



Pest Management Programs for Small Farms

Use these guidelines to help make sure your animals stay in good health for the show season.

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Rodent problems and pest infestations can easily affect the bottom line of an operation and trigger other issues on the farm that affect the health of the animals raised and people working at the facility.

Why should you have a pest control program for your farm?

Instituting and maintaining a pest control program on your farm will help mitigate the risks associated with a rodent population. There are many methods of control, and a robust pest control program should include several different physical and biological systems. Take time on a regular basis to assess the situation at your farming operation to determine if there is a routine control issue or infestation. Farms should always maintain a pest control program that involves monitoring, evaluation, and treatment of problems. When you implement a comprehensive rodent control program, you will see fewer issues caused by infestation, equating to improved health of the animals and productivity on the farm.

Why should pest problems be considered a big issue?

Rodents are an issue on every farm; however, farmers rarely manage pest populations to the best of their ability. Rodent problems and pest infestations can affect the bottom line and trigger other issues. The environments created on farmsteads and in barns create greater risk for pest infestations. Especially during seasonal changes, rodents such as rats and mice tend to sneak into barns and wreak havoc on barns and animals. While there is a cost associated with implementing a pest control plan, the benefits of having a well-managed rodent population far outweigh the costs of having a major pest infestation at your facility.

Reasons for pest control

Rodents can damage electrical systems, potentially leading to fires, as well as destroy insulation and wood. They can also get into feed, contributing to disease and biosecurity problems.

Rats and mice endanger the health of both animals and people since diseases they carry can be transferred to both.

“Rodents have been recorded to carry up to 45 diseases that can easily be transmitted to farm animals if they are in the same vicinity” (Brown, 2018).

(See Table 1).

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Table 1. Pig Diseases Spread by Rodents

Disease	Agent	Rodent Implicated
Bordetellosis	bacteria	rats
Encephalomyocarditis	virus	rats, mice
Leptospirosis	bacteria	rats, mice
Pseudorabies	virus	rats
Salmonellosis	bacteria	rats, mice
Swine dysentery	bacteria	rats, mice
Swine erysipelas	bacteria	rats
Toxoplasmosis	protozoan	various rodents
Trichinosis	nematode	rats

Source (used with permission): Timm, R. M., Marsh, R. E., Hygnstrom. S. E., & Corrigan, R. M. (2012). *Controlling rats and mice in swine facilities* (Pork Information Gateway Factsheet PIG 04-04-04). U.S. Pork Center of Excellence. <https://porkgateway.org/resource/controlling-rats-and-mice-in-swine-facilities/>

Identifying a rodent control issue

Having a high rodent population at your facility comes with important risks: harming the health of the animals, reducing the structural integrity of your facility, and causing human health issues. Having a pest management plan in place with routine monitoring and being alert to the signs of an increasing rodent population will help diminish these risks. While having some rodents is commonplace on every farm, farmers should understand how to identify what rodents they are dealing with, when an influx to the rodent population at their facilities happens, and how to respond effectively. Using best practices to identify, monitor, and target rodent populations will help control the pest population, mitigate risks to nontargeted animals, protect human health, and improve environmental management on the farm.

Understanding rodent types

All rodents cannot be treated the same and controlled using the same practices. The behavior of mice and rats are different, and they should be managed differently.

Rats

- Are generally larger than field mice or farm mice and cause more damage.
- Have small ears in proportion to their bodies and are known to live up to 2 to 3 years. The rat's head has a blunter snout than that of a mouse, and rats have long hairless tails.
- Have poor eyesight, including being completely color blind.



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- Are creatures of habit as well as shy and nervous, so they stay close to walls and structural parts of the buildings and will follow the same path to and from a feed or water source.
- Easily exploit the structural weaknesses of a building, especially in the fall and winter months.
- Require a water source to remain viable.
- Typically require time to approach new objects or materials.
- Tend to carry bait away and hoard it.

When baiting rats, use existing materials instead of introducing something new such as a bait station. Find the path that rats generally take, identified by droppings, and place the bait next to their typical path.

