Fumigants are pesticides that use gas to kill pests. Pests inhale the pesticide and receive the pesticide through their lungs rather than by eating pesticidal bait. While highly effective, fumigants pose some unique safety challenges for applicators. This article will review tips to help applicators use fumigants more safely. This article will only discuss use of fumigants for the control of vertebrate pests in non-structural sites, such as pastures and rangeland. Fumigation of buildings or grain is beyond the scope of this article. Finally, readers should note that the advice presented here does not replace the information provided by the label. The label is the law.

Fumigants fall into three legal classifications, General Use, Restricted Use and Non-regulated. General Use fumigants are registered by the Environmental Protection Agency (EPA), but users do not have to have a pesticide license to use them on property they own or lease. Ignitable gas cartridges, commonly called “gas bombs,” are an example of a General Use fumigant. Restricted Use fumigants also have a registration number from the EPA but may only be applied by licensed individuals. Aluminum phosphide-based products, such as Fumatos®, are an example of a Restricted Use fumigant. Non-regulated fumigants do not have an EPA registration number because they are classified as devices rather than as pesticides. Pressured Exhaust Rodent Control (P.E.R.C.) is an example of a non-regulated fumigant. It works by capturing and compressing the fumes from a gasoline-powered engine, thereby allowing the applicator to inject it into a burrow. Understand that all fumigants are potentially dangerous whether they are regulated or not. Do not fall into the mistaken belief that General Use or non-regulated products are “safe.” They are not.

The greatest challenge facing applicators using fumigants is controlling the dispersal of the toxic gas. Gas from fumigants moves from areas of higher concentration to lower concentration to the extent the space allows. Baits, in contrast, are self-contained in pellets, grains, or blocks. They remain where they are placed until moved. Due to the mobility of gas, applicators must take precautions to protect themselves and non-targets from exposure to toxic fumes. The first and most essential step in being safe with fumigants is to read and follow label use instructions. The vast majority of injuries with fumigants are caused by individuals failing to abide by label instructions. The most egregious errors involve application of fumigants near structures. Labels and instructions often require applicators to maintain minimum distances from structures to prevent the likelihood of gas penetrating gaps in the foundation and risking the health/life of the structure’s occupants. In those limited cases where the label or product instructions do not provide guidance on application distances from structures, use the recommended guidelines below. Note these distances are the closest one should get to a structure when treating rodent burrows.

- Pocket gopher: 150 feet
- Prairie dog: 100 feet
- Ground squirrel: 20 feet
- Rat: 20 feet
- All other rodent species not listed avoid, treating burrows closer than 150 feet from structures.

The period of time during the application process presents the greatest risk of exposure and potential injury to the applicator. Fortunately, following the label or product instructions significantly reduces pesticide exposure risk to the applicator. While that prior comment is certainly true, applicators can take additional steps to reduce their exposure risk even more. What follows are several additional ways fumigant applicators can reduce their risk of pesticide exposure.

The first recommendation is to work in two-person teams. Use one person to apply the product to the burrow, while the other prepares to backfill the burrow. By having the second person ready to close the burrow, the amount of toxic gas that will escape the burrow, and expose applicators is dramatically reduced. Control is improved because the toxic gas remains in the burrow and is not lost to the outside air.

Second, plan the application to start treating from the downwind side and work into the wind. Even though fumigated burrows are backfilled, some gas may still escape. Working into the wind ensures that any gas that happens to escape from treated burrows will be blown away from the location.

Third, fumigate under ideal conditions. Fumigation is best done when the ground is moist. The reason is that moist soil has fewer air pockets for gas to escape when compared to dry soil. It seems strange to speak of gases in the soil, but there are. Water fills gaps between the soil particles, thereby preventing gas from escaping the burrow, as gas escaping the burrow means lower efficacy. When using ignitable gas cartridges, moisture also reduces the fire risk associated with that fumigant.

Fourth, monitor your health, particularly your level of mental clarity. If at any point during application, you feel light-headed, dizzy, weak, tired, develop a headache or experience any change in sense of well-being, STOP. These symptoms are early indicators of possible exposure to the gas. Stop applying fumigants. Get to fresh air. Do not make excuses of being tired, thirsty, or simply having a bad day. Seek medical attention as appropriate. Be sure to evaluate application methods to see if you missed something before returning to the application site.

Finally, keep non-essential people and animals out of the treatment area. Don’t have children or pets lingering around the treatment site.

Fumigants are highly effective pesticidal products and play an important role in the management of rodent pests. But they need to be used properly, in accordance with the label, to be effective while avoiding injury to non-target animals and humans. Information on the use of fumigants for specific vertebrate pests is available in the Vertebrate Pest Bulletin published by the Montana Department of Agriculture. Bulletins may be downloaded from http://agr.mt.gov/Topics/Vertebrate-Pests.