Foam Application in Professional Pest Control

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INTRODUCTION

Professional pest control has used foam for more than 20 years. It was first used to treat under concrete foundations. Now this method is used to treat a variety of surfaces, from wall voids for controlling bed bugs to powderpost beetle galleries in structural wood. Foam is also effective in delivering biocide cleaners to surfaces and floor drains in commercial kitchens.

Many of the labels of household insecticides, termiticides, and wood-protection products have instructions for mixing and using foam. B&G has provided pest control operators with a range of reliable tools for the safe and effective application of foam. Insecticide manufacturers and equipment companies both understand that the foam is a unique method for getting liquid insecticide to 'travel' across uneven surfaces and 'enter' narrow spaces that a typical liquid spray can not.

Most professional pest control companies are familiar with foam, but they may not have a complete understanding of this application method. The objectives of this review are to explain the basic structure and mechanics of foam, and how to use foam in residential and commercial accounts.

FOAM BASICS

You already know a lot about foam, but may not realize it. If you have had a glass of beer, if you have used shaving foam from an aerosol can, or used hair shampoo, you know something about water-based foam. Each of these shows an important characteristic of foam.

- Foam at the top of the beer glass is made of small bubbles. They don't last long but collapse quickly into the liquid below. If you place some of that foam on your hand, you will notice that your hand will be wet after the bubbles break. That liquid (beer) was a part of the bubbles, but it was released when the bubbles broke.

- Shaving foam is made of very small bubbles, and they last a long time. These bubbles do not collapse when you place some of them on your hand. After holding the shaving foam you will notice that you hand does not get wet. It will be slippery but not actually wet because there is little water contained in these small bubbles.

Foam is a mixture of air and liquid. It is made by injecting air into a liquid that contains a small amount of soap. Technically the soap is considered a surfactant, which is a chemical that reduces the surface tension of water. Without a surfactant there can be no foam, without air there can be no foam. The amount of surfactant and air determine everything about foam.

SURFACTANT

The natural surface tension of water can be seen by looking at water drops on a smooth surface. The droplets are rounded along the perimeter and not flat and spread out. The rounded shape is maintained by the strong surface tension or outer 'skin' of the water. The role of a surfactant in making foam is to reduce the surface tension of the water.

- When added to water, molecules of surfactant move to the surface. Once they get there they link together and prevent the tense, outer 'skin' from forming.

Hair shampoo, dishwashing soap, and hand soap have some of the same ingredients as the

foaming agent used in professional pest control. One of these is the surfactant, lauryl sulfate. You will find this listed in the ingredients of the shampoo you use, in the shaving cream, and it is probably in your toothpaste. There is a lot of this chemical in hair shampoo, and hair shampoo makes a lot of foam bubbles.

The role of the surfactant is to permit air to penetrate the liquid to make the foam bubbles. Most modern insecticides are compatible with foaming agents (surfactants) and can be easily made to foam. But a word of caution: generic insecticides often use formulation solvents that can limit the action of surfactants. These generic products may be difficult to make into foam.

- There is a limit to the amount of surfactant or foaming agent necessary to change the surface tension of water to make foam. The surfactant molecules move to the water surface, but there is space for only a certain number of these molecules. After that, the additional surfactant molecules have no influence on the surface, and they have no influence on the production of foam.

Using more foaming agent will produce more foam. There is a limit to the influence of a foaming agent on the production of foam. Adding more and more foaming agent to a spray tank will not continue to increase the foam produced, and will eventually result in clogged valves and nozzles.

AIR

The introduction of air into the liquid is a key step in making foam. The amount of air introduced determines whether 'dry foam' or 'wet foam' is produced. It is important to understand the concept of dry and wet foam because these terms are used to describe some pest control applications of foam.

Dry foam is produced when a large amount of air is added to a liquid. This foam is considered dry because it is mostly air and only a small amount of liquid.

- The foam delivered by the aerosol can of shaving cream is a good example of dry foam. When the liquid leaves the can the pressurized gas expands to create the foam. The shaving cream foam is primarily soap, which will smooth the path of the razor.
- There is little value in using dry foam to deliver insecticides. Only a small amount of liquid carried by this type of foam, which provides little insecticide residue when the foam reaches the surface.

Wet foam is produced when a small amount of air is added to the liquid. It is considered wet because of the quantity of liquid.

- The foam produced by laundry soap and shampoo are examples of wet foam. The large bubbles carry the cleaning agent into the fabric or hair so that the dirt can be dislodged and carried away.
- The foam at the top of a glass of beer is another example of wet foam. Although the bubbles are small, the liquid they contain drains into the beer and the foam head usually collapses in a few minutes.

LIQUID

Almost any liquid can be made into foam, but some liquids are more difficult than others to create foam. It is important to remember that every insecticide formulation is different and may create foam differently. There are many different insecticides, and each manufacturer produces a slightly different formulation. It is the formulation that influences the production of foam.

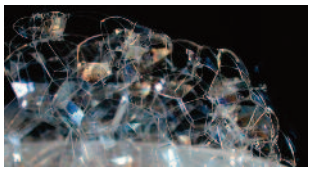
Follow the mixing directions for adding the foaming agent to the final dilution of insecticide.

- The best procedure for using a foaming agent is to add the lowest recommended amount of foaming agent per gallon. Then check your foam. If you want to create more foam, then slowly add more foaming agent until you get the desired foam.

FOAM MECHANICS

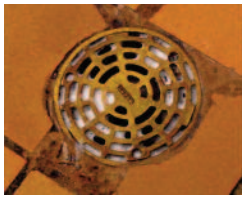
Foam is a method of delivering liquid insecticide to a surface to create an effective residue when the foam collapses and the liquid dries.