Mice

- Are smaller than rats.
- Have poor vision; however, they can distinguish all colors except red.
- Have larger ears proportionately when compared to those of rats. The ears sit on a triangular-shaped head.
- Have long, thin, and hairy tails.
- Live over 5 years in the wild.
- Are inquisitive and likely to approach new items and do not need to travel the same path.
- Are known to travel in zigzag patterns, not necessarily keeping next to walls.
- Exist in the “fabric” of a building, feeding and living in the same area.
- Are easily introduced through materials, feed, and supplies brought into the farm.
- Are less responsive than rats to seasonal change.
- Do not need a water source, and the population typically exists year-round.

When baiting mice, place small amounts of bait over a large area or location, making it easier for the mice to find and eat the bait.

Signs of rodents

If rodents are present in your barns, you will see and hear:

- Sounds, such as squeaking.
- Gnawed wood and wires and evidence of their climbing along walls.
- Rodent droppings behind objects and near the food supply.
- Dust-free spots where they have been traveling, most often seen along the outer walls and floorboards.
- Burrow patterns along the outside of the building, showing attempts to get into the barn for warmth and food.
- Smudge marks on the pipes and rafters where the dirt and oil rubbed off by their fur, which will typically leave a greasy film.

In addition, rodents will be active during the day but come into the barn during the night due to the quiet nature of the barn at night.

Rats typically follow the same path when traveling and evidence such as defecation will be seen in the same area.

Managing the rodent population on the farm

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Rodent populations are common occurrences on all farms, regardless of facility and production type or the animals and products being grown and raised. Farmers should implement and maintain a pest control program to help mitigate the risks associated with a rodent population. There are many methods of control and a robust pest control program should include several different physical and biological systems. Farms should always maintain a pest control program that involves monitoring, evaluation, and treatment of problems. When you implement a comprehensive rodent control program, you will see fewer issues caused by infestation, equating to improved health of the animals and productivity on the farm.

Improving the environment of your farmstead or barn

One of the keys to improving the environmental management of a site is to implement an increased pest management system. You can do this by using a routine four-step approach of:

- Increasing hygiene, or cleanliness.
- Rodent-proofing the farmstead or barn.
- Completely and routinely maintaining the site.
- Making needed repairs to the farmstead or site.

Farmers can use best practices to target rodents and mitigate harm to animals and the environment including:

- Keeping the area clear of debris, old equipment, trash, and junk.
- Denying access to food (including dead animals) and water sources.
- Clearing the area of harborage (places where rodents may live and feel protected).
- Removing unwanted vegetation and maintain grassy areas. (This allows for natural predators to have better access to rodents, helping to control the population.)
- Creating and maintaining hard surfaces around the site or barn. (This will prevent rodent burrowing.)
- When needed, using physical or biological methods to help reduce and control the rodent population.

Rodent-proofing the barn

Taking the time to rodent-proof your facility is an essential component of your pest management plan; it helps maintain the integrity of your biosecurity practices and health of the animals. The initial construction footings should extend down around 19 inches into the ground to deter burrowing. Routine inspections and maintenance on the facility should be done to help deter rodent infestations. Usually, rodents enter the barn from cracks around the door frames; under doors; and through broken windows or ripped curtains, water lines and utility hook-ups, vents, and holes surrounding the feed augers and bins. Installing baffles around cables and pipes and placing kickplates on the lower edge of the doors discourages rodents and helps prevent gnawing. Flaps or crushed wire mesh on inlets will also help prevent rodents from entering the facility.

Barns above average in cleanliness are less likely to attract rodents. Best practices include cleaning up feed spills quickly and disposing of spoiled or rotten feed properly, where rodents cannot access it. Removing trash and debris from the facility will also help maintain hygiene and limit exposure to rodents.

Methods of rodent control

Rodent control on farms and around livestock facilities should be a multi-pronged and integrated approach as there is no single method that is 100% effective. Due to the make-up of farms and the availability of feed and materials, farm sites are high-risk areas for rodent populations. A solid rodent control plan may include the use of physical and biological methods as well as rodenticides to remove rodent populations.

Physical Control Methods

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Traps and high-pitch sound-generating devices can provide effective and humane ways of getting rid of small populations of rodents either inside or around the perimeter of the barn. Physical methods are best when used to help control a rodent population and to deter infestation; however, the effectiveness of these methods can be variable and depend on the creativity of the user.

Traps

Snap and glue traps are both effective, and both lead to death of the rodent.

