

A School's Guide
to
Dealing with

MOLD

Using
Integrated
Pest Management
(IPM)



Wisconsin Department of Agriculture, Trade & Consumer Protection

Division of Agricultural Resource Management

PO Box 8911, Madison WI, 53708-8911 - Phone: 608-224-4547

Website: datcp.state.wi.us

Mold problems can present a health hazard to school occupants, but so can improperly - used chemicals that may be used to kill mold.

Building occupants should use Integrated Pest Management (IPM) to address the threat of unhealthy levels of mold growth. Prevention, monitoring, documentation, cleaning, (with or without chemicals) are the basic steps of IPM - the safer approach to preventing pest problems, including mold, before they occur, and dealing with them if they are found.

What is mold and why is it a problem?

'Mold' is a common term for hundreds of naturally occurring species of microscopic plants called 'fungi' and is present in small amounts in the air around us. Mold can either reproduce or lay dormant for a time, as 'spores', then become active again. Depending on the species, spores can live many months and be easily transported on air currents. Normally the presence of mold is not a problem. But when conditions are right, mold can multiply to intolerable levels.

- relative humidity greater than 50%,
- temperatures between 40 and 100 °F,
- organic matter as a substrate (insect bodies, wet wood, carpet, wallboard ...)

Some of the common symptoms associated with overexposure to mold are similar to flu or allergy symptoms and include sinus congestion, watery or itchy eyes and sore throat. In extreme cases, some individuals are susceptible to mold-induced asthma. (Note that these symptoms can also be caused by other irritants such as

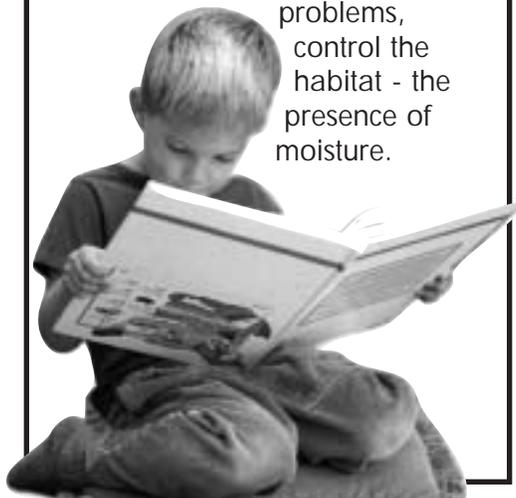
extremely high or low humidity, chemicals, insect and rodent droppings, other pests such as dust mites and they depend on people's varying reactions to their environment.) Excess mold can also cause structural impacts such as building discoloration, deterioration and equipment malfunction.

Prevention - Keep it dry

- Adjust humidity in the building to 30-50% (impedes mold growth, but is not uncomfortably dry)
- Routinely empty standing water in condensation pans at chillers
- Restrict water infiltration - seasonally check flashing, weather-stripping, caulking around conduit entering the building. Make prompt repairs.
- Insulate pipes and seal ductwork to eliminate condensation.
- With acoustic fiberglass-insulated AC ductwork, seal the ductwork, run only conditioned, dehumidified air through it and periodically inspect the insulation for visible mold.

It is virtually impossible to get rid of all mold and mold spores indoors; they are always present floating on the air and dust particles. To minimize mold

problems, control the habitat - the presence of moisture.



Look for the Signs

Monitoring is the cornerstone to IPM. Inspect your school routinely.

If you sample for mold, you will often find it in some concentration, since it is so common. The best way to determine if the amount of mold present is or will likely become a problem is by a documented increase of occupant complaints about health-related symptoms or comfort issues such as odor. Another way to determine if there's a mold problem is to visually inspect the facility for mold buildup.

Health complaints

Occupant's information will help show patterns related to a specific part of a building, a time of day or week, or certain operations that generate airborne contaminants. For example, you might find a high percentage of complaints about stuffy air on Monday mornings after the air handling system has not been operating over the weekend. But if those types of complaints do not clear up after the system runs for a few hours, they could be related to another type of air quality problem; perhaps mold, second-hand smoke or use of a cleaning product. Be inquisitive.

Visual inspection

Common sources of mold problems are where water is allowed to collect indoors such as at a waterline leak, condensation on pipes, ductwork or equipment, or on entryway carpeting.

If you suspect a mold problem and the humidity is not within 30-50%, adjust the building's humidification so it is within that

range. If humidity is within the proper range, look for signs of water infiltration. Since water flows downhill, you might find a leak somewhere in the building by tracing the likely path of water flow. Start where you find a problem, like a visible patch of mold or a damp or wet surface, and search for the most likely path from points above or even on the same level as that location. Look for leaks or condensation. You can also look for likely areas where materials of different temperature meet such as cold water pipes running above a warmer ceiling where the dew point at the pipe's surface can condense humidity and drip water onto ceiling tiles below. One IPM coordinator even found moldy condensate pooled in the narrow 'U' channel supporting a skylight. Finding a leak, especially a slow or old one, can be more difficult than it sounds.

