



Tracking Powders in Rodent Management: A Cautionary Tale

Safety and *efficacy* are increasingly important components of rodent management programs. Safety concerns arise from accidental poisonings of children, pets and wildlife, while failure to effectively manage rodents can result in physical damage to structures, electronics, contamination of food supplies, and expose humans to asthma-inducing allergens, pathogens such as *Leptospirosis*, *Bartonella*, and other food-borne or febrile illnesses.

For rodent management, the concept of success continues to evolve (Frishman 2017). In the past, success was defined by the number of rodents killed during scheduled service visits from the *exterminator*. For today's *pest management professional*, however, successful rodent management considers the entire pest population, aims to eliminate existing rodents, and as best as possible, prevent new infestations. Successful rodent management, therefore, involves sanitation to remove food and water sources, exclusion to keep rodents out, and population reduction techniques to eliminate existing individuals.

Every rodent job is unique, requiring an evaluation of the site and development of an individualized action plan to manage the pest population (Corrigan 1997). This concept replaces the antiquated approach of relying solely on haphazardly placed rodenticides, or rodent-killing pesticides, to solve the problem. Indeed, accurate placement of rodenticides is critical to ensure their effectiveness.

A group of rodenticides that are not well understood and therefore frequently misused are tracking powders. According to label instructions, tracking powders are placed where rodents encounter the powders on their feet and fur, and then ingest the powder during daily grooming activities. When used properly, tracking powders are placed in areas accessible to rodents, but inaccessible to all non-targets (humans, pets, domestic animals and wildlife). Because of the hazards associated with these products, tracking powders are not to be used in ventilation ducts that could force particles into the air, or in areas where they can contaminate food items or food surfaces.

In New York State, only three tracking powders are currently (March 2017) registered for use as rodenticides, each representing a different active ingredient. All three products are "**Restricted-Use Pesticides.**" This designation is given to tracking powders because they present enough risk to human health and the environment that proper training is needed for their safe handling and use. Therefore, only Certified Pesticide Applicators can purchase and apply tracking powders; **apprentices and technicians cannot.** For more information about pesticide certification and product use restrictions in New York, see [Pesticide Applicator/Technician Certification](#) and [Pesticide Safety Education Program \(PSEP\): State Laws and Regulations](#), respectively.

Two of the tracking powders available for use in New York contain anticoagulant active ingredients (chlorophacinone and diphacinone) and have a **Warning** signal word. This means that the pesticide product is moderately toxic if eaten, absorbed, or inhaled. Anticoagulant rodenticides limit the body's ability to produce Vitamin K, which plays a role in blood clotting. When exposed to a lethal dose of anticoagulant rodenticides, an organism will bleed internally and eventually die.

The third tracking powder registered in New York contains zinc phosphide, a single-dose, fast-acting rodenticide with the **Danger** signal word. This designation is used for pesticides that are **highly toxic** to humans by at least one route of exposure: consumption, inhalation or absorption, and requires the word “POISON” to be included in red letters on the front panel of the product label. The mode of action for zinc phosphide is very different from anticoagulants. When ingested, zinc phosphide interacts with acids in a mammal’s stomach, creating acutely toxic phosphine gas that will kill the rodent in one to three days after ingestion. Zinc phosphide tracking powder is registered *only* for indoor applications and *only* against mice in New York because this pesticide, and this formulation, is highly toxic to birds, fish and other mammals. The risks from accidental exposure to zinc phosphide are **significantly greater** than the anticoagulant tracking powders mentioned above.



Figure 1. Excessive use/amount of tracking powder as evidenced by clumping; inappropriate placement in an unprotected area: both violations of the label and law.



Figure 2. Excessive use of tracking powder in bait station, with a 0.5 cm layer of material. An additional violation is the failure to secure the soft bait rodenticide in the station.

An unfortunate trend observed first hand is the overreliance, overuse and misuse of tracking powders to address rodent problems (Figures 1-3). During inspections, I have come across tracking powder applications in food establishments, public spaces, offices and homes, putting numerous people, pets and wildlife at risk of exposure. To me, overuse of tracking powders signifies a lack of understanding about effective rodent management and the real danger of these products. Tracking powders may be misused when applicators are desperate for an “easy” solution to a complex problem, or when applicators succumb to client demands without consideration of unintended consequences.



