

The Dangers of Homemade Pest Control Remedies

Instructions for making homemade mixtures to control pests are easy to find online and in social media, and it's tempting to make your own home remedy when pests invade, but did you know that what you are mixing is considered a pesticide? A pesticide is any mixture used to kill, destroy, repel, or mitigate a pest. Common garden pests include insects, spiders, weeds, plant diseases, and rodents.

Pesticide mixtures of household ingredients like dish soap, garlic, and vinegar (Figure 1) may seem innocuous and safer than storebought formulated pesticides, but they can actually pose unrealized risks.

What is the concern with homemade pesticides?

While ingredients in home remedies are items we might eat or use in the kitchen, the mixture of them is not tested for efficacy, health, or safety, so their impacts are unknown. Because of this, homemade pesticides have the potential to harm human health, damage plants, be toxic to pets and wildlife, and pollute the environment.

For example, some online sources describe making a homemade insecticide from the tobacco leaves found in cigarettes and tout it as "natural" or "organic." While cigarettes are readily available for purchase, the resulting concoction (a pesticide) made from



Figure 1. Pesticides made from household ingredients lack the details needed to safely and effectively control pests.

tobacco is extremely concentrated and highly poisonous to humans and pets. There are many additives used in producing products such as cigarettes, soaps, or detergents and these ingredients are not always known to the consumer.

Another concern is the potential hazard created during the mixing and making of home remedies. Even while natural, some ingredients become more toxic during the process of cooking the mixture, which may concentrate the ingredients and increase risks of harmful health side effects due to inhalation of fumes or contact with skin.

No instructions for use

Commercially available pesticides (Figure 2) are required by law to have a label with instructions on use, mixing, storage,

and first aid. Home remedies don't have instructions for specific dilution or use rates, nor do they identify how often mixtures should be applied. Home remedies also contain no guidance about wearing gloves or other protective equipment or how to properly store the mixture.

Homemade mixtures are stored in containers that are either not labelled with what's inside or lack the required label information registered pesticides contain. Each year, poison control centers report poisonings of children and adults from drinking pesticides that have been stored in food or drink containers. Without a label and knowledge of how a mixture can affect people when exposed, first aid information isn't available. To prevent accidental poisoning, pesticides should never be mixed or stored in food or drink containers even if the container is marked.

Are home remedies effective?

Because homemade pesticides vary greatly in their makeup and are not tested through rigorous research studies, there is no data to support whether they consistently control targeted pests. Unlike commercial pesticides that must show their efficacy data before being registered, homemade remedies lack scientific studies to show that they are effective. Applying ineffective or improperly diluted pesticides can make

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Pests of Backyard Poultry

Backyard chickens are increasingly being raised as pets, for egg production, and for youth development and science projects. While raising chickens can be an interesting and economically beneficial activity, chickens and other fowl may also have pest problems. Chickens are natural hosts to a variety of arthropod pests (called ectoparasites), including mites, lice, and fleas which feed on chickens and use chicken coops as habitats. These pests may cause discomfort to birds and decrease their egg production. This article aims to help people who keep chickens understand and learn treatment options for the common ectoparasites that can affect their animals.

Lice

The most common pests found on backyard chickens include several species of lice (singularly called a louse), including the chicken body louse and fluff louse. Lice live full-time on chickens and feed primarily on feather material. Lice are generally chicken-specific but may infest related poultry species (such as turkeys or pheasants). Adult and immature lice are pale yellow in color, and eggs are found in white clusters, usually at the base of feathers. Lice may be found on any or all parts of the chicken, depending on the louse species (Figure 1). Lice can irritate birds, causing increased preening and decreased egg production.

Mites

There are two main species of mite found in backyard chicken flocks: the northern fowl mite (NFM; *Ornithonyssus sylviarum*) and poultry red mite (PRM; *Dermanyssus gallinae*). Both mite species feed on blood. NFM live on chickens in the fluffy feathers of the vent region (Figure 2a). PRM live off the animal in cracks and crevices near the birds, such as on perches (Figure 2b), in nestboxes, or in coops. Mites can bite people but cannot survive or reproduce on human blood and will not infest human bodies.