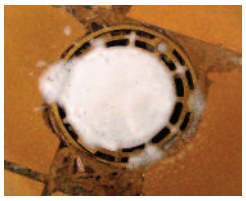
- The liquid insecticide that remains after the foam collapses will control the target pest. The function of foam is to move or carry a lethal amount of that insecticide to the surface.



Liquid will drain from the bubbles to the surface below. This is the result of gravity and the weight of the liquid. All that remains are empty bubbles when the liquid drains to the surface below. These bubbles are clear because they are composed of the surfactant and no insecticide.

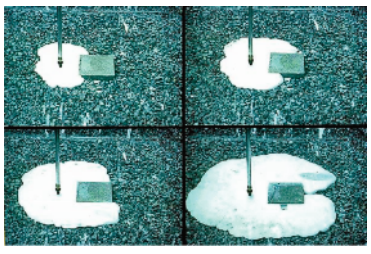
- Not all surfaces contacted by foam will have an effective insecticide residue. Foam can not be used to treat a surface above it, only a surface below it. Foam applied to a void beneath a concrete slab may contact the concrete above, but little or no insecticide will be delivered to that surface.



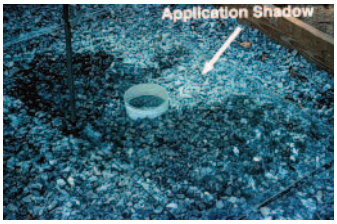


The bubbles of wet foam will collapse in about 30 minutes after they are applied. This indicates that the liquid insecticide has been delivered to the substrate. Foam applied to floor drains collapses quickly when the liquid is carried to the drain pipe below.

FOAM MOVEMENT OVER SOIL SURFACE

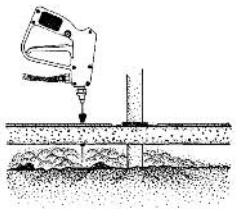


The greatest advantage to using foam is its ability to move across uneven surfaces and around obstacles. Foam can be applied through a nozzle like a liquid, but it is a liquid in 3-D and in slow motion. The foam layer contacts all surface features as it moves forward, and it can surround the vertical obstacles in its path.



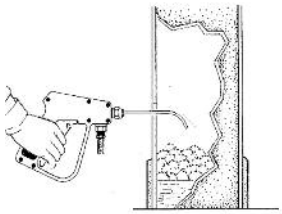
When treating beneath a concrete slab with a liquid spray nozzle, the spray pattern will create a 'spray shadow' of there is an obstruction in front of the spray. This may be a pipe, a mound of soil. The untreated soul in the spray shadow may provide termites a route to enter the structure. The typical wet foam application of insecticide would be able to treat all sides of an angular or round obstruction.

FOAMING UNDER CONCRETE SLAB



Foam applied to the void beneath a concrete slab will move around obstructions, such as pipes, to deliver a uniform residual in the soil. Research on foam treatments under concrete slabs shows that a continuous layer of treated soil is created. This foam application results in a more uniform residue of termiticide and better protection of the structure from termites.

FOAMING IN WALL VOIDS

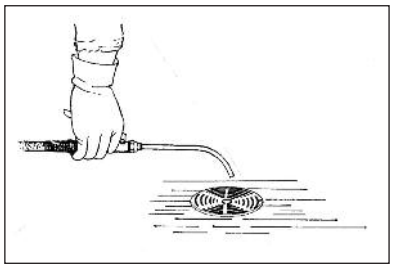


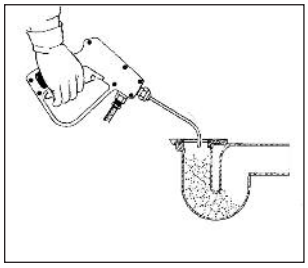
Foam applied to wall voids is an effective method to prevent or control pests that use this space as a harborage, or travel route between rooms or apartments. Foam will establish an insecticide residue on the wood at the sides and bottom of the void. This is the wood that is attacked by termites, and this is the harborage site for cockroaches and silverfish, and a travel route for bed bugs and ants.

FOAMING IN FLOOR DRAINS

Foam can deliver biological cleaners and pest control liquids to floor drains. The microbes in these materials consume the organic material used as food by moth fly and fruit fly larvae.

The benefit of using foam is its the ability to penetrate the drain and contact all surfaces from the top of the drain to the pipe below.

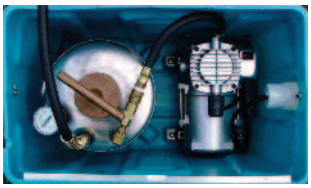




Professional Equipment for Foam Application

VERSAFOAMER 4000

This is a heavy-duty foam application system that includes a 1-gallon stainless steel tank and a compressor enclosed in a leak-proof carry case.



The 7 foot hose and gun-type valve make the Versafoamer 4000 ideal for treating a range of locations, from commercial kitchens to residential wall voids, and it can be used to apply termiticides to sub-slab voids.

The Drain Tip is designed to treat deep into floor drains that may be difficult to treat with the standard curved tip on the Versafoamer 4000.

The sub-slab application tip (Straight Tip) has a rubber gasket to seal the hole drilled in the concrete slab.

VERSAFOAMER HH

This is a hand-held foamer that can be easily carried into residential and commercial accounts. This foamer operates with the 35-40 psi pressure generated by hand-pumping the 1-gallon tank.

The XR-valve on the Versafoamer HH has the same curved tip on the 4000 model, and the optional Drain Tip is also available for this model.

B&G Equipment Company

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