Consider the potential that a pipe in a wall is leaking. But first, investigate all other possibilities before you open a wall, because most indoor air quality problems such as this are corrected by proper operation of the air handling system.



Record keeping

Keep a record of the building's water-related problems.

- Frequency, time, location, and a description of where the water went and what was done about it will be helpful information should a mold problem develop.
- Keep track of indoor air quality complaints: specific location, time and day of the week when symptoms occur.
- Work with your school personnel office to design any survey or recording system that collects information about individual employee's health. Certain personal details are considered to be medical records requiring confidentiality and special handling.

Monitoring and record keeping will generate valuable data to help identify and communicate to occupants the true problem when there may be many theories afoot.

Cleaning - If mold is found.

Mechanical methods

Remove and dispose of all wet building materials (e.g., wet or contaminated carpet, wallboard, pinned on duct lining) - even after they have dried. If dried materials are re-exposed to humidity, spores of the mold that are present in these materials can begin to multiply. Take precautions to avoid mold overexposure during cleanup - wear personal protective equipment and minimize turbulence by closing doors, windows and air ducts during the work.

On hard, solid surfaces like sealed concrete, metal ducts,

and tile, remove debris such as dirt, insects, and visible mold by brushing or scraping it off. A household bleach mixture of 1 part bleach to 10 parts water (10%) works well as a final wash or mist to disinfect the surface after all mechanical methods are used. Use proper personal protective measures during this process, including hand & eye protection and good ventilation.

Chemical Product choices

The Environmental Protection Agency (EPA) cautions against using anti-microbial agents to prevent or treat mold problems in air ducts. EPA finds the effectiveness of these products is questionable. Because mold spores can have long dormant stages, preventive pesticides applied to the school would have to stay active over a long period. Lingering pesticides can potentially be unhealthy for building occupants and may also create resistance in mold species, making them ineffective on the mold. Pesticides are labeled for use in specific areas at specific rates of application, and very few are registered for this purpose. (see [http://www.kellysolutions.com/wi/.](http://www.kellysolutions.com/wi/))

Labels for pesticide products registered by the EPA will list the ingredients and legal uses of the products. Read and understand the label before purchase and application of any product. Labels also contain important safety information.

Pesticide Use on School Property

Wisconsin law requires that when pesticides are applied on public school grounds (indoors or outdoors), the applicator must be certified and licensed in the appropriate category, by the Wisconsin Department of Agriculture, Trade and Consumer Protection. The treated area must be posted for 72 hours thereafter. Pesticides are classes of chemicals that include insecticides, herbicides, rodenticides and other products that kill, repel or control pests. Only the use of sanitizers, disinfectants, or germicides are exempt from these requirements. Posting requirements can be found in s. 94.715, Wis. Stats. or at the DATCP website.

There are other state and federal health and environmental regulations that pertain to the use of chemicals on school property. School staff should weigh all the safety health and environmental requirements that pertain to use of chemicals at school, and the usefulness of non-chemical methods before electing chemical products for use on mold.



Hiring a Professional Service

If hiring an outside service to deal with mold, DATCP recommends that school personnel discuss the following points with the intended contractor:

- references of experience with mold remediation
- plan of approach to the problem - including steps that include inspection and, if necessary, sampling to verify presence of a mold problem
- methods to be used to correct any problem found
- product name and label information for all chemicals recommended for use and an explanation as to why chemical use is preferable to non- chemical treatment
- produce their DATCP pesticide applicator license and certification if a pesticide will be used, and the product's not labeled solely as a sanitizer, germicide or disinfectant

Mold problems can present a health hazard to building occupants, but so can improperly-used chemicals. School personnel are legally responsible for proper use of pesticides on school grounds.

Building occupants should never concede to use of chemicals as a first line or on-going remedy for mold problems. Prevention and mechanical methods should be adequate and may be followed with a mist of diluted 1:10 household bleach as a final disinfecting step.

For further information contact:

Wisconsin Department of Agriculture, Trade and Consumer Protection,
608-224-4547

School Integrated Pest Management Program assistance:

- http://datcp.state.wi.us/arm/agriculture/pest-fert/pesticides/school_ipm.html
- agriculture@datcp.state.wi.us

Wisconsin Occupational Health Laboratory - Mycology lab for mold sample analysis:
608-224-6261

US EPA information:

- <http://www.epa.gov/iaq/molds/>
- <http://www.epa.gov/iaq/pubs/airduct.html>

Wisconsin Department of Health and Family Services, mold safety and health information:
608-266-2817

DATCP pesticide applicator certification and licensing information:
608-224-4560

- <http://datcp.state.wi.us/arm/agriculture/pest-fert/pesticides/licenses/>

Pesticide information:

- <http://www.kellysolutions.com/wi/>