Controlling Mold Growth when Cleaning Flooded or Rain-Wetted Homes

MISSISSIPPI STATE UNIVERSITY EXTENSION

Hurricane victims whose homes have been severely damaged by winds and rainfall or flooding also find themselves confronted with the rapid growth of mold fungi on the wetted interior building components.

Unfortunately, hurricanes often occur during the summer in the hot, humid southern and southeastern United States. The environmental conditions at this time of year also are ideal for the growth of mold fungi.

Long-term residents of this region know that air-conditioning, fans, and ventilation not only make the temperatures in their homes more comfortable but also decrease the interior moisture and chances of mold growth. However, following a hurricane, many homes are exposed to rain or flooding with no way to decrease their moisture. If interior walls and flooring are wet, all wall and/or flooring components (for example, wall coverings, insulation, and framing) are wet and will remain so for an extended period of time. These items are likely to become moldy and must be removed as soon as possible.

However, in the days and weeks following hurricanes Katrina and Rita, a reasonable approach to controlling molds was replaced by near hysteria. Newspaper articles and instant "mold experts" convinced owners of damaged structures that their homes contained "toxic molds" that threatened their lives.

The perceived growth of "toxic mold fungi" within the walls of otherwise habitable structures was of concern to many hurricane victims whose homes were flooded or wetted by rainfall. However, relatively few mold species are "toxic" to humans, and the probability of these causing medical problems is extremely low.

The spores of most molds are airborne, and some can cause allergic reactions in people. But the spores of stachybotrys, a mold that causes toxic responses in humans and can occur on wet building components, are not airborne and people are not likely to come into contact with them.

What Are Mold Fungi?

As a homeowner, you need to understand what molds are and how they can be controlled. Mold fungi are primitive organisms that obtain their food from various materials on which they grow. Molds growing on wood building components use simple sugars and other products stored within specialized wood cells. Molds do not cause structural damage to wood.

The reproductive units of molds are called spores, and these can be seen on the surface of materials colonized by them. These small spores are pigmented and, depending on the mold species, may be black, green, red, yellow, or other colors. In small quantities, these spores are very unlikely to elicit an allergic response. In large numbers, as may occur in flooded or rain-wetted houses along the Gulf Coast, mold spores can trigger respiratory allergic responses in some individuals.

Other irritants, such as the dust created when wall coverings such as gypsum sheetrock are removed, also may cause allergic responses. Susceptible individuals should take precautions, such as wearing respirators or dust masks as needed.

It is usually not necessary to spend money to identify the mold species present. If you see mold in your home, you should take measures to get rid of it, regardless of the type.

Controlling Mold Growth

While they are primitive organisms, molds need the same things humans do in order to grow:

1. Air for respiration.
2. Favorable temperatures. Many mold species grow well between 60 and 90°F.
3. Water. Molds cannot grow on wood with a moisture content of less than about 20 percent. Building components normally have an average moisture content of 10–15 percent.
4. Food. Molds can obtain nutrients from a variety of building components.

If you want to prevent or control mold growth, you must alter one of these four basic factors. For example, dry building components to a moisture content below 20 percent, or add mold-inhibiting fungicides to the food source.

Cleaning/Controlling Microbes in Flooded and Rain-Wetted Homes

The interior building materials of structurally sound, flooded homes on the Gulf Coast were wet and very warm for several weeks after Hurricane Katrina. The floodwaters likely deposited bacteria in the structures, and the warm, wet conditions also contributed to the widespread growth of mold fungi. In instances where house framing remained wet for prolonged periods of time, wood decay fungi resulted.

When cleaning up mold, keep these points in mind:

- People with known mold allergies should not attempt to clean moldy structures.

- Even people who don't have mold allergies should wear particulate masks or other respiratory equipment to avoid inhaling air-borne materials while cleaning.
- Wear light-weight, moisture-resistant coveralls during cleaning operations, and wash these separately from normal laundry.
- Wash your hands often with soap and water.
- Always make sure the electricity and gas have been turned off before you begin cleaning activities.

Flooded Homes

1. First, open all windows for ventilation and remove all carpets, furniture, clothes, and other items that were wetted by floodwaters.
2. Remove interior ceiling and wall coverings and insulation in the wall cavities, attics, and between floor joists.
3. Wash the wall cavities and wall framing with an aqueous low-phosphate detergent solution using low to moderate pressure. Phosphate residues can stimulate the growth of mold fungi on moist surfaces, so be sure to rinse thoroughly. Using sodium hypochlorite (household bleach) solutions is not recommended except on small areas or nonporous materials (such as tile). Sodium hypochlorite is an EPA-registered pesticide, but it is not labeled for treatment of wood or other porous building materials.
4. Spray-treat the framing and wall cavities with a nonvolatile antimicrobial that is registered by the EPA for this use. All pesticides should be applied according to label directions. Restricted-use pesticides should be applied by licensed, certified pesticide technicians. Borate products supplemented with a mold-control agent are recommended because borates will kill bacteria and decay fungi, as well as insects such as termites and roaches. The mold-control agent increases the effectiveness of borates on mold fungi. In addition, borates have low mammalian toxicity, are corrosion inhibitors, and are colorless and odorless. Two EPA-registered products labeled for use on wood for controlling wood-inhabiting insects and fungi are Bora-Care with Mold-Care by Nisus Corporation (www.nisuscorp.com) and Bor-Ram with Mold-Ram by Sostram Corporation (www.sostram.com). These products contain both borate and a mold-control agent. Check with the EPA to see if other products have been registered for use on porous building materials in living spaces.
5. Place fans throughout the structure and open all interior doors. This will increase ventilation and allow materials to dry more quickly.
6. When the framing is dry, have the electrical connections and plumbing within the walls checked by licensed professionals.
7. Replace wall insulation and wall coverings. All closet doors should be louvered to increase interior ventilation.

Rain-Wetted Homes

All of the points discussed above for flooded homes apply to homes "flooded" by rainwater, except for item 3. The wall cavities should be relatively clean when exposed and not require a detergent wash.

In most instances, homes wetted by rainfall have experienced roof damage. A priority item should be to make temporary roof repairs to keep interior materials from getting wet again.

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