fails!**

### **Understanding baits**

Baits are designed to be attractive food resources and may include fish oil, molasses or peanut butter that may be highly attractive to children, non-targets and pets. They may be non-toxic (used to monitor rodent activity) or they may contain a toxin that proves deadly to the rodent when a sufficient amount is consumed. **There have been significant changes in rodenticide regulations to reduce rodenticide hazards to wildlife, pets and children.** Manufacturers are



Set out several traps about 3 feet apart or closer, then remove them and set them up a week later in a new location.



Traps can be baited with a variety of foods. There is no one “favorite” bait for mice. Place traps against walls with the snap end facing the wall.

now required to produce over-the-counter products that are sold as ready-to-use, disposable bait stations. Agricultural producers and professional pest management professionals have access to a wider array of rodenticide options, including restricted use pesticides in a variety of forms.



### Anticoagulant rodenticides

Anticoagulants cause blood-thinning in almost all warm-blooded animals. These products stop the normal blood clotting process. They are a relatively humane toxicant that causes little in the way of pain and suffering. The rodenticides are slow acting and animals may continue to be active for up to a week before dying. The animal dies of internal bleeding. Until recently there were two types of anticoagulants available: the first-generation type required multiple doses to cause the death of the animal and a second-generation type that may be fatal after only one feeding. Additionally, second generation anticoagulants are not easily excreted from the body, and they can be stored in the liver. Due to the higher relative risk, the second-generation anticoagulants are no longer allowed for sale to the general public. Consumers are now able to purchase only prepackaged, ready-to-use bait stations containing the first-generation anticoagulants (e.g. warfarin, chlorophacinone, or diphacinone) or non-anticoagulants (e.g. bromethalin or cholecalciferol).

### Other rodenticides

There are several non-anticoagulant toxicants used in rodenticides. In general they pose higher relative risks to non-target organisms and are less suitable for use around children (some are prohibited on school grounds).

There are restrictions on zinc phosphide, aluminum phosphide and magnesium phosphide based products. Depending where you live they may NOT be permitted for use on school grounds (there may be an allowance for athletic fields under some circumstances). Following ingestion, zinc phosphide reacts with the gastric acid in the stomach. The result is phosphine gas that causes damage to the small blood vessels, red blood cells, and blood vessels in the kidneys, liver, and lungs. Sadly, **multiple child fatalities have occurred due to accidents and misuse.**

**Rodenticides have historically ranked second in the number of human exposures to pesticides each year compared with the three other major categories of pesticides (American Association of Poison Control Centers).**

*Product names mentioned are registered trademarks. Any products, services, or organizations that are mentioned, shown, or indirectly implied in this publication do not imply endorsement by The University of Arizona.*

There are many steps and strategies you can take before resorting to rodenticide baits, especially around children. See the following resources for more information.

Read more information about IPM of the house mouse in schools (Stock et al. 2013):  
<http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/38106/em9062.pdf>

See the videos in this three-part series "IPM for Mice – Exclusion, Sanitation, Trapping":  
<http://www.sustainableplaces.org/general-ipm/mouse-control-exclusion>

<http://www.sustainableplaces.org/general-ipm/ipm-for-mice-sanitation>  
<http://www.sustainableplaces.org/general-ipm/ipm-for-mice-trapping>

House mouse: [http://cals.arizona.edu/urbanipm/pest\\_press/2004/dec.pdf](http://cals.arizona.edu/urbanipm/pest_press/2004/dec.pdf)

Mice: [http://cals.arizona.edu/urbanipm/pest\\_press/2004/feb.pdf](http://cals.arizona.edu/urbanipm/pest_press/2004/feb.pdf)

Rodenticides: <http://npic.orst.edu/factsheets/rodenticides.html>

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## Bed Bug Battle – We Want to Hear From You

The University of Arizona and several partnering research institutions are working to battle the bed bug resurgence in the United States. Researchers hope to determine the real impact and social cost of bed bugs, the risks to individuals and society, as well as the significant causes of infestations.

We hope you will complete an online bed bug survey. This voluntary survey should take about ten minutes. The survey is available in English and Spanish. There is no compensation available for your participation. Your answers are anonymous and confidential while you contribute information that will help us battle the pesky parasites.

**Who should take this survey? Everyone!**

English version of Bed Bug survey: <http://www.surveymonkey.com/s/DGLQS52>

Spanish version of Bed Bug survey: <https://es.surveymonkey.com/s/F5NZXJK>

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## Publication Available

**[“Handbook on Pests of Community Environments in the Desert Southwest United States”](#)**  
by Nair S., D.H. Gouge, M. Rust, S. Li, U.K. Schuch, A.J. Fournier, D.M. Kopec, K. Umeda, P.B. Baker, L.M. Brown, N. Duggal. 2015.