Figure 3. Egregious violation of label, exceeding location placement, amount of product, and patch size specifications.

Pesticide applicators may also misuse these products if they confuse **rodenticide tracking powders** with **insecticidal “dusts”**. In fact, many applicators will indicate that they are “dusting for mice,” a statement that indicates a lack of understanding about how these products can and should be applied. While insecticidal dusts are used against cockroaches, bed bugs and other crawling insect pests and can be applied using special application equipment, there are restrictions as to how rodenticide tracking powders can be applied based on the label. It is important to note that rodenticide tracking powders are not classified by EPA and state regulatory agencies as dust

formulations. Applicators should take care to use the correct terminology when describing these products, which have very different target pests and modes of action.

To highlight the dangers of tracking powder misuse, consider the scenario in Figure 4. This void was an area of heavy rodent activity based on reports from the client and the presence of feces. In response to complaints and failure to catch mice on glue boards (not the best trap for this job) the pest professional coated all surfaces with tracking powder. It is very likely that any rodent entering this space will be exposed to a lethal dose and die in a matter of days, superficially solving the problem. However, this void is actually the space inside a booth seat at a restaurant. Any rodent that walks through this space and picks up tracking powder can now spread rodenticide where it walks: perhaps onto food preparation surfaces, tables, and seats where people place their belongings or where small children drop their toys and pacifiers. Rodents might die in nearby areas, resulting in putrid odors and decaying animals that can attract other pests such as maggots and beetles. Any contractor (notice the electrical box) or even an information technology worker dealing with the wires in this space may be exposed, unknowingly, to a dangerous tracking powder. They may experience symptoms such as nausea, abdominal pain, tightness of chest, vomiting, diarrhea, restlessness and fever, but not know that it is from pesticide exposure.



Figure 4. Excessive tracking powder use in a void. Mouse droppings are visible as texture under powder to the right of the image.

Tracking powders represent a highly effective tool in rodent management. However, the potential risks and dangers of tracking powders are very significant and cannot be easily dismissed. This is why all rodenticide tracking powders are designated as Restricted-Use Pesticides. These products do not provide long-term solutions to rodent infestations and should never be used to “protect” structural wall, ceiling, or floor voids from rodents. Rather, tracking powders should be used in a very targeted manner as instructed on the pesticide label. It is critically important to note the restrictions on how much tracking powder can be used according to the pesticide label.

For the very same location highlighted in Figure 4, an effective and safe rodent management strategy would have been to seal the space against rodent entry. For mice, this includes any round openings greater than 3/8 inch, and linear gaps/cracks greater than 1/4 inch. The size of the opening will determine the appropriate material that should be used for exclusion, with guidelines available from [Pest Prevention by Design](#).

In place of glue boards, snap traps or passive rodent stations can be used to reduce pest populations, while sanitation improvements can eliminate food sources that are attractive to rodents. Using this approach would eliminate the risk of contamination to food surfaces, prevent re-infestation of the space, and restrict the location of dead rodents to snap traps that can easily be removed, all the while preventing unnecessary exposure to rodenticides. This approach is representative of Integrated Pest Management, or IPM, and offers a way for pest professionals to balance concerns of safety and efficacy in rodent management.

References:

Corrigan, RM. 1997. Rodent Control: A Practical Guide for Pest Management Professionals. GIE Media, Inc., Richfield, OH. 355 pp.

Frishman, AM. "How Rodent Control Has Evolved." Pest Management Professional Magazine, North Coast Media, LLC. Web. URL: www.mypmp.net/2017/01/03/how-rodent-control-has-evolved/

Gervais, JA; B Luukinen; K Buhl; D Stone. 2010. Zinc Phosphide/Phosphine General Fact Sheet; National Pesticide Information Center, Oregon State University Extension Services. Web. URL: <http://npic.orst.edu/factsheets/znpngen.html>.

Links:

Pest Prevention by Design:

<https://sfenvironment.org/download/pest-prevention-by-design-guidelines>

Pesticide Applicator/Technician Certification: www.dec.ny.gov/permits/45618.html

Pesticide Safety Education Program (PSEP): State Laws and Regulations:

<http://psep.cce.cornell.edu/Tutorials/core-tutorial/module02/index.aspx>



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