Mold Growth – Cleaning Up Flood Damaged Homes

Carroll Welte, Nebraska Extension Educator and Dr. Kandace Fisher-McLean, Missouri Housing and Environmental Design Specialist

Cleaning up and restoring a flood-damaged home is emotional, expensive and exhaustive. There are no shortcuts and or products to make the work easier and faster.

With so much focus on DIY home repair, varied and limited income levels, and the age/health of people affected by the flooding, not to mention NE's climate variability all factor into people's capacity to process and implement best practices for cleaning, disinfecting, drying out and restoring flood damaged homes. It's a challenge to convince people to rely on best practices, to make well-thought out decisions and to be patient.

Mold growth is on everyone's mind after a flood. Dr. Claudette Reichel, Professor and Extension Housing Specialist with Louisiana State University AgCenter presented best practices for cleaning, disinfecting and drying out flood damaged houses. She talked extensively about mold.

Extension and the public health departments should expect an increase in the number of mold-related questions over the next year. All extension staff should take time to review Dr. Reichel's slide presentation and webinar (https://youtu.be/8Luu68SEAMQ).

Kandace and Carroll, offer a few related comments below:

It is recommended in the South that people consider borate treatments be applied to wood in flood-damaged houses to provide some resistance to termites, decay and mold (Slide 41).

In Nebraska, if termite damaged wood is discovered in a flood-damaged house it should be removed and replaced with sound wood, and after that the homeowner should consider a protective termite treatment to prevent future infestations. If there is no termite damage present and people are taking steps to repair and remediate moisture issues, then there is no **need** for the borate treatment. However, it is an option on the table for homeowners who have the wherewithal to hire a licensed applicator.

People should read all product safety data sheets and labels to be informed about the hazards associated with use of any chemical product in the clean-up, disinfecting, drying and restoration of flood-damaged houses and or other structures. People should follow all precautions and recommendations and in particular, wear personal protection equipment such as a NIOSH-approved N95 mask and work in well-ventilated spaces.

People should also read and understand product disclaimers, in particular, products that claim to be mold inhibitors. While some mold species may not grow, mold spores re-suspended into the air may be dead or alive and may carry mycotoxins that could cause adverse health effects.

If a flood-damaged structure is not clean, moisture has not been managed or controlled and wood is not dry before restoration (i.e. a moisture meter indicates less than 16% moisture in wood), mold spores could resettle and eventually grow. It is imperative that people **do not to cover wall cavities or floors until wood has been properly cleaned, disinfected and is completely dry.**

The potential health hazards from mold depend on the level of exposure and the sensitivity of the individual persons exposed to the mold. People should be on mold alert throughout the entire process of cleaning, disinfecting, drying and restoring a flood-damaged house or other structure and remain on mold alert for some time thereafter.

There are also potential health hazards associated with chemicals in cleaning products, disinfectants and other products used in the restoration of flood-damaged buildings. People should always follow the directions and precautions stated on product labels. Here again, the potential health hazards from chemicals depend on the level of exposure and the sensitivity of the individual persons exposed to the chemicals.

For people concerned about mold growth in flood damaged homes **Isolate and Ventilate** (Slide 29) is a key step. Setting up a containment area helps minimize the risk of massive mold spore release into the clean or unaffected area of a flood damaged structure. Sealing off doorways with 6 to 9 mil polyethylene sheets can also help with keeping the humidity level in the flood affected area below 60%. While high humidity doesn't seem to be a problem, higher temperatures and humidity will arrive any day now. Encourage people to monitor humidity during the drying-out phase with an inexpensive relative humidity gauge purchased from a hardware or farm-supply store.

As per **Remove & Discard** (Slide 31) In Nebraska drywall should be removed two foot above the wet line and discarded. Absolutely all carpet padding should be removed and discarded.

When there is a flooding event, people should be as concerned with killing bacteria as much as they're concerned about mold. As stated in Slide 33 the main purpose of using disinfectants is to kill bacteria. On the **EPA Registered Hard Surface Disinfectants Comparison Chart** on Slide 40 in the bottom left cell labeled Pre-cleaning Needed, notice that under both Bleach and Quaternary Ammonium Compounds, BEST PRACTICES ADVISE PRE-CLEANING ALL SURFACES BEFORE DISINFECTING. Disinfectants are less effective on dirty surfaces. In NebGuide G2108, *Entering and Cleaning Up Flooded Homes*, 15 to 20 minutes of wet contact time is recommended for disinfectants to be effective.

Absolutely **Speed Dry!!** (Slide 42) if possible and after isolating clean areas from flood affected areas. But consider the air flow. Remember to pull potentially contaminated air out windows and openings within the flood affected space, not through windows or openings within clean, unaffected areas.

In the notes on Slide 42 Dr. Reichel states "Remember that mold grows on materials that stay damp for more than 2-3 days, so that is the drying time goals." In typical flooding events water recedes in a few days. It's been over six weeks since the March flood and some homes are still standing in water. In 2011 along the Missouri River some houses stood in water up to 90 days. The longer the flood duration the more saturated materials become. Therefore speed drying out wood and/or other materials could take much longer than 2-3 days to dry. Not everyone has access to mechanical drying equipment, generators or electricity. Encourage people to check out the moisture meters and to test wood building materials. Again the moisture reading should be less than 16%, according to Dr. Reichel.

Although the presentation may have referenced light power washing, it isn't recommended because of the damage this can cause to building materials. Also power washing may cause more moisture to penetrate wood and other building materials which prolongs the drying out period.

The goal is to rebuild safe and healthy homes. Therefore, it's recommended that the restoration phase is started no sooner than six months after the flood event. People should consider using flood-resistant building materials. Another consideration is to install drain covers and other features to minimize flood damage in the future. After all it's not a matter of if there's going to be another flooding event, it's a matter of when.

For more information about mold and or restoring healthy homes post-disaster download:

NebGuide G2108, *Entering and Cleaning Up Flooded Homes*
http://extensionpublications.unl.edu/assets/html/g2108/build/g2108.htm

Report to the U.S. Environmental Protection Agency of Guidance Documents to Safely Clean, Decontaminate, and Reoccupy Flood-Damaged Houses
https://www.epa.gov/sites/production/files/2018-10/documents/flood-related_cleaning_contractor_report-final-508_8.31.18.pdf

Rebuild Healthy Homes – Guide to Post-disaster Restoration for a Safe and Healthy Home
https://www.hud.gov/program_offices/healthy_homes/disasterrecovery