Learn more about biting mites in homes and other structures at ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=44344.



Figure 1. Chicken body lice and eggs on a chicken.



Figure 2a. Northern fowl mites (NFM) feeding on a chicken.



Figure 2b. Poultry red mites (PRM) on a perch in a chicken coop.



Figure 3. A chicken infested with scaly leg mite.



Figure 4. Sticktight fleas on the face of a chicken.

Scaly leg mites (*Knemidocoptes mutans*) may also affect chickens. These mites are microscopic and identification must be confirmed by an expert. However, the signs of a scaly leg mite infestation are obvious and include scabby or crusty legs or feet (Figure 3). Scaly leg mites spread by direct contact between animals, so quarantining infested birds can limit infestations within a flock.

Fleas

The sticktight flea (*Echidnophaga gallinacea*) can also be found on backyard chickens. This flea is not bird specific and is often introduced to flocks by rodents, cats, or other mammals. Adult fleas embed themselves in the skin of chickens while they feed on their blood (Figure 4). Females drop eggs without detaching, and immature fleas develop in the environment, feeding on detritus and adult flea feces. It can take a month or longer for fleas to complete development to the adult stage, resulting in newly emerging adults even after treatment of birds.

Management

Lice, mites, and fleas also parasitize wild birds and rodents and could be introduced to flocks by wild animals or even by contaminated equipment or people. To reduce pests in backyard flocks, focus on good biosecurity, which includes all practices that help to prevent or reduce disease in your flock. New chickens should be quarantined for at least two weeks to avoid introducing parasites (or other diseases) to the flock, washing hands and boots should occur before visiting the flock, and chickens should be separated from other animals. Birds should also be examined for signs of pests regularly to catch infestations early, which are easier to deal with than a large outbreak.

Insects and mites are very susceptible to water loss, so using natural materials that cause desiccation can be highly effective for general control. One such compound is diatomaceous earth (DE). Food-grade DE can be mixed with clean

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play sand in containers to create dust-bathing areas for birds. Dustbathing is a natural behavior chickens perform to keep their feathers clean. The addition of DE helps to suppress pest populations.

Insecticides can be an effective tool for pest control. Farm stores often sell sprays or dusts that can be applied directly to birds or to coops for insect control. It is important to always read and follow the label instructions to

avoid poisoning birds, people, or other animals. Pests that live in the environment, such as poultry red mites and sticktight fleas, are trickier to control since they may not be visible on chickens.

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www.researchgate.net/publication/290211878_Diversity_and_Prevalence_of_Ectoparasites_on_Backyard_Chicken_Flocks_in_California
Veterinary Entomology website with pest resources for professionals and the general public www.veterinaryentomology.org/poultry
For more backyard poultry resources, check out: ucanr.edu/sites/poultry/Resources_335/Production/type/backyard/

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pest problems worse. Not using enough of the homemade pesticide won't control the pest while using too much could be harmful to the plant, kill the pest's natural enemies, or could contaminate waterways. A homemade pesticide sprayed in the garden may kill the "good bugs" as well as the targeted pest insects. Many commercial pesticides are formulated to work only on specific pests or groups of pests.

Many home remedies specify using dish soap mixed with other ingredients to kill insects, plant diseases, or weeds. Dish

soap, which is a powerful detergent, can injure desirable plants by stripping the waxy layer off the leaves. Commercially available insecticidal, fungicidal, and herbicidal soaps, which are registered pesticides, are highly effective against the targeted pest and will not damage plants when used correctly. These products cannot be made at home with common household ingredients.

Are home remedies legal?