This publication was developed through a grant from the Western Region IPM Center, and is available on the Arizona Pest Management Center website at <http://cals.arizona.edu/apmc/Handbook.html>.

It covers all major arthropod, vertebrate and weed pests encountered in community environments in the desert southwestern United States, and will serve as a handy reference guide to support community IPM efforts in this region. The book consolidates available information into a single, reader-friendly unit that can be easily accessed online, or printed as necessary. Management measures for individual organisms are not presented, but IPM steps



to manage most of these organisms in a practical, safe and sustainable manner are listed, as well as sources that provide information on specific management measures for individual pests.

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## Upcoming Webinars and Events

Attend Free Sessions of the [Green Strides Webinar Series](#). View archived webinars [here](#).

November 21, Saturday, 10:00 am to 2:00 pm. The University of Arizona [Maricopa Agricultural Center \(MAC\) Farm Family Field Day](#), 37860 W. Smith-Enke Road, Maricopa, AZ 85138.

*What:* A special open house at the University of Arizona's MAC Farm

*When:* Saturday, November 21, 2015, 10:00 a.m. - 2:00 p.m.

*Where:* At the Maricopa Agricultural Center (MAC Farm), 37860 W. Smith-Enke Road

*Why:* To learn, and have fun learning about what we do related to arid land agriculture

Information below on three University of Minnesota Bed Bug Webinars in December:

**December 1, 2015, 9am (CST): [Bed Bug Updates for Pest Management Professionals](#)**

Topics will include: Best Management Practices, Customer Service, Protecting the Company

**December 3, 2015, 9am (CST): [Understanding Bed Bug Control for Social Service Professionals](#)**

Basic bed bug control information particularly relevant to social service workers who do home visiting. Topics will include: Protecting Yourself, Educating Your Clients, Resources Available Through the University of Minnesota

**December 10, 2015, 9am (CST): [Four Steps to Bed Bug-Free Premises for Landlords](#)**

Topics will include: Encouraging Tenants to Report Infestations Promptly, Helping Tenants Prevent Bed Bug Entry Into Residences, Successful Control Procedures – a Partnership between Tenants and Landlords

For more information and to register visit [www.bedbugs.umn.edu/webinars](http://www.bedbugs.umn.edu/webinars)

**January 4-8, 2016, Arizona: A one-week course [Desert Turf School](#). The University of Arizona Maricopa County Cooperative Extension, 4341 E. Broadway Road, Phoenix, AZ 85040.**

The registration deadline is December 1<sup>st</sup>, so register now. Turf managers of golf courses and sports turf facilities, commercial, residential, and school landscapers are invited to register and attend the weeklong Turf School. Topics will include turfgrass species identification; overseeding and transition; cultural management practices; soil science, fertility, and nutrition; salinity principles and management; irrigation audits and analysis; irrigation “smart” controllers; heat and drought stress; disease, insect, and weed management. Online registration is available or a discounted mail-in registration is an option at <http://turf.arizona.edu>.

For more information about the EPA Schools program, visit:  
<http://www.epa.gov/schools/>

For more information about the Community IPM, visit:  
<http://www.extension.org/pages/23359/urban-integrated-pest-management-community-page>



For more information about School IPM in Arizona, visit:  
<http://cals.arizona.edu/apmc/westernschoolIPM.html>

**Shujuan (Lucy) Li**, Newsletter Editor and Assistant in Extension. Email: [lisj@cals.arizona.edu](mailto:lisj@cals.arizona.edu)

**Dawn H. Gouge**, Public Health IPM Expert. Email: [dhgouge@cals.arizona.edu](mailto:dhgouge@cals.arizona.edu)

**Shaku Nair**, Assistant in Extension. Email: [nairs@email.arizona.edu](mailto:nairs@email.arizona.edu)

**Al Fournier**, IPM Assessment. Email: [fournier@cals.arizona.edu](mailto:fournier@cals.arizona.edu)

**Ursula Schuch**, Environmental Horticulture. Email: [ukschuch@ag.arizona.edu](mailto:ukschuch@ag.arizona.edu)

**Kai Umeda**, Extension Agent, Turf. Email: [kumeda@cals.arizona.edu](mailto:kumeda@cals.arizona.edu); <http://turf.arizona.edu>

**Dave Kopec**, Turf Specialist. Email: [dkopec@ag.arizona.edu](mailto:dkopec@ag.arizona.edu)

**Peter Warren**, Extension Agent, Urban Horticulture. Email: [plwarren@cals.arizona.edu](mailto:plwarren@cals.arizona.edu)

**Michael Wierda**, Assistant in Extension. Email: [mwierda@email.arizona.edu](mailto:mwierda@email.arizona.edu)

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