- Snap traps, or break-back traps, are common rodent control methods. The most effective way to lure rats or mice into these traps is to use food and leave the trap alone near a wall or door for 4 to 5 days.
- Glue boards are also effective and are used in a similar way as traps. However, dust sometimes captures on the glue, compromising their effectiveness.

Sound devices

Sound devices, usually ultrasonic, are effective in causing rodents to leave the premises without trapping or killing them.

Biological control methods

The barn cat is commonplace in rural America and finding cats on farms is a frequent occurrence. However, the confidence that people have in cats to control rodent issues in their facilities may be misplaced. Using cats to control or avoid a rodent infestation may actually contribute to other issues. Cats may act as vectors for the introduction of disease. In general, MSU Extension does not recommend using cats for keeping buildings rodent free or keeping rodent populations in check.

Rodenticides

Rodenticides are pesticides used to kill rodents; these products must be proven substantially effective by those that sell or produce them and the efficacy data for the products must be available to the user. Rodenticides can be considered the best method to use when dealing with an infestation of rodents. They are generally grouped as anticoagulants or non-anticoagulants.

Anticoagulants

- Anticoagulants are used in 90% of all rodent baits, and these compounds are typically grouped or referred to as first or second-generation anticoagulants.
- First generation anticoagulants including warfarin and pindone are less toxic and less persistent in animal tissues. Using this type of rodenticide has a lower risk to human hazard and nontargeted animals. These products can take longer to control rat populations, and surplus bait should be available for the rats to feed on.
- Resistance to first generation anticoagulants is widespread in mice.
- Popular second-generation anticoagulants include brodifacoum, bromadiolone, and difethialone.
- Second generational anticoagulants are usually highly effective when dealing with a rodent infestation, and activity may extend to strains of rodents that are resistant to first generation anticoagulants.
- Second generation anticoagulants are considerably more toxic and have a longer half-life. These products have a greater risk to nontargeted animals when ingested and require considerably less bait to be consumed by the rodents to be effective.
- Vitamin K1 acts as an antidote to anticoagulants. A veterinarian can administer it if your dog or cat ingests one of these products.

Non-anticoagulants

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- The most frequently used non-anticoagulants are bromethalin, cholecalciferol, and zinc phosphide.
- These compounds are typically neurotoxins or metabolic inhibitors; they are typically effective against strains of rodents resistant to anticoagulants.
- These compounds may be less safe to use than anticoagulants as there are no known antidotes.

Other classifications

The active ingredients in rodenticides vary from product to product and can be classified in three different ways: acute, sub-acute, and chronic:

- **Acute rodenticides** are fast acting and normally are effective within 24 hours. If a nonlethal dose of an acute rodenticide is ingested, rodents can have bait shyness and not consume any more of the bait.
- **Sub-acute rodenticides** cause death after several days. The lethal dose of the rodenticide may be consumed early on and feeding of this bait may continue until death.
- **Chronic rodenticides** are slow acting and cause death as early as 2 to 3 days or on average from 5 to 7 days.

Bait formulations

Bait formulations are rodenticides blended in the form of meals; cut or whole grain; pellets; wax blocks; edible lards, pastes, and gels; contact gels; or foams and gases. Particulate baits are generally more palatable to rodents when compared to wax blocks, whereas wax blocks are better under some adverse conditions and areas such as sewers and drainage pipes. The types of rodents you are dealing with may dictate which bait formulation is best suited for your use. For example, when baiting outside in burrows, grains are less likely to be moved or kicked out by the rodents. Take care to cover baits or secure them so that the rodents are less likely to remove them.

In Summary

Implementing a proper rodent control program will result in a decreased rodent population, which in turn helps maintain the structural integrity of facilities, diminishes the health risk for your animals, and reduces human health issues associated with pest populations. Using best practices to identify, monitor, and target rodent populations will help control the pest population, mitigate risks to nontargeted animals, work to protect farm productivity and profitability, and improve environmental management on the farm.

For More Information

- You can find out more about pest management on farms and agricultural operations by visiting the Management Over Medication page on the Michigan State University Extension website (www.extension.msu.edu) or by contacting the authors.

Reference

Brown, S. (2018, November 2.) Get your barns ready for winter. *Dairy Herd Management*. Farm Journal. <https://www.dairyherd.com/news/hog-production/get-your-barns-ready-winter>