The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) covers the use of homemade pesticides. According to FIFRA, in order to legally apply a material as a pesticide it must be either registered with the Environmental Protection Agency (EPA) or be exempt from registration. There is a list of active ingredients (the part of a pesticide that affects the pest) that can be used in pesticide products without requiring registration; these are called minimum risk or 25(b) products). The active ingredient list allows the use of single chemicals, like sodium lauryl sulfate (found in soap), as

unregistered pesticides, but does not include commercial products like dish soap that may contain other ingredients, such as viscosity modifiers, preservatives, and pH adjusters.

Alternatives to pesticides

Many pests in the home and garden can be managed without pesticides. In a garden, grow plants suited to the environment and keep them healthy with proper irrigation and fertilization. Weeds can be controlled by hand-pulling and mulching. For more information, see the UC IPM Home and Garden pages at ipm.ucanr.edu/PMG/menu.homegarden.html.

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Figure 2. Commercially available pesticides made from botanical extracts.

WHAT IS IPM? Integrated Pest Management (IPM) programs focus on long-term prevention of pests or their damage through a combination of techniques including resistant plant varieties, biological control, physical or mechanical control, and modification of gardening and home maintenance practices to reduce conditions favorable for pests. Pesticides are part of IPM programs but are used only when needed. Products are selected and applied in a manner that minimizes risks to human health, beneficial and nontarget organisms, and the environment.

Further Rodenticide Restrictions

Rodenticide products containing the active ingredients brodifacoum, bromadiolone, difenacoum, or difethialone (known as second-generation anticoagulant rodenticides or SGARs) are restricted materials and have been unavailable for the general public in California since 2014. These materials were only available for use by licensed pest control applicators, but a law enacted in 2020 restricts their use even further, banning almost all uses in non-agricultural settings.

The new restrictions are intended to reduce potential poisoning of nontarget wildlife (Figure 1). Scientific research and state studies have found rodenticides in over 75 percent of animals tested including mountain lions, bobcats, Pacific fishers, and northern spotted owls.

What are other options for rodent control in urban settings?

A successful rodent control strategy includes prevention through sanitation measures including landscape maintenance, physical exclusion methods, and a combination of effective population control methods like snap trapping.



C. SWEET, USEFWS

Figure 1. Rodents are kit foxes' primary food item, which makes the foxes vulnerable to rodenticide poisoning.

Good sanitation in and around buildings is crucial to controlling rodents. Landscaped shrubs, trees, and untrimmed palm trees can provide harborage for rats and mice to live in so make sure the landscape is well-maintained. Plants should be trimmed up and off the ground and should not be densely planted if rodents are a problem in the area.

Manage rodents by excluding them, or "building them out" of structures. This can be accomplished in part by sealing cracks and openings in building foundations and pipes with steel wool or metal sheeting to prevent rodents from gnawing through.

Snap traps can be useful tools around homes, garages, and other structures. For instance, small populations of house mice can be effectively managed with traps. Be sure to select the correct size trap for the problem rodent. Older designs of rat and mouse traps can be difficult to operate so choose a newer, easy-set design (Figure 2).

When dealing with a rat problem, it is important to be realistic about the number of snap traps that will be required to manage the issue. One or two snap traps will not curb a population. It is important to saturate an area with snap traps. When conducting a trapping program outdoors, always be mindful of nontarget wildlife by trapping only at night or by using trapping stations that can exclude nontarget wildlife.

Persistent and chronic rodent infestations may require the use of rodenticides. Rodenticides that are still available in California include the first-generation anticoagulant rodenticides or



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Figure 2. A newer rodent snap trap design that is easier to set.

FGARs (warfarin, chlorophacinone, and diphacinone) and the non-anticoagulant rodenticides (bromethalin, cholecalciferol, and zinc phosphide). It is critical that pest management professionals (PMPs) and residents alike apply all rodenticides in tamper-resistant bait stations.

For more information about rodent management, see *Pest Notes: Rats* at ipm.ucanr.edu/PMG/PESTNOTES/pn74106.html and *Pest Notes: House Mouse* at ipm.ucanr.edu/PMG/PESTNOTES/pn7483.